Seed Physiology: Germination and reserve mobilization

Handbook of Plant and Crop Physiology

Sprouted Grains: Nutritional Value, Production and Applications is a complete and comprehensive overview of sprouted grains, with coverage from grain to product. Sections include discussions on the process of grain germination from both a genetic and physiological perspective, the nutrients and bioactive compounds present in sprouted grains, and the equipment and technical innovation of use to manufacturers of sprouted grains and sprouted grain products. This book is essential reading for cereal science academics and postgraduate students interested in the subject of cereal processing, but is also ideal for industrial product developers in cereal companies. This edited volume brings together the world's leading researchers on sprouted grains. Presents the nutrient and bioactive components of these healthy grains Provides extensive coverage of products developed from sprouted grains Includes contributions from an International team of both academic and industrial authors Covers the equipment and technology used in grain processing.

Physiology and Biochemistry of Seeds in Relation to Germination

Fully covers the biology, biochemistry, genetics, and genomics of *Medicago truncatula* Model plant species are valuable not only because they lead to discoveries in basic biology, but also because they provide resources that facilitate translational biology to improve crops of economic importance. Plant scientists are drawn to models because of their ease of manipulation, simple genome organization, rapid life cycles, and the availability of multiple genetic and genomic tools. This reference provides comprehensive coverage of the *Model Legume Medicago truncatula*. It features review chapters as well as research chapters describing experiments carried out by the authors with clear materials and methods. Most of the chapters utilize advanced molecular techniques and biochemical analyses to approach a variety of aspects of the Model. The *Model Legume Medicago truncatula* starts with an examination of *M. truncatula* plant development; biosynthesis of natural products; stress and *M. truncatula*; and the *M. truncatula*-Sinorhizobium melliloti symbiosis. Symbiosis of *Medicago truncatula* with arbuscular mycorrhiza comes next, followed by chapters on the common symbiotic signaling pathway (CSSP or SYM) and infection events in the Rhizobium-legume symbiosis. Other sections look at hormones and the rhizobial and mycorrhizal symbioses; autoregulation of nodule numbers (AON) in *M. truncatula*; *Medicago truncatula* databases and computer programs; and more. Contains reviews, original research chapters, and methods Covers most aspects of the *M. truncatula* Model System, including basic biology, biochemistry, genetics, and genomics of this system Offers molecular techniques and advanced biochemical analyses for approaching a variety of aspects of the *Model Legume Medicago truncatula*. Includes introductions by the editor to each section, presenting the summary of selected chapters in the section Features an extensive index, to facilitate the search for key terms The *Model Legume Medicago truncatula* is an excellent book for researchers and upper level graduate students in microbial ecology, environmental microbiology, plant genetics and biochemistry. It will also benefit legume biologists, plant molecular biologists, agrobiologists, plant breeders, bioinformaticians, and evolutionary biologists.

Handbook of Seed Physiology

The evolution of seeds has contributed to one of the most astonishing explosions of biodiversity in history. Indeed, most plants employ seeds as reproductively crucial structures. Everything about seeds involves timing. Seeds result from fertilization occurring when conditions are favorable, i.e., after sufficient resources have been devoted to reproductive tissues. Furthermore, seeds help ensure that these are the necessary stored materials for the early growth and development of the next generation of plants. And finally, seeds allow the next generation to wait in a form of suspended animation until conditions for the next generation are once again favorable. This book about seeds focuses upon their two most important functions-dormancy and germination. The topics covered include the types of dormancy, theories of the relationship between dormancy and germination, the timing of germination, the various factors that control germination, and the general aspects of germination in different sorts of habitats. Ecologists, plant scientists, agriculturists, foresters—indeed, anyone interested in plants and their life cycles will want to add this title to his or her library.

Advances in Rice Research for Abiotic Stress Tolerance

Seed Physiology: Germination and reserve mobilization

Handbook of Plant and Crop Physiology

Sprouted Grains: Nutritional Value, Production and Applications

Physiology and Biochemistry of Seeds in Relation to Germination

Handbook of Seed Physiology

Advances in Rice Research for Abiotic Stress Tolerance
The study of plant development using molecular and genetic techniques is rapidly becoming one of the most active areas of research on flowering plants. Developmental Biology of Flowering Plants relates classical developmental work with the outstanding problems of the future in the study of plant development. An important feature of this book is the integration of results from molecular and genetic studies on various aspects of plant development in a cellular and physiological context.

