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Methodologies and Results in Grapevine Research

 Springer

Methodologies And Results In Grapevine Research

Dario Cantu, M. Andrew Walker



Methodologies And Results In Grapevine Research:

Methodologies and Results in Grapevine Research Serge Delrot, Hipólito Medrano, Etti Or, Luigi Bavaresco, Stella Grando, 2010-10-19 Grapevine is a crop of major economical interest and wine represents a multicultural heritage which has been growing since several milleniums Yet modern viticulture must face several challenges Global climate has increased berry sugar content and alcohol in the wine whereas phenolic and aromatic ripeness are not always achieved Water supply is becoming shorter New varieties better adapted to new climatic conditions might have to be planted which may affect wine typicity Phytochemical treatments are more controlled and the consumer pays increasing attention to environmentally safe practices New methods reducing pesticide use but maintaining yield and typicity must be designed The present book illustrates the recent progress made in ecophysiology molecular and cell biology and pathology of grapevine as well as in precision viticulture and berry composition Combination of these new tools with field observations will undoubtedly make it easier to face the challenges described above These multidisciplinary contributions will be of interest to anyone involved in grapevine and wine activities

Advances in Plant Ecophysiology Techniques Adela M. Sánchez-Moreiras, Manuel J. Reigosa, 2018-08-17 This handbook covers the most commonly used techniques for measuring plant response to biotic and abiotic stressing factors including in vitro and in vivo bioassays the study of root morphology photosynthesis pigment content net photosynthesis respiration fluorescence and thermoluminescence and water status thermal imaging the measurement of oxidative stress markers flow cytometry for measuring cell cycle and other physiological parameters the use of microscope techniques for studying plant microtubules programmed cell death last generation techniques metabolomics proteomics SAR QSAR hybridization methods isotope techniques for plant and soil studies and the measurement of detoxification pathways volatiles soil microorganisms and computational biology

The Grape Genome Dario Cantu, M. Andrew Walker, 2019-11-13 This book describes the current state of international grape genomics with a focus on the latest findings tools and strategies employed in genome sequencing and analysis and genetic mapping of important agronomic traits It also discusses how these are having a direct impact on outcomes for grape breeders and the international grape research community While *V. vinifera* is a model species it is not always appreciated that its cultivation usually requires the use of other *Vitis* species as rootstocks The book discusses genetic diversity within the *Vitis* genus the available genetic resources for breeding and the available genomic resources for other *Vitis* species Grapes *Vitis vinifera* spp *vinifera* have been a source of food and wine since their domestication from their wild progenitor *Vitis vinifera* ssp *sylvestris* around 8 000 years ago and they are now the world's most valuable horticultural crop In addition to being economically important *V. vinifera* is also a model organism for the study of perennial fruit crops for two reasons Firstly its ability to be transformed and micropropagated via somatic embryogenesis and secondly its relatively small genome size of 500 Mb The economic importance of grapes made *V. vinifera* an obvious early candidate for genomic sequencing and accordingly two draft genomes were reported in 2007 Remarkably these were the first

genomes of any fruiting crop to be sequenced and only the fourth for flowering plants. Although riddled with gaps and potentially omitting large regions of repetitive sequences, the two genomes have provided valuable insights into grape genomes. Cited in over 2 000 articles, the genome has served as a reference in more than 3 000 genome-wide transcriptional analyses. Further recent advances in DNA sequencing and bioinformatics are enabling the assembly of reference-grade genome references for more grape genotypes, revealing the exceptional extent of structural variation in the species.

Improving Sustainable Viticulture and Winemaking Practices J. Miguel Costa, Sofia Catarino, Jose M. Escalona, Piergiorgio Comuzzo, 2022-03-19. *Improving Sustainable Practices in Viticulture and Enology* provides an up-to-date view on the major issues concerning the sustainability of the wine supply chain. The book describes problems and solutions on the use of inputs e.g. water, energy, and emphasizes the roles and limitations of implementing circularity in the sector. It identifies some of the most relevant metrics while pinpointing the most critical issues concerning the environmental impacts of wine's supply chain: vineyards, wineries, trading. This is a novel reference to help the industry excel in production while improving current environmental practices. Professionals in industry, academics, environmentalists, and anyone interested in gaining knowledge in sustainable solutions and practices in viticulture and wine production will find this resource indispensable. Suggests and discusses solutions to overcome challenges imposed by adverse climate conditions. Presents innovative technologies that have an impact on the efficiency of resources and recycling. Includes technological tools for more precise monitoring and management in the wine supply chain.

