【Workshop 2】Crop Production under Heat Stress

Responses to Elevated Temperature in Rice and Wheat

Len Wade

Charles Sturt University, EH Graham Centre, Wagga Wagga NSW 2678, Australia

(lwade@csu.edu.au)

The Murray-Darling Basin in southern Australia is predicted to encounter severe consequences under climate change. Severe drought, temperature extremes, and greater fluctuations in weather are already impacting upon crop production and river flow, with worse expected to follow. Consequently, a recent book called "Where the hell is Wagga Wagga" highlighted the expected severity in the Riverina and Wagga Wagga, the site of Charles Sturt University (CSU). Hence, the CSU-Department of Industry and Investment (DII) alliance, via the EH Graham Centre for Agricultural Innovation, is well placed to address research issues in climate change, especially heat stress in crop production. This presentation will outline recent research approaches in examining the consequences of elevated temperature for rice in the tropics, initially via the PhD studies of Ms Estela Pasuquin, in collaboration with Dr Toshi Hasegawa (NIAES), Dr Tanguy Lafarge (IRRI), Dr Russell Reinke (DII) and A/Prof Phil Eberbach (CSU). Related questions for wheat exposed to elevated temperature in grain filling will also be outlined, featuring collaboration with Dr Livinus Emebiri (DII) under the proposed Cooperative Research Centre for Cereals. This research will address both physiology and genetic questions, including changes in heat shock proteins. Dr D. Vijayalakshmi from Tamil Nadu Agricultural University in India is expected to further strengthen these research activities in 2010, if her application for an AusAID Endeavour Postdoctoral Fellowship is successful. Likewise, Dr Rolly Cruz, Chief Scientist from Philrice, will join us in 2010 as a Visiting Professor with CSU support, to assist us in further methodology development. Our recent success is receiving a $34.0 Million grant (with a further $10.0 Million from CSU-DII) under the federal Education Investment Fund will allow us to establish a National Life Sciences Hub at Wagga Wagga, to further strengthen research and learning facilities from field to laboratory for research under drought, climate change and food security. These enhanced facilities will further strengthen these emerging projects. We look forward to exploring collaborative opportunities for research under heat stress in crop production with you.