

Agbiotech to the people: an African approach

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In Cameroon, the final test of an improved crop is not how well it withstands pests or drought or disease. In the end, it comes down to a matter of farmers' acceptance: Is its colour good? How does it taste?

"We start with the ones that the farmers say taste the best," says Anne Awah Selatsa, a native of the African nation of Cameroon and PhD student at the University of Hanover in Germany.

Selatsa was attending the Agricultural Biotechnology International Conference (ABIC 2010) in Saskatoon on a bursary from the ABIC Foundation, which pays all the expenses for promising young researchers from the developing world to attend the conference.



Anne Awah Selatsa (on left), one of the ABIC 2010 International Poster Competition winners (Sustainability stream), also won the ABIC Foundation 2010 Travel Bursary. Selatsa accepts a certificate from head judge, Dr. Sue Abrams.

She is working to genetically transform cowpea (more commonly known in North America as black eyed peas) to tolerate drought and insect pests that can sometimes claim up to 80 per cent of yields. Her poster, "Improving Drought Tolerance and Insect Resistance in West and Central African Cowpeas" took top honours in its category at the ABIC 2010 Poster Competition.

Cowpeas are a staple food in the agricultural region of Cameroon, where the legume is known as koki bean. A common supper is koki bean flour made into a paste with palm oil and vegetables. People often stop at roadside vendors for a breakfast of akara, a sort of fried pancake made from cowpeas. At nearly 25 per cent high-quality protein, the crop is an



essential part of the local diet.

In the richly fertile soil of Cameroon, Selatsa says nearly everyone is a farmer – 80 per cent of the population depends on agriculture, regardless of what their day job might be. Each house is surrounded by hand-tilled plots of guava, plantains, coco, and cowpeas. These are typically about a quarter of a hectare. A large farmer might have a full hectare.

“It's normal in Cameroon,” she says. “Everyone has one of these.”

Selatsa grew up in a family two brothers and a sister. Her father, a farmer and businessman, and her mother, a teacher, taught her the value of both hard work and education. Her work ethic served her well as she went to university, studying agronomy and plant science. She applied for and received scholarships to study in Europe, where she completed her Master's degree. She currently has the first year of a three-year doctorate program completed.

Her current project uses *Agrobacterium*, the “workhorse” of the biotech industry, to introduce two genes into cowpeas: one to increase drought tolerance, and another to add insect resistance.

It is a daunting project, both because there are two genes involved, and because the protocols to get *Agrobacterium* to shuttle the genes into the cowpeas differ from variety to variety. Cameroon farmers have their favourites, so she worked with six different varieties, four of which are from home.

After much hard work, she was successful in establishing tissue culture protocols. The next steps will be to introduce the two genes and grow her varieties in the greenhouse. From there they will be tested, including field trials, and if all goes well, she will face the ultimate test: the farmers back home.

“I like contact with the farmers; it's kind of a 'feedback' approach,” she says. “I like to know what's going on with the farmers.”

Typically, plant breeders will work with an NGO, who calls together the local farmers. The farmers test the cowpea varieties on offer, and score them according to taste, yielding data for the plant breeders. If a variety gets a thumbs down, it's back to the lab to improve the taste, as no one will grow it.

Selatsa hopes to bring her transgenic cowpeas to Cameroon, but this will depend on funding – about \$130,000. She and her professor are currently shopping the idea around to various government agencies and private foundations for support. “If I have funding, I am ready to go home and start something,” she says.

This “something” is more home-grown agriculture research potential. This includes infrastructure and facilities to do the research, as well as training for more plant scientists.

“It requires some money, but the ideas are there.”