**Recent Advances in the Development and Germination of Seeds**

This Fourth Edition of Principles of Seed Science and Technology, like the first three editions, is written for the advanced undergraduate student or lay person who desires an introduction to the science and technology of seeds. The first nine chapters present the seed as a biological system and cover its origin, development, composition, function (and sometimes nonfunction), performance and ultimate deterioration. The last nine chapters present the fundamentals of how seeds are produced, conditioned, evaluated and distributed in our modern agricultural society. Two new chapters have been added in this fourth edition, one on seed ecology and the second on seed drying. Finally, revisions have been made throughout to reflect changes that have occurred in the seed industry since publication of the Third Edition. Because of the fundamental importance of seeds to both agriculture and to all of society, we have taken great care to present the science and technology of seeds with the respect and feeling this study deserves. We hope that this feeling will be communicated to our readers. Furthermore, we have attempted to present information in a straight-forward, easy-to-read manner that will be easily understood by students and lay persons alike. Special care has been taken to address both current state-of-the-art as well as future trends in seed technology.

**Seed Dormancy, Germination and Pre-Harvest Sprouting**

**Seed Development and Germination**

The seed plays a fundamental role in plant reproduction as well as a key source of energy, nutrients and raw materials for developing and sustaining humanity. With an expanding and generally more affluent world population projected to reach nine billion by mid-century, coupled to diminishing availability of inputs, agriculture is facing increasing challenges to ensure sufficient grain production. A deeper understanding of seed development, evolution and physiology will undoubtedly provide a fundamental basis to improve plant breeding practices and ultimately crop yields. Recent advances in genetic, biochemical, molecular and physiological research, mostly brought about by the deployment of novel high-throughput and high-sensitivity technologies, have begun to uncover and connect the molecular networks that control and integrate different aspects of seed development and help determine the economic value of grain crops with unprecedented details. The objective of this e-book is to provide a compilation of original research articles, reviews, hypotheses and perspectives that have recently been published in Frontiers in Plant Science, Plant Evolution and Development as part of the Research Topic entitled “Advances in Seed Biology”. Editing this Research Topic has been an extremely interesting, educational and rewarding experience, and we sincerely thank all authors who contributed their expertise and in-depth knowledge of the different topics discussed. We hope that the information presented here will help to establish the state of the art of this field and will convey how exciting and important studying seeds is and hopefully will stimulate a new crop of scientists devoted to investigating the biology of seeds.

**Physiology of Cotton**

**Seeds in Emergencies**

In the two decades since the last comprehensive work on plant peroxisomes appeared, the scientific approaches employed in the study of plant biology have changed beyond all recognition. The accelerating pace of plant research in the post-genomic era is leading us to appreciate that peroxisomes have many important roles in plant cells, including reserve mobilisation, nitrogen assimilation, defence against stress, and metabolism of plant hormones, which are vital for productivity and normal plant development. Many plant scientists are finding, and will no doubt continue to find, that their own area of research is connected in some way to peroxisomes. Written by the leading experts in the field, this book surveys peroxisomal metabolic pathways, protein targeting and biogenesis of the organelle and prospects for the manipulation of peroxisomal function for biotechnological purposes. It aims to draw together the current state of the art as a convenient starting point for anyone, student or researcher, who wishes to know about plant peroxisomes.

