



China trip delivers valuable research insights

A recent trip to China has given an insight into variety development and nematode research for Australian sugarcane industry researchers.

Australian sugarcane researchers have been given new knowledge and insight into sugarcane research and development in China, following a recent trip to the country.

In November 2017, SRA Researchers Dr Shamsul Bhuiyan and Dr Priyanka Wickramasinghe were accompanied by CSIRO scientist Dr Karen Aitken for a visit to research facilities in the Yunnan province.

Situated in the country's Southwest, Yunnan shares a border with Vietnam, Laos and Myanmar and is the second largest sugarcane production area in China, with cultivation of about 300,000 hectares and production of around 1.8 million tonnes.

The purpose of the trip was two-fold: to meet with Chinese scientists to develop collaborative research on sugarcane nematodes; and to run a workshop on sugarcane nematodes for the Chinese. In addition, it also presented the chance to discuss sugarcane breeding and in particular introgression, a breeding

technique that brings in traits from wild relatives of sugarcane into commercial varieties.

The travel was sponsored by the Office of Overseas Training Management, Department of Human Resources and Social Security of Yunnan.

The trip involved the Australian scientists visiting facilities including the Biotechnology and Genetic Resources Institute (BGR), the Yunnan Academy of Agricultural Science (YAAS), the Yunnan Sugarcane Research Institute (YSRI), and the Yunnan Agricultural University.

"The visit was a valuable learning experience for Australia and allowed us to observe one of the most diverse collections of wild sugarcane germplasm and its associated introgression breeding programs," Dr Bhuiyan explained. "Introgression is playing an increasingly important role in the Australian sugarcane breeding program, so it was useful to gain valuable insights into the successes and challenges faced by our Chinese counterparts."

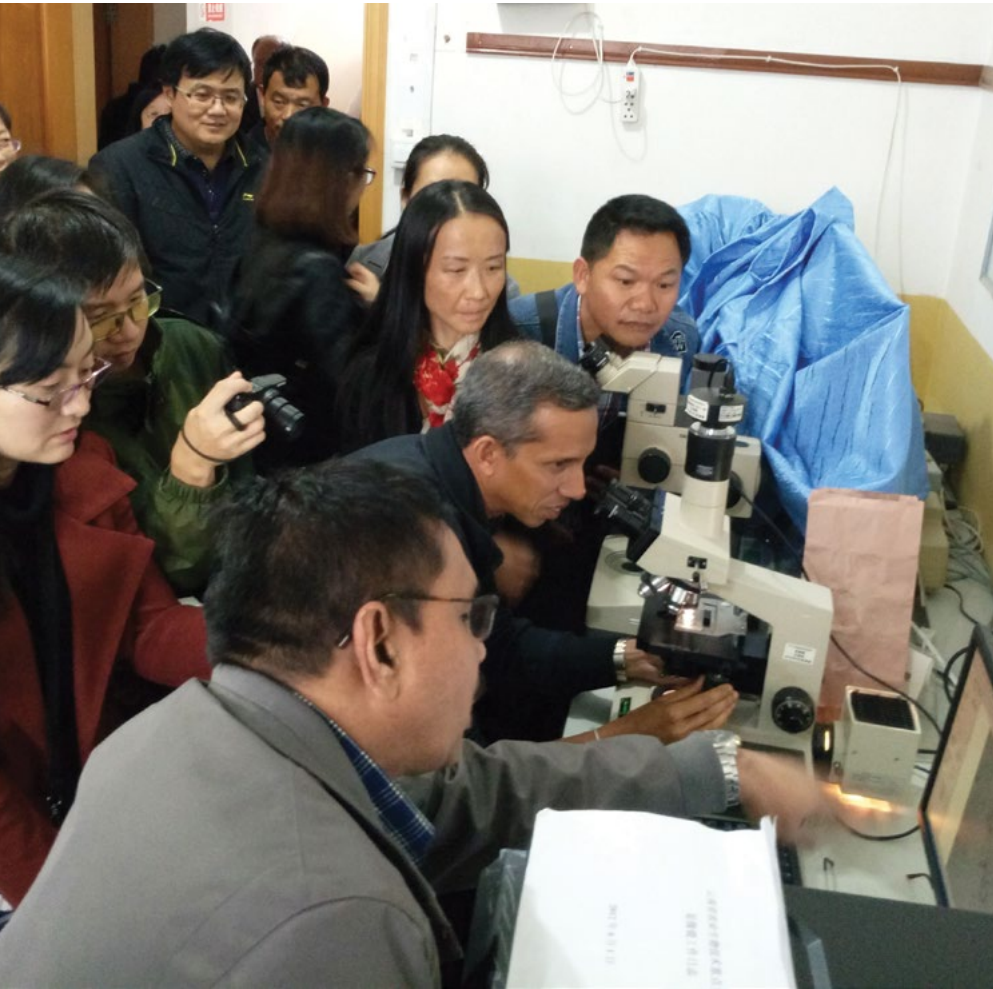
At the YSRI, they saw more than 2000 sugarcane germplasm accessions that are maintained there.

In addition, while at the Yunnan Agricultural University, they heard that the University has more than 800 lines of sugarcane plant material in their collection, belonging to wild relatives of sugarcane.

"Most of the accession lines were collected from Tibet, Nepal, and Myanmar, from high altitude of approximately 1800 metres and higher," Dr Bhuiyan said. "Those accessions have been tested for their growth and flowering at altitude, high latitude, and for cold tolerance."

"They explained to us that, recently, YAU developed a new variety from the cross of introgression material and commercial canes, with high sugar and cold tolerance traits."

"Lack of diversity in breeding programs is one of the factors that impacts productivity worldwide."



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“But viewing these germplasm collections was a reminder of how much untouched diversity is still available for exploitation.”

A major focus of the trip was on sugarcane nematodes, which included a training workshop for about 50 scientists in Kunming.

Recently, Australian researchers, through SRA-funded research, discovered a new beneficial bacteria called *Pasteuria penetrans*. It is a natural parasite of root-knot nematodes, and its presence could help contribute to improved productivity for growers and millers. The key message around this discovery is that *Pasteuria penetrans* can be encouraged by adopting

a controlled traffic and minimum till farming system.

This bacterium was one topic of discussion, as well as molecular marker screening, management of nematodes, and diagnosis of sugarcane nematodes.

“In conducting soil sampling in the field, it was interesting to note that the Chinese face large numbers of root-lesion nematodes and spiral nematodes, both of which are the most common nematodes in Australian sugarcane fields,” Dr Bhuiyan said.

“We will investigate further collaboration and partnership with the Chinese with fundamental research into nematodes and variety exchange.” ■

(Over Page) With flowering sugarcane plants at YSRI – Dr Cai Qing, Dr Shamsul Bhuiyan (SRA), Dr Karen Aitken (CSIRO), Prof Zhan Shaosong, and Dr Priyanka Wickramasinghe (SRA). (Top Left) A practical session with SRA Researchers Dr Priyanka Wickramasinghe and Dr Shamsul Bhuiyan on nematode extraction and diagnosis at the BGRI nematology laboratory. (Top Right) Seedlings from the various stages of the introgression breeding selection program in the field.

For more information, contact:

Dr Shamsul Bhuiyan

E sbhuiyan@sugarresearch.com.au

T (07) 5434 5902