Applications Of Soil Physics

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Soil Mechanics Fundamentals - Isao Ishibashi 2010-12-14
While many introductory texts on soil mechanics are available, most are either lacking in their explanations of soil behavior or provide far too much information without cogent organization. More significantly, few of those texts go beyond memorization of equations and numbers to provide a practical understanding of why and how soil mechanics work.
Soil Physics - Theo John Marshall 1979
Now in its third edition, this textbook gives a comprehensive account of soil physics with emphasis on field applications. Copyright © Libri GmbH. All rights reserved.
Principles of Soil Physics - Rattan Lal 2004-05-28
Principles of Soil Physics examines the impact of the physical, mechanical, and hydrological properties and processes of soil on agricultural production, the environment, and sustainable use of natural resources. The text incorporates valuable assessment methods, graphs, problem sets, and tables from recent studies performed around the globe and offers an abundance of tables, photographs, and easy-to-follow equations in every chapter. The book discusses the consequences of soil degradation, such as erosion, inhibited root development, and poor aeration. It begins by defining soil physics, soil mechanics, textural properties, and packing arrangements . The text continues to discuss the theoretical and practical aspects of soil structure and explain the significance and measurement of bulk density, porosity, and compaction. The authors proceed to clarify soil hydrology topics including hydrologic cycle, water movement, infiltration, modeling, soil evaporation, and solute transport processes. They address the impact of soil temperature on crop growth, soil aeration, and the processes that lead to the emission of greenhouse gases. The final chapters examine the physical properties of gravelly soils and water movement in frozen, saline, and water-repellant soils. Reader-friendly and up-to-date, Principles of Soil Physics provides unparalleled coverage of issues related to soil physics, structure, hydrology, aeration, temperature, and analysis and presents practical techniques for maintaining soil quality to ultimately preserve its sustainability.
An Introduction to Soils for Environmental Professionals - Duane L. Winegardner 2019-01-22
An Introduction to Soils for Environmental Professionals assembles and presents the basic principles of each of the major soil science fields. It introduces fundamental concepts and shows the interrelationships between the various branches of soil science - from mineralogy to soil physics. Each chapter was reviewed by a professional in the particul
Environmental Soil and Water Chemistry - V. P. Evangelou 1998-10-12
An excellent knowledge base in soil and water chemistry --the ideal basic text for students of the environmental sciences In Environmental Soil and Water Chemistry, leading soil and water authority V. P. Evangelou presents a complete overview of the principles and applications of soil science, addressing the subject by viewing the interactions between soil and water as a basis for understanding the nature, extent, and treatment of polluted soil and water. The text opens with a discussion of principles--the fundamental tenets of chemistry needed to understand soil and water quality and treatment of polluted resources--and continues with a look at applications for the control and treatment of soil and water. Suitable for advanced undergraduates and beginning graduate students, this extensive, timely volume covers: * Water chemistry and mineral solubility; soil minerals and surface chemical properties and their behavior; and electrochemistry and kinetics * The control of agricultural chemical pollution and land disturbance pollution; colloids and transport processes in soils; and technologies for measuring quality and executing treatment * Specific chemical contaminants and the procedures for their neutralization In a world where chemical pollutants pose a grave threat to the earth's natural resources, Environmental Soil and Water Chemistry offers students both an excellent textbook and a handy reference on the wide spectrum of environmental problems they will confront outside the classroom.
Biochar: Fundamentals and Applications in Environmental Science and Remediation Technologies - 2021-11-11
Biochar: Fundamentals and Applications in Environmental Science and Remediation Technologies, Volume Six provides readers with the fundamentals of scientific and technological aspects of biochar application in stormwater treatment, its use in contaminant removal, greenhouse gas mitigation, as landfill cover material, and new environmental and agronomic applications. Chapters in this new release cover Biochar application for soil remediation in a redox-sensitive environment, Remediation of heavy metal contaminated soil: Role of biochar, Role of biochar as a cover material in Landfill waste disposal system- Perspective from Unsaturated soil mechanics, Biochar in soil re-engineering, Green remediation of contaminated agricultural land using biochar, and more. Additional chapters cover the Impact of biochars on redox processes in soils, Biochar for manipulation of manure properties, A relationship paradigm between biochar amendments and green house gas emissions, Biochar amalgamation with clay: Enhanced performance for environmental remediation, Functionalization of biochar using microbial consortia, and the Potential role of biochar to mitigate the negative impacts of climate change on water quality. Provides up to-date information on the use of biochar for contaminant remediation, as landfill cover material, and as a tool for energy transition Includes the aspect of biochar’s use in mitigating impacts of climate change and how manure properties can be altered through biochar addition Covers the role of microbial consortia on biochar functionalization
Applied Soil Physics - R.J. Hanks 2011-09-16
This second edition was undertaken to update information which has become available since the first edition and to convert completely to the SI system. The main objective of this book is to stress application of soil physics principles to real problems. The problems are heavily oriented toward the soil water-plant-atmosphere continuum. This book grew out of a course taught to upper level undergraduate and graduate students from many different disciplines and backgrounds. I have found that problems are a very good teaching tool because students need to solve them on their own and adapt them to their own understanding. I have found this problem-solving experience to be greatly enhanced if examples are available. Thus, this book is heavily laden with examples. This edition includes reference to many models, involving basic concepts discussed herein, by which it is possible to solve many more realistic--and more complex--problems such as drainage below the root zone (and associated pollution), plant growth as related to climate, soil properties, management, etc. The intent is to encourage students to advance to the next level. The book is not intended to be a complete introduction to applied soil physics, but rather to emphasize problem-solving and the important aspects of soil water and temperature.
Soil Chemistry and its Applications - Malcolm Cresser 1993-05-06
The central role of soil chemistry in the ecosystem and other disciplines is becoming increasingly important. For example the effects of the increased levels of atmospheric carbon dioxide, and accelerated use of pesticides, on soil fertility has been a focus of much high-level debate. This text begins by defining

