The science of food provision

KAREN KOTZE

Genetically modified crops. These three words divide opinion as few others can. To shed some light on the facts, the Tatler spoke to the woman scientist who has blazed a biotechnology trail through the African continent.

Professor Jennifer Thomson is one of the world's leading advisors on genetically modified crops. She was also the first person to bring genetic engineering to South Africa.

Her third book, *Food for Africa: The Life and Work of a Scientist in GM Crops*, traces her career through the development of this research, starting as a keen student in a laboratory at Harvard University, where she went against the trend and used genetic engineering (and so ended up with a single author paper from Harvard Medical School on the technology, which she pioneered) up to current times, when 80% of maize grown in Africa is genetically modified – for insect and herbicide resistance.

Research is already under way to create drought-resistant maize, crucial, she says, to food security in Africa.

"This is one of the many ways in which we can achieve food security in a time of climate change," Ms Thomson says. "It is not the only technology, but it is certainly one of the techonologies that will help us."

■ Jennifer Thomson is Emeritus Professor in the Department of Molecular and Cell Biology at the University of Cape Town. Her third book, detailing her career and research in biotechnology and genetic engineering, has just been published.

Dr Mamphela Ramphele, chair of the Technical Innovation Agency (TIA) has been quoted as saying: "The work of Jennifer Thomson has been transformational in demonstrating the value of biotechnology to food security on a continent that suffers from droughts and adverse weather conditions."

The second most important way of achieving food security, Ms Thomson says, is through educating women, particularly mothers. "In traditional African farming systems, women tend the crops that feed the family, while men manage the crops that make money," she says.

In recognition of their ilk, Ms Thomson and Lesley Shackleton have co-founded South African Women in Science and Engineering (SAWISE) to strengthen the role of women in these subjects.

Ms Thomson was the recipient of the L'Oreal/UNESCO prize for Women in Science for Africa in 2004.

The role of women is very dear to her heart as a supremely successful woman in a traditionally male-dominated domain.

One day a male professor at Cambridge arrived to find some of the men in the Genetics Department class absent. He declared: "Gentlemen, we do not have a quorum; I will not lecture today," and promptly left the class.

She describes the early days of academic study for women as challenging, but says that "luckily" she enjoys a challenge.

She laughs as she relates what Ed Rybicki said of her. Mr Rybicki is South Africa's leading plant virologist, who worked on a virus that attacks only maize in South Africa. At her recent book launch in Claremont, he said that Ms Thomson does not even notice glass ceilings, she just smashes right through them.

On the coffee table is a selection of the most delectable home made chocolates – Ms Thomson's hobby.

Amid the seriousness of the topic, these chocolates and that comment combine in the image of the glass elevator, catapulting out of the pages of *Charlie and the Chocolate Factory*. It's a delicious moment. I indicate towards the chocolates, ask if they are GM. Her answer is a hearty, genuinely amused laugh.

Continued on facing page

From previous page

It's made funnier when I learn that she was told by colleagues in America not to even get into research of this nature, unless she had a computer-controlled glass house.

"I daren't have told them then that I didn't have a glass house.

"In fact, I still don't have a glass house – but I do have a lab in Nairobi," she laughs. "Even then, the new science of genetic engineering was highly controversial, even among scientists; it was a fiercely debated topic," she says.

And the reasons it is still so hotly debated is due to "a lot of opinion and misinformation" about the process.

Why believe her? "Because I learned genetic engineering from the gurus," she says. "While at Wits University, I went on a European Molecular Biology organisation's course. There is a technique we use called Southern blotting, and I learned it directly from Edwin Southern himself. And Marc van Montagu, who is going to get this year's World Food Prize, taught me plant genetic engineering."

Ms Thomson has two projects on the go. One is on virus resistance, and that has already gone through pre-commercial trials, and the other is drought tolerance, which is very much in the lab.

She is very happy to discuss the safety of genetically modified (GM) food.

"First off, no food in the history of mankind has ever been subjected to such rigorous safety tests as foods derived from GM crops," she says.

She says labelling is enforced if only 5% of the product has been genetically modified.

"This means that an item will be labelled – not on its content – but on the way its content has been produced. That is a significant point to note.

"Also, there are no regulations on the use of fertilisers and pesticides used in non-GMO crops. Surely those interested in their health, would like to see that noted on labels?"

On this point she mentions in her book the positive environmental impact of GM crops, due to less pesticide and insecticide being used. Using less pesticide also allows for healthier top soil.

On the subject of animal genes being used in GM crops, Ms Thomson says: "No animal gene has yet been introduced into a plant for commercial use.

"However, as humans share about 50% of their genes with a banana, one might be hard-pressed to define an animal gene." Concerns have been expressed by the anti-GM lobbyists that genes can flow from GM crops to non-GM crops, and Ms Thomson says that gene flow takes place between all crops.

"Conventional hybrid crops can just as readily 'pollute' local varieties.

"When I was in the lab in Harvard, the answer to what I was working on became very clear — once you get the technology better, this is going to be the safest, quickest, easiest way to do things.

"It's clean, you can put a gene in and you know what it is. It is such a neat, clean technique," she says.

Because of fears around the emotive subject of food, regulations for commercialisation of GM products take up to 15 years of testing, and cost $130 million (US dollars).

"A friend once told me that to be successful in developing a GM crop you don't need just good ideas, but also perserverance.

"Fortunately, the perseverance fairy was present at my birth," she quips.

Ms Thomson says while it cannot be called "natural", genetic modification is not alone on this front.

"Plant breeding hasn't been natural ever since we began planting.

"A lot of plants that we consume have been irradiated to change their characteristics. If you haven't got what you want in the natural plant population, you irradiate it to look for something that's got the trait you want.

"But you don't know what else you've done.

"I am not saying it's dangerous, but it's just that people take that as is."

Another factor that Ms Thomson briefly touched on is that so many medications are genetically engineered.

"Any medication that is a protein, you can make in a bacteria. It's much easier and safer to do that than in an animal system," she says. "Nobody says they are not going to take their medicines because they are genetically engineered," she points out.

For more information read Ms Thomson's book, available at most book stores, including Exclusive Books and Reader's Warehouse.