Upgrade of the Molecular Research Laboratory at KARI-Njoro, Kenya: A platform to enhance marker-assisted wheat breeding in Kenya

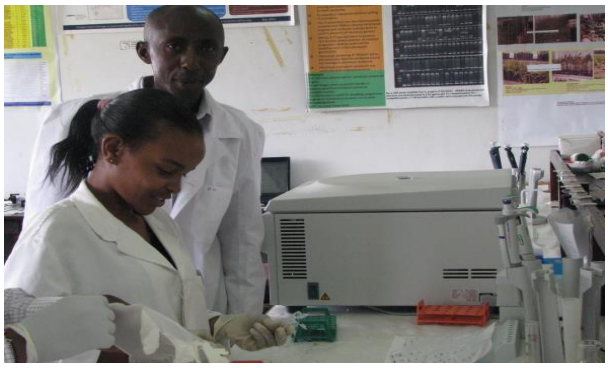
The BBSRC Sustainable Crop Production Research for International Development (SCPRID) initiative has provided funds to purchase state-of-the-art equipment for KARI-Njoro. Dr Peter Njau, Head Wheat Breeder at Njoro comments "This is the best thing that has ever happened to the Molecular Research Laboratory at the Kenya Agricultural Research Institute, Njoro (KARI-Njoro)".

Equipping the Molecular Research Laboratory at KARI-Njoro will go a long way to remove bottlenecks that have hitherto hindered application of marker technologies in wheat breeding in Kenya. First hand access to DNA markers will enable the wheat breeders at KARI-Njoro to fast track wheat breeding in Kenya. This comes at a time when new wheat germplasm with effective rust resistance genes have been identified. There is now an urgent need to introduce these sources of rust resistance, along with other high-value traits, into new, superior wheat varieties for cultivation in East Africa.

DNA extraction has been a pestle and mortar affair (left). Newly installed equipment, including a tissuelyser (right) will increase efficiency and throughput at the KARI-Njoro Molecular Marker Research Laboratory.

The SCPRID project "Implementing effective marker technologies into disease resistance wheat breeding programmes within Africa", is a collaboration between Dr Lesley Boyd at the National Institute of Agricultural Botany, Cambridge, UK, Dr. Peter Njau, Dr. Godwin Macharia, Dr. Sridhar Bhavani and Ms Bernice Ngina at KARI-Njoro, and Dr Renée Prins and Prof Zakkie Pretorius of the University of the Free State, South Africa.

The team at KARI-Njoro are currently optimizing publicly available microsatellite markers diagnostic for rust resistance genes, as well as other important traits in wheat. These DNA markers provide valuable tools by which to identify genes of value within Kenyan wheat germplasm, informing Dr Peter Njau as to the best wheat parents to cross within his wheat improvement breeding programme.



Dr. Godwin Macharia and Bernice Ngina, co-investigators in the SCPRID project

With the installation of this new equipment Kenyan researchers can now undertake marker studies as part of national and international projects, providing a facility for use by other KARI partners, including local universities. The newly equipped laboratory has also attracted students seeking training in molecular techniques. Projecting forward, the KARI-Njoro Molecular Research Laboratory will help close the existing gap in staff trained in molecular biology, both for KARI and other, educational institutions in Kenya.

Acknowledgement: This work was funded by the Biotechnology and Biological Sciences Research Council, the Department for International Development and (through a grant to BBSRC) the Bill & Melinda Gates Foundation, under the Sustainable Crop Production Research for International Development programme, a joint initiative with the Department of Biotechnology of the Government of India's Ministry of Science and Technology.