

Hort Forum

Leveraging Molecular Markers in Fruit Tree Breeding: From Promise to Reality

Tuesday
28th November 2023,
Hours: 17:00 – 19:00
Central European Time (CET)

Registration link:
https://us02web.zoom.us/webinar/register/WN_tUs7kiDkSd-k3nNB9ko9pQ

ISHS
International Society for Horticultural Science



The International Society for Horticultural Science invites you to the third episode of Hort Forum:

Leveraging Molecular Markers in Fruit Tree Breeding: From Promise to Reality

Speaker: Ksenija Gasic, Professor
Clemson University, South Carolina, USA

Abstract

Fruit tree breeding has undergone a significant transformation with the emergence of genomics technologies. The availability of extensive genomic resources, such as whole genome sequences, genetic maps, quantitative trait loci (QTLs) and genetic markers, has created expectations for DNA-assisted breeding potential to accelerate the development of new cultivars with desirable traits. DNA-informed breeding is now the norm in many tree fruit breeding programs, successfully increasing the efficiency of trait selection and gene pyramiding while shortening the time required for new cultivar development. While genetic-based breeding has been successful in improving fruit quality and biotic stress resistance in tree fruits, the application of genomic-assisted breeding is still in its early stages and presents new opportunities for future breeding efforts. An overview of the status and future prospects of genomics-enabled breeding efforts in tree fruit crops will be presented. The challenges and opportunities associated with the use of DNA information in tree fruit breeding, including the need to better understand the genetic architecture of important traits and the development of reliable and efficient genomic selection methods will be discussed. Examples of DNA-informed breeding use from RosBREED project will be presented for all breeding stages, including pre-breeding for disease resistance, parental and seedling selection, and elite selection advancement. Finally, a perspective on the future directions of tree fruit breeding in the genomic era and how genomics-enabled breeding can contribute to the sustainable production of high-quality cultivars and their adaptation to new climatic scenarios will be provided.



Short Bio

Dr. Ksenija Gasic is a Professor of Horticulture and a peach breeder and geneticist at Clemson University, South Carolina, USA. Her program is developing fresh market types of peach varieties adapted to environmental conditions of Southeastern U.S. and replant tolerant rootstocks. The emphasis of the fresh market breeding is on development of high quality, disease resistant peach varieties and involves characterization and utilization of the peach genetic diversity and development and utilization of genomic technology and computational approaches to improve breeding efficiency. Rootstock breeding is focused on combining tolerance to two replant diseases that affect the southeast of U.S., Armillaria Root Rot and Peach Tree Short Life. Dr. Gasic's program has been actively involved in development and application of modern technological tools in breeding programs (www.rosbreed.org, www.rosaceae.org), germplasm preservation and utilization, and education of future generations of plant breeders. Dr. Gasic has received the 2020 Godley-Snell Award for Excellence in Agriculture Research from Clemson University. She authored/coauthored 74 refereed publications, generated over \$5 million in grants, and has given over 140 presentations at national and international professional and research meetings. She is serving as a President of the American Pomological Society (americanpomological.org/), Past-President of the National Association of Plant Breeders (NAPB; plantbreeding.org), Chair of the Prunus Crop Germplasm Committee, and is a member of US Rosaceae Executive Committee and Plant Breeding Coordinating Committee, among others.

Moderator



François Laurens,
President of ISHS

Organizers



Theodore DeJong,
University of
California, Davis,
USA



George Manganaris,
Cyprus University
of Technology,
Cyprus

Panelists



Tom Gradziel,
UC Davis,
USA



Richard Volz,
The New Zealand
Institute for Plant
& Food Research



Marco Cirilli,
University of Milan,
Italy



Jose Quero,
INRA, Bordeaux,
France