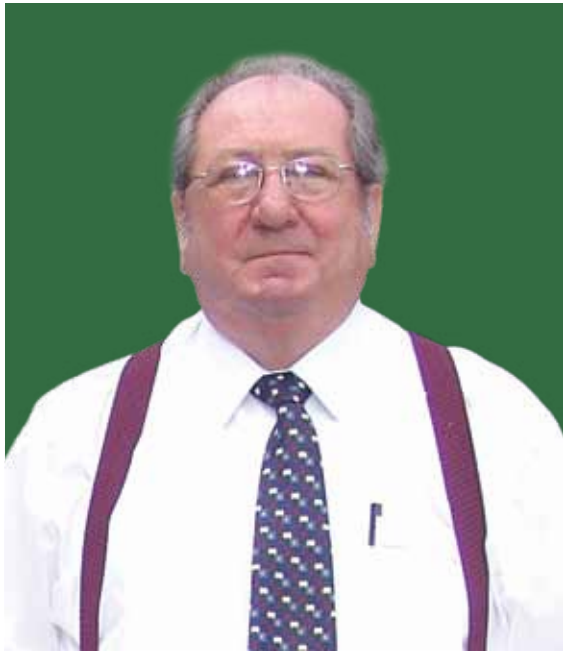
WALTER FRIEDRICH OTTO MARASAS



TOP THREE AWARDS

- A appointment as a member (foreign associate) of the National Academy of Sciences (USA), 2008
- Two Honorary Doctorates – one from the University of the Free State and the other from the University of Pretoria.

DEFINING MOMENT

The part he played in discovering the role of the fungal toxin *Fumonisin (Fusarium monliliforme* toxin) and defining its role in human and animal health.

WHAT PEOPLE DO NOT KNOW

He was a passionate philatelist and botanist, avidly collecting stamps depicting flowers and fungi that he classified botanically and mycologically. He sadly did not live to see the publication of his book *Philatelic Mycology*.

ZOOMING IN ON MYCOTOXINS

Walter Friedrich Otto Marasas was born on 25 October 1941 in Boksburg, South Africa. In 1962, he graduated from the University of Pretoria (UP) with a BSc in agriculture (plant pathology and botany), followed by an MSc in agriculture (plant pathology) in 1965, while lecturing and conducting research in the field of mycology. Having developed an interest in the mycotoxins produced by fungi, as well as the human and animal diseases associated with these toxins (a topic which had not yet been researched extensively in South Africa), he enrolled for a PhD in plant pathology at the University of Wisconsin in the USA, graduating in 1969.

In 1975, the family relocated to Cape Town, upon Marasas' appointment as Chief Specialist Scientist of the Programme on Mycotoxins and Experimental Carcinogenesis (PROMEC). This was based at the Medical Research Council (MRC) in Tygerberg, where Marasas was able to develop his research focus on mycotoxins with the potential to affect human health. He later became Programme Leader and in 2001, was promoted to the position of Director of the PROMEC Unit. He would remain at the MRC until his retirement in 2006.

A leading authority in the field of mycology and mycotoxicology, Marasas focused particularly on the taxonomy and biology of genus *Fusarium*, a common maize-infecting fungus, and the range of diseases which could be transferred to humans and animals in food and feed as a result of *Fusarium* toxins. In addition to this, he was able to contribute to the classification and description of numerous other toxigenic fungi – both in South Africa and internationally. Over the course of his career, he was instrumental in the classification of 34 taxa. Two taxa were also named in his honour: *Mycosphaerella marasasii* and *Pseudocercospora marasasii*.

INITIAL INTEREST