the relationship between soil chemistry and other fields such as plant science and pollution science. A detailed description of the components of soils follows, including inorganic, mineral and organic matter. The book addresses cogent issues such as soil fertility and soil pollution. In a concluding chapter, a review of future analytic advances in the study of soil chemistry is given, emphasising the importance of the soil chemist in equitable and sustainable land use and agricultural policy. The book is an ideal starting point for the student undertaking undergraduate study in the environmental and soil sciences.

Soil Physics - H. Don Scott 2000-09-11

This textbook is designed for use in university courses on the subject and as a reference book for practitioners and students. The work describes the physical properties of soils and how these properties affect agriculture and the environment. It is unique in its inclusion of pedology, taxonomy and pedotransfer functions.

Soil Physics Companion - A.W. Warrick 2001-12-28

An authoritative reference on soil physics, Soil Physics Companion is lavishly illustrated with graphs, charts, line drawings, and equations. The book provides a valuable source of material and reference for most contemporary topics of soil physics and the vadose zone - arguably the most comprehensive volume available. In addition to being a reliable reference, it is valuable as an advanced text from which topics of interest can be selected by the teacher and student. Topics include: Static and dynamic aspects of soils Transport processes and soil water measurements Movement of soil water in the context of overall water balance and its key role in the hydrologic cycle Energy balance and thermal regime Soil-plant-atmospheric interface Solute transport and soil-gas movement Spatial variability Building on the work begun in the bestselling Handbook of Soil Science, this reference takes soil physics one step further. Convenient and easy-to-use, it provides in-depth information at your fingertips. When you need easily accessible, readily available facts and theories, you need the Soil Physics Companion.

Soil Physics - T. J. Marshall 1996-05-31

Now in its third edition, this textbook gives a comprehensive account of soil physics with emphasis on field applications for students and research workers engaged in water resources studies, soil sciences, and plant sciences. The authors have added chapters on soil erosion, conservation, and the role of soil in affecting water quality to this new edition. The book gives an account of how water influences the structure and strength of soil; how plants absorb water from soils; how water from rain and irrigation enters the soil and flows through it to contribute to stream flow and flow in artificial drains; how soluble salts and chemical pollutants are transported; how soils are eroded by water and wind; and how the evaporation rate from the land surface is influenced by soil water supply, the nature of the plant cover and the evaporative power of the atmosphere. This book will be useful to students and research workers in environmental sciences, hydrology, agriculture, soil science, and civil engineering.

