Alliance of the CGIAR Centers

Collective Action News

Updates from agricultural research in Africa

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Biotechnology, Bioinformatics and Food Security: Hype or hope?

'It is high time that the heroic simplification of the 'GM crops are good for the poor' storyline is finally laid to rest', contends Dominic Glover in a thoughtful new paper on BT Cotton (see link below). He goes on to conclude that 'The extravagant hype of GM crop advocates (and not only the alarmism of anti-GM campaigners) has unfortunately suffocated debate about this important new technological field. It is a field which, in truth, does indeed hold the potential to help address some important developmental challenges of the twenty-first century, whether through genomic techniques, marker-assisted selection or indeed some transgenic applications. But, to realize this potential, it is not enough to pay lip service to the idea that GM crops will not be a silver bullet against hunger and poverty, while simultaneously designing impact assessments around the implicit assumption that such a magical effect is indeed possible.'

Glover advocates the need to think about how technologies may work in the dynamic and complex agricultural systems and institutional frameworks of the real world. His call for a realistic assessment of both the promise and the pitfalls of biotechnology, and by extension bioinformatics, prompted us to reflect on this subject as well, given the investments in biotechnology and bioinformatics taking place in the region. Just in Nairobi, for example, over the last several months, the brand new, state-of-the-art Biosciences eastern and central Africa (BecA) laboratory and greenhouse facilities are being completed. Along with this, a huge effort to build capacity of young scientists is taking place as reflected in the African Fellowship Program and the Graduate Fellows Forum, and rapid advances in bioinformatics capacity that is underpinning development of harder infrastructure. So do we have, as Glover demands, a new set of research questions and methods and a rigorous focus on the problems to be solved rather than a fascination with a quick technological fix? We thought we'd ask a number of people their opinions on this.

Purvi Mehta: I agree that agricultural productivity and sustainability are complex issues and that there are no 'silver bullets'. It makes sense to think of biotech crops simply as tools in our tool box. The experience with BT cotton is evidence of the power of these tools. Any tool that can offer about 40% higher productivity and the socio-economic benefits that derive from this, has to be one that we value. As Glover says, while transgenics such as BT cotton may not work in every situation or for every country, we should be pragmatic and take advantage of it wherever it does extend benefits to farmers. Determining this is surely one of the new set of research questions that Glover calls for. Transgenic technology is often portrayed as an industrial country 'phenomenon', but of the 25 countries growing these crops, 15 are developing countries!

Etienne de Villiers: Achieving the Millennium Development Goals to reduce poverty and hunger in the world will clearly require serious investment in science and technology. Cereal genomics has advanced enormously since the rice genome was described, with the many expressed sequence tags data now within reach of all researchers. Plant breeding institutions such as IRRI (International Rice Research Institute) and CIMMYT (The International Maize and Wheat Improvement Centre) have become centres of excellence for plant genomics and gene discovery due to their long-term vision on research directions. Bioinformatics is central to their programs of work. Developing countries such as Brazil, India and China have not been left behind since they realized early the potential benefits to their countries of investing in new technologies for better health care and food security. Here in Kenya, collaboration between scientists at The Institute for Genomics Research (TIGR) and the International Livestock Research Institute (ILRI) resulted in a major achievement: the sequencing of the genome of *Theileria parva*, among the deadliest parasites of cattle in Africa. The genomic information of this parasite gave an inside view of the organism's metabolic pathways and is being used to design better vaccines. This collaboration proved that North-South cooperation could catalyze research outputs and accelerate the quest for better solutions to tropical health problems. This success also triggered development of a platform for bioinformatics in Kenya; the Bioinformatics platform at BecA is now available for use by all scientists in the region. The platform is actively engaged in building capacity in bioinformatics skills in the region and recently hosted the third "Introductory Course in Bioinformatics" on the ILRI campus, with 25 students from Kenya, Tanzania, Uganda and South Africa participating.

The BecA platform is not just looking for silver bullets; it is actively promoting debate on the role of biotechnology. In advancing the livelihoods of poor farmers in Africa, some solutions may be developed from existing knowledge and adaptation of available technologies. Many, however, require new knowledge, new discoveries and endogenous innovation—by Africans, for Africa. BecA provides the capacity scientists need to uncover the wealth of biological information hidden in the mass of DNA sequences, structure, literature and other biological data. The research agenda is beginning to emerge, and Africa is now asking the right questions.

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More information:

Undying Promise: Agricultural Biotechnology's Pro-poor Narrative, Ten Years on, by Dominic Glover is available at www.steps-centre.org

Bioinformatics: http://hub.africabiosciences.org/index.php/News/Introductory-Course-in-Bioinformatics.html.
http://www.embnet.org/ EMBnet.news Volume 15 (2009) Issue 2

The Collective action underpinning this initiative: BecA is a NEPAD centre of excellence, whose partners include the African Agricultural Technology Foundation (AATF), African Biotechnology Stakeholders Forums (ABSF), Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA), African Forum on Science and Technology for Development (AFSTD), The Generation Challenge Programme and HarvestPlus. Four CGIAR Centres - the International Livestock Research Institute (ILRI), the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), International Maize and Wheat Improvement Centre (CIMMYT), and the International Institute of Tropical Agriculture (IITA) are also partners. BecA is funded by CIDA, and the Syngenta Foundation for Sustainable Agriculture.

Newsbytes

Strengthening Capacities for Informed Decisions

Any new technologies, including BT cotton technology, goes through the initial cycle of assumptions, fear and apprehension. This is often attributed to the lack of understanding and limited capacity to 'handle' the innovation. BT cotton, a new technological intervention with potential to contribute to the cotton sector, comes with the need for capacity building and preparation of the 'system' for understanding and handling of the technology and its implications. It calls for capacity strengthening efforts and cognizance building at every level: policy makers to facilitate decision making; media to communicate the evidence based message to the people; farmers and consumers to take informed decisions and for their ability to weigh the pros and cons of the technology.

With 25 countries already commercializing biotech crops, and many countries in the process of building policies and setting up national systems for adoption of biotech crops - investment in capacity building can immensely contribute towards facilitating informed decisions. Strengthened cognizance and capacity among stakeholders will support evidence based, rather than assumption based, decision making.

Insights from CGIAR Research Map – What are the projects working on?

An analysis of the agricultural products that the CGIAR centres work with, along with relevant data from the online surveys of research projects in the region is now available:

http://www.ilri.org/regionalplan/documents/Database%20highlights%20-%20CG%20agricultural%20commodities1.pdf

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