



HAL
open science

Genetic and genomic control of response to water deficit in cultivated tomato

Elise Albert, Yolande Carretero, Justine Gricourt, Esther Pelpoir, Romain
Novaretti, Claire Duffes, Julien Bonnefoi, Mathilde M. Causse

► To cite this version:

Elise Albert, Yolande Carretero, Justine Gricourt, Esther Pelpoir, Romain Novaretti, et al.. Genetic and genomic control of response to water deficit in cultivated tomato. Innovation in Integrated & Organic Horticulture, INNOHORT 2015, International Society for Horticultural Science (ISHS). INT., Jun 2015, Avignon, France. hal-02744107

HAL Id: hal-02744107

<https://hal.inrae.fr/hal-02744107>

Submitted on 3 Jun 2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



ISHS INTERNATIONAL SYMPOSIUM

INNOHORT

Innovation in
Integrated & Organic
Horticulture

Avignon, France

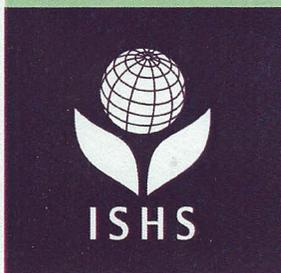
2015

June 8 - 12

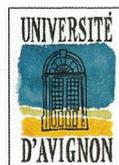
PROGRAM
AND ABSTRACT BOOK



© Photo C. Bozde - Avignon Tourisme



INNOHORT
is organized by



GENETIC AND GENOMIC CONTROL OF RESPONSE TO WATER DEFICIT IN CULTIVATED TOMATO

Elise Albert¹, Yolande Carretero¹, Justine Gricourt¹, Esther Pelpoir¹, Romain Novaretti¹, Claire Duffes², Julien Bonnefoi², Mathilde Causse¹

¹ INRA, GAFL, F-85000 Montfavet, France; ² GAUTIER Semences, F-13630 Eyragues, France

In the next decade water will be increasingly limiting crop production, in particular in Mediterranean region. Improving plant water use efficiency (WUE) by studying genotype x water regime (G x WR) interactions is of main interest to improve plant adaptation to low water availability. At different degrees, plants can change their phenotypes (molecular, morphological and physiological levels) in response to environmental changes. These modifications relate to phenotypic plasticity. In Tomato (*Solanum lycopersicum* L.), extensively grown in Mediterranean region, first studies have shown genetic variability in the response to water deficit, but very few genes/QTLs have been identified and mostly in wild relative species. Studying water deficit in this fleshy fruit is of particular interest since a well mastered water deficit can stimulate secondary metabolism production, increasing plant defenses and concentration of compounds involved in tomato fruit quality at the same time. In our laboratory, we analyzed 119 recombinant inbred lines (RIL population) and 142 unrelated cherry tomato (*Solanum lycopersicum* L. *cerasiforme*) accessions (GWA population), grown in greenhouse under two watering regimes (WR), in two locations (Morocco and France). Plants were phenotyped for plant phenology, plant vigor and fruit quality traits. We assessed genetic variability and G x WR interactions, for the above traits in the two populations. QTL and GWA analysis were conducted to identify QTL x watering regime (QTL x WR) interactions. The presentation will give a short overview of the research methods available to study genotype by environment interactions in plant and to present the first results of our research project. The possible use of slight water deficit to improve tomato fruit quality in future breeding programs will be investigated.

Keywords: Genotype x Environment interaction, QTL, GWAS, linkage mapping, water deficit, tomato