Science and Technology of Fruit Wine Production Maria R. Kosseva, V.K. Joshi, P.S. Panesar, 2016-11-01. *Science and Technology of Fruit Wine Production* includes introductory chapters on the production of wine from fruits other than grapes, including their composition, chemistry, role, quality of raw material, medicinal values, quality factors, bioreactor technology, production optimization, standardization, preservation, and evaluation of different wines, specialty wines, and brandies. Wine and its related products have been consumed since ancient times, not only for stimulatory and healthful properties but also as an important adjunct to the human diet by increasing satisfaction and contributing to the relaxation necessary for proper digestion and absorption of food. Most wines are produced from grapes throughout the world; however, fruits other than grapes, including apple, plum, peach, pear, berries, cherries, currants, apricot, and many others, can also be profitably utilized in the production of wines. The major problems in wine production, however, arise from the difficulty in extracting the sugar from the pulp of some of the fruits or finding that the juices obtained lack the requisite sugar contents, have higher acidity, more anthocyanins, or have poor fermentability. The book demonstrates that the application of enzymes in juice extraction, bioreactor technology, and biological deacidification, MLF bacteria, or deacidifying yeast like *Schizosaccharomyces pombe* and others in wine production from non-grape fruits needs serious consideration. Focuses on producing non-grape wines, highlighting their flavor, taste, and other quality attributes, including their antioxidant properties. Provides a single-volume resource that consolidates the research

findings and developed technology employed to make wines from non grape fruits Explores options for reducing post harvest losses which are especially high in developing countries Stimulates research and development efforts in non grape wines

Phenotyping at plant and cell levels: The quest for tolerant crop development Ulrich Schurr, Estelle Goulas, Carla Pinheiro, Sebastien Christian Carpentier, Dionysia Apostolos Fasoula, Astrid Junker, 2024-02-05 *Microbial Interventions in Agriculture and Environment* Dhananjaya Pratap Singh, Vijai Kumar Gupta, Ratna Prabha, 2019-11-16 Microbial communities and their functions play a crucial role in the management of ecological environmental and agricultural health on the Earth Microorganisms are the key identified players for plant growth promotion plant immunization disease suppression induced resistance and tolerance against stresses as the indicative parameters of improved crop productivity and sustainable soil health Beneficial belowground microbial interactions with the rhizosphere help plants mitigate drought and salinity stresses and alleviate water stresses under the unfavorable environmental conditions in the native soils Microorganisms that are inhabitants of such environmental conditions have potential solutions for them There are potential microbial communities that can degrade xenobiotic compounds pesticides and toxic industrial chemicals and help remediate even heavy metals and thus they find enormous applications in environmental remediation Microbes have developed intrinsic metabolic capabilities with specific metabolic networks while inhabiting under specific conditions for many generations and so play a crucial role The book *Microbial Interventions in Agriculture and Environment* is an effort to compile and present a great volume of authentic high quality socially viable practical and implementable research and technological work on microbial implications The whole content of the volume covers protocols methodologies applications interactions role and impact of research and development aspects on microbial interventions and technological outcomes in prospects of agricultural and environmental domain including crop production plan soil health management food nutrition nutrient recycling land reclamation clean water systems and agro waste management biodegradation bioremediation biomass to bioenergy sanitation and rural livelihood security The covered topics and sub topics of the microbial domain have high implications for the targeted and wide readership of researchers students faculty and scientists working on these areas along with the agri activists policymakers environmentalists advisors etc in the Government industries and non government level for reference and knowledge generation *Molecular Aspects of Plant Beneficial Microbes in Agriculture* Vivek Sharma, Richa Salwan, Laith Khalil Tawfeeq Al-Ani, 2020-03-12 *Molecular Aspects of Plant Beneficial Microbes in Agriculture* explores their diverse interactions including the pathogenic and symbiotic relationship which leads to either a decrease or increase in crop productivity Focusing on these environmentally friendly approaches the book explores their potential in changing climatic conditions It presents the exploration and regulation of beneficial microbes in offering sustainable and alternative solutions to the use of chemicals in agriculture The beneficial microbes presented here are capable of contributing to nutrient balance growth regulators suppressing pathogens orchestrating immune response and improving crop performance The book also

offers insights into the advancements in DNA technology and bioinformatic approaches which have provided in depth knowledge about the molecular arsenal involved in mineral uptake nitrogen fixation growth promotion and biocontrol attributes