Introduction to Environmental Soil Physics - Daniel Hillel 2003-12-17

An abridged, student-oriented edition of Hillel's earlier published Environmental Soil Physics, Introduction to Environmental Soil Physics is a more succinct elucidation of the physical principles and processes governing the behavior of soil and the vital role it plays in both natural and managed ecosystems. The textbook is self-contained and self-explanatory, with numerous illustrations and sample problems. Based on sound fundamental theory, the textbook leads to a practical consideration of soil as a living system in nature and illustrates the influences of human activity upon soil structure and function. Students, as well as other readers, will better understand the importance of soils and the pivotal possition they occupy with respect to careful and knowledgeable conservation. Written in an engaging and clear style, posing and resolving issues relevant to the terrestrial environment Explores the gamut of the interactions among the phases in the soil and the dynamic interconnection of the soil with the subterranean and atmospheric domains Reveals the salient ideas, approaches, and methods of environmental soil physics Includes numerous illustrative exercises, which are explicitly solved Designed to serve for classroom and laboratory instruction, for self-study, and for reference Oriented toward practical problems in ecology, field-scale hydrology, agronomy, and civil engineering Differs from earlier texts in its wider scope and holistic environmental conception

Introduction to Soil Physics - Daniel Hillel 2013-10-22

This book is a unified, condensed, and simplified version of the recently issued twin volumes, Fundamentals of Soil Physics and Applications of Soil Physics. Nonessential topics and complexities have been deleted, and little prior knowledge of the subject is assumed. An effort has been made to provide an elementary, readable, and self-sustaining description of the soil's physical properties and of the manner in which these properties govern the processes taking place in the field. Consideration is given to the ways in which the soil's processes can be influenced, for better or for worse, by man. Sample problems are provided in an attempt to illustrate how the abstract principles embodied in mathematical equations can be applied in practice. The author hope that the present version will be more accessible to students than its precursors and that it might serve to arouse their interest in the vital science of soil physics.

Handbook of Soil Sciences (Two Volume Set) - Pan Ming Huang 2018-10-03

An evolving, living organic/inorganic covering, soil is in dynamic equilibrium with the atmosphere above, the biosphere within, and the geology below. It acts as an anchor for roots, a purveyor of water and nutrients, a residence for a vast community of microorganisms and animals, a sanitizer of the environment, and a source of raw materials for co

Biological Approaches to Sustainable Soil Systems - Norman Uphoff 2006-03-03

Global agriculture is now at the crossroads. The Green Revolution of the last century is losing momentum. Rates of growth in food production are now declining, with land and water resources becoming scarcer, while world population continues to grow. We need to continue to identify and share the knowledge that will support successful and sustainable agriculture systems. These depend crucially on soil. Gaining international attention, Dr. Uphoff’s efforts to promote and develop sustainable agriculture was recently featured in the N.Y. Times Led by Norman Uphoff, internationally renowned for his proactive approach to world hunger, this volume brings together 102 experts representing 28 nations and multiple disciplines to report on achievements in sustainable soil-system management. While accepting some continuing role for chemical and other external inputs, this book presents ways in which crops can be produced cost effectively in greater abundance with lessened dependence on the exogenous resources that have driven the expansion of agriculture in the past. Including the work of both researchers and practitioners, this important volume — · Explores soil systems in a variety of climate conditions · Discusses the importance of symbiotic relationships between plants and soil organisms, looking at crops as integral and interdependent participants in ecosystems · Seeks to reduce the distance between scientific research and technical practice · Examines related considerations such as pest and disease control, climate change, fertility restoration, and uses of monitoring and modeling With 50 self-contained chapters, this work provides researchers, practitioners, and policy makers with a comprehensive understanding of the science and steps needed to utilize soil systems for the long-term benefit of humankind. For information on the SRI, System of Rice Intensification being developed by Uphoff and others, go to http://ciifad.cornell.edu/sri/

Essential Soil Physics - K. H. Hartge 2016-11

Soils are the porous skin of the Earth with variable and complex structures composed of solid, liquid and gaseous phases. This textbook (based on the 4th, German language edition) introduces the reader gently but comprehensively to soil physical processes. The authors discuss both the origin and dynamics of soil physical properties and functions -- including volume-mass relations of the solid, water and gas phases, grain and pore size distributions, permeability and storage capacity for water, gases and heat -- and finally soil deformation and strength in relation to mechanical and hydraulic stresses resulting in structural changes through compaction, kneading, slaking and soil crusting.

