Sodium Affected Soils Basic Basic Knowledge 101
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With an ever-increasing proportion of the world’s population living in cities, soil properties such as salinity, acidity, water retention, erosion and pollution are becoming more significant in urban areas. While these are known issues for agriculture and forestry, as urban development increases, it is essential to recognise the potential of soil properties to create problems for the environment as well as structural concerns for buildings and other engineering works. Understanding Soils in Urban Environments explains how urban soils develop, change and erode. It describes their physical and chemical properties with a focus on specific soil problems that cause environmental damage, such as acid sulfate soils, and also affect the integrity of engineering structural works. This fully revised second edition addresses contemporary issues, including an increase in the use of green roofs and urban green space as well as manufactured soils in a variety of urban environments. Understanding Soils in Urban Environments provides a concise introduction to all aspects of soils in urban environments and will be extremely useful to students in a wide range of disciplines, from soil science and urban forestry and horticulture, to planning, engineering, construction and land remediation, as well as to engineers, builders, landscape architects, ecologists, planners and developers. The sections in this handbook series reflect the input of different editors and advisory boards, and as a consequence, there is considerable variation in both the depth and coverage offered within a given area. However, an attempt has been made throughout to bring together pertinent information that will serve the needs of nonspecialists, provide a quick reference to material that might otherwise be difficult to locate, and furnish a starting point for further study. The project was undertaken with the realization that the initial volumes in the series could have some obvious deficiencies that will necessitate subsequent revisions. In the meantime, it is felt that the primary objectives of the Sections Editors and their Advisory Boards has been met in this first Edition. The first soil survey in the Philippines was done by Mr. Clarence Dorsey, an American soil scientist in the province of Batangas in 1903. The Soils of
the Philippines, however, is the first comprehensive summary of more than a century of soil-survey work in this country. It integrates the soil concepts of the reconnaissance soil-survey results, which commenced as early as 1934 and continued until the mid 1960s, with the semi-detailed soil surveys that continue to this day. The result is the first-ever genetic key for classifying Philippine soils at soil series level; thus, making it possible for any newcomers to the soil survey field to confidently produce their own soil map, at a more detailed map scale, to suit the project requirements. This book brings together discussions on soils and soil mapping units and up-to-date international techniques and technologies. It makes soils relevant to current political realities and national issues. As soil survey moves from a reductionist agricultural-development planning tool to a more holistic and integrated approach, to enable us to understand our dynamic and complex environment, The Soils of the Philippines will be the only source of authoritative and updated data on soil resources for macro-level resource management planning for decades to come. With a vanishing breed of experienced soil surveyors, not only in the Philippines but also worldwide, it may remain the only book on Philippine soils for the next hundred years or more. Since soils follow a geological and not a human time frame, the contents of this volume will stay relevant for soil surveyors even in a fast changing world. As the country leaps from an agricultural economy towards modernization and a more diversified economic base, some of the soil series in the Philippines, for example the Guadalupe series underlying the skyscrapers of Makati City, are becoming extinct as a result of urban development. Therefore, this book serves as the repository for the soils that we possess, the soils that have been lost through decades of urbanization while, at the same time, it creates a soil classification system for the soils we are yet to discover. Due to the adverse stress conditions typical of olive cultivation in desert conditions, the olive tree is responding with production of high levels of antioxidant substances. Among these substances are polyphenols, tocopherols, and phytosterols. Studies have shown that saline irrigated varieties of olives have demonstrated advantages over those irrigated with tap water. This is just one of the aspects of desert cultivation of olives that is covered in Desert Olive Oil Advanced Biotechnologies. Based on 20 years of research, the book expounds on the appropriate selection of olive varieties with high productivity and oil quality, the impact of foliar nutrition on decreasing alternate bearing and increasing fruit quality, improving efficiency of mechanical harvesting, and increasing efficiency of oil extraction and oil quality regulating