

Modified sorghum to boost nutrition in Africa

By Jerry Perkins

Researchers at Pioneer Hi-Bred International Inc. are helping develop transgenic sorghum that will be more nutritious for the 300 million Africans who eat the grain as a staple in their diets.

Genetic modification of crops is controversial in Africa, where some say the technology is unsuited for developing countries and potentially dangerous.

But the payoff, project sponsors say, will be better nutrition and improved health for many poor, subsistent African farmers and their families who grow sorghum in small food plots.

Pioneer is building better sorghum as part of the Africa Biofortified Sorghum Project, a nine-member consortium that won a five-year, \$US18.6 million grant, one of four funded by the Gates Foundation.

The project has developed its second generation of transgenic sorghum seeds, known as 'ABS#2'. The second-generation transgenic sorghum plants have more essential amino acids that are easily digestible, especially lysine, and more of vitamins A and E, along with more available iron and zinc.

Pioneer also is training African scientists from South Africa's Council for Scientific and Industrial Research and the Kenya Agricultural Institute to work on the project in Johnston (Pioneer's US HQ) and back home in Africa.

Two of the African scientists – Kenneth Mburu of Kenya and Getu Beyene, an Ethiopia native working in South Africa – are now working on the project at Pioneer's laboratories in Johnston. Three African scientists preceded them.

Biotechnology breakthrough

Paul Anderson, research director for grain end-use improvement at Pioneer and the project's principal investigator, said the breakthrough in the second-generation sorghum was made possible by biotechnology.

"There is no way this could be done by (conventional) plant breeding alone," said Paul.

Using Pioneer's biotechnology techniques, genes that boosted protein qual-

ity and digestibility and mineral availability were transferred to sorghum, Paul said.

"They all seem to work as expected. This is a great success within a very short period of time."

Because the project involves a genetically modified plant, it is controversial in Africa.

An organisation called GM Watch, which grew out of a news and research service in the United Kingdom, says it opposes biotechnology because corporations are using biotechnology and genetically modified plants to take advantage of poor farmers in developing countries.

Other organisations say biotechnology threatens Africa's biodiversity, traditional food crops, production systems and native cultures.

Paul Anderson says Europeans are foisting such views on Africans.

In fact, Paul said, it was an African – Florence Wambugu – who proposed the sorghum partnership with Pioneer, a unit of DuPont.

"This is a very heavily African-influenced project," Paul said. "It was designed by Africans, in Africa, for Africa."

Florence was a member of the DuPont Biotech Advisory Panel and visited Pioneer's Johnston headquarters about six years ago, when Paul told her about Pioneer's sorghum research.

When the call for proposals came from the Gates Foundation, Florence remembered Pioneer's work and suggested to Paul that they seek a grant.



As part of the successful grant application, Pioneer has donated about \$5 million in patented sorghum genetics, seeds and know-how to the project.

The consortium is working with other African countries that are interested in growing the modified sorghum.

GM opposition

Opposition in Africa to genetically modified crops like ABS#2 has made it more difficult to secure permits needed to test genetically modified sorghum.

Paul said that the South African regulatory body that governs experimental crop trials rejected an application for greenhouse tests of the genetically modified sorghum. The consortium has appealed the rejection.

Field tests of the genetically modified sorghum have been conducted in the US and Puerto Rico. Paul hopes that experience will help the consortium overturn the denial of the permit in South Africa.

Robert Paarlberg, a professor of political science at Wellesley College, said the South African denial of the biofortified sorghum trial surprised its advocates. South Africa has been the only African government that has approved genetically modified crops.

"South Africa wanted to be extra careful with sorghum because it has wild relatives in Africa," said Robert. "They wanted to take a look at the gene flow issues."

Robert has written a book that will be published in March about how anti-biotechnology groups are trying to influence African governments.

"It would be a shame if unproven and undocumented biosafety risks block the (biofortified sorghum) project," Robert said.

The genetically modified sorghum faces other hurdles, even if it is approved for production in Africa.

"There is no guarantee farmers would grow the biofortified seed," Robert said. "You need a distribution system to get the seeds in the hands of low-resource farmers."

Jerry Perkins is a writer for the *Des Moines Register*, based in Iowa. ■