Vadose Zone Hydrology - Daniel B. Stephens 2018-02-06

Vadose Zone Hydrology describes the elements of the physical processes most often encountered by hydrogeologists and ground-water engineers in their vadose zone projects. It illustrates the application of soil physics to practical problems relevant to the characterization and monitoring of the vadose zone. It includes an introduction to physical processes, including basic flow theory, and provides examples of important field-scale processes that must be recognizable by hydrogeologists. Considerable attention is given to the concepts of recharge, including how it is most accurately evaluated in the vadose zone. Field and laboratory methods for characterizing hydraulic properties in the vadose zone are also covered, and case studies illustrating these methods are provided. New and emerging technologies for monitoring the

vadose zone, particularly for the purpose of detecting contaminants, are highlighted. In the last section of the book, additional case studies are presented, demonstrating applications related to seepage detection, landfill monitoring, and soil gas investigations. This book is written from the perspective of hydrogeologists and is designed to be directly applicable and to maintain continuity and consistency between chapters. It will be an invaluable primer for environmental or geotechnical consultants, regulators, or students who have no prior formal academic training in unsaturated flow concepts. Because the text contains some of the latest advances in this field, it will be an excellent reference for geologists and engineers currently working on problems of vadose zone hydrology.

Environmental Soil Physics - Daniel Hillel 1998-09-09

Environmental Soil Physics is a completely updated and modified edition of the Daniel Hillels previous, successful books, Introduction to Soil Physics and Fundamentals of Soil Physics. Hillel is a Pulitzer Prize-winning author, one of the true leaders in the field of environmental sciences. The new version includes a chapter and problems on computational techniques, addresses current environmental concerns and trends. Updates and expands the scope of Hillel's prior works, Fundamentals of Soil Physics (1980)and Applications of Soil Physics (1980) Explores the wide range of interactions among the phases in the soil and the dynamic interconnections of the soil with the subterranean and atmospheric domains Draws attention to historical and contemporary issues concerning the human management of soil and water resources Directs readers toward solution of practical problems in terrestrial ecology, field-scale hydrology, agronomy, and civil engineering Incorporates contributions by leading scientists in the areas of spatial variability, soil remediation, and the inclusion of land-surface processes in global climate models

Scaling Methods in Soil Physics - Yakov Pachepsky 2003-03-26

The scaling issue remains one of the largest problems in soil science and hydrology. This book is a unique compendium of ideas, conceptual approaches, techniques, and methodologies for scaling soil physical properties. Scaling Methods in Soil Physics covers many methods of scaling that will be useful in helping scientists across a range of soil-rel

Soil Physics - William A. Jury 2004-03-25

The completely revised and updated edition of the classic guide to soil physics The revised edition of an environmental soil science classic, Soil Physics, Sixth Edition presents updated and expanded material on the latest developments in the industry, providing the best preparation for students and a state-of-the-art reference for professionals. Through a systemic use of physical principles, Soil Physics, Sixth Edition demonstrates how to simplify the general theory used in transport processes for specific applications. With broad coverage of the role soil plays in the environment, this Sixth Edition offers more than seventy worked problems illustrating specific lessons in the book, and features: * New material on soil's influence on the health of an ecosystem * Expanded coverage of modern in-site and noninvasive field-scale subsurface measurement techniques * Discussions on the latest advances in regional and watershed hydrology * Up-to-date information on the use of algorithms and computers in the study and modeling of soil processes * New coverage of preferential flow Soil Physics, Sixth Edition is an essential volume for students and professionals in soil science, natural resource management, forestry, agriculture, hydrology, and civil and environmental engineering.

Applications of Soil Physics - Daniel Hillel 1980

Infiltration and surface runoff. Internal drainage and redistribution following infiltration; Ground drainage; Evaporation from bare-surface soils; Uptake of soil moisture by plants; Water balance and energy balance in the fields; Irrigation and crop response; Tillage and soil structure management; The development and extension of penmans evaporation formula; Freezing phenomena in soils; Similitude and scaling of soil-water phenomena; Spatial variability of soil physical properties in the field; Solute transport during infiltration in to homogeneous soil.