Viticulture and Winemaking under Climate Change Helder Fraga, 2019-12-19 The importance of viticulture and the winemaking socio economic sector is acknowledged worldwide The most renowned winemaking regions show very specific environmental characteristics where climate usually plays a central role Considering the strong influence of weather and climatic factors on grapevine yields and berry quality attributes climate change may indeed significantly impact this crop Recent trends already point to a pronounced increase in growing season mean temperatures as well as changes in precipitation regimes which have been influencing wine typicity across some of the most renowned winemaking regions worldwide Moreover several climate scenarios give evidence of enhanced stress conditions for grapevine growth until the end of the century Although grapevines have high resilience the clear evidence for significant climate change in the upcoming decades urges adaptation and mitigation measures to be taken by sector stakeholders To provide hints on the abovementioned issues we have edited a Special Issue entitled Viticulture and Winemaking under Climate Change Contributions from different fields were considered including crop and climate modeling and potential adaptation measures against these threats The current Special Issue allows for the expansion of scientific knowledge in these particular fields of research as well as providing a path for future research

Wine Science Ronald S. Jackson, 2020-04-04 Wine Science Principles and Applications Fifth Edition delivers in depth information and expertise in a single science focused volume including all the complexities and nuances of creating a quality wine product From variety to the chemistry that transforms grape to fruit to wine the book presents sections on the most important information regarding wine laws authentication the latest technology used in wine production and expert insights into the sensory appreciation of wine and its implications in health This book is ideal for anyone seeking to understand the science that produces quality wines of every type Presents thorough explanations of viticulture and winemaking principles from grape to taste bud Addresses historical developments in wine production notably sparkling wines Provides techniques in grapevine breeding notably CRISPR Compares production methods in a framework that provides insights into the advantages and disadvantages of each

Principles of Soil and Plant Water Relations M.B. Kirkham, 2023-07-13 Principles of Soil and Plant Water Relations Third Edition describes the fundamental principles of soil and water relationships in relation to water storage in soil and water uptake by plants The book explains why it is important to know about soil plant water relations with subsequent chapters providing the definition of all physical units and the SI system and dealing with the structure of water and its special properties Final sections explain the structure of plants and the mechanisms behind their interrelationships especially the mechanism of water uptake and water flow within plants and how to assess parameters All chapters begin with a brief paragraph about why the topic is important and include all formulas necessary to calculate respective parameters This third edition includes a new chapter on

water relations of plants and soils in space as well as textbook problems and answers Covers plant anatomy an essential component to understanding soil and plant water relations includes problems and answers to help students apply key concepts Provides the biography of the scientist whose principles are discussed in the chapter **Agro-Environmental Sustainability in MENA Regions** Mohamed Abu-hashim, Faiza Khebour Allouche, Abdelazim Negm, 2021-10-11 This book focuses on the status quo and the latest information on the water soil agriculture nexus in the MENA countries It presents several case studies and applications from e g Morocco Algeria Tunisia Egypt and Jordan while also sharing and discussing the latest findings The content includes a range of agriculture related topics that focus on water resources management impacts of climate change and wastewater treatment for reuse in agriculture sectors in addition sustainable approaches to agricultural based industry organic crop production crop water requirements and soil environment are discussed in an updated and comprehensive review In turn the book discusses the applications of GIS and remote sensing as a new technology for better agriculture management as well as its use in Egypt as a representative country In closing it considers the implementation of an environmental information system in data scarce MENA countries from the standpoint of the water food nexus and addresses the question of climate justice in the MENA region Exploring various dimensions of MENA country based case studies on achieving sustainable agriculture the book offers an invaluable source of topical information for agricultural sustainability related stakeholders in the region researchers and graduate students alike Changing Climate and Resource use Efficiency in Plants Amitav Bhattacharya, 2018-11-01 Changing Climate and Resource Use Efficiency in Plants reviews the efficiencies for resource use by crop plants under different climatic conditions This book focuses on the challenges and potential remediation methods for a variety of resource factors Chapters deal with the effects of different climatic conditions on agriculture radiation use efficiency under various climatic conditions the efficiency of water and its impact on harvest production under restricted soil moisture conditions nitrogen and phosphorus use efficiency nitrogen use efficiency in different environmental conditions under the influence of climate change and various aspects of improving phosphorus use efficiency The book provides guidance for researchers engaged in plant science studies particularly Plant Crop Physiology Agronomy Plant Breeding and Molecular Breeding In addition it provides valuable insights for policymakers administrators plant based companies and agribusiness companies Explores climatic effects on agriculture through radiation water nitrogen and phosphorus use efficiency Guides the planning and research of and recommendations for fertilizer application for different crops under various climatic conditions Discusses efficiency improvements for plant and molecular breeders seeking to maximize resource use **Genomic Designing of Climate-Smart Fruit Crops** Chittaranjan Kole, 2020-03-30 This edited book provides a comprehensive overview of modern strategies in fruit crop breeding in the era of climate change and global warming It demonstrates how advances in plant molecular and genomics assisted breeding can be utilized to produce improved fruit crops with climate smart traits Agriculture is facing a number of challenges in the 21st

