PlantBio

National Innovation Centre for Plant Biotechnology

PlantBio Trust Newsletter Volume 1 October 2005

The Route to the Future

PlantBio is a National Innovation Centre established by the Department of Science and Technology to capitalize on the plant biotechnology opportunities in South Africa, establish new companies and create jobs. PlantBio is "The Route to the Future" by directing and investing in plant biotechnology research projects and new companies in South Africa. We are based in Pietermaritzburg, but travel around the country on a regular basis, sourcing projects and meeting with current project holders. PlantBio's current project portfolio includes uplifting small scale farmers using basic plant biotechnology techniques, plant breeding ventures, genomics and biological control studies, the establishment of tissue culture, plant transformation and biosafety facilities.

PlantBio's involvement at Umbumbulu

Umbumbulu is a serene, rural area in the south of Durban. The faces of the green hills and valleys are home to a population of thirty to fifty thousand people. Past midday the dusty roads get filled with school children going home. They are full of life and are eager to greet a passing stranger driving in to their village. Almost all of the homes are surrounded by farms where family members work. The community looks forward to a better tomorrow when the lack of basic infrastructure such as electricity, irrigation and phone lines will be a thing of the past. Speaking to the wise elderly people infuses one with hope that tomorrow will be better.

For many years small subsistence farmers in this area have been engaged in growing indigenous crops like maize, madumbe, sweet and baby potatoes, green beans and wild melons; however the lack of infrastructure limits development in this area. In the quest to improve their livelihood, several farmers in Umbumbulu came together in 2001 to form the Ezemvelo Farmer's Organisation (EFO), which was facilitated by Dr. Albert Modi, a senior lecturer at the University of KwaZulu-Natal. Dr Modi introduced the concept of collective organic marketing from individual homesteads to the farms, to produce organic vegetables and market them.

Organic farming is a production system that largely excludes or avoids the use of synthetic pesticides and or fertilizers. This method of farming relies on crop rotation, crop residue and animal manure. All this maintains and replenishes soil fertility in harmony with nature. Traditional farming practices by rural African communities fully meet organic farming systems. Based on this fact, the EFO was the first black small scale farmer group to acquire group organic certification and have sold a small production of their organic vegetables to supermarket chains such as Woolworths and Pick n' Pay.

PlantBio is interested in assisting the EFO and the Umbumbulu community to reach their full potential for growing and commercializing organic produce. This will be done in three tiers. For the commercialization of the organic produce, a simple structure will be erected at Umbumbulu that will serve as a Pack House. Initially the capacity will not allow for processing of the organic produce however this will be incorporated as the commercial aspect of the project grows. The second tier is capacity building within Umbumbulu. Training will be provided to members of the community involved in the commercialization of the pack house and related activities including Research and Development, which is the last tier. R & D in conventional biotechnology will be conducted. This includes plant breeding and *in vitro* propagation which is the production of disease free material. The agronomy is targeted at increasing crop yield and introducing new crops with a higher market value. In addition PlantBio seeks to coordinate fund raising activities to develop infrastructure in Umbumbulu directly impacting on production and commercialisation. The Umbumbulu project falls within one of PlantBio's Strategic Focus Areas which is Food security to alleviate poverty and empower small scale farmers. In the near future PlantBio will be implementing the project and assisting the farmers with their commercial venture.

PlantBio Board Members visit Japan

In implementing the South Africa–Japan Science and Technology Cooperation Agreement, the Department of Science and Technology (DST) sent a science delegation to Japan to establish links and develop joint research proposals and projects with fellow researchers at various research institutions in Japan. Members of this delegation were Prof. Mark Laing (ACCI), Prof. Johan Burger (PlantBio) and Dr. Luke Mehlo (CSIR) visited Japan during the week of 13-21 August.

The most urgent mission was to establish contacts and work out details of a collaborative project to subject African food crops to cyclotron mutagenesis. These negotiations were successful and the first plant material (seeds of maize, sorghum and millet) were subjected to heavy ion beam irradiation at the cyclotron facility on Wako campus of the Riken Institute on the 21st of September.

Apart from the visit and negotiations at the Riken Accelerator Research Facility (RARF) in Wako, the delegation also visited a number of other institutions. Among these were the Genomics Science Centre, the Plant Science Centre, the SNP Research Centre and the Research Centre for Allergy and Immunology, all at the Riken Yokohama Institute. All these research centres are at the forefront of their respective disciplines and epitomise the term "high throughput science". The level of automisation was really staggering to witness.

The delegation also visited the Institute of Radiation Breeding, where mutation breeding is done through gamma irradiation and the National Institute of Agrobiological Sciences (NIAS), where one of the world's largest plant, animal and microbial germplasm and DNA collections are housed.

Professors Laing and Burger made oral presentations explaining the respective roles of the ACCI and PlantBio in the South African biotechnology environment at three different occasions during the trip. Apart from being a very successful trip as far as establishing contacts and collaborative projects are concerned, the delegation was treated like royalty and all members were unanimous in our praise for the hospitality of our hosts. We were treated to the finest Japanese cuisine and even experienced an earthquake firsthand. We believe that this visit has opened the door to several other research collaborations in the broader biotechnology field and wish to thank both our Japanese hosts and the DST for making this trip possible.

Dr Mel Oliver, Research leader at the Plant Genetics Research Unit of the US Department of Agriculture's Research Service.

PlantBio and Cape Biotech will be hosting Dr Oliver who will be giving lectures on "Genetic Strategies of Biocontainment of Transgenes" in Pietermaritzburg and Cape Town.

Dr Oliver obtained a Ph.D. in Plant Biochemistry from The University of Calgary, Alberta, Canada, and is considered a world leader in the field of desiccation tolerance in plants and plant genetic engineering for cotton improvement. He received the Southern Plains Area Early Career: Scientist of the Year: 1992, and Senior Southern Plains Area Scientist of the Year 1999 for pioneering research accomplishments leading to a more complete understanding of natural stress tolerance mechanisms in plants. He has authored over 70 publications and is the lead inventor on several US plant biotechnology patents associated with the biosafety of GM crops and containment of transgenes. Dr Oliver is an associate editor for Physiologia Plantarum and is on the Executive Board of the American Society of Plant Biologists.

Date : Friday, 21 October 2005 — 9.00 am
Venue :John Bews Building, Life Science Campus, University of KwaZulu Natal, Carbis Road, Pietermaritzburg.
Please R.S.V.P. to Helen@plantbio.co.za

Date : Monday, 24 October 2005 — 5.30 pm
Venue : Cape Town Hotel School Restaurant, Beach Rd, Granger Bay
Please RSVP to info@capebiotech.co.za .

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PlantBio Trust
PostNet Suite 201, Private Bag X6,
Cascades, Pietermaritzburg, 3202
Tel: +27(0)33 846 1980
Fax : +27(0)33 846 1990
Www.plantbio.org.za

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Department:
Science and Technology
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