Introduction to Soil Physics - Natasha Kennedy 2019-06-19

The study of the physical properties and physical processes of the soil is under the domain of soil physics. It is a multidisciplinary science that integrates the principles of physics, physical chemistry, meteorology and engineering for the study of soil components, their phases and dynamics. Such investigations drive solutions to problems in agriculture, ecology and engineering. This textbook is a compilation of chapters that discuss the most vital concepts in the field of soil physics. Different approaches, evaluations and methodologies have been included in this book. As this field is emerging at a rapid pace, the contents of this book will help the readers understand the modern concepts and applications of the subject.

Principles of Soil and Plant Water Relations - M.B. Kirkham 2014-04-21

Principles of Soil and Plant Water Relations, 2e describes the principles of water relations within soils, followed by the uptake of water and its subsequent movement throughout and from the plant body. This is presented as a progressive series of physical and biological interrelations, even though each topic is treated in detail on its own. The book also describes equipment used to measure water in the soil-plant-atmosphere system. At the end of each chapter is a biography of a scientist whose principles are discussed in the chapter. In addition to new information on the concept of celestial time, this new edition also includes new chapters on methods to determine sap flow in plants dual-probe heat-pulse technique to monitor water in the root zone. Provides the necessary understanding to address advancing problems in water availability for meeting ecological requirements at local, regional and global scales Covers plant anatomy: an essential component to understanding soil and plant water relations

Soil Physics with HYDRUS - David E. Radcliffe 2018-10-03

Numerical models have become much more efficient, making their application to problems increasingly widespread. User-friendly interfaces make the setup of a model much easier and more intuitive while increased computer speed can solve difficult problems in a matter of minutes. Co-authored by the software’s creator, Dr. Jirka Šimůnek, Soil Physics with HYDRUS: Modeling and Applications demonstrates one- and two-dimensional simulations and computer animations of numerical models using the HYDRUS software. Classroom-tested at the University of Georgia by Dr. David Radcliffe, this volume includes numerous examples and homework problems. It provides students with access to the HYDRUS-1D program as well as the Rosetta Module, which contains large volumes of information on the hydraulic properties of soils. The authors use HYDRUS-1D for problems that demonstrate infiltration, evaporation, and percolation of water through soils of different textures and layered soils. They also use it to show heat flow and solute transport in these systems, including the effect of physical and chemical nonequilibrium conditions. The book includes examples of two-dimensional flow in fields, hillslopes, boreholes, and capillary fringes using HYDRUS (2D/3D). It demonstrates the use of two other software packages, RETC and STANMOD, that complement the HYDRUS series. Hands-on use of the windows-based codes has proven extremely effective when learning the principles of water and solute movement, even for users with very little direct knowledge of soil physics and related disciplines and with limited mathematical expertise. Suitable for teaching an undergraduate or lower level graduate course in soil physics or vadose zone hydrology, the text can also be used for self-study on how to use the HYDRUS models. With the information in this book, you can run models for different scenarios and with different parameters, and thus gain a better understanding of the physics of water flow and contaminant transport.

Occupational Outlook Handbook - United States. Bureau of Labor Statistics 1976

Transport & Fate of Chemicals in Soils - H. Magdi Selim 2014-09-17

During the last four decades, tremendous advances have been made towards the understanding of transport characteristics of contaminants in soils, solutes, and tracers in geological media. Transport & Fate of Chemicals in Soils: Principles & Applications offers a comprehensive treatment of the subject complete with supporting examples of mathematical models that describe contaminants reactivity and transport in soils and aquifers. This approach makes it a practical guide for designing experiments and collecting data that focus on characterizing retention as well as release kinetic reactions in soils and contaminant transport experiments in the laboratory, greenhouse), and in the field. The book provides the basic framework of the principals governing the sorption and transport of chemicalsin soils. It focuses on physical processes such as fractured media, multiregion, multiple porosities, and heterogeneity and effect of scale as well as chemical processes such as nonlinear kinetics, release and desorption hysteresis, multisite and multireaction reactions, and competitive-type reactions. The coverage also includes details of sorption behavior of chemicals with soil matrix surfaces as well the integration of sorption characteristics with mechanisms that govern solute transport in soils. The discussions of applications of the principles of

sorption and transport are not restricted to contaminants, but also include nitrogen, phosphorus, and trace elements including essential micronutrients, heavy metals, military explosives, pesticides, and radionuclides. Written in a very clear and easy-to-follow language by a pioneer in soil science, this book details the basic framework of the physical and chemical processes governing the transport of contaminants, trace elements, and heavy metals in soils. Highly practical, it includes laboratory methods, examples, and empirical formulations. The approach taken by the author gives you not only the fundamentals of understanding of reactive chemicals retention and their transport in soils and aquifers, but practical guidance you can put to immediate use in designing experiments and collecting data.