analysis. Addresses olive cultivation methods for semi-arid environments Focuses on intensive cultivation using saline and municipal waste recycled irrigation water and their significant impact on the production and nutritional value of olive oil Integrated and multidisciplinary approaches providing a comprehensive view of the desert olive industry Provides key considerations including ecological, biotechnological, agricultural and political impacts With the growing popularity and availability of precision equipment, farmers and producers have access to more data than ever before. With proper implementation, precision agriculture management can improve profitability and sustainability of production. Precision Agriculture Basics is geared at students, crop consultants, farmers, extension workers, and practitioners that are interested in practical applications of site-specific agricultural management. Using a multidisciplinary approach, readers are taught to make data-driven on-farm decisions using the most current knowledge and tools in crop science, agricultural engineering, and geostatistics. Precision Agriculture Basics also features a stunning video glossary including interviews with agronomists on the job and in the field. Definitional Glossary of Agricultural Terms (Vol-1) includes the terms related mainly to agronomy, crop production, sustainable agriculture, agro-ecology, environment, soil science, soil fertility, plant nutrition, organic farming, latest concepts in agronomy, agro-forestry and grassland agriculture, agricultural economics and farm management, etc. It explains, especially the new terms, in a comprehensive and easy to understand way. Very often descriptive text, related terms, synonyms and antonyms are given
in addition to the proper definition to help the reader to understand the term in its context and practical use. Although it is primarily a definitional glossary of agricultural terms used in India, but various terms in common use in other developing countries are also included. Salt-affected soils such as saline or sodic soils are distributed in all continents at various levels of problem intensity. They are soils with high amounts of soluble salts and/or sodium ions. An updated information of their distribution and drivers is a first step towards their sustainable management. This book provides technical guidelines and approach for developing a harmonized multiscale soil information of salt-affected soils. The book is organized into three sections covering seven chapters. The sections are sequentially arranged but independently designed to benefit focused readership who may want to go straight to any section. Section 1 gives the background information. It has three chapters covering existing literature on the characteristics and mapping methods for salt problems in the soil. It is intended to illustrate the basic concepts, linkage of the characteristics of salt-affected soils with input data requirements for their mapping, existing classification methods, and global distribution of these soils. Section 2 covers the methodological procedures for developing multiscale spatial information of salt-affected soils. It has two chapters describing requirements, input data preparation, and the procedural steps for developing spatial information of salt-affected soils. It outlines how data from different sources and characteristics are harmonized and integrated to produce information of salt-affected soils. Section 3 covers information sharing and resources mobilization when developing information on salt-affected soils. It gives the guidelines for preparing spatial maps and steps for value-addition to benefit end-users of the information. It also contains a generic training program for building technical capacity for mapping salt-affected soils. This book on the sustainable use of soils and water addressed a variety of issues related to the utopian desire for environmental sustainability and the deviations from this scene observed in the real world. Competing interests for land are frequently a factor in land degradation, especially where the adopted land uses do not conform with the land capability (the natural use of soil). The concerns of researchers about these matters are presented in the articles comprising this Special Issue book. Various approaches were used to assess the (im)balance between economic profit and environmental conservation in various regions, in addition to potential routes to bring landscapes back to a sustainable status being disclosed. Origin, classification and distribution of salt-affected soils; saline soils and their management; sodic soils and their management; salinity problems of the dryland regions; water quality and crop production; socio-economic considerations in reclamation and management of salt-affected soils; This open access book is an outcome of the collaboration between the Soil and Water Management & Crop Nutrition Section, Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture, Department of Nuclear Sciences and Applications, International Atomic Energy Agency (IAEA), Vienna, Austria, and Dr. Shabbir A Shahid, Senior Salinity Management Expert, Freelancer based in United Arab Emirates. The objective of this book is to develop protocols for salinity