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RESEARCH DIRECTIONS

Fibres to weather a hotter, drier future

Dr Robert Sharwood, a postdoctoral fellow at the Hawkesbury Institute for the Environment, has received funding to investigate how cotton, one of Australia's most significant agricultural exports, can better cope with hotter and drier growing conditions. The project is supported by the federal Department of Agriculture and the Cotton Research and Development Corporation in collaboration with the CSIRO in Narrabri. It seeks to understand the underlying physiology of cotton to assist in developing more resilient varieties and crop management systems.

'Australia's cotton industry is a world leader in production, generating some of the greatest yields and highest-quality fibre in the world,' says Dr Sharwood. 'However, high temperatures and drought significantly reduce cotton productivity.'

According to the CSIRO, cotton production in Australia is valued at $1.7 billion a year, making it one of country's largest farming industries. It is grown in both irrigated and dry-land conditions, and the bulk of it is exported.

This project builds on research work being undertaken at CSIRO Narrabri and at UWS on cotton cultivation and the challenges posed by climate change. CSIRO scientists have identified cotton cultivars, in commercial field conditions, that are more heat tolerant and water-use efficient but they do not have a full understanding of the attributes that make those cultivars successful. This project aims to partially fill that gap by identifying the photosynthetic traits that will be so important in promoting cotton production over the coming decades of variable weather conditions and climate change.

Research conducted in state-of-the-art glasshouses will examine cotton varieties that are heat-tolerant and water-use efficient as well as old and new varieties used in climate change studies. They will be grown under current (28°C) and projected (32°C) temperatures. Half the plants will be subjected to a progressive drought while the other half will receive adequate water, allowing water-use efficiency to be compared between cotton plants.

Using a multidisciplinary approach, the research will analyse a range of physiological and biochemical factors to determine what contributes to the greatest tolerance of heat and the most efficient use of water. The end result may assist future pre-breeding work in the development of resilient cotton varieties and cropping systems.

Project Title: Improved understanding of underlying physiology contributing to heat tolerance and water use efficiency in cotton
Funding has been set at: $20,999
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