Dr Nasser Yao

"Demand-led genetics and molecular breeding"

As a molecular breeder at the BecA-ILRI hub, Nasser Yao has long been accustomed to explaining and reassuring breeders and farmers about the application of genetics and biotechnology to farming.

Yao sees this form of stakeholder communication as an essential part of his job. "*New disciplines can be major challenges, especially those involving the addition of many new processes. It's not surprising that breeders find it difficult to adapt to demand-led practices*, *which can seem complicated. There are a lot of data to assimilate and understand*".

In today's market conditions, it is difficult to criticise farmers for being impatient for new and improved plant varieties. The market often moves quicker than research timescales will allow. So plant breeders need to anticipate future needs and know how to develop and release new varieties faster and more efficiently.

While some African agriculturists and farmers from developed countries worry about replacing conventional with molecular breeding, breeders themselves can also have concerns. Molecular selection speeds up the selection process, and it can be quickly explained and demonstrated. Breeders also know that they need to identify, use and share all the known best practices in breeding, and especially those that are simple to implement and easy to understand.

For farmers the concerns may be different but the need for reassurance is the same. Most farmers in Africa, as elsewhere, don't enjoy contemplating or taking risks. This doesn't mean that they won't try new ideas. Far from it. They work closely with their suppliers and customers, and the relationship between farmer and breeder in particular rests on a composite bond of trust, confidence and credibility. This is partly why some varieties developed by conventional breeding in the past have taken as long as 10-15 years to get to the fields.

Molecular compared to conventional breeding is like using a computer to resolve by digital means a complex equation, rather than by using paper and a pencil to work it all out with long division, calculus or log tables. But molecular breeding has clear benefits over conventional approaches by its ability to accelerate the breeding programme, reduce its duration, and introduce enhanced cost effectiveness. It can combine the best of market driven research with the most advanced bioscience available. Yao explains, "*This involves using best practices in visioning and foresight as shown in the demand-led training manual and using these targets to find new sources of genes that create improved and new varieties with a broader genetic diversity".*

The BecA-ILRI hub is rooted securely in scientific research for development that connects African scientists with the global research community. The BecA-ILRI hub uses

biotechnology to improve agriculture in Eastern and Central Africa and helps the African scientific community to support the activities of agencies as they tackle agricultural issues relating to poverty and development. This support has also created triangular alliances between the BecA-ILRI Hub, African national agricultural research systems and advanced international research institutions, providing and applying the most advanced knowledge and technology to smallholder farmers' fields in Africa.

The hub is well placed to benefit from new policy trends in research for development in Africa. A recent joint article by the CEO of the Bill & Melinda Gates Foundation and Britain's international development minister, sets out how joint investments by large funders and government development agencies are improving lives globally by using science to reduce extreme poverty.

Yao observes that a firm characteristic of the demand-led process, namely the enhanced and dependable monitoring, evaluation and learning inherent in the new breeding initiative, constitutes a particularly interesting and significant potential benefit to investors and funders. Currently every project has an iron-clad review and self-adjustment element. As a component of the programme, it offers a built-in and dependable review system that fits perfectly with the most up to date assessment procedures. Another important aspect that encourages professionalism amongst breeders and sustainability of programmes is a requirement to understand the full costs of all activities in the array of different disciplines required for successful creation and release of new varieties, at the outset of the investment.

Yao believes that these are critical characteristics that provide trump cards in the search for new funding sources. The private sector as well as institutional and public funders can be confident that investments in demand-led plant breeding will bring success in their objective of transforming and reviving African plant breeding.