



Dr. Jana Kholová

Crop Physiology Laboratory
International Crops Research Institute for the Semi-Arid Tropics (ICRISAT),
Patancheru
Telangana,
India
E-mail: J.Kholova@cgiar.org

Dr. Jana Kholová obtained her MSc degree, with specialization in plant genetics & physiology at the Dept. of Genetics and Microbiology, Charles University in Prague, Faculty of Science. From 2006- 2010, she did her Ph.D, specializing in plant genetics & physiology. Since 2009, Dr. Kholová is serving as Scientist

at the Dept. of Crops Physiology, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru, India. Her work areas include plant stress physiology & modeling; genetics; plant biochemistry; molecular biology; plant nutrition; and interdisciplinary research along the SAT-crops value-chain.

Adapting crops for semi-arid-tropical (SAT) agricultural systems: progress in TE research

Jana Kholová¹, Graeme L. Hammer², Tharanya Murugesan¹, Sivasakthi Kaliamoorthi¹, Greg McLean³, Surjit Vikraman¹, Erik van Oosterom², Keerthi Chandavalada¹, Vincent Vadez^{1*}

¹International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Crop Physiology Laboratory, Patancheru 502324, Telangana, India

²The University of Queensland, Queensland Alliance for Agriculture and Food Innovation, Brisbane, QLD 4072, Australia

³Agri-Science Queensland, Department of Agriculture and Fisheries, Toowoomba, QLD 4350, Australia

*E-mail v.vadez@cgiar.org

Increasing the efficiency of water conversion into biomass (TE) is in focus for improvement of crop productivity under water-limited environments. The last ID conference highlighted that stomatal regulation under high vapor pressure can increase TE, which represented a new opportunity for crop improvement. While increasing TE leads to enhanced crop production under drought stress, managing water to assure its availability for the grain filling period is necessary. Particularly, we will focus on traits that alter the crop water-use profile during the season (e.g. canopy size and development), increase TE (e.g. canopy conductivity and structure), or achieve both. For these water-use related traits, the range of genetic variability has been explored and this allowed designing crops suitable for either agro-systems intensification or resilience. Yet, the interactions

of physiological processes responsible for plant water use with environments are not fully understood and this talk will provide an update on these aspects. We will also show how the crop and socio-economic models are used to quantify the benefits and evaluate the trade-offs associated with different crop water-use strategies in semi-arid tropics agro-ecologies. Results indicate that variation in water-use related traits is frequently associated with grain versusstover production trade-offs. Therefore, the economic value of a particular technology intervention depends on the nature and type of commodity demand within the specific agro-system. We will discuss the possibilities of enhancing the crop value in the systems with high demand for staple food grains or more complex dual purpose (food and fodder) crop production systems.