Applications of Soil Physics - Daniel Hillel 2012-12-02

Applications of Soil Physics deals with the applications of soil physics and covers topics ranging from infiltration and surface runoff to groundwater drainage, evaporation from bare-surface soils, and uptake of soil moisture by plants. Water balance and energy balance in the field are also discussed, along with tillage and soil structure management. The development and extension of Penman's evaporation formula is also described. This book is comprised of 14 chapters and begins with a systematic description of the field-water cycle and its management, with emphasis on infiltration and runoff; redistribution and drainage; evaporation and transpiration; and irrigation and tillage. Subsequent chapters focus on transpiration from plant canopies; freezing phenomena in soils; scaling and similitude of soil-water phenomena; spatial variability of soil physical properties; and movement of solutes during infiltration into homogeneous soil. Concepts of soil-water availability to plants are considered, together with principles of irrigation management and the advantages and limitations of drip irrigation. This monograph is intended for upper-level undergraduate and graduate students of the environmental, engineering, and agronomic sciences.

Soil-water Interactions - Shingo Iwata 1988

Emphasizing pioneering achievements, this work offers a clear and systematic description of various soil-water phenomena and their applications to soil problems such as water retention and the flux of water in soils and clays. This second edition contains material on the physical properties of adsorbed water, the application of fractal theory to solute and water flows in field soils, fingering research, and more.

Soil Physics with HYDRUS - David E. Radcliffe 2010-05-21

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Soil Physics - Leonard D. Baver 1972-11-17

The soil as a disperse system; The viscosity and swelling of soil colloids; The dynamic properties of soils; Soil structure classification and genesis; Soil Structure-evaluation and agricultural significance; Soil aeration; The thermal regime of soils; Soil water retention; Soil water movement; Soil water-the field moisture regime; Soil water - plant relations; Soil water menagement; Soil erosion - water erosion; Soil erosion - wind erosion.

Ecological Climatology - Gordon B. Bonan 2008-09-18

This book introduces an interdisciplinary framework to understand the interaction between terrestrial ecosystems and climate change. It reviews basic meteorological, hydrological and ecological concepts to examine the physical, chemical and biological processes by which terrestrial ecosystems affect and are affected by climate. The textbook is written for advanced undergraduate and graduate students studying ecology, environmental science, atmospheric science and geography. The central argument is that terrestrial ecosystems become important determinants of climate through their cycling of energy, water, chemical elements and trace gases. This coupling between climate and vegetation is explored at spatial scales from plant cells to global vegetation geography and at timescales of near instantaneous to millennia. The text also considers how human alterations to land become important for climate change. This restructured edition, with updated science and references, chapter summaries and review questions, and over 400 illustrations, including many in colour, serves as an essential student guide.

Soil Physics - T. J. Marshall 1996-06-13

Now in its third edition, this textbook gives a comprehensive account of soil physics with emphasis on field applications for students and research workers engaged in water resources studies, soil sciences, and plant sciences. The authors have added chapters on soil erosion, conservation, and the role of soil in affecting water quality to this new edition. The book gives an account of how water influences the structure and strength of soil; how plants absorb water from soils; how water from rain and irrigation enters the soil and flows through it to contribute to stream flow and flow in artificial drains; how soluble salts and chemical pollutants are transported; how soils are eroded by water and wind; and how the evaporation rate from the land surface is influenced by soil water supply, the nature of the plant cover and the evaporative power of the atmosphere. This book will be useful to students and research workers in environmental sciences, hydrology, agriculture, soil science, and civil engineering.