century as it has to address food nutritional energy and environmental security Future fruit varieties must be adaptive to the varying scenarios of climate change produce higher yields of high quality food feed and fuel and have multiple uses To achieve these goals it is imperative to employ modern tools of molecular breeding genetic engineering and genomics for precise plant breeding to produce designed fruit crop varieties This book is of interest to scientists working in the fields of plant genetics genomics breeding biotechnology and in the disciplines of agronomy and horticulture

Water Scarcity and Sustainable Agriculture in Semiarid Environment Ivan Francisco Garcia Tejero, Victor Hugo Duran Zuazo, 2018-01-03

Water Scarcity and Sustainable Agriculture in Semiarid Environment Tools Strategies and Challenges for Woody Crops explores the complex relationship between water scarcity and climate change agricultural water use efficiency crop water stress management and modeling water scarcity in woody crops Understanding these cause and effect relationships and identifying the most appropriate responses are critical for sustainable crop production The book focuses on Mediterranean environments to explain how to determine the most appropriate strategy and implement an effective plan however core concepts are translational to other regions Informative for those working in agricultural water management irrigation and drainage crop physiology and sustainable agriculture Focuses on semi arid crops including olive vine citrus almonds peach nectarine plum subtropical fruits and others Explores crop physiological responses to drought at plant cellular and or molecular levels Presents tool options for assessing crop water status and irrigation scheduling

Data Acquisition and Processing in Cultural Heritage Gabriele Bitelli, Fulvio Rinaudo, Diego Gonzalez-Aguilera, Pierre Grussenmeyer, 2020-03-16

Advances in the knowledge of the tangible components position size shape and intangible components identity habits of an historic building or site involves fundamental and complex tasks in any project related to the conservation of cultural heritage CH In recent years new geotechnologies have proven their usefulness and added value to the field of cultural heritage CH in the tasks of recording modeling conserving and visualizing In addition current developments in building information modeling HBIM allow integration and simulation of different sources of information generating a digital twin of any complex CH construction As a result experts in the area have increased the number of available sensors and methodologies However the quick evolution of geospatial technologies makes it necessary to revise their use integration and application in CH This process is difficult to adopt due to the new options which are opened for the study analysis management and valorization of CH Therefore the aim of the present Special Issue is to cover the latest relevant topics trends and best practices in geospatial technologies and processing methodologies for CH sites and scenarios as well as to introduce the new tendencies This book originates from the Special Issue Data Acquisition and Processing in Cultural Heritage focusing primarily on data and sensor integration for CH documentation restoration in CH heritage 3D documentation and modeling of complex CH sites drone inspections in CH software development in CH and augmented reality in CH It is hoped that this book will provide the advice and guidance required for any CH professional making the best

