

Tukkies tree health expert rewarded for life's work

Prof Jolanda Roux won the top Distinguished Young Woman in Science Award for Life, Natural and Agricultural Sciences from the Department of Science and Technology's (DST) annual Women in Science Awards.

Prof Roux, from the Faculty of Natural and Agricultural Sciences, also received the Queen's Award from the Commonwealth Forestry Association for her contribution to forestry. This award recognises the achievements of an outstanding forester and supports the winner's future work.

Prof Roux is a researcher at the Department of Science and Technology/National Research Foundation (DST/NRF) Centre of Excellence in Tree Health Biotechnology (CTHB) and the Tree Protection Cooperative Programme (TPCP) of the Forestry and Agricultural Biotechnology Institute (FABI). She has dedicated her career largely to researching tree diseases. Her main research focus is the fungi and bacteria that cause disease and death in woody hosts.

Her career started with the commercial forestry industry in South Africa, where she worked on diseases of introduced trees. Her interests later expanded to include research on the diseases of indigenous trees in Africa. Prof Roux has become known for her exceptional contributions to forestry and the innovative approach to her work. She diagnoses disease and pest problems in the field and uses morphological and molecular techniques to identify the causal agents of the disease.

"The Commonwealth Forestry Association weighs one's entire career when considering one for the award, so it is difficult to pinpoint a single criterion that might have made them choose me in the end. It was my work over a number of years that earned me the award, not one specific project. It is a lifetime's research that went into this award, so I am very honoured to receive it. Many of the people who received it before were much older than I am," says Prof Roux. "If I had to guess, it is probably my work towards increasing knowledge on fungi and tree diseases on the African continent that might have contributed to my winning the award. There are not many forest pathologists in Africa and our continent still holds many secrets, especially in the fungal world. Less than 5% of the planet's microfungi are known, and even less are known in Africa."

Prof Jolanda Roux says researchers and students with whom she has worked over the years, share the Queen's Award with her.

In addition to the honour that this award brings, it also includes a cash prize of £2000. Prof Roux plans to use this money to travel to an international tree health conference in Uruguay.

However, she refuses to take sole credit for her achievement and says that she shares this honour with the other researchers and students with whom she has worked with over the years.

"I am part of a winning team. That is what has helped me achieve what I have in my career. I've had so many wonderful mentors at FABI and internationally, and I have had the privilege of working with wonderful students and support staff."

The project of which Prof Roux is most proud is one where she and her students worked on an important fungal pathogen of *Acacia mearnsii*, which was thought to have been introduced to South Africa. There were concerns that this fungal pathogen might pose a threat to the country's native trees. "One of my career highlights was to discover this fungus on several indigenous trees in Africa. After the discovery, we could prove that it was an indigenous fungus with a widespread occurrence in Southern Africa. This meant that it didn't pose a major threat to our indigenous plants, because there were naturally occurring biological control systems in the ecosystem that kept it in check. We also identified the insects that carried the fungus from tree to tree, which could assist foresters to control its spread." this fungal pathogen might pose a threat to the country's native trees. "One of my career highlights was to discover this fungus on several indigenous trees in Africa. After the discovery, we could prove that it was an indigenous fungus with a widespread occurrence in Southern Africa. This meant that it didn't pose a major threat to our indigenous plants, because there were naturally occurring biological control systems in the ecosystem that kept it in check. We also identified the insects that carried the fungus from tree to tree, which could assist foresters to control its spread."

Any identification and source discoveries are, in fact, major breakthroughs in the field, as one needs to identify the diseases and determine their source in order to control the plant disease. Interestingly, it is not only local plants that matter in South Africa. Tree health management requires neighbouring countries to work together and share their knowledge of indigenous plant pests and diseases.

Studying exotic plants and their diseases and collaborating with other countries in Africa help foresters improve their efforts to control tree diseases in South Africa. Regular



Prof Jolanda Roux

survey and research visits to other countries and the training of sufficient postgraduate students from South Africa and other African countries are therefore necessary. The Forest Invasive Species Network for Africa (FISNA), which was recently established, plays a role in this regard.

"Trees are critical for the survival of our planet and thus our own survival on earth. They provide us with food, oxygen (by removing CO₂ from the air), shelter, medicine, fuel, paper, clothing and tools, to name but a few things. What few people know, however, is that fungi are just as essential. Not all fungi are bad. The majority are actually necessary for plant life and for our survival. They recycle dead material, provide antibiotics and food, and are a crucial part of the global ecosystem," says Prof Roux.

"Due to human activities, the natural balance of many ecosystems, including that of plants and trees, has been changed. As a species, we have been responsible for moving plants, and thus their insects and fungi, around the world. Trees have been brought into contact with fungi to which they do not have a natural, coevolved resistance, resulting in devastating tree diseases. These diseases have changed entire ecosystems and the history of life on earth. That, together with climate change, the destruction of natural environments and the stress we place plants under through our day-to-day activities place plant and tree survival on earth under considerable threat," she says.

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Since its inception, FABI has been a major help in the ongoing battle with forest pests. The research conducted at FABI focuses on understanding tree health and the pests and pathogens of trees and plants in order to develop better and more durable management strategies against plant diseases.

"Without baseline knowledge of pathogens, the environment and trees, even the most advanced management strategies are doomed to eventually fail. Since much of our knowledge is based on research from Europe and the USA, it is important to train people in Africa under African conditions and to improve our knowledge of what we are dealing with on our own continent."

"FABI is a great forum for the exchange of information between all its different role-players," she says. "With FABI, each time you research a topic, you don't have to reinvent the wheel, because a lot of that work has been done by researchers on other projects. We work together as a team and this joint force helps all our work," because a lot of that work has been done by researchers on other projects. We work together as a team and this joint force help all our work."