CIRAD STRATEGY FOR COTTON BREEDING IN TROPICAL COUNTRIES

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Abstract

Genetic research of CIRAD Cotton Programme, involves germplasm management, breeding, biotechnology, and methodological studies. It is being carried out joinly with partners from developing countries.

Introduction

The aim of the CIRAD cotton genetic improvement programme is to create new commercial varieties that are more profitable, give higher yields and have better qualities characteristics for the farmers of the developing countries.

Discussion

Genetic Resources Management

Conventional breeding methods are still the best responses to the complex challenges involved in improving yields within sustainable agriculture systems (Hau et al, 1997). Thus, CIRAD is continuing efforts to maintain a genotypes collection (4000 cultivated and wild genotypes), to evaluate this germplasm. The collection is regularly assessed and renewed in tropical countries. Prebreeding lines are prepared by combining new variabilty within recurrent selection populations.

Biotechnology

In the field of biotechnology, CIRAD has focused in collaboration with INRA (Institut National de Recherche Agronomique) on inserting genes from the entomopathogenic bacteria *Bacillus thuringiensis* to improve the natural resistance of cotton to insect pests (Pannetier et al, 1997). CryIA(b) et cryIA(c) genes code for toxins active against the main cotton pests (*Helicoverpa sp.* and *Pectinophora gossypiella*), and the toxin CryIC is effective against several *Spodoptera* species. The first transgenic plants have been obtained but many steps need to be taken before farmers are given access to these new plants. These include clearly defining the conditions required for releasing the transgenic cotton plants to reduce or delay as much as possible the risk of appearance of resistant insects. CIRAD is thus developing a multidisciplinary approach for the integrated management of transgenic varieties. Recently, CIRAD initiated researrch on molecular biology techniques for mapping the cotton genome, which will provide new potential for using interspecific hybrids, especially *Gossypium barbadense x Gossypium hirsutum*.

Breeding Programs

Several breeding programs are being carried out in Africa, , Asia, and South America, jointly with partners of NARS, universities or private companies.

Summary

CIRAD is developing a cotton improvement programme for farmers of developing countries. Varieties already developed are now cultivated worldwide on some 1.5 million hectares.

References

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