possible use of these sensors and methods in CH

PGPR Amelioration in Sustainable Agriculture Amit Kishore Singh, Pawan Kumar Singh, Ajay Kumar, 2018-09-14 PGPR Amelioration in Sustainable Agriculture Food Security and Environmental Management explores the growth promoting rhizobacteria PGPR that are indigenous to soil and plant rhizosphere. These microorganisms have significant potential as important tools for sustainable agriculture. PGPR enhance the growth of root systems and often control certain plant pathogens. As PGPR amelioration is a fascinating subject, it is multidisciplinary in nature and concerns scientists involved in plant health and plant protection. This book is an ideal resource that emphasizes the current trends of and probable future of PGPR developments. Chapters incorporate both theoretical and practical aspects and may serve as baseline information for future research. This book will be useful to students, teachers, and researchers both in universities and research institutes, especially working in areas of agricultural microbiology, plant pathology, and agronomy. Presents new concepts and current development in PGPR research and evaluates the implications for sustainable productivity. Describes the role of multi-omics approaches in establishing an understanding of plant-microbe interactions that help plants optimize abiotic stresses. Incorporates both theoretical and practical aspects and will serve as a baseline for future research.

Virtual Plants: Modeling Plant Architecture in Changing Environments Katrin Kahlen, Hartmut Stützel, 2017-02-07 Plant architecture is a major determinant of the resource use efficiency of crops. The architecture of a plant shows ontogenetic structural changes which are modified by multiple environmental factors. Plant canopies are exposed to natural fluctuations in light quantity, and the dynamically changing canopy architecture induces local variations in light quality. Changing temperature conditions or water availability during growth additionally affect plant architecture and thus crop productivity because plants have various options to adapt their architecture to the available resources. Meeting the challenge of ensuring food security, we must understand the plant's mechanisms for integrating and responding to an orchestra of environmental factors. Virtual plants describe plant architecture *in silico*. Virtual plants have the potential to help us understand the complex feedback processes between canopy architecture, multiple environmental factors, and crop productivity. As a research tool, they have become increasingly popular within the last decade due to their great power of realistically visualizing the plant's architecture. This Research Topic highlights current research carried out on modeling plant architecture in changing environments.

Genomic Designing for Biotic Stress Resistant Fruit Crops Chittaranjan Kole, 2022-03-18 This book presents deliberations on the molecular and genomic mechanisms underlying the interactions of crop plants with the biotic stresses caused by insects, bacteria, fungi, viruses, and oomycetes etc., important to develop resistant crop varieties. Knowledge on the advanced genetic and genomic crop improvement strategies including molecular breeding, transgenics, genomic assisted breeding, and the recently emerging genome editing for developing resistant varieties in fruit crops is imperative for addressing FPNEE (food, health, nutrition, energy, and environment) security. Whole genome sequencing of these crops followed by genotyping by sequencing have facilitated precise information about

the genes conferring resistance useful for gene discovery allele mining and shuttle breeding which in turn opened up the scope for designing crop genomes with resistance to biotic stresses The nine chapters each dedicated to a fruit crop in this volume deliberate on different types of biotic stress agents and their effects on and interaction with the crop plants enumerate the available genetic diversity with regard to biotic stress resistance among available cultivars illuminate on the potential gene pools for utilization in interspecific gene transfer present brief on the classical genetics of stress resistance and traditional breeding for biotic stress resistance depict the success stories of genetic engineering for developing biotic stress resistant varieties discuss on molecular mapping of genes and QTLs underlying biotic stress resistance and their marker assisted introgression into elite varieties enunciate different emerging genomics aided techniques including genomic selection allele mining gene discovery and gene pyramiding for developing resistant crop varieties with higher quantity and quality of yield and also elaborate some case studies on genome editing focusing on specific genes for generating disease and insect resistant crops

Internet Research Annual Mia Consalvo, Nancy Baym, Jeremy Hunsinger, Klaus Bruhn Jensen, 2004

Internet Research Annual offers a selection of the best work presented at the first three conferences of the Association of Internet Researchers and provides a useful overview of the cutting edge in Internet studies Established scholars and new researchers address issues such as communities on off line the Internet as a methodological tool and space for research and the places politics and policies of the Internet creating a volume that comprehensively covers the field of Internet research Also included are a brief history of the organization a list of previously published papers from the conferences and works by several of the keynote speakers including Phil Agre Barbara Warnick Bill Dutton Sheizaf Rafaeli Susan Herring Robin Mansell and much more

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