

Building a Community of Biotechnology in the Mekong Region

Molecular breeding of rice in the Mekong Region began when a long term training on marker-assisted selection (MAS) was initiated in 2004 by Rice Gene Discovery Unit (RGDU), BIOTEC, Thailand which was sponsored by Rockefeller Foundation. This training program aims to develop popular varieties in Cambodia, Laos and Myanmar lacking in traits that may improve quality and adaptation in the local area. The plant materials that has to be developed has not reached the final target. In a project under the Generation Challenge Program, the lines initially developed have the chance to be continued until they reached target location testing. Molecular techniques particularly focusing on QTL/gene identification and MAS were introduced through workshops carried out within and outside RGDU, BIOTEC.

MAS Workshop at RGDU



The first workshop in RGDU was held in May 21-30, 2007. Two participants from each institution, CARDI (Cambodia), NAFRI (Laos) and DAR (Myanmar) were invited. CARDI is developing CAR3 rice with drought resistance and also aromatic. The glutinous rice Thadokkham 1 (TDK1) is largely grown and consume in Laos and incorporating aroma gene may enhance consumption of this variety. Improving salinity tolerance in the variety IR53936 is the target of DAR in this MAS training program. The DAR started with BC3F4 from the BC3F1 selected under the RF project. The total number of selected lines were 10 BC2F4, 7BC2F3 and 77 BC3F4 for CARDI, NAFRI and DAR, respectively.

Workshop on QTL and Marker-Assisted Selection for Plant Breeding

Application of biotechnology in agriculture and lectures on gene, DNA, genome structure, DNA markers, linkage map construction, QTL mapping and MAS were introduced to the participants. Laboratory techniques used in MAS were shown through a video and linkage and QTL mapping were demonstrated. MAS was demonstrated using germplasms from each institute that were genotyped in RGDU and were phenotyped during the workshop to prove the efficiency of the marker in distinguishing cultivars.

The workshop in CARDI was held in June 19-20, 2007. Thirteen participants from different divisions in CARDI attended the workshop. CARDI has a molecular lab. but with limited skilled personnel.



The workshop in NAFRI was held in July 3-4, 2007. Participants were from inside and outside NAFRI. NAFRI has a molecular lab. established but it is still not operating due to limited skilled personnel. There were educators who attended the workshop and were happy to share the knowledge to their students.



A RGDU production on laboratory techniques needed in MAS program in plant breeding. This video comes in four different languages which was used in the on site workshop.



The workshop in DAR was held in August 19-20, 2007. DAR researchers and educators from Yezin University attended the workshop. DAR has no molecular lab. but the tissue culture lab. has been operating not only for plant propagation but also for drought, salinity and submergence screening. In 2004 training in MAS, quality improvement of the highly consumed Manawthuka was also improved to be aromatic. In Myanmar, aromatic rice is normally consumed only by rich people. Hopefully, next year every people in Myanmar may be able to consume aromatic rice.



Collaborating institutes discovered the potential of biotechnology in breeding program and in germplasm identification and management. All institutes are seeking help for more technology transfer and human resource development through trainings and scholarships.

