11th GERMPLASM & BREEDING

8th MOLECULAR BIOLOGY

ISSCT WORKSHOP

Saint-Gilles Réunion Island / 1–5 June 2015



« Pushing the frontiers of sugarcane improvement »

ABSTRACT

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ORGANIZATION

SUMMARY

MO8

MICROSATELLITE MARKERS – CAN WE AGREE ON AN INTERNATIONAL SET FOR SUGARCANE VARIETY IDENTIFICATION?

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For more than a decade, SRA has undertaken a variety audit trail to provide a quality-assurance system for delivery of new varieties to the industry. An important component of this is to DNA fingerprint new varieties at critical stages of the selection program on the path to variety release. In mid-2005, SRA (formerly BSES), in collaboration with the Australian Genome Research Facility Ltd (AGRF), initiated a system to incorporate microsatellite fingerprinting techniques into the variety audit trail and quality assurance pipeline. A set of six highly-selected microsatellite primers was provided to the AGRF and a web-based searchable index of allele sizes of sugarcane cultivars was developed. The database is routinely accessed with approximately 1,000 assays per year. The success of this work in resolving and preventing potentially costly field identification errors has led to the incorporation of the test as a routine step in the SRA Variety Audit system.

Microsatellites (also named SSR) appear to be the marker of choice internationally for sugarcane variety identification. However most sugarcane institutes or research teams have selected different sets of SSRs for this purpose. An attempt was previously made to identify an agreed set of SSR for sugarcane identification at an international level. However, this proved difficult for several reasons including difficulties and differences in the systems used to reveal the markers (silver staining, radioisotopes, autoradiographs), challenges associated with allele calling, and mislabelling of varieties. With the advent of new platforms for revealing SSR markers, and advanced software for identifying alleles these issues may now be easier to resolve. Such a marker system would have great benefits for the international sugarcane community and would overcome many of the problems we face with regard to the unequivocal identification of sugarcane cultivars. It would also be valuable, given the amount of sugarcane germplasm that is exchanged internationally each year.