$40 Million Project To Revitalize Africa's Orphaned Crops Announced

EurekAlert

A visionary $40 million effort to boost Africa's health and economic vitality by genetically sequencing and breeding some of the continent's most important, but neglected, native crops was announced today during the Clinton Global Initiative meeting in New York City by a consortium of international partners, including the University of California, Davis.

The recently formed African Orphan Crops consortium will work with African scientists to identify at least two dozen African food crops and tree species that have been neglected by science because they are not economically important on the global market.

Approximately $7.5 million for the effort has already been raised by the consortium, which presented its plan at the Clinton Global Initiative meeting in hopes of generating additional investments of approximately $32.5 million.

An integral part of the new initiative will be the African Plant Breeding Academy, developed in Ghana by UC Davis researchers to train African scientists to incorporate the latest technologies for breeding these orphaned crops in Africa.

The academy will be established in 2012 by UC Davis in Accra, Ghana's capital and largest city. Life Technologies Corporation, a California-based global biotechnology tools company, will provide technology equipment for the academy.

"Due to the diverse nature of the crops grown in Africa, including cassava, cacao, cocyam, millet, sorghum and legumes, there is a need to adapt the latest breeding strategies and develop new strategies that are appropriate for these crops," said Kent Bradford, director of UC Davis' Seed Biotechnology Center.

The consortium will sequence the genome - an organism's entire collection of genes - for each species and make that information freely available to scientists around the world. That information will then be applied, using the most advanced breeding techniques and technologies, to develop new varieties of crops that are more nutritious, produce higher yields and are more tolerant of environmental stresses, such as drought.

"UC Davis is a powerful enterprise for innovations that address the world's most pressing problems," said UC Davis Chancellor Linda P.B. Katehi. "Few problems are more urgent than the looming global food shortage. I am tremendously proud of the vision and promise of the African Orphan Crops consortium. It is leading the way to an era in which genomics research can be moved from the research laboratory into the hands of the farmers who feed the world."

"As this knowledge is used to develop improved varieties of these 'orphan crops,' African farmers will be able to grow highly nutritious, productive and robust crops for local consumption and create surpluses that can be marketed for income," said Howard Yana Shapiro, global director for plant science and external research at Mars Inc. and an adjunct plant sciences professor at UC Davis.

Shapiro said that the need for enhanced, native crops is acute throughout most of Africa, where per capita food yields have been declining for decades and more than one-third of African children suffer the debilitating effects of malnutrition.

The consortium has developed a list of 96 species, which will be narrowed to 24 food crops and tree species whose genomes will be sequenced. The selected species will have the potential to play a nutritionally significant role in the African diet and directly or indirectly improve food security in Africa. Some of the better-known species to be considered for sequencing include amaranth, marula, cocyam, Ethiopian mustard, ground nut tree, African potato, acacia, baobob, matoke bananas, African medlars, African eggplant and Cape tomato.

"Virtually every small-farm producer growing food crops for subsistence in Africa is growing a species that the consortium will be striving to improve," Shapiro said.

He noted that the consortium has already begun to sequence the Faidherbia albida, a type of acacia tree that can be used for improving soil nitrogen content and preventing erosion. The tree also has edible seeds and, unlike most trees, sheds its leaves during the rainy season so that it can be grown among field crops without shading them.

The sequencing of the selected 24 food crops and tree species will be carried out by BGI, the world's largest genome sequencing institute. UC Davis in June announced a partnership with the China-based institute to conduct large-scale genome sequencing and functional genomics programs, focusing initially on the areas of food security; human and animal health and wellness; and biodiversity and environmental health.

About the plant breeding academy:

"The goal of the African Plant Breeding Academy will be to educate African plant breeders in the application of genomic information to crop improvement, so that they can quickly adopt efficient, advanced breeding approaches," said Allen Van Deynze, director of research for UC Davis' Seed Biotechnology Center. "This will accelerate the rate of genetic improvement to increase yield and nutritional quality of African staple crops."

The scientists and technicians trained through the African Plant Breeding Academy in Ghana will, in turn, educate the next generation of African plant breeders, he said.

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