Taiwan Banana Research Institute (TBRI)

The Taiwan Banana Research Institute (TBRI) was founded in 1971 and is based in Pingtung, Taiwan. The institute is best known for mass plantings of tissue-culture plantlets in fields heavily infested with the tropical race 4 (TR4) strain that causes Fusarium wilt in Cavendish bananas. The objective is to select mutants, the so-called Giant Cavendish tissue-culture variants or GCTCVs, that are less susceptible to TR4 than the average Cavendish cultivar.

The institute also provides tissue-culture plantlets and extension services to Taiwanese growers. The research projects are funded by the Council of Agriculture and the Department of Forestry and Agriculture. Overhead expenses are covered by the interest generated by the Foundation's fund, charges collected on export bananas and revenues from an experimental farm. The Fruit Cooperative supports the technical services. As a member of BAPNET, TBRI participates in international research activities. It also provides training courses on tissue culture at an international level.

Contents

- Research on bananas
  - Micropropagation
  - Varietal improvement
  - Pest management
  - Germplasm collection
- References
- External links
- Also on this website

Research on bananas

Micropropagation
TBRI has been supplying virus-indexed tissue-culture plantlets to growers since 1983. It has also been doing research on improving the efficiency of the in vitro multiplication technology while maintaining the incidence of off-types below 5%.

Varietal improvement
TBRI's varietal improvement programme is based on the production of somaclonal variants of the Giant Cavendish clone Pei Chiao by using tissue culture to increase the mutation rate. The mass
produced plantlets are then planted in TR4-infested fields and monitored for symptoms of Fusarium wilt. The symptomless plants are selected and further tested[1].

Screening for increased levels of resistance started in 1984, when some 20,000 plantlets were transplanted to a 1-ha field in which the pathogen population was between 300 to 1,000 propagules per gram of soil. This resulted in the selection of 6 clones that became known as GCTCV-40, GCTCV-44, GCTCV-46, GCTCV-53, GCTCV-62 and GCTCV-119 (GCTCV stands for Giant Cavendish tissue-culture variant)[2]. As the search continued, 6 more clones (GCTCV-104, GCTCV-105, GCTCV-201, GCTCV-215, GCTCV-216 and GCTCV-217) were obtained by testing tissue-culture plantlets produced from rhizomes collected in different locations[2].

Although they are less susceptible to TR4 than Pei Chiao, GCTCV clones tend to have agronomic traits that make them less suitable for the export trade. However, when they are planted in large numbers, plants with improved agronomic characters can be found. For example, a selection of GCTCV-215, or GCTCV-215-1, was registered for commercial production as Tai-Chiao No. 1 in 1992.

Another somaclonal variant was found by a farmer who had noticed in his field symptomless plants growing among diseased plants. He was able to trace them back to one of the GCTCV suckers he had obtained from his neighbour. He informed TBRI of his discovery, which was confirmed experimentally. The clone was designated GCTCV-218 and registered in Taiwan as Formosana in 2002.

More variants have since been selected, of which two have been registered as Tai-Chiao No. 3 and Tai-Chiao No. 5. The efficiency of selection has been about 2-3 clones from every 10,000 plantlets screened[3]. In addition to screening in infested fields, selections are also conducted in participating farmers' fields.

**Pest management**

TBRI is also conducting studies to control the *Cucumber mosaic virus* using silver mulching. It is also experimenting, in collaboration with the National Chung Hsin University, the use of an endophyte as biological control agent against Fusarium wilt.

**Germplasm collection**

TBRI has a germplasm collection of 229 accessions, which include diploids, triploids, tetraploids and abaca.

**References**

External links

Official website of TBRI (in Chinese)

Also on this website

News and analysis on Growing Cavendish in the presence of TR4
Improved materials produced by TBRI:
  GCTCV-105, GCTCV-119, GCTCV-218
Musapedia pages on research organizations:
  Bioversity International
  Centre de coopération internationale en recherche agronomique pour le développement - CIRAD
  Centro Agronómico Tropical de Investigación y Enseñanza - CATIE
  Empresa Brasileira de Pesquisa Agropecuária - Embrapa
  Fundación Hondureña de Investigación Agrícola - FHIA
  International Institute of Tropical Agriculture - IITA
  Taiwan Banana Research Institute - TBRI

Contributors to this page: Anne Vézina.

Page last modified on Thursday, 11 January 2018 14:19:49 CET by Anne Vézina.
The original document is available at
http://www.promusa.org/Taiwan+Banana+Research+Institute++-+TBRI