



Mike Cox in the field as part of work with the SRA breeding program.



Mike receives life membership of the Australian Society of Sugarcane Technologists in April, 2015, from Neil Sichter.

Meeting the challenges of sugarcane breeding

Mike Cox's interest in plant breeding was raised during work experience with Dekalb Shand's plant breeding outfit in Tamworth. By Amy Claireton

Since then he contributed to the selection of improved crop varieties in the wheat, rice and sugarcane industries in a plant breeding career that spans almost 45 years, up to his retirement from SRA in August this year.

Starting with a scholarship to study agricultural science at the University of Queensland, Mike spent seven years with the Queensland Wheat Research Institute then travelled with his young family to undertake his PhD studies at University of California. On his return he led the Queensland Government's rice breeding program in the Burdekin until 1989.

Mike took up a position with the then BSES as the leading plant breeder responsible for the southern region variety selection program. Working initially under the leadership of Dr Mac Hogarth until Mac's retirement in 2002, Mike has contributed to many of the achievements of the plant breeding team. In 2002 Mike took on the responsibility of Manager Plant Breeding, in time to assist the industry with the rapid release of

smut-resistant varieties following the outbreak in Queensland in June 2006.

Being prepared for such events is an important component of the industry's breeding program. Mike is proud of the plant breeding and biosecurity team's success in limiting the impact of potentially industry-destroying diseases such as Fiji disease, leaf scald, orange rust and sugarcane smut, all of which have been managed primarily through the release of resistant varieties. Estimates suggest that the investment in screening varieties for smut resistance and developing breeding strategies prior to the incursion saved the industry at least \$200 million.

Over the 26 years he has worked in the sugarcane industry Mike has seen the plant breeding program embrace new technology and develop advancements that have greatly improved the effectiveness and efficiency of the selection process. There have also been huge advancements in the use of statistical analysis and experimental

design to estimate the genetic effects of potential crosses and clones. Mike has championed and overseen the development of a plant breeding database, SPIDNet, which is unique in the world and greatly envied in sugarcane breeding circles. SPIDNet contains all manner of plant breeding data including pedigrees, trial design and raw and analysed data that breeders can interrogate to assist in breeding and selection.

Tissue culture has also assisted the management of foreign germplasm imported into Australian quarantine at SRA. Just one small pot of this important material can be used to quickly generate all the material required for the crossing and disease resistance screening processes.

Mike sees the next big challenge for the industry and their plant breeding team as the potential for sugarcane to meet increasing demands for biofuel. As breeding new varieties takes about twelve years, early planning for development of varieties with new traits, such as ligno-cellulosic conversion of fibre to biofuel, is critical.