



specialisation: Bio-energetic Systems, Participatory Forestry Management and Commercial Plantation Management.

Bio-energetic systems

In contrast to the negative perception that plantations only slurp up natural resources like water, the reality is that trees are some of the most effective users of water and nutrients (and that plantations by nature constitute a renewable and sustainable form of land use). It is precisely for this reason that tree planting for bio-energy has been widely implemented in Europe for a long time. In South Africa a more recent start has been made to experimenting with renewable tree-based bio-energy systems.

One group of postgraduate students is currently working on bio-energy projects for several Western Cape land owners. Some of these students are researching suitable tree species and hybrids that are well adapted for planting in energy plantations across a wide range of plant habitats in the research area. They are also experimenting with combinations of standing densities (the number of trunks per hectare) and rotation periods (the time from planting to chopping down) so as to be able to deliver specific dimensions of wood for maximum effectiveness at the time of harvesting and processing. Another focus of research is the harvesting and processing of the wood as biofuel where skills such as forestry engineering techniques, conventional engineering and logistics are needed.

Participatory forestry and agro-forestry

South African foresters are known around the world for their proficiency in plantation forestry, but few people are aware of the research that is being done in areas with bushveld and savannah vegetation. This while there are more than 21 million hectares of these systems in South Africa compared with the 1,35 million hectares of plantations. In other Southern African countries, these types of vegetation play a cardinal role in fulfilling human needs.

A team of postgraduate students is therefore focusing on agro forestry systems (or the combination of forest management and agricultural practices) in several countries throughout Southern Africa. Some of the projects are for example

examining management practices to improve the production of fruit by indigenous trees, while in other projects the emphasis is being placed on the commercialisation of products from the veld.

Students in this group also pay attention to monitoring the amount of wood from certain species in savannah ecosystems that can be used sustainably. There are also studies that focus on the dynamics of nutrients in agro forestry systems and the natural recovery processes in miombo-veld with differing land-use practices. Community interaction is an important component of management of these systems, especially where land ownership does not always reside with individuals.

Sustainable production in plantations

In the medium term, an acute shortage of pine is being predicted for South Africa, especially in the Western Cape. A group of students is examining eco physiological response mechanisms in these forests to find ways to increase production. The soil where plantations occur in the Western Cape is mostly poor. One can therefore increase the potential growth tempo through fertilisation, but meaningful improvements are unlikely where trees experience stress due to lack of water. This study group has members who are conducting research on the relationship of isotope species ^{13}C and ^{12}C in the wood, a figure that correlates well with drought stress. Other students are examining the amount of light the crown absorbs and how effectively this radiant energy is converted to fixed carbon by photosynthesis.

A career in forestry not only offers an opportunity to work in a field that brings one close to nature, but also focuses on the sustainable use of renewable resources which, ecologically speaking, leaves a soft footprint.

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Prof Wally becomes a member of the American National Academy of Science



Prof Wally Marasas (right) signs the Great Book first signed by Abraham Lincoln in 1863, while Dr MT Clegg, secretary of the Council of Foreign Associates of the American National Academy of Science, looks on.

Professor Wally Marasas, Professor Extraordinaire in the Department of Plant Pathology, was inaugurated as a foreign associate of the American National Academy of Science in Washington DC on April 26.

He is only the second South African to have been accorded this honour - Prof Philip Tobias of the University of the Witwatersrand was elected to the academy in 1987. Outside the United States of America, only about 18 scientists are elected as members annually.

Prof Marasas is regarded internationally as a world leader in the fields of *Fusarium* taxonomy and mycotoxicology. He has been widely published throughout his career and is regarded as one of the hundred most quoted scientists in the agricultural, plant and animal sciences. He has described 34 new taxa, while two taxa have been named after him by other people.

He also has three books on *Fusarium* and mycotoxins, 50 chapters in books and more than 300 scientific articles to his credit.

Prof Marasas has been awarded national and international honours, including honorary degrees from the University of the Free State and the University of Pretoria.

If one looks at his CV, the list of honours Prof Marasas has received is very long. This latest one, however, represents the crown of his academic career. "It is the pinnacle of honour to belong to this elite academy, which is highly regarded around the world and consulted regularly by the American Government," he said.

What advice does Prof Marasas have for young upcoming scientists who dream of also one day receiving such an honour? "A very, very great deal of hard work and total dedication to science is all that will take you to the top. Science is such a competitive field today that there is simply no room for second-class mediocrity. As Prof Philip Tobias said, it takes first-class science to solve Third World problems," he said.