

*Microsoft-FAPESP Environmental Science
Workshop*

Glass house with controlled environment aiming
sugarcane crossing in subtropical conditions

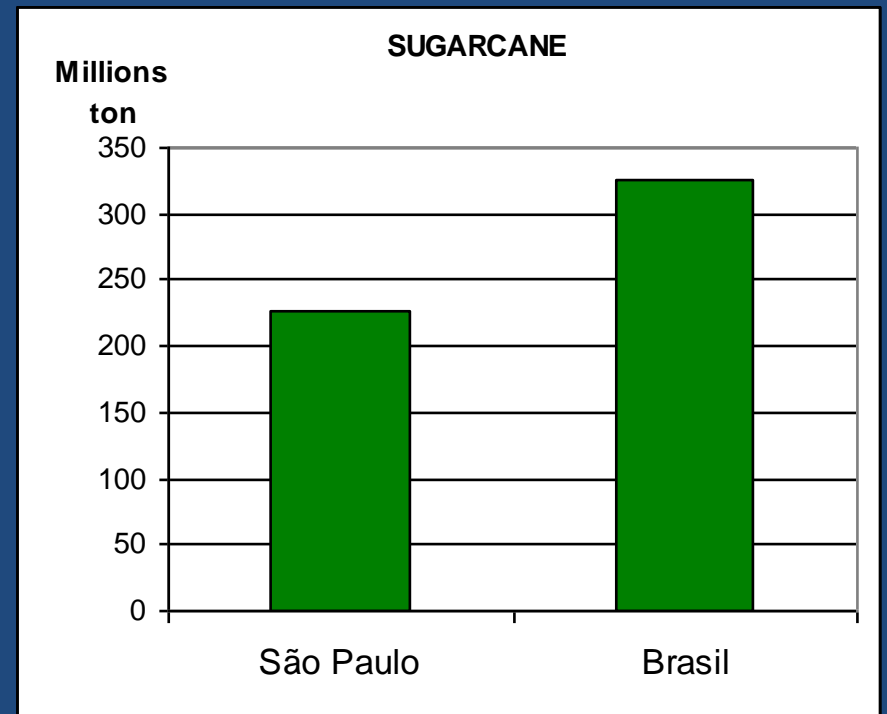
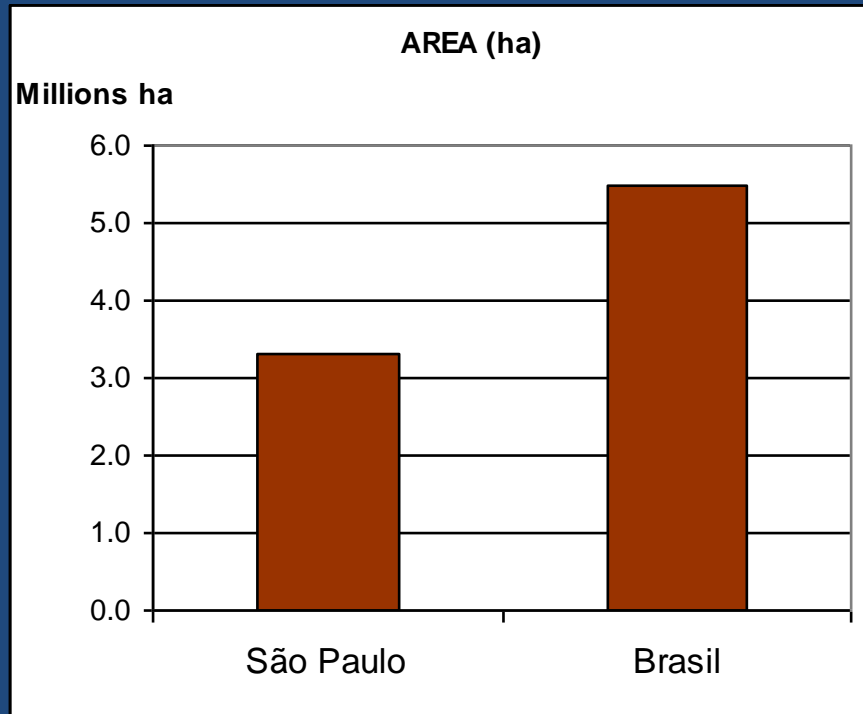
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IAC – Sugarcane Center

