News from the Field:

Callum Scotson

Trinidad and Tobago Cocoa Research Centre

Callum Scotson conducted research on the genetic variability of Cauliflory in Theobroma cacao *Accession, as part of his BSc in Plant Biology at Aberystwyth.*

It has previously been demonstrated that the cauliflorous flowers (flowers present on the trunk) of *Theobroma cacao* (cocoa trees) will produce a greater yield of cocoa than the flowers present within the canopy. The aim of my research is to investigate the heritability of cauliflory in *T. cacao* by studying flower distribution in over eighty genetic accessions at the International Cocoa Genebank, Cocoa Research Centre, University of the West Indies, Trinidad and Tobago.

While the data analysis is still ongoing, that which has been undertaken thus far suggests the density of cauliflorous flowering is to some extent influenced by the variations in resource allocation within the plant that result from alterations in the branching structure. The branching structures appear to vary by accession group which may indicate that this is a genetically controlled trait. If this is found to be the case it would suggest that accession groups typically found to have only a single primary trunk, such as the TRD and MOQ accession groups, may allocate greater resources to this region and therefore produce a greater density of cauliflorous flowers which may in turn increase yield.

The research project has expanded significantly since visiting the UWI – I am now coordinating a multidiscipline inter-institute research project which will involve the application of novel computed tomography image analysis techniques that I have developed over the summer. This will hopefully allow me to assess variations between cauliflorous and canopy pod and bean morphology. This is particularly exciting because the application of computed tomography techniques has so far been limited within plant science research and, as far as I am aware, this will be the first instance of its use within a tropical crop science research context. This research will hopefully contribute towards ensuring that Trinidad and Tobago remains an international leader in the research and development of cocoa production.

Throughout the project I have developed numerous technical skills, but what has been of most value is the experience this opportunity has provided of working within a professional tropical crop research environment and of making contacts within both industry and the academic world. This would not have been possible if it were not for the TAA MSc Award. I am grateful for the support and generosity of the TAA and its members without which this research would not have been possible.

(Callum Scotson)

Callum at the Cocoa Research Station, Trinidad