RAS5070: Developing Bioenergy Crops to Optimize Marginal Land Productivity through Mutation Breeding and Related Techniques (RCA)

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Sub title: Improvement of Yield and Sugar Content in *Sugarcane* using Mutation Techniques and Biotechnology for Bio-energy Production

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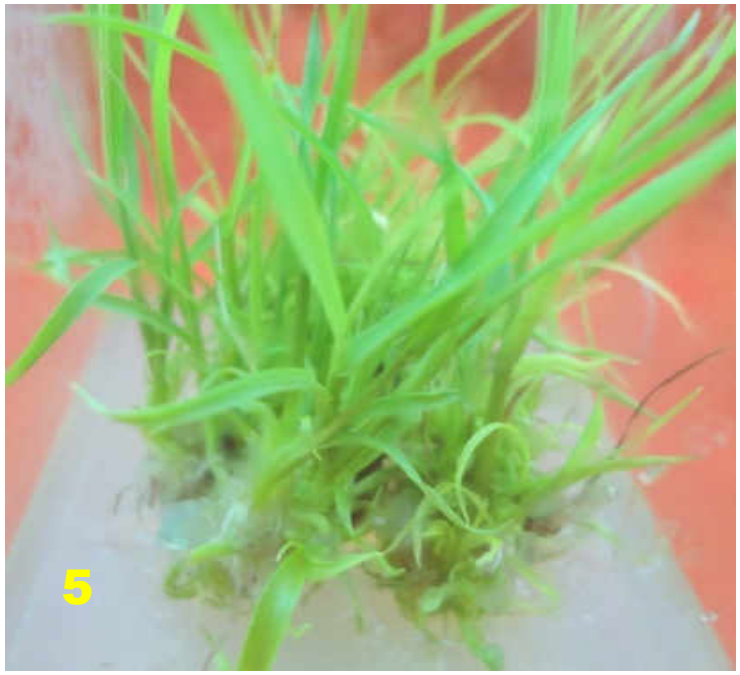
Project Objectives

Attempts to develop new mutant(s) varieties of sugarcane with higher yield, high brix content, tolerant to insect-pest-diseases and adaptable to marginal lands.

Different stages of tissue culture derived sugarcane plants



Effects of Different doges of Gamma rays in *in vitro* grown plants

Among the different doses *in vitro* mutagenesis 15Grays is best dose.

Attempt to made mutant in sugarcane

Demerits:

*Short inter-node (3.0 cm)~(9.5 cm)~(11.0 cm)

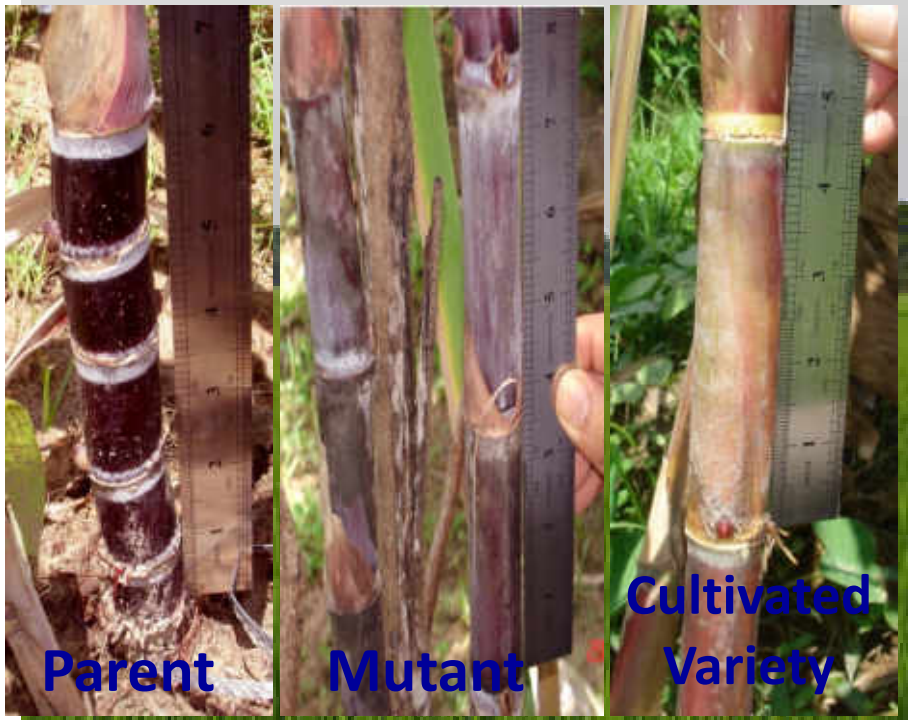
*No seed-seat

Merits:

*More juicy, very soft (internode also soft) and low fibre with attractive colour for attaining market value

*Considering better chewing variety over existing one

*Brix/Sugar (Soluble solid in a solution) content 16-18%



M1 Generation in *in vivo*

Effects of Different doges of Gamma rays in *in vivo* grown plants



Among the different doses *in vivo* mutagenesis 40Grays is best dose.

Sugarcane field

Different Generation in *in vivo*

Relation between control and mutants in M1V2 generation

Achievements

 # Some mutant plants show increase length of internodes and vigorous growth in different generations.

 # Some promising mutant lines are selected for further experiments.

Future plan

(1) Assessing the performance of the advance mutants in different conditions

(2) Selection of more promising mutant lines from different generation.

Finally

(3) Selection of sugarcane mutant lines with higher yield, high brix content, tolerant to insect-pest-diseases and adaptable to marginal lands.

Acknowledgement

1. IAEA/RCA for coordination and exchange of knowledge