

The trials taking place inside a climate controlled glasshouse at the CSIRO facility at the James Cook University campus in Townsville.

Project details

Key Focus Area: 1

Optimally adapted varieties, plant breeding and release

Project name

Sugarcane for future climates

Project number

2013/029

Principal provider

CSIRO

Project end date

June 2017

Getting the most crop per drop

New research is looking at ways that future sugarcane varieties can be bred to offer the best performance for future climatic challenges such as increased water stress and increased carbon dioxide levels.

By Brad Pfeffer

Recent seasons in some regions have been an unwelcome reminder for many sugarcane growers of the lost potential of sugarcane when it is placed under water stress.

But new research undertaken by the CSIRO and SRA is looking at ways to adapt upcoming cane varieties to better deal with water stress and the other climate challenges that may occur in the future.

Lead researcher Chris Stokes from CSIRO said that even in irrigated regions, the sugarcane industry continued to lose significant production each year through water stress.

"While a lot of that water stress is unavoidable even in irrigated and high rainfall areas, this research is focused on improving sugarcane varieties so that they are more water-efficient and more productive," Dr Stokes said.

The project is being funded by the Commonwealth Department of Agriculture and Water Resources (*Filling the Research Gap*) and SRA, and is a collaborative project that involves both CSIRO and SRA.

The project is looking at two main opportunities, both of which would assist farmers in dealing with the current and future climate challenges in existing regions, and also for expansion to possible new areas in northern Australia.

These are: the improvements in water use efficiency to reduce crop production losses from water deficit; and also how plant responses to increasing carbon dioxide levels in the atmosphere can be used to further enhance water use efficiency of sugarcane.

The researchers want to discover how sugarcane varieties differ in their patterns of water use and their responses to water stress and carbon dioxide levels in the air.

If they do respond differently, this would indicate a trait (or traits) within these varieties that could be incorporated into future varieties through breeding, with tangible benefits for the industry.

Recent trials have screened about 100 clones in a climate-controlled glasshouse at CSIRO in Townsville, comparing how each of these clones respond in the controlled environment.

If there is a difference in response, this would indicate that some clones are better than others in water deficit or well-watered conditions and they could be incorporated into the plant breeding program for developing new sugarcane varieties.

According to researchers, the work done on this project could also assist in the late-stage selection of clones to determine their suitability for different regions, particularly in the rain-fed areas.

SRA Trait Development Manager Prakash Lakshmanan believes the purpose of the research is about discovering how the industry can maximise productivity of sugarcane varieties under variable water conditions.

“If this system can be implemented in the SRA plant breeding program, more information about the likely performance of new varieties in irrigated and rain-fed conditions can be provided to growers. The impact of such variety release decisions may become apparent in about five years’ time,” Dr Lakshmanan said.

“We’ve been working on this issue since 2006 in collaboration with CSIRO, and this work is an excellent example of collaboration between these two bodies to deliver crop improvement for the sugarcane industry.”

For more information contact Dr Chris Stokes at chris.stokes@csiro.au or Prakash Lakshmanan at plakshmanan@sugarresearch.com.au.



Dr Chris Stokes from CSIRO says research is looking at how different cane varieties respond to water stress and increased carbon dioxide levels in the atmosphere.

Ecuador congress provides biosecurity insights

The International Society for Sugarcane Technologists (ISSCT) Pathology and Entomology workshop was held from September 14–18 in Ecuador recently. By Nicole Thompson



Perkinsiella saccharicida is a pest in its own right in Ecuador – they are free from Fiji leaf gall disease.

This was the first time that pathology and entomology sections have held a joint workshop, and it was a very full program of presentations and a field visit. There were 59 participants from 14 countries.

SRA was represented by Dr Nader Sallam (member of the ISSCT entomology committee), Dr Peter Samson (entomologist from SRA’s Research Funding Unit) and pathologists Dr Shamsul Bhuiyan (recipient of a Sugar Travel and Learning Award (STLA)), Dr Kathy Braithwaite (STLA recipient) and Dr Nicole Thompson (member of the ISSCT pathology committee and STLA recipient).

SRA’s attendance at workshops such as this form an integral part of ensuring that our researchers are fully informed about leading advances in biosecurity and other research from around the world – as well as potential new biosecurity threats to our industry. All this helps to form part of SRA’s ongoing strategic commitment to protecting the Australian sugarcane industry from biosecurity threats.

The workshop’s keynote presentation was delivered by Dr Andy Sheppard (CSIRO), who gave an overview of biosecurity planning. He introduced some of the tools that CSIRO has developed in this area for improving risk analysis, stakeholder decision framework tools, and structured decision making for emergency response.