**Seed Physiology: Development**

A multi-faceted reference work, the Encyclopedia of Applied Plant Sciences addresses the core knowledge, theories, and techniques employed by plant scientists, while also concentrating on applications of these in research and in industry. Plants influence all our lives as sources of sustenance, fuel and building materials. The Encyclopedia of Applied Plant Sciences is a comprehensive yet succinct publication that covers the application of current advances in the biological sciences, through which scientists can now better produce sustainable, safe food, feed and food ingredients, and renewable raw materials for industry and society. This three-volume set also covers the concerns over continuing advances in the application of knowledge in the areas of ecology and plant pathology, genetics, physiology, biochemistry and biotechnology, as well as the ethical issues involved in the use of the powerful techniques available to modern plant science. An invaluable reference, the Encyclopedia of Applied Plant Sciences will be an indispensable addition to the library of anyone involved in the study of plant sciences. The Encyclopedia of Applied Plant Sciences is available online on ScienceDirect. The print edition price for this reference work does not include online access. For more information on pricing for access to the online edition, please review our Licensing Options. The richness and authority of Elsevier reference works is now lent valuable functionality and accessibility through the online launch of
Elsevier Reference Works on ScienceDirect. Features: Extensive browsing and searching across subject, thematic, alphabetical, author and cited author indexes - as applicable to the work Basic and advanced search functionality within volumes, parts of volumes, or across the whole work Ability to build, save and re-run searches as well as combine saved searches Internal cross-referencing between articles in the work, plus dynamic linking to journal articles and abstract databases, making navigation flexible and easy All articles are available as full-text HTML files, and as PDF files that can be viewed, downloaded or printed out in their original print format A dedicated Reference Works navigation tab and homepage on ScienceDirect to enable easy linking from your OPAC or library website For more information about the Elsevier Reference Works on ScienceDirect Program, please visit: http://www.info.sciencedirect.com/reference_works. Comprehensively covers both the key theoretical and practical aspects of plant sciences Edited and written by a distinguished international group of editors and contributors Well-organized format provides for concise, readable entries, easy searches, and thorough cross-references Presents complete up-to-date information on over 25 separate areas of plant science Features many tables and figures, with a color plate section in each volume New terms clearly explained in glossary sections of each article

**Developmental Biology of Flowering Plants**


**Encyclopedia of Applied Plant Sciences**

**Seed Biology and Yield of Grain Crops, 2nd Edition**

Seed dormancy and germination are critical processes for the development of plants. Seed dormancy allows seeds to overcome harsh periods of seedling establishment, and is also important for plant agriculture and crop yield. Several processes are involved in the induction of dormancy and in the shift from the dormant to the germinating state, and hormones and regulatory genetic networks are among the critical factors driving these complex processes. Germination can be prevented by different factors leading to seed dormancy, which is highly dependent on environmental cues. During and after germination, early seedling growth is sustained by catabolism of stored reserves (proteins, lipids, or starch) accumulated during seed maturation, supporting cell morphogenesis, chloroplast development, and root growth until photo-auxotropic growth can be resumed.

**Seed Physiology**

Seed Physiology, Volume 2, Germination and Reserve Mobilization, addresses some of the major unanswered questions about seed dormancy, germination, and post-germination development of the seedling. The book contains seven chapters and begins with two studies on dormancy—one on the structural constraints to germination and another on metabolic barriers preventing germination. These are followed by separate chapters on the physical and biochemical events following the inhibition of water by dry seeds; the mobilization of polysaccharide reserves from endosperm; the mobilization of nitrogen and phosphorus from external storage tissues; and the mobilization of lipid reserves in seed tissues. The final chapter reviews the subject of embryonic axis-cotyledon interaction, considering mainly those species where the cotyledons are adapted for the storage of reserves. Both this volume and its companion (Seed Physiology Volume 1. Development) will provide a valuable resource for advanced students, teachers, and researchers in plant physiology, biochemistry, agronomy, and related disciplines.

**Seed Dormancy and Germination**

This text is intended for plant physiologists, molecular biologists, biochemists, biotechnologists, geneticists, horticulturalists, agronomists and botanists, and upper-level undergraduate and graduate students in these disciplines. It integrates advances in the diverse and rapidly-expanding field of seed science, from ecological and demographic aspects of seed production, dispersal and germination, to the molecular biology of seed development. The book offers a broad, multidisciplinary approach that covers both theoretical and applied knowledge.

