

HOST-PLANT RESISTANCE TO INSECTS

- Plant resistance: mechanisms by which plants resist insect attack
- 3 types of plant resistance:
 1. Antibiosis: plant negatively affects the biology of the insect
 - Factors include: toxins, growth inhibitors, low nutrients, trichomes, indigestibles
 2. Antixenosis: plant deters insect feeding due to being a poor host
 - Factors include: repellents, deterrents, trichomes, waxes, thickness, toughness
 3. Tolerance: plant is able to withstand or recover from insect damage
 - Involves only plant features and not interactions with insects



Plant Resistance To Insects

Ramesh Arora, Surinder Sandhu



Plant Resistance To Insects:

Plant Resistance to Insects C. Michael Smith, 1989-10-02 What is plant resistance to insects How is plant resistance to insects obtained How can plant resistance to insects be utilized

Host Plant Resistance to Insects G. S. Dhaliwal, 2005 Contributed articles

Breeding Plants Resistant to Insects Fowden G. Maxwell, Peter Randolph Jennings, 1980 Plant resistance to insects Types and classification of resistance Biochemical and morphological bases of resistance Genetic factors affecting expression and stability of resistance Environmental factors influencing the magnitude and expression of resistance Insect behavior and plant resistance Insects and plant pathogens The pathosystem concept The problem of variable pests The use of plant insect models Resistant varieties in pest management systems Germplasm resources and needs Breeding systems for resistance breeding for resistance in specific crops Breeding approaches in alfalfa Breeding approaches in cassava Breeding cotton for resistance to insect pests Breeding approaches in rice Breeding sorghums resistant to insects Breeding forest trees resistance to insects Breeding approaches in wheat Future opportunities and directions

Host Plant Resistance to Insects Niranjan Panda, Gurdev S. Khush, 1995 Historical overview of host plant resistance Crop plant and insect diversity Secondary plant metabolites for insect resistance Insect plant interactions Host plant selection Mechanisms of resistance Factors affecting expression of resistance Screening for insect resistance Plant resistance and insect pest management Genetics of resistance to insects Breeding for resistance to insects

Techniques for Evaluating Insect Resistance in Crop Plants Charles M. Smith, Z. R. Khan, Mano Dutta Pathak, 1993-12-17 This comprehensive book is the first illustrated volume to provide detailed discussions of all plant genera regarding techniques developed to evaluate plant resistance to insects Many of the book's references have never before appeared in a volume on this subject The authors systematically discuss techniques used to evaluate different types of insect behavior and plant morphological and phytochemical factors responsible for plant resistance and susceptibility to insects

Plant Resistance to Arthropods C. Michael Smith, 2006-01-16 This book synthesizes new information about the environmental advantages of plant resistance transgenic resistance the molecular bases of resistance and the use of molecular markers to map resistance genes Readers are presented in depth descriptions of techniques to quantify resistance factors affecting resistance expression and the deployment of resistance genes New information about gene for gene interactions between resistant plants and arthropod biotypes is discussed along with the recent examples of using arthropod resistant plants in integrated pest management systems

Disease and Insect Resistance in Plants Dhan Pal Singh, Arti Singh, 2005 The book covers in detail the principles and practices of conventional plant breeding as well as newer and recent biotechnological tools such as marker assisted selection and transgenic crops The book is suitable for use as an advanced text A basic knowledge of plant pathogens insect pests and their genetics is assumed In addition the book can be used as reference book by plant pathologists entomologists and geneticists engaged in developing germplasm with resistance to biotic stresses Attempts have

been made to draw specific examples from as many different crop plants and their harmful parasites as possible and an extensive reference list provides access to the original literature

Breeding Insect Resistant Crops for Sustainable Agriculture Ramesh Arora, Surinder Sandhu, 2017-10-16 This book reviews and synthesizes the recent advances in exploiting host plant resistance to insects highlighting the role of molecular techniques in breeding insect resistant crops It also provides an overview of the fascinating field of insect plant relationships which is fundamental to the study of host plant resistance to insects Further it discusses the conventional and molecular techniques utilized useful in breeding for resistance to insect pests including back cross breeding modified population improvement methods for insect resistance marker assisted backcrossing to expedite the breeding process identification and validation of new insect resistance genes and their potential for utilization genomics metabolomics transgenesis and RNAi Lastly it analyzes the successes limitations and prospects for the development of insect resistant cultivars of rice maize sorghum and millet cotton rapeseed legumes and fruit crops and highlights strategies for management of insect biotypes that limit the success and durability of insect resistant cultivars in the field Arthropod pests act as major constraints in the agro ecosystem It has been estimated that arthropod pests may be destroying around one fifth of the global agricultural production potential production every year Further the losses are considerably higher in the developing tropics of Asia and Africa which are already battling severe food shortage Integrated pest management IPM has emerged as the dominant paradigm for minimizing damage by the insects and non insect pests over the last 50 years Pest resistant cultivars represent one of the most environmentally benign economically viable and ecologically sustainable options for utilization in IPM programs Hundreds of insect resistant cultivars of rice wheat maize sorghum cotton sugarcane and other crops have been developed worldwide and are extensively grown for increasing and or stabilizing crop productivity The annual economic value of arthropod resistance genes developed in global agriculture has been estimated to be greater than US 2 billion Despite the impressive achievements and even greater potential in minimizing pest related losses only a handful of books have been published on the topic of host plant resistance to insects This book fills this wide gap in the literature on breeding insect resistant crops It is aimed at plant breeders entomologists plant biotechnologists and IPM experts as well as those working on sustainable agriculture and food security

