

Mars collaborates to sequence Africa's neglected food crops

A scientist at Mars pledged to work with American and Chinese collaborators to make the genomic data of almost 100 of Africa's orphan crops publicly available on the internet. Howard-Yana Shapiro, chief agricultural officer at the confectionery and animal food company Mars in McLean, Virginia, made this statement at the G-8 International Conference in Washington in June. Shapiro led a partnership that sequenced, assembled and annotated the cacao (cocoa) genome in 2010 and made the data freely available to all researchers. The \$40-million African Orphan Crop Consortium (AOCC), which includes the New Partnership for Africa's Development, the Beijing Genomics Institute (BGI), Life Technologies, the World Wildlife Fund, the University of California, Davis (UCD), Mars and others, was set up in 2011 at the Clinton Global Initiatives conference.

The overall AOCC goal is to improve the nutrition, productivity and climatic adaptability of Africa's most important food crops, including African eggplant and potato, cassava, sorghum, yam and Ethiopian mustard, as well as other food crops and tree species—24 of them in all will have their genomes sequenced—that are not considered economically important on the global market. Genomic sequencing will be carried out by BGI in partnership with a group at UCD, which will work with scientists at the African Plant Breeding Academy with facilities in Ghana and Kenya, in efforts to adopt advanced breeding approaches, according to Allen Van Deynze, director of research for the UCD Seed Biotechnology Center.

Amid praise for the long-term goals of the orphan crops genomic sequencing initiative lingers lies some skepticism over how well the program will help African scientists, farmers and peoples in the shorter term. Moreover, voicing of that skepticism proves a delicate issue because no one is eager to sound ungrateful or to trample on the feelings of those who are leading AOCC and mean to do well.

"My instinct tells me not to make a public comment," says Calestous Juma of the Belfer Center for Science and International Affairs at Harvard University in Cambridge, Massachusetts, who directs the Agricultural Innovation in Africa Project. Instead, he refers to several passages in a Belfer Center report from 2011, *The New Harvest*: "The challenge facing Africa is building capacity in bioinformatics to understanding the location and functions of genes," it reads in part. "It is through the annotation of genomes that scientists can understand the role of genes and their



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Howard-Yana Shapiro, joined Mars as chief agricultural officer after selling them his organic seed company Seeds of Change. Last June, Shapiro announced genome data from 100 neglected crops will be made freely available in a bid to end stunting in African children.

potential contributions to agriculture, medicine, environmental management, and other fields. Bioinformatics could do for Africa what computer software did for India."

Although that message may be embedded in the AOCC program, its emphasis on genomics may simply be too abstract and futuristic, Juma seems to suggest. Yes, genomics studies of orphan crops could well help African farmers in the long run, but in the near term, African scientists might be happier with assistance that is more pragmatic and better geared to meeting their immediate challenges.

Additionally, there are concerns over how Africa can deal with controversies over agbiotech that remain unsettled among highly industrialized nations. "Within Africa there has been controversy over biotech for years, largely stemming from those that are close with the European Union (EU) and have been influenced by their EU view on biotech versus others," says Ellen Terpstra, president and CEO of the Washington, DC-based International Food and Agricultural Trade Policy Council.

African nations with biotech regulatory policies might run into difficulties trading with neighbors that are not ready to accept such crops, and additional problems could arise in cases in which biotech-allergic EU countries are trading partners, she suggests. These concerns could be finessed, of course, if the forthcoming genomic data were used exclusively to inform conventional breeding programs rather than those that entail genetic engineering.

"We certainly think that a focus on biodiversity and agroecology, that is, learning exchanges and other farmer-controlled seed exchanges and development, have a much better chance of success than an effort to map and possibly patent genes," says Karen Hansen-Kuhn of the Institute for Agriculture and Trade Policy, which is based in Minneapolis and has offices in Washington, DC. That latter concern appears moot, however, since the AOCC announced earlier this year that data it develops will be made publically available.

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Correction

In the May 2013 news analysis "Second oral MS drug..." (*Nat. Biotechnol.* **31**, 373, 2013), the headline incorrectly stated that the drug Tecfidera was the second oral MS drug to win FDA approval when it was the third. The error has been corrected in the HTML and PDF versions of the article.

Correction

In the August 2013 feature "Genomic testing reaches into the womb" (*Nat. Biotechnol.* **31**, 595–601, 2013), Karen Drexler was incorrectly identified as the CEO of CellScape. She is co-founder and executive chair. The error has been corrected in the HTML and PDF versions of the article.