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BMT/13/27 Add.
ORIGINAL: English
DATE: December 8, 2011

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS
GENEVA

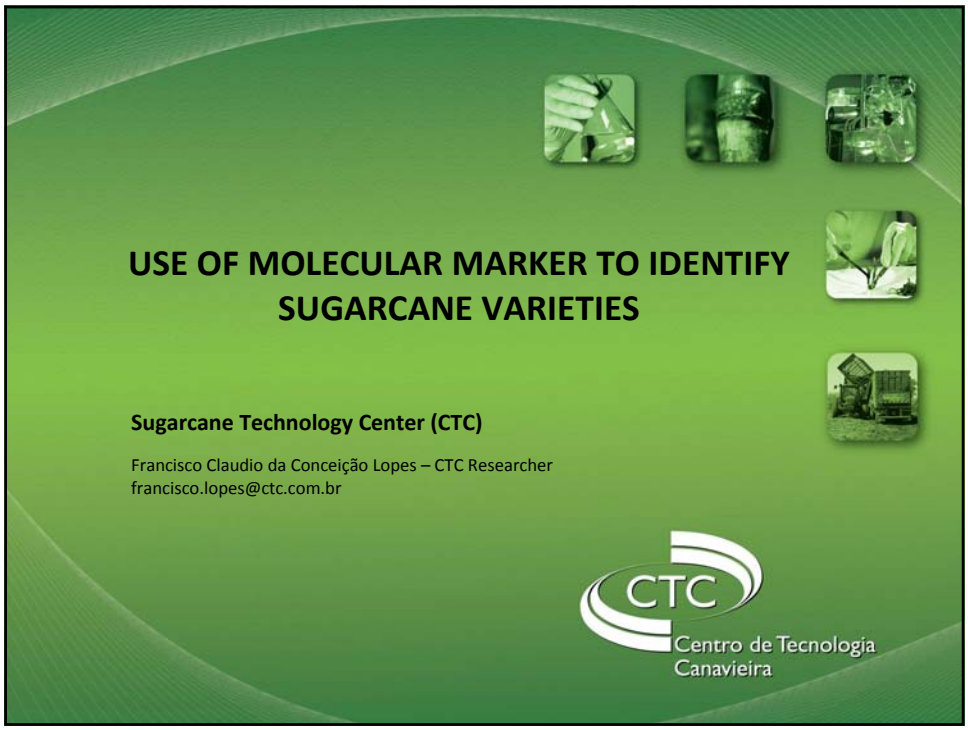
WORKING GROUP ON BIOCHEMICAL AND MOLECULR TECHNIQUES, AND DNA-PROFILING IN PARTICULAR

Thirteenth Session
Brasilia, November 22 to 24, 2011

ADDENDUM

USE OF MOLECULAR MARKER TO IDENTIFY SUGARCANE VARIETIES

Document prepared by experts from Brazil


USE OF MOLECULAR MARKER TO IDENTIFY SUGARCANE VARIETIES
Sugarcane Technology Center (CTC)
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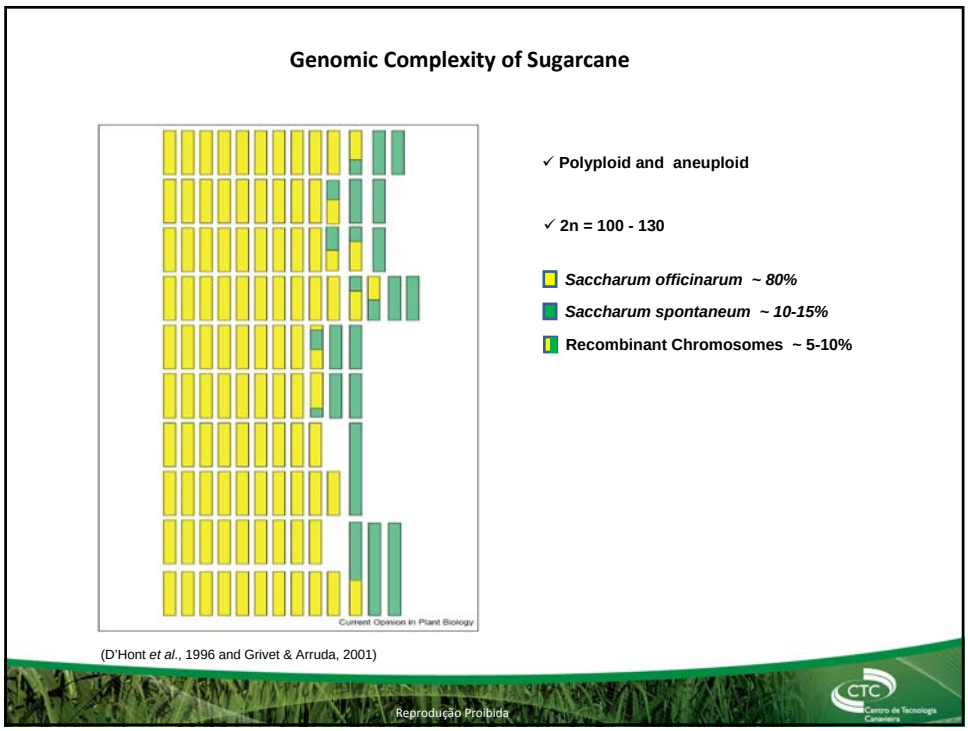
CTC
Centro de Tecnologia Canavieira