**Principles of Seed Science and Technology**

??This book is devoted to grain legumes and include eight chapters devoted to the breeding of specific grain legume crops and five general chapters dealing with important topics which are common to most of the species in focus. Soybean is not included in the book as it is commonly considered an oil crop more than a grain legume and is included in the Oil Crops Volume of the Handbook of Plant Breeding. Legume species belong to the Fabaceae family and are characterized by their fruit, usually called pod. Several species of this family were domesticated by humans, such as soybean, common bean, faba bean, pea, chickpea, lentil, peanut, or cowpea. Some of these species are of great relevance as human and animal food. Food legumes are consumed either by their immature pod or their dry seeds, which have a high protein content. Globally, grain legumes are the most relevant source of plant protein, especially in many countries of Africa and Latin America, but there are some constraints in their production, such as a poor adaptation, pest and diseases and unstable yield. Current research trends in Legumes are focused on new methodologies involving genetic and omic studies, as well as new approaches to the genetic improvement of these species, including the relationships with their symbiotic rhizobia.

**Plant Peroxisomes**
Plants, crops, and growth environment; Physiology of plant/crop growth and developmental stages; Plant growth regulators; Whole plant vs. reductive research on physiological genetics of crops.

Seed Physiology

The seed security of small-scale rural households is often put at risk by natural and human-caused disasters. As a consequence, seeds are frequently provided to vulnerable households as part of the emergency response. However, seeds are unlike other inputs such as fertiliser or tools because they are fragile living organisms with specific quality attributes. In addition, crop varieties must be adapted to the targeted agro-ecological zone and meet the preferences of the local households. Farmers' seed systems are complex and seed exchange is highly regulated at the national and international levels.

Seeds

Pre-harvest sprouting (PHS) and late-maturity alpha-amylase (LMA) are two of the biggest grain quality defects that grain growers encounter. About 50 percent of the global wheat crop is affected by pre-harvest sprouting to various degrees. Pre-harvest sprouting is a genetically-based quality defect and results in the presence of alpha-amylase in otherwise sound mature grain. It can range from perhaps undetectable to severe damage on grain and is measured by the falling numbers or alpha-amylase activity. This is an international issue, with sprouting damage lowering the value of crops to growers, seed and grain merchants, millers, maltsters, bakers, other processors, and ultimately the consumer. As such it has attracted attention from researchers in many biological and non-biological disciplines. The 13th International Symposium on Pre-Harvest Sprouting in Cereals was held 18-20 September, 2016 in Perth to discuss current findings of grain physiology, genetic pathways, trait expression and screening methods related to pre-harvest sprouting and LMA. This event followed the previous symposium in 2012 in Canada.

Annual Plant Reviews, Seed Development, Dormancy and Germination

Seeds

Feathers are one of the most unique characteristics of modern birds and represent the most complex and colourful type of skin derivate within vertebrates, while also fulfilling various biological roles, including flight, thermal insulation, display, and sensory function. For years it was generally assumed that the origin of flight was the main driving force for the evolution of feathers. However, various discoveries of dinosaur species with filamentous body coverings, made over the past 20 years, have fundamentally challenged this idea and produced new evolutionary scenarios for the origin of feathers. This book is devoted to the origin and evolution of feathers, and highlights the impact of palaeontology on this research field by reviewing a number of spectacular fossil discoveries that document the increasing morphological complexity along the evolutionary path to modern birds. Also featuring chapters on fossil feather colours, feather development and its genetic control, the book offers a timely and comprehensive overview of this popular research topic.

Seed Development and Germination

Physiology and Biochemistry of Seeds in Relation to Germination

Advances in Rice Research for Abiotic Stress Tolerance provides an important guide to recognizing, assessing and addressing the broad range of environmental factors that can inhibit rice yield. As a staple food for nearly half of the world's population, and in light of projected population growth, improving and increasing rice yield is imperative. This book presents current research on abiotic stresses including extreme temperature variance, drought, hypoxia, salinity, heavy metal, nutrient deficiency and toxicity stresses. Going further, it identifies a variety of approaches to alleviate the damaging effects and improving the stress tolerance of rice. Advances in Rice Research for Abiotic Stress Tolerance provides an important reference for those ensuring optimal yields from this globally important food crop. Covers aspects of abiotic stress, from research, history, practical field problems faced by rice, and the possible remedies to the adverse effects of abiotic stresses Provides practical insights into a wide range of management and crop improvement practices Presents a valuable, single-volume sourcebook for rice scientists dealing with agronomy, physiology, molecular biology and biotechnology

