



OPPORTUNITY FOR MSc STUDY

SASRI Crop Biology Resource Centre

Genomics of Quantitative and Qualitative Disease Resistance in Sugarcane

● The Problem

Sugarcane cultivars are released after a long plant breeding selection process during which multiple beneficial traits are targeted, in particular yield and sugar content. Released cultivars are often susceptible to at least one major fungal pathogen, for example *Puccinia melanocephala* which causes Brown Rust. A possible solution to this problem is the pyramiding of quantitative (minor gene) resistances with each other and with qualitative (major gene) resistance through the use of partially-resistant and resistant genotypes as parents in the breeding programme.

● The Project

Quantitative disease resistance is controlled by multiple loci, referred to as quantitative trait loci (QTLs). In order to identify quantitative resistance we will refine a rust inoculation technique applicable to the mass screening of a population of genotypes (LD2) for which a linkage disequilibrium map has already been created. This will allow the identification of markers for quantitative rust resistance QTL's.

Detection of an as yet uncharacterised major R gene (Bru1) will be carried out using an established PCR method. Gene expression profiling will be done comparing resistant and susceptible genotypes using Suppression Subtractive Hybridisation in order to identify candidate resistance genes. Candidate gene analysis will be carried out by Targeted Region Amplified Polymorphism in order to detect markers tightly, if not completely linked to rust resistance. Further details are available on request.

● The Candidate

The ideal candidate must hold a BSc Honours degree encompassing the plant sciences and be enthusiastic about plant pathology and molecular biology. This project affords the opportunity to learn multiple molecular techniques. This is a team-orientated project and the ability to get on with others is essential, as is a generous disposition.

● The Position

The successful candidate will be provided with a competitive bursary and a dynamic, well-resourced and friendly working environment. Though not an essential requirement, candidates seeking to secure free-standing NRF funding are encouraged to apply.

● The Contact

A résumé and covering letter should be sent before 25th September 2009 to:

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