THE SEIBERSDORF LABS THROUGH THE EYES OF VISITING SCIENTISTS


(Photo: Mohammad Hasanuzzaman, IAEA)

LESOTHO

***Motlatsi James Ntho**, Laboratory Technician–Research Officer, Department of Agriculture Research, Ministry of Agriculture and Food Security, Maseru, Lesotho*

"In Lesotho, we are being affected by climate change, meaning we have more and longer droughts, and the rains farmers need for their crops to grow and flourish are often late. We are also seeing more agricultural crops blighted by disease. Therefore I am working to improve sweet potatoes and wheat because of wheat's importance in the daily diet, and because sweet potatoes could become an equally important staple in the next 10 years if we make a greater effort to promote its consumption.

In Lesotho's Department of Agriculture Research, we are focusing on these two staple foods initially because we want to improve the country's food security — growing more and better crops to adequately feed the population.

Once I return home at the end of my two-month fellowship at Seibersdorf, I will be using nuclear and other techniques to improve the drought tolerance, yield, nutritional value and disease resistance of both sweet potato and wheat.

The Department of Agriculture Research is hoping to establish a tissue culture lab where we can conduct this kind of plant breeding and the IAEA is helping us with equipment as well as with training. I was sent to the Seibersdorf labs in Austria because there are no institutions in southern Africa where these skills (induced mutation through irradiation) are taught.

When I've completed my training I have no doubt that I will be a competitive candidate to undertake tissue culture research in my country's new laboratories. And this fellowship will help me participate fully in the development of these skills in Lesotho.

Bonus

Apart from learning the specific techniques I'll need to conduct my own research, I have gained even more than I had hoped to receive when I first came to Seibersdorf.

I've learned how to work with other plants like chillies and tomatoes, and I've been inspired by the other fellows from across Africa and by the IAEA staff in the Plant Breeding and Genetics Laboratory. I think these relationships, which will make professional collaboration easier when we return home, are one of the greatest additional benefits I have received."


(Photo: Pichler Rudi, IAEA)

MADAGASCAR

***Norbertin M. Ralambomanana**, Engineer of Agronomy, responsible for the Genetic and Reproduction Laboratory, Department of Zootechnic and Veterinary Research, National*

Centre for Applied Research in Rural Development (FOFIFA), Ministry of Agriculture of Madagascar

"The island of Madagascar has a population of more than 23 million. Over half of its rural dwellers are agricultural workers, particularly in cattle farming. But the country still has to import milk as it is depleting its stock of indigenous Malagasy Zebu cattle in order to keep up with beef exports to neighbouring islands.

Therefore, the Madagascar Government is partnering with the IAEA to improve milk and beef production from the indigenous Zebu, Renitelo and Manjani Boina cattle breeds, through selective breeding based on the intimate knowledge of their DNA.

We in the Ministry of Agriculture doubt that our efforts will completely eliminate milk imports, but our aim is to significantly reduce the quantities the country needs to buy elsewhere. And we are aiming to significantly increase the number of cattle produced in our country.

One key element of the project is the training scientists from Madagascar receive at the Animal Production and Health Laboratory at Seibersdorf in Austria. I am currently participating in a three month fellowship in Seibersdorf where we are using the 172 DNA samples from three cattle breeds indigenous to the island to compare relationships between genotypes and phenotypes and to compare cattle breeds in our country with those in other countries in order to improve the quality of our home-grown animals.

Tools of the Trade

Madagascar doesn't have the right equipment to conduct the necessary DNA analysis. So the IAEA trains scientists like me in using its equipment at the Seibersdorf laboratories, while helping our government procure and purchase equipment of its own.

When I return home, my colleagues at the Ministry of Agriculture and I will use the information I've gathered here to figure out the best way to improve our indigenous cattle breeds. It won't be easy, however. We face a number of significant challenges.

First, the animals are scattered in rural settlements where it's not easy to get blood samples. And second, local breeders have their own ideas about the best way to do things. It will be very difficult to change these perceptions and convince breeders that the more scientific approach will produce better results than what they have been doing all along.

Fellowships like the one from which I am benefitting are very important for developing Member States because by training our scientists, the IAEA is giving us the tools we need to meet our own needs now and in the future."

SENEGAL

***Fatimata Ndiaye**, Researcher and Consultant, Laboratory of Fungal Biotechnology, Faculty of Science and Technology, Cheikh Anta Diop University, Dakar*

"In Senegal, we are struggling to adequately feed our population as persistent drought and poor soil quality combine to cause crop failure year after year. My area of focus is the improvement of soil fertility and quality. That is, increasing soil nutrient content by introducing more carbon into poor soil and ensuring that soil retains this carbon. The techniques I need to conduct such experiments and get the right results are what I'm learning at the IAEA's nuclear applications laboratories in Seibersdorf during this four-month fellowship.

My colleagues in Senegal and I will use this data to create an agro-technology package that will adequately address Senegal's agricultural problems (at least as far as they relate to soil). Our recommendations to the government and farmers will deal with better soil management

and more effective and efficient ways to increase organic matter (carbon) in soil.

These types of fellowships are good opportunities for young scientists like me to improve our expertise, further our careers, and have access to the technical tools which are available at Seibersdorf. Such opportunities are necessary and help us obtain positive results in our agriculture industries."

SUDAN

***Tahani Bashir Abd Elkareim**, Researcher, Tropical Medicine Research Institute, Sudan*

"Malaria is a treatable but deadly disease transmitted by the bite of female Anopheles mosquitoes. According to the US Centers for Disease Control and Prevention, malaria is a major international public health problem causing an estimated 215 million infections and 655 000 deaths worldwide each year.

Sudan is one of the countries where malaria is endemic, and we are engaged in a number of efforts to limit transmission and get rid of the Anopheles mosquito. One of these efforts involves using the sterile insect technique (SIT) where male mosquito larvae are irradiated, making them unable to produce offspring when, as adults, they are released into the wild to mate with females.

If successful, the SIT will help to gradually reduce the mosquito population available to infect humans. At the IAEA's Seibersdorf labs I've been learning how to raise large quantities of sterilized mosquitoes. This includes understanding the feeding, caging, equipment and cleaning requirements of mosquitoes from larvae to adulthood.

I'm here to see how the IAEA's system for mass rearing compares to our own, what more we need in terms of equipment and expertise, and to see the methods used to make the SIT process more efficient and effective.

I think that these fellowships for scientists from developing Member States are golden gifts that give young professionals training opportunities they wouldn't normally have had. Also, the hands-on experience and interaction with the IAEA's patient and knowledgeable staff is invaluable."