2010

1. Introduction

SUGARCANE PRODUCTION 2008



1. Introduction

IAC - Sugarcane Research Center

Breeding

Soil Science

Physiology

Phytopatology

Entomology

Crop Modeling

Biotechnology

1. Introduction

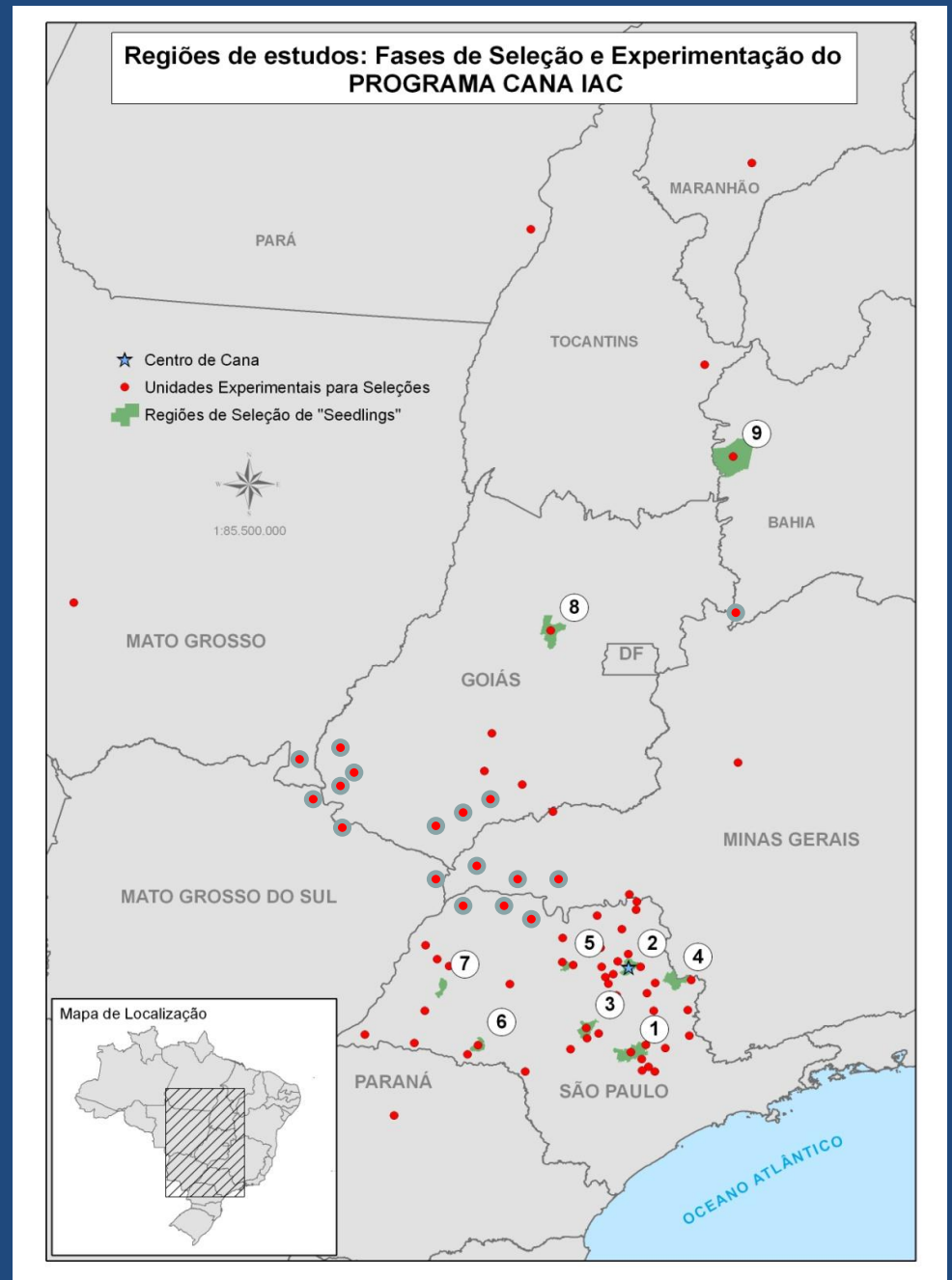
Breeding

NEW VARIETIES

- *High yield and sucrose*
- *Resistance to pests and diseases*
- *Tolerance to drought stress*
- *Adaptation to mechanical harvest*
- *“New concept”: biomass*