and sodicity assessment and develop mitigation and adaptation measures to use saline and sodic soils sustainably. The focus is on important issues related to salinity and sodicity and to describe these in an easy and user friendly way. The information has been compiled from the latest published literature and from the authors’ publications specific to the subject matter. The book consists of six chapters. Chapter 1 introduces the terms salinity and sodicity and describes various salinity classification systems commonly used around the world. Chapter 2 reviews global distribution of salinization and socioeconomic aspects related to salinity and crop production. Chapters 3 covers comprehensively salinity and sodicity adaptation and mitigation options including physical, chemical, hydrological and biological methods. Chapter 4 discusses the efforts that have been made to demonstrate the development of soil salinity zones under different irrigation systems. Chapter 5 discusses the quality of irrigation water, boron toxicity and relative tolerance to
boron, the effects of chlorides on crops. Chapter 6 introduces the role of nuclear techniques in saline agriculture. The constant growth of the world’s population and the decline of the availability of land and soil resources are global concerns for food security. Other concerns are the decrease in productivity and delivery of essential ecosystems services because of the decline of soil quality and health by a range of degradation processes. Key soil properties like soil bulk density, organic carbon concentration, plant available water capacity, infiltration rate, air porosity at field moisture capacity, and nutrient reserves, are crucial properties for soil functionality which refers to the capacity of soil to perform numerous functions. These functions are difficult to measure directly and are estimated through indices of soil quality and soil health. Soil degradation, its extent and severity, can also be estimated by assessing indices of soil quality and health. "Geospatial Technology for Land Degradation Assessment and Management" uses satellite imagery and remote sensing technologies to measure landscape parameters and terrain attributes. Remote sensing and geospatial technologies are important tools in assessing the extent and the severity of land and soil degradation, their temporal changes, and geospatial distribution in a timely and cost-effective manner. The knowledge presented in the book by Dr. R.S. Dwivedi shows how remote sensing data can be utilized for inventorying, assessing, and monitoring affected ecosystems and how this information can be integrated in the models of different local settings. Through many land degradations studies, land managers, researchers, and policymakers will find practical applications of geospatial technologies and future challenges. The information presented is also relevant to advancing the Sustainable Development Goals of the United Nations towards global food security. More than ever before, a compelling need exists for an encyclopedic resource about soil - the rich mix of mineral particles, organic matter, gases, and soluble compounds that foster both plant and animal growth. Civilization depends more on the soil as human populations continue to grow and increasing demands are placed upon available resources. The Encyclopedia of Soils in the Environment is a comprehensive and integrated consideration of a topic of vital importance to human societies in the past, present, and future. This important work encompasses the present knowledge of the world's variegated soils, their origins, properties, classification, and roles in the biosphere. A team of outstanding, international contributors has written over 250 entries that cover a broad range of issues facing today's soil scientists, ecologists, and environmental scientists. This four-volume set features thorough articles that survey specific aspects of soil biology, ecology, chemistry and physics. Rounding out the encyclopedia's excellent coverage, contributions cover cross-disciplinary subjects, such as the history of soil utilization for agricultural and engineering purposes and soils in relation to the remediation of pollution and the mitigation of global climate change. This comprehensive, yet accessible source is a valuable addition to the library of scientists, researchers, students, and policy makers involved in soil science, ecology, and environmental science. Also available online via ScienceDirect - featuring extensive browsing, searching, and internal cross-referencing between articles in the work, plus dynamic linking to journal articles and abstract databases, making navigation flexible and easy. For more information, pricing options and availability visit www.info.sciencedirect.com. A distinguished international group of editors and contributors Well-organized encyclopedic format providing concise, readable entries, easy searches, and thorough cross-references Abundant visual resources - photographs, figures, tables, and graphs - in every entry Complete up-to-date coverage of many important topics - essential information for scientists, students and professionals alike Winner of an Outstanding Academic Title Award from CHOICE Magazine Encyclopedia of Environmental Management gives a comprehensive overview of environmental problems, their sources, their assessment, and their solutions. Through in-depth entries and a topical table of contents, readers will quickly find answers to questions about specific pollution and management issues. Edited by the esteemed Sven Erik Jørgensen and an advisory board of renowned specialists, this four-