Seeds

The latest findings in seed physiology—discussed as they relate to agricultural problems! Presenting the latest findings in the area of seed physiology as well as the practical applications of that knowledge in the field, the Handbook of Seed Physiology: Applications to Agriculture provides a comprehensive view of seed biology and its role in crop performance. Key topics include seed germination, crop emergence, crop establishment, dormancy, preharvest sprouting, plant hormones, abscisic and gibberellic acids, weeds, grain quality, oil crops, and malting quality. Abundant case studies provide information of value to researchers, students, and professionals in the fields of seed science, field crop research, crop science, agronomy, and seed technology. The Handbook of Seed Physiology discusses vital topics which serve as the basis for the development of techniques and processes to improve seed performance and crop yield. In this text, you will explore: the effect of the soil physical environment on seed germination the roles of physiology, genetics, and environment in the inception, maintenance, and termination of dormancy the relationship between the termination of dormancy and the synthesis and signaling of gibberellins and abscisic acid mechanisms of orthodox seed deterioration and approaches for repair of seed damage characteristics, behavior, and mechanisms of desiccation tolerance in recalcitrant seeds the role of seed moisture in free radical assaults on seeds and the protective function of
raffinose oligosaccharides the production of free radicals and their effect on lipids and lipid peroxidation components of grain quality in oil crops and factors influencing them structural components and genotypic and environmental factors affecting barley malting quality. In addition to the latest scientific information in the area of seed physiology, this text provides insights into practical applications of that knowledge through the description of: screening protocols for germination tolerance to temperature and water stress methods for improving seed performance in the field techniques for controlling preharvest sprouting of cereals breeding and production strategies for improving grain quality population-based threshold models in the prediction of germination and emergence patterns modeling changes in dormancy to predict weed emergence Extensive reference sections accompanying each chapter include both foundational texts and current research. Principles and concepts discussed in the text are elaborated upon through equations, figures, and tables covering such topics as water and soil thermal regimes; seed water potential; temperature and water effects on germination; free radical attack; and molecular structures. Exploring concepts, techniques, and processes related to seed germination and crop establishment, this comprehensive, one-of-a-kind reference is an indispensable tool for seed scientists and agricultural professionals. Add it to your library today and put seed physiology research to work in establishing high-quality “next crops”!

Physiology and Biochemistry of Seeds in Relation to Germination

In a convenient, single-source reference, this book examines plant growth substances and their relationship to a wide range of physiological processes, ranging from seed germination through the death of the plant. If offers a clear illustration of the pragmatic uses of plant substances in agriculture and demonstrates how basic laboratory research has translated into increased production and profit for the grower. This work begins by building a solid foundation in the subject, which contains historical aspects and fundamental concepts, and provides a methodology for extraction, purification, and quantification of plant growth substances. This forms the basis for understanding the ensuing chapters that explore the many processes involving plant growth substances, including: seed germination * seedling growth * rooting * dormancy * juvenility * maturity * senescence * flowering * abscission * fruit set * fruit growth * fruit development * premature drop * ripening * promotion of fruit drop * tuberization * photosynthesis * weed control. Providing a detailed examination of plant growth substances and their relationships to specific physiological plant processes, Plant Growth Substances gives students, researchers, and professionals a much-needed reference.

Seeds

These Proceedings are a product of the International Workshop on Seeds held in Williamsburg, Virginia, USA, at the College of William and Mary, during the week of August 6-11, 1989. Sixty-eight participants attended. The location provided a scenic and historical setting for the excellent work presented. Good facilities and amenities also contributed to the success of the meeting. The Proceedings present the substance of the main lectures given at this meeting. In addition, there were 29 brief paper presentations and 30 poster presentations which have been summarized in abstract form in a separate publication. This meeting represents the third such meeting of a diverse group of scientists interested in the behavior of seeds, both in an agricultural sense and as tools for the advancement of more particular subject matter. The first meeting was held in Jerusalem, Israel in 1980 and the second in Wageningen, The Netherlands in 1985. A fourth meeting is being planned. The Editor and Organizer wishes to thank not only the contributors to this volume for their efforts but also all the other participants whose combined efforts made this meeting a great success.