1. Introduction

Sites of study: varietal selection and testing of Sugarcane IAC Program



1. Introduction

Results of technology “new varieties” on the yield (plant cane)

INCREASE OF YIELD 1935 - 1995
730 kg cane/ha/year

During 10 years
7.3 Tons/ha

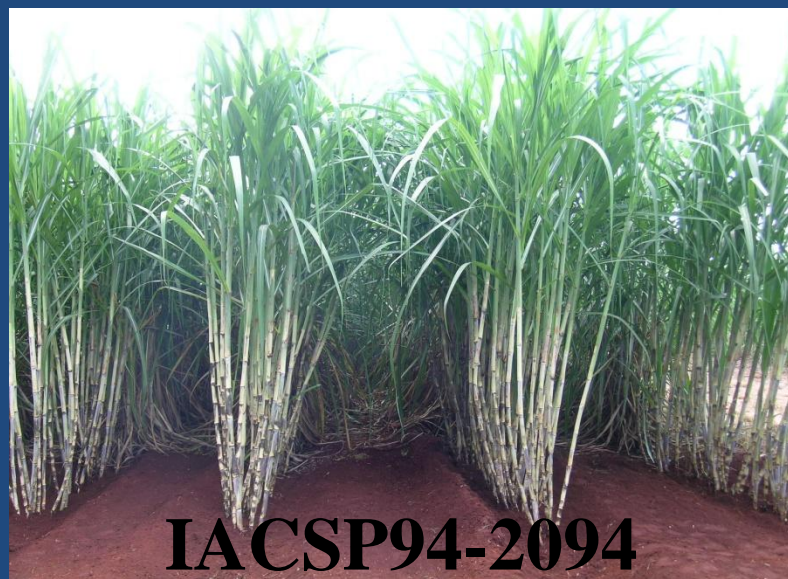
1. Introduction IAC SUGARCANE VARIETIES examples



IACSP93-3046



IACSP94-2101



IACSP94-2094



IACSP94-4004

2. Sugarcane Breeding in Brasil

How is made the sugarcane breeding in Brasil??



2. Sugarcane Breeding in Brasil

Problem: in nature is difficult to synchronize the flowering seeking specific crossings, we could not control the photoperiod or temperature;

Difficulty in crossing of wild individuals as *Saccharum spontaneum* with *Saccharum officinarum* and thus make gene introgression needed to increase the genetic sugarcane bases (emission flowers).

2. Sugarcane Breeding in Brasil

Solution???

PHOTOPERIOD FACILITIES

- Temperature control around 21 – 32 C;
- Inductive photoperiod control of 12 hours and 55 minutes with decrease of 45 seconds daily;
- High water availability.

Photoperiod facility (BSES – Queensland/Australia)



Photoperiod facility (SASRI – South Africa)



3. Photoperiod facility

Photoperiod facility (IAC – Sugarcane Center – Brasil)



BIOEN-FAPESP (08/56146-5)

3. Photoperiod facility

Particulars:

43 L pots 3 stalks per pot (52 pots = 156 stalks per facility);

Specific medium (1:1:1 sand, soil, vermiculite);