volume set shares insights from more than 500 contributors—all experts in their fields. The encyclopedia provides basic knowledge for an integrated and ecologically sound management system. Nearly 400 alphabetical entries cover everything from air, soil, and water pollution to agriculture, energy, global pollution, toxic substances, and general pollution problems. Using a topical table of contents, readers can also search for entries according to the type of problem and the methodology. This allows readers to see the overall picture at a glance and find answers to the core questions: What is the pollution problem, and what are its sources? What is the "big picture," or what background knowledge do we need? How can we diagnose the problem, both qualitatively and quantitatively, using monitoring and ecological models, indicators, and services? How can we solve the problem with environmental technology, ecotechnology, cleaner technology, and environmental legislation? How do we address the problem as part of an integrated management strategy? This accessible encyclopedia examines the entire spectrum of tools available for environmental management. An indispensable resource, it guides environmental managers to find the best possible solutions to the myriad pollution problems they face. Also Available Online This Taylor & Francis encyclopedia is also available through online subscription, offering a variety of extra benefits for researchers, students, and librarians, including: Citation tracking and alerts Active reference linking Saved searches and marked lists HTML and PDF format options Contact us to inquire about subscription options and print/online combination packages. US: (Tel) 1.888.318.2367 / (email) e-reference@taylorandfrancis.com International: (Tel) +44 (0) 20 7017 6062 / (email) online.sales@tandf.co.ukThe Voluntary Guidelines for Sustainable Soil Management (VGSSM) embody a framework for worldwide application addressing sustainable management of soils (SSM) in all type of land use systems. They promote the effective and viable maintenance and enhancement of the ecosystem services that soils provide such as food, feed, fiber production, climate regulation, nutrient cycling, carbon sequestration, and the regulation of water quality and quantity. Their overarching goals are to achieve food security for all, improve nutrition and support the progressive realization of a judicious management of non-renewable natural resource in the context of sustainable development. They represent a key output for the Global Soil Partnership that demonstrate once again to be an effective global policy forum where global soil issues are discussed and addressed by multiple stakeholders. The Guidelines serve as both a complementary tool fostering the implementation of the revised World Soil Charter and as a reference for a wide range of committed stakeholders, such as government officials, policy makers, farmers, pastoralists, forest and land managers, extension specialists and agricultural advisors, development partners, civil society, private sector and, academia, etc. The VGSSM’s added value is in its principal aim: setting out established scientific principles and internationally acknowledged recommended management practices for the responsible governance of soils. By setting out these technical and policy recommendations, they provide guidance to all stakeholders on how sustainable soil management can be achieved. Bringing together a wealth of knowledge, Environmental Management Handbook, Second Edition, gives a comprehensive overview of environmental problems, their sources, their assessment, and their solutions. Through in-depth entries and a topical table of contents, readers will quickly find answers to questions about environmental problems and their corresponding management issues. This six-volume set is a reimagining of the award-winning Encyclopedia of Environmental Management, published in 2013, and features insights from more than 400 contributors, all experts in their field. The experience, evidence, methods, and models used in studying environmental management are presented here in six stand-alone volumes, arranged along the major environmental systems. Features The first handbook that demonstrates the key processes and provisions for enhancing environmental management Addresses new and cutting-edge topics on ecosystem services, resilience, sustainability, food–energy–water nexus, socio-ecological systems, and more Provides an excellent basic knowledge on