Structure and Function of Roots - F. Baluska 2013-11-11

In 1971, the late Dr. J. Kolek of the Institute of Botany, Bratislava, organized the first International Symposium devoted exclusively to plant roots. At that time, perhaps only a few of the participants, gathered together in Tatranska Lomnica, sensed that a new era of root meetings was beginning. Nevertheless, it is now clear that Dr. Kolek's action, undertaken with his characteristic enormous enthusiasm, was rather pioneering, for it started a series a similar meetings. Moreover, what was rather exceptional at the time was the fact that the meeting was devoted to the functioning of just a single organ, the root. One possible reason for the unexpected success of the original, perhaps naive, idea of a Root Symposium might lie with the fact that plant roots have always been extremely popular as experimental material for cytologists, biochemists and physiologists whishing to probe processes as diverse as cell division and solute transport. Of course, the connection of roots with the rest of the plant is not forgotten either. This wide variety of disciplines is now coupled with the development of increasingly sophisticated experimental techniques to study some of these old problems. These factors undoubtedly contribute to the necessity of continuing the tradition of the root symposia. The common theme of root function gives, in addition, a certain unity to all these diverse activities.

Soil Physics - Manoj K. Shukla 2013-11-26

Designed for undergraduate and graduate students, this book covers important soil physical properties, critical physical processes involving energy and mass transport, movement and retention of water and solutes through soil profile, soil temperature regimes and aeration, and plant-water relations. It includes new concepts and numerical examples fo

Application of Soil Physics in Environmental Analyses - Wenceslau Geraldes Teixeira 2014-07-11

The importance to preserve soil and water have is increasingly recognized. Agricultural practices and ecological trends both affect and are affected by soil physical properties. The more frequency of natural disasters, as landslides and thunderstorms addresses the importance to integrate soil characteristics in predictive models. Soil physics research has grown considerably specially in the use of innovative sensors, soil databases, and modeling techniques have been introduced into soil water relationship and

environmental monitoring. Those advances are thoroughly dispersed in articles and conference proceedings In this volume, the authors will bring together the effectiveness of many new field and lab sensors and examine the current state-of-the-art in modeling and data analysis. It also includes innovative approaches and case studies in tropical soils. Future directions in soil physics research are given by key researchers in this discipline.

Application of Soil Physics in Environmental Analyses - Wenceslau Geraldes Teixeira 2014-06-30

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Scaling in Soil Physics, Principles and Applications - Daniel Hillel 1990

Scaling of freezing phenomena in soils; Miller similitude and generalized scaling analysis; Application of scaling to soil-water movement considering hysteresis; Application of scaling to the characterization of spatial variability in soils; Application of scaling to the analysis of unstalbe flow phenomena; Characteristic lenghts and times associated with processes in the root zone; Scaling of mechanical stresses in unsaturated granular soils; The consequences of fractal scaling in heterogeneous soils and porous media.

Hydropedology - Henry Lin 2012-07-09

Hydropedology is a microcosm for what is happening in Soil Science. Once a staid discipline found in schools of agriculture devoted to increasing crop yield, soil science is transforming itself into an interdisciplinary mulch with great significance not only for food production but also climate change, ecology, preservation of natural resources, forestry, and carbon sequestration. Hydropedology brings together pedology (soil characteristics) with hydrology (movement of water) to understand and achieve the goals now associated with modern soil science. The first book of its kind in the market Highly interdisciplinary, involving new thinking and synergistic approaches Stimulating case studies demonstrate the need for hydropedology in various practical applications Future directions and new approaches are present to advance this emerging interdisciplinary science

Soil-Water Interactions - Shingo Iwata 2020-08-26

Emphasizing pioneering achievements, this work offers a clear and systematic description of various soil-water phenomena and their applications to soil problems such as water retention and the flux of water in soils and clays. This second edition contains material on the physical properties of adsorbed water, the application of fractal theory to solute and water flows in field soils, fingering research, and more.

Soil, Plant and Atmosphere - Klaus Reichardt 2019-08-16

This textbook presents the concepts and processes involved in the soil-plant-atmosphere system as well as its applications in the water cycle in agriculture. Although reaching the frontier of our knowledge in several subjects, each chapter starts at the graduation level and proceeds to the post-doctoral level. Its more complicated subjects, as math and physics, are well explained, even to readers not well acquainted with these tools. Therefore, it helps students read, understand, and developing their thoughts on these subjects. Instructors also find it an easy book with the needed depth to be adopted in courses related to Soil Physics, Agricultural Management, Environmental Protection, Irrigation and Agrometeorology. It serves also as “lexicon” to engineers and lawyers involved in agricultural, environmental cases.