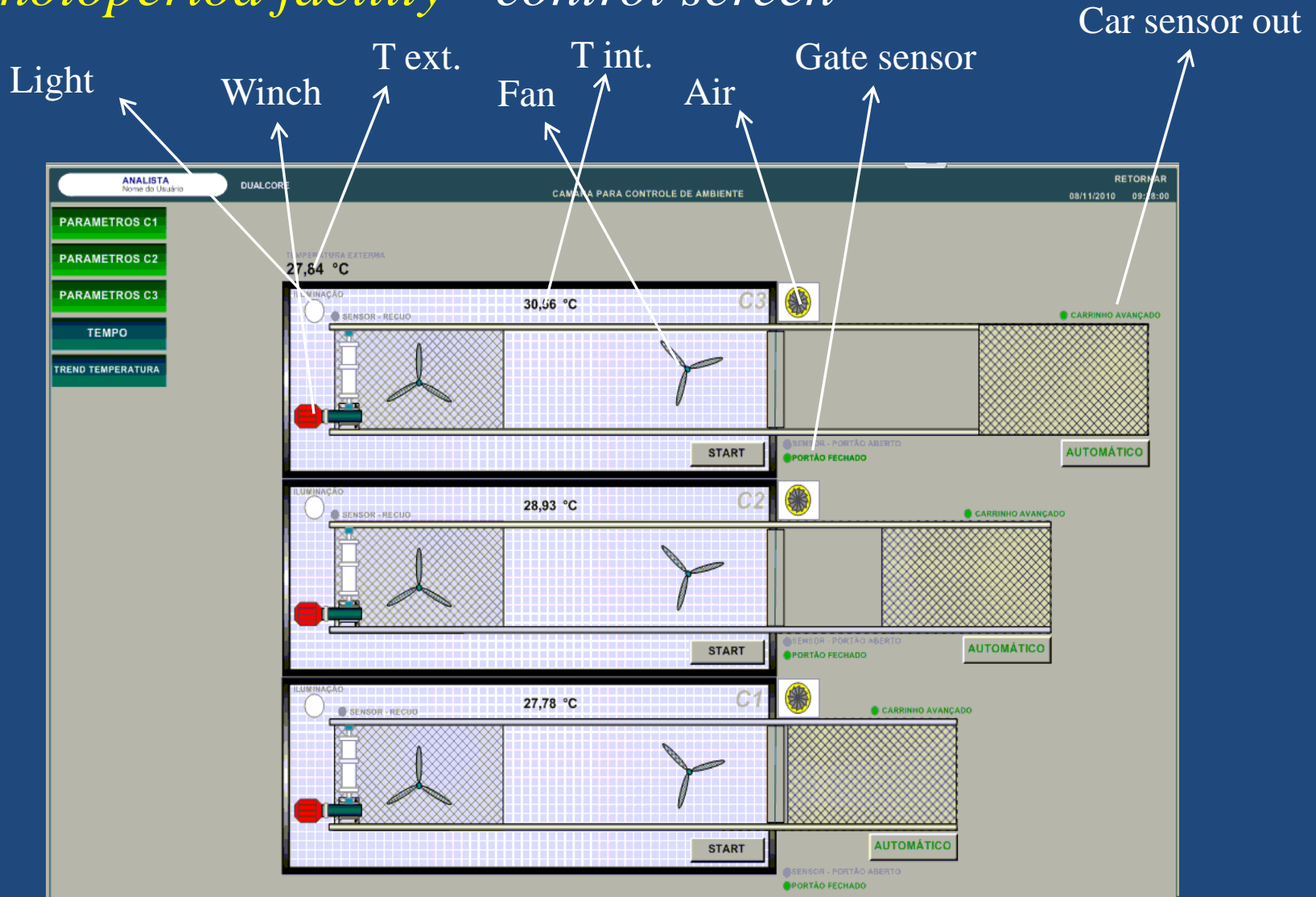
Irrigation (2 times a day, ponded water renewed fortnightly);

Nocturnal temperature (24 – 26°C);

Extension lighting (Red : Far red 1.4) - to induce phytochrome;

Fully automated – direct digital controllers.

3. Photoperiod facility - control screen



The system can be accessed remotely

3. Photoperiod facility

All this work aims to get the sugarcane flowers at the desired time and make the interest crosses, increasing the chance of choosing individuals higher in sucrose and fibers.



4. Glass house project

To ensure the pollen viability and the crossing, we need to keep the flowers (male and female) for approximately 21 days at a temperature between 21 and 32 ° C with relative humidity above 85%.

Solution??

4. *Glass house project*



**IAC - Centro de Cana
Sala de Cruzamento**

THAT'S ALL

Thank you very much

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