environmental systems, explains how these systems function, and offers strategies on how to best manage them. Includes the most important problems and solutions facing environmental management today. In this third volume, Managing Soils and Terrestrial Systems, the general concepts and processes of the geosphere with its related soil and terrestrial systems are introduced. It explains how these systems function and provides strategies on how to best manage them. It serves as an excellent resource for finding basic knowledge on the geosphere systems and includes important problems and solutions that environmental managers face today. This book practically demonstrates the key processes, methods, and models used in studying environmental management. The course work for various degree programs are constantly revised and or new courses added so that the future teachers, researchers and planners are able to face the new emerging challenges. The environmental concerns of irrigated agriculture in the form of water logging and soil salinity are expanding and impacting food grains production. These challenges are commonly articulated at various forums. Thus, reclamation, management and crop production practices of waterlogged salt affected soils have been introduced as a subject in agricultural and agricultural engineering colleges. Since there is a general lack of a good textbook on this subject, authors have attempted to fill this gap through the current publication titled ‘Crop Production in Salt Affected Soils’. It comprehensively deals with the fundamentals of land reclamation principles and crop production practices. It has been divided into 16 Chapters. The book begins with general introduction comprising of categorization of salt affected soils, extent and distribution and nature and physical, chemical and biological properties. Other chapters include basic information on on-farm land development, hydrology, irrigation practices, drainage methods, leaching, soil salinization, chemical amendments, and new innovative techniques including agronomic and cultural practices related to land reclamation. Crop production practices for select cereal, oil seeds, sugar, fiber and forage, green manure crops, grasses and forest plantations are also included. Chapter sixteen covers the economic evaluation and social issues involved in land reclamation programs. A Glossary of terms has been added for quick overview of the terms used in the book. The textbook designed and developed for the undergraduate/post graduate students of agricultural/agricultural engineering has been profusely illustrated so that students are able to visualize the processes and phenomena being dealt with. Besides serving as a text book, it will prove to be a handy resource book to conduct specialized training programs on land reclamation. We believe that the book will find its due place in the shelves of students and teachers, field functionaries and college libraries of state agricultural universities and civil engineering colleges. This Encyclopedia of Land Use, Land Cover and Soil Sciences is a component of the global Encyclopedia of Life Support Systems (EOLSS), which is an integrated compendium of twenty one Encyclopedias. Land is one of our most precious assets. It represents space, provides food and shelter, stores and filters water, and it is a base for urban and industrial development, road construction, leisure and many other social activities. Land is, however not unlimited in extent, and even when it is physically available its use is not necessarily free, either because of natural limitations (too cold, too steep, too wet or too dry, etc.) or because of constraints of access or land tenure. This 7-volume set contains several chapters, each of size 5000-30000 words, with perspectives, applications and extensive illustrations. It carries state-of-the-art knowledge in the fields of Land Use, Land Cover and Soil Sciences and is aimed, by virtue of the several applications, at the following five major target audiences: University and College Students, Educators, Professional Practitioners, Research Personnel and Policy Analysts, Managers, and Decision Makers and NGOs. Beginning with vol. 9, only new and continuing but modified projects are listed. Vols. 8- should be kept as a record of continuing but unchanged projects. Soil and Environmental Chemistry, Second Edition, presents key aspects of soil chemistry in environmental science, including dose responses, risk characterization, and practical
applications of calculations using spreadsheets. The book offers a holistic, practical approach to the application of environmental chemistry to soil science and is designed to equip the reader with the chemistry knowledge and problem-solving skills necessary to validate and interpret data. This updated edition features significantly revised chapters, averaging almost a 50% revision overall, including some reordering of chapters. All new problem sets and solutions are found at the end of each chapter, and linked to a companion site that reflects advances in the field, including expanded coverage of such topics as sample collection, soil moisture, soil carbon cycle models, water chemistry simulation, alkalinity, and redox reactions. There is also additional pedagogy, including key term and real-world scenarios. This book is a must-have reference for researchers and practitioners in environmental and soil sciences, as well as intermediate and advanced students in soil science and/or environmental chemistry. Includes additional pedagogy, such as key terms and real-world scenarios. Supplemented by over 100 spreadsheets to migrate