Genomic Complexity of Sugarcane
✓ Polyploid and aneuploid
✓ 2n = 100 - 130
Saccharum officinarum ~ 80%
Saccharum spontaneum ~ 10-15%
Recombinant Chromosomes ~ 5-10%
Current Opinion in Plant Biology
(D'Hont et al., 1996 and Grivet & Arruda, 2001)
Reprodução Proibida

Traditional Tools for Sugarcane Identification

✓ Morphological descriptors / Traits for phenotypic variety characterization

❖ Influenced by environment

❖ May not be sufficient/reliable

Potential Use of Molecular Markers for Varietal Fingerprinting

❖ Minimal or no environmental influence

❖ High discrimination power

❖ **Database for commercial protection**

✓ *Available Molecular Markers for sugarcane*

- AFLP (*Amplified Fragment Lenght Polymorphisms*)
- SSR (*Single Sequence Repeats*)
- SNPs (*Single Nucleotide Polymorphisms*)

Molecular Markers for Sugarcane Fingerprinting at CTC

- SNP markers (*Single Nucleotide Polymorphisms*)
- MALDI-TOF MS Technology, Sequenom Inc.
- MassARRAY® Analyzer System
  - ✓ High throughput
  - ✓ Flexibility
  - ✓ Robust and accurate detection
  - ✓ Automated operations

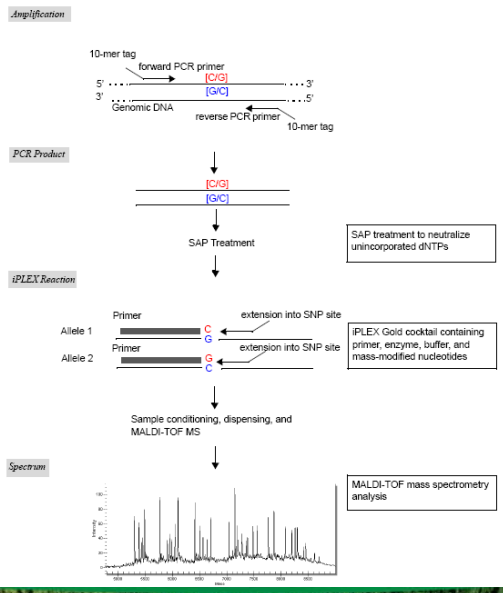
The MassARRAY Analyzer System at CTC

Liquid Handler

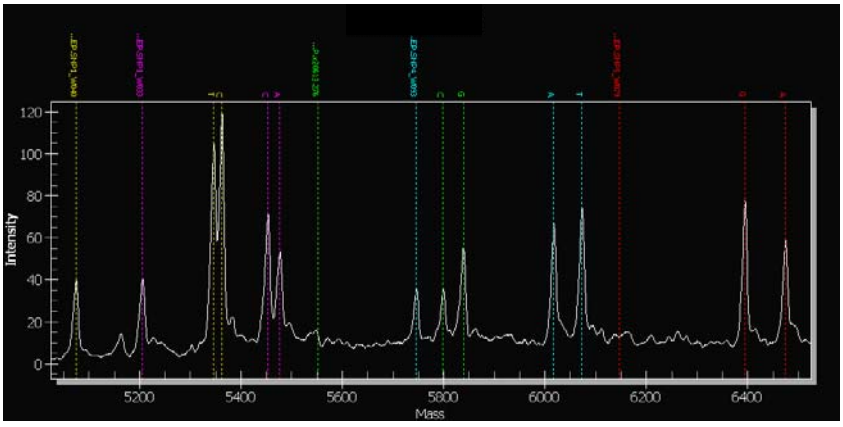
Nanodispenser

Mass Spectrometry

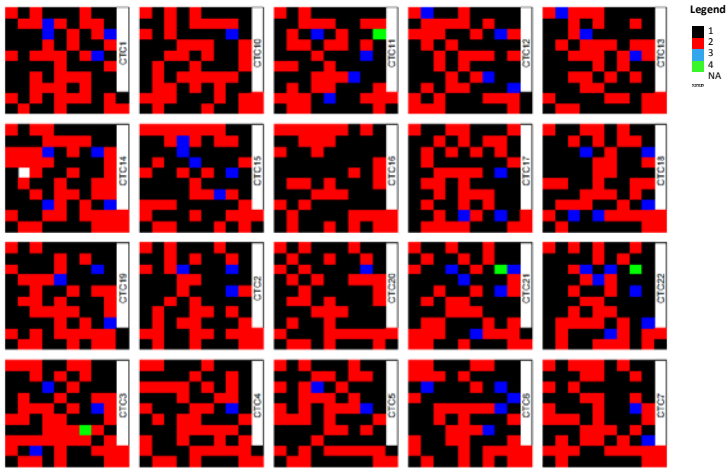
iPLEX® Gold SNP Genotyping



SNPs Genotyping - Spectrum - Raw Data



SNP Fingerprinting of CTC Varieties



Summary of Observations and Main Achievements

Possibility to determine allele dosage (Trait genetic architecture)

Highly reproducible

Very useful for fingerprinting studies

Specific variety profiles

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