Principles of Host-plant Resistance to Insect Pests Niranjana Panda, 1979 *Insect Resistance in Crop Plants* Reginald Henry Painter, 1951

Molecular Host Plant Resistance to Pests S. Sadasivam, B. Thayumanayan, 2003-07-15 Molecular Host Plant Resistance to Pests examines environmentally safe and integrated techniques for effective pest management Offering more than 1500 references for further exploration of the topic this reference details the bioactivity biosynthetic pathways mechanisms of action and genetic regulation for improved methods of crop protection a

Plant Resistance to Insects in Major Field Crops Sarwan Kumar, Michael Furlong, 2025-02-10 This edited book is a comprehensive collection of information on host plant resistance to insects in major field crops The focus of the book is to

make the audience aware of the latest developments in host plant resistance in major field crops and how it can be used for sustainable pest management solutions It deals with the insect plant interactions plant defence responses to herbivore attacks plant phenotyping and breeding for insect resistance Insects are an important group of biotic stresses that limit crop productivity in many regions of the world At present they are largely managed by synthetic insecticides which have their own adverse effects including insecticide resistance pest resurgence environmental pollution and pesticide residues to name a few Thus there is an urgent need to develop alternate pest management strategies that can provide a sustainable solution to pest problems Host plant resistance is considered an important pest management strategy as it offers an effective economical and environmental friendly solution to pest problems This book is of interest to postgraduate students crop entomologists and breeders working on host plant resistance to insect pests It is also valuable for teachers researchers and climate change scientists The book serves as an additional reading material for undergraduate and graduate students of agriculture ecology and environmental sciences Agricultural experts from around the world as well as policymakers will also find this book helpful

Biological and Biotechnological Control of Insect Pests Jack E. Rechcigl, Nancy A. Rechcigl, 1999-09-24 Pest and disease management continues to challenge the agricultural community The rise in new pest and crop problems juxtaposed with public concern over pesticide use and more stringent environmental regulations creates the need for today's agricultural producers to stay current with new technologies for producing quality crops profitably Biological and Biotechnological Control of Insect Pests presents an overview of alternative measures to traditional pest management practices utilizing biological control and biotechnology The removal of some highly effective broad spectrum chemicals caused by concerns over environmental health and public safety has resulted in the development of alternative reduced risk crop protection products These products less toxic to the environment and easily integrated into biological control systems target specific life stages or pest species Predation recognized as a suitable long term strategy effectively suppresses pests in biotechnological control systems Biological and Biotechnological Control of Insect Pests covers these topics and more It explores the current approaches in alternative solutions such as biological control agents parasites and predators pathogenic microorganisms pheromones botanical insecticides genetic control genetic engineering of plants and biocontrol agents and government regulations for biocontrol agents and recombinant DNA technology This book will be a useful resource to entomologists agronomists horticulturists and environmental scientists

Plant Resistance to Insects in Sorghum H.C. Sharma, 1997 Sorghum is one of the most important cereals in the semi arid tropics Nearly 150 insect species have been reported to damage the crop worldwide causing an estimated loss of over U 1000 million annually Of these shoot fly stem borers greenbug sugarcane aphid shoot bug spider mites armyworms midge head bug and head caterpillars are the major pests Plant resistance to insects is one of the most important components of pest management in sorghum Thus the 18 specialist scientists who have contributed the 25 papers included in the book that is based on a training course for

researchers involved in the development of insect resistant cultivars for integrated pest management in sustainable agriculture describe and discuss the theoretical and practical aspects of resistance screening techniques mechanisms and inheritance of resistance breeding for resistance statistical designs and strategies for integrated pest management Information has also been provided about the international sorghum insect resistance testing program and the role of networks in collaborative research and technology exchange **Plant Resistance to Insects** Paul Arthur Hedin,1983 Twenty chapters explore the role of secondary plant substances as the central aspect in plant insect interactions Such substances can act as repellents attractants growth retardants antifeedants teratogens sterilants and behavior modifiers

Molecular Host Plant Resistance to Pests S. Sadasivam,B. Thayumanayan,2003-07-15 Sadasivam and Thayumanavan both of the Center for Plant Molecular Biology Tamil Nadu Agricultural U India catalogue known information regarding plant borne chemicals that seem to be associated with pest resistance They cover chemical structures biosynthesis bioactivity mechanism of action Inducing Plant Resistance Against Insects Using Exogenous Bioactive Chemicals: Key Advances and Future Perspectives Islam S. Sobhy,Yonggen Lou,Toby J. A. Bruce,2022-05-05 *Mechanisms and Deployment of Resistance in Trees to Insects* Michael R. Wagner,2002-07-31 Mechanisms and Deployment of Resistance in Trees to Insects is a worldwide synthesis of tree resistance to insects The contributions are by senior scientists and represent all the major forested regions of the world The book constitutes a comprehensive treatment of the state of our knowledge on patterns of resistance by insect guilds and how this knowledge can be deployed to achieve the management of damaging forest insects This book will serve as an essential reference book for all researchers and practitioners attempting to manage forest pests using genetic resistance *Annual Plant Resistance to Insects Newsletter* ,1983 **Plant Resistance to Insects** C. Michael Smith,1989-10-02 What is plant resistance to insects How is plant resistance to insects obtained How can plant resistance to insects be utilized

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