readers from calculator-based to spreadsheet-based problem-solving that are directly linked from the text. Includes example problems and solutions to enhance understanding. Significantly revised chapters link to a companion site that reflects advances in the field, including expanded coverage of such topics as sample collection, soil moisture, soil carbon cycle models, water chemistry simulation, alkalinity, and redox reactions. Integrated Management of Salt Affected Soils in Agriculture is a concise guide to evaluating and addressing soil issues related to saline content. Methods focused, the book combines agricultural and soil-based insights to efficiently remediate salt-affected soil. Environmental stress conditions such as salinity have a devastating impact on plant growth and yield, causing considerable loss to agricultural production worldwide. Soil salinity control prevents soil degradation by salinization and reclaim already saline soils. This book will help develop the proper management procedures, to solve problems of crop production on salt-affected soils. Provides both agricultural science and soil science perspectives on soil salinity. Identifies differences in salt-affected soils and appropriate remediation options. Includes methodologies based on existing scenario and targeted outcomes. This edited volume focuses on the characterization, reclamation, bioremediation, and phyto-remediation of salt affected soils and waterlogged sodic soils. Innovative technologies in managing marginal salt affected lands merit immediate attention in the light of climate change and its impact on crop productivity and environment. The decision-making process related to reclamation and management of vast areas of salt affected soils encompasses consideration of economic viability, environmental sustainability, and social acceptability of different approaches. The chapters in this book highlight the significant environmental and social impacts of different ameliorative techniques used to manage salt affected soils. Readers will discover new knowledge on the distribution, reactions, changes in bio-chemical properties and microbial ecology of salt affected soils through case studies exploring Indian soils. The contributions presented by experts shed new light on techniques such as the restoration of degraded lands by growing halophyte plant species, diversification of crops and introduction of microbes for remediation of salt infested soils, and the use of fluorescent pseudomonads for enhancing crop yields. As the author states in his Preface, this book is written at a time when scientific and lay communities recognize that knowledge of environmental chemistry is fundamental in understanding and predicting the fate of pollutants in soils and waters, and in making sound decisions about remediation of contaminated soils. Environmental Soil Chemistry presents the fundamental concepts of soil science and applies them to environmentally significant reactions in soil. Clearly and concisely written for undergraduate and beginning graduate students of soil science, the book is likewise accessible to all students and professionals of environmental engineering and science. Chapters cover background information useful to students new to the discipline, including the chemistry of inorganic and organic soil components, soil acidity and salinity, and ion exchange and redox phenomena. However, discussion also extends to
sorption/desorption, oxidation-reduction of metals and organic chemicals, rates of pollutant reactions as well as technologies for remediating contaminated soils. Supplementary reading lists, sample problems, and extensive tables and figures make this textbook accessible to readers. Key Features * Provides students with both sound contemporary training in the basics of soil chemistry and applications to real-world environmental concerns * Timely and comprehensive discussion of important concepts including: * Sorption/desorption * Oxidation-reduction of metals and organics * Effects of acidic deposition and salinity on contaminant reactions * Boxed sections focus on sample problems and explanations of key terms and parameters * Extensive tables on elemental composition of soils, rocks and sediments, pesticide classes, inorganic minerals, and methods of decontaminating soils * Clearly written for all students and professionals in environmental science and environmental engineering as well as soil science

This handbook has been developed to bridge the gap between the advanced salinity literature and practical information on salinity intended for lay audiences. A user-friendly resource for agricultural consultants and advisors, as well as for local, state and federal agricultural and water agency management staff. Includes thirty-eight chapters covering a broad spectrum of salinity and drainage topics, written so as to be easily understood by anyone with a general agricultural background. Also includes appendices presented as a shorthand guide to assessing soil salinity and to determining the suitability of a given water for irrigation. Illustrated with 27 tables and 44 figures. One of a series of water management handbooks prepared by the UC Irrigation Program.

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