The Evolution of Feathers

This text is intended for plant physiologists, molecular biologists, biochemists, biotechnologists, geneticists, horticulturalists, agronomists and botanists, and upper-level undergraduate and graduate students in these disciplines. It integrates advances in the diverse and rapidly-expanding field of seed science, from ecological and demographic aspects of seed production, dispersal and germination, to the molecular biology of seed development. The book offers a broad, multidisciplinary approach that covers both theoretical and applied knowledge.

Cotton Physiology

Structural aspects of dormancy; Metabolic aspects of dormancy; Early events in germination; Mobilization of polysaccharide reserves from endosperm; Mobilization of nitrogen and phosphorus from endosperm; Mobilization of oil and wax reserves; Axix-cotyledon relationships during reserve mobilization.

The Model Legume Medicago truncatula, 2 Volume Set

Cotton production today is not to be undertaken frivolously if one expects to profit by its production. If cotton production is to be sustainable and produced profitably, it is essential to be knowledgeable about the growth and development of the cotton plant and in the adaptation of cultivars to the region as well as the technology available. In addition, those individuals involved in growing cotton should be familiar with the use of management aids to know the most profitable time to irrigate, apply plant growth regulators, herbicides, foliar fertilizers, insecticides, defoliants, etc. The chapters in this book were assembled to provide those dealing with the production of cotton with the basic knowledge of the physiology of the plant required to manage the cotton crop in a profitable manner.

Plant Growth Substances

In response to enormous recent advances, particularly in molecular biology, the authors have revised their warmly received work. This new edition includes updates on seed development, gene expression, dormancy, and other subjects. It will serve as the field's standard textbook and reference source for many years to come.
Germination and Reserve Mobilization

The structure of seeds and their food reserves; The legacy of seed maturation; Imbibition, germination, and growth; Biochemistry of germination and growth; Mobilization of reserves; Control processes in the mobilization of stored reserves.

Grain Legumes

The formation, dispersal and germination of seeds are crucial stages in the life cycles of gymnosperm and angiosperm plants. The unique properties of seeds, particularly their tolerance to desiccation, their mobility, and their ability to schedule their germination to coincide with times when environmental conditions are favorable to their survival as seedlings, have no doubt contributed significantly to the success of seed-bearing plants. Humans are also dependent upon seeds, which constitute the majority of the world’s staple foods (e.g., cereals and legumes). Seeds are an excellent system for studying fundamental developmental processes in plant biology, as they develop from a single fertilized zygote into an embryo and endosperm, in association with the surrounding maternal tissues. As genetic and molecular approaches have become increasingly powerful tools for biological research, seeds have become an attractive system in which to study a wide array of metabolic processes and regulatory systems. Seed Development, Dormancy and Germination provides a comprehensive overview of seed biology from the point of view of the developmental and regulatory processes that are involved in the transition from a developing seed through dormancy and into germination and seedling growth. It examines the complexity of the environmental, physiological, molecular and genetic interactions that occur through the life cycle of seeds, along with the concepts and approaches used to analyze seed dormancy and germination behavior. It also identifies the current challenges and remaining questions for future research. The book is directed at plant developmental biologists, geneticists, plant breeders, seed biologists and graduate students.

Seed Dormancy and Germination

Since the publication of our monograph on seed physiology and biochemistry (The Physiology and Biochemistry of Seeds in Relation to Germination, Springer-Verlag, 1978, 1982), it has been suggested to us that a text covering the same subject area would be appropriate. This book is our response. Unlike the previous volumes, however, this text is not intended to be either a critical or a comprehensive account. Instead it is a more generalized consideration of the essential aspects of seed physiology and biochemistry as we see them. It also includes a substantial amount of new and different material. In a work of this sort it is inevitable that some simplifications must be made, but we hope, nevertheless, that we have presented the most reasonable conspectus of areas of controversy and uncertainty. In this respect, literature citations have been kept to a minimum and do not interrupt the text; they are placed at the end of each chapter and are intended to be used as a source for further references. We hope that this book will be of value to students and teachers in universities, colleges, and other institutes of higher learning whose courses include plant biology. Although it is particularly appropriate for studies of seed biology, it should also find broader applications in general plant physiology, agriculture, and horticulture.

Seeds

In response to enormous recent advances, particularly in molecular biology, the authors have revised their warmly received work. This new edition includes updates on seed development, gene expression, dormancy, and other subjects. It will serve as the field’s standard textbook and reference source for many years to come.

Advances in Seed Biology

This new edition of a successful text, originally published in 1992, has been thoroughly revised and updated to include recent advances. In addition, new chapters have been introduced to ensure comprehensive coverage of all aspects of seed ecology. These include evolutionary ecology of seed size, the roles of fire and of gaps in regeneration and seedling colonization. Chapters are written by internationally acknowledged experts to give a comprehensive overview of all aspects of seed ecology which will be invaluable to advanced students and researchers in seed science and plant ecology.

Sprouted Grains

V.1 - Development; The seed and survival; The carbon and nitrogen nutrition of fruit and seed - case studies of selected grain legumes; Accumulation of seed reserves of nitrogen; Accumulation of seed reserves of phosphorus and other minerals; The synthesis of reserve oligo- and polysaccharides; Synthesis of storage lipids in developing seeds; Toxic compounds in seeds. V.2 - Seed physiology; Structural aspects of dormancy; Metabolic aspects of dormancy; Early events in germination; Mobilization of polysaccharide reserves from endosperm; Mobilization of nitrogen and phosphorus from endosperm; Mobilization of oil and wax reserves; Axis - cotyledon relationships during reserve mobilization.

The Woody Plant Seed Manual

This new edition of an established title examines the determination of grain crop yield from a unique perspective, by concentrating on the influence of the seed itself. As the food supply for an expanding world population is based on grain crops harvested for their seeds, understanding the process of seed growth and its regulation is crucial to our efforts to increase production and meet the needs of that population. Yield of grain crops is
determined by their assimilatory processes such as photosynthesis and the biosynthetic processes in the seed, which are partly regulated within the seed itself. Substantially updated with new research and further developments of the practical applications of the concepts explored, this book is essential reading for those concerned with seed science and crop yield, including agronomists, crop physiologists, plant breeders, and extension workers. It is also a valuable source of information for lecturers and graduate students of agronomy and plant physiology.

New Challenges in Seed Biology

This updated and much revised third edition of Seeds: Physiology of Development, Germination and Dormancy provides a thorough overview of seed biology and incorporates much of the progress that has been made during the past fifteen years. With an emphasis on placing information in the context of the seed, this new edition includes recent advances in the areas of molecular biology of development and germination, as well as fresh insights into dormancy, ecophysiology, desiccation tolerance, and longevity. Authored by preeminent authorities in the field, this book is an invaluable resource for researchers, teachers, and students interested in the diverse aspects of seed biology.

Seeds

The germination of seeds is a magical event, in which a pinch of dust-like material may give rise to all the power and the beauty of the growing plant. The mechanisms of seed dormancy, of the breaking of seed dormancy and of germination itself continue to remain shrouded in mystery, despite the best efforts of plant scientists. Perhaps we are getting there, but very slowly. This book considers germination and dormancy from the point of view of plant physiology. Plant physiologists attempt to understand the relation ship between plant form and function and to explain, in physical and chemical terms, plant growth and development. The place of germination and dormancy in plant ecophysiology is taken into account with attempts to understand the seed in its 'environment, whether the environment be natural, semi-natural or wholly artificial. In due course plant scientists hope to develop a precise understanding of germination and dormancy in cellular and molecular terms, and therefore there is some biochemistry in this book. Biochemists who wish to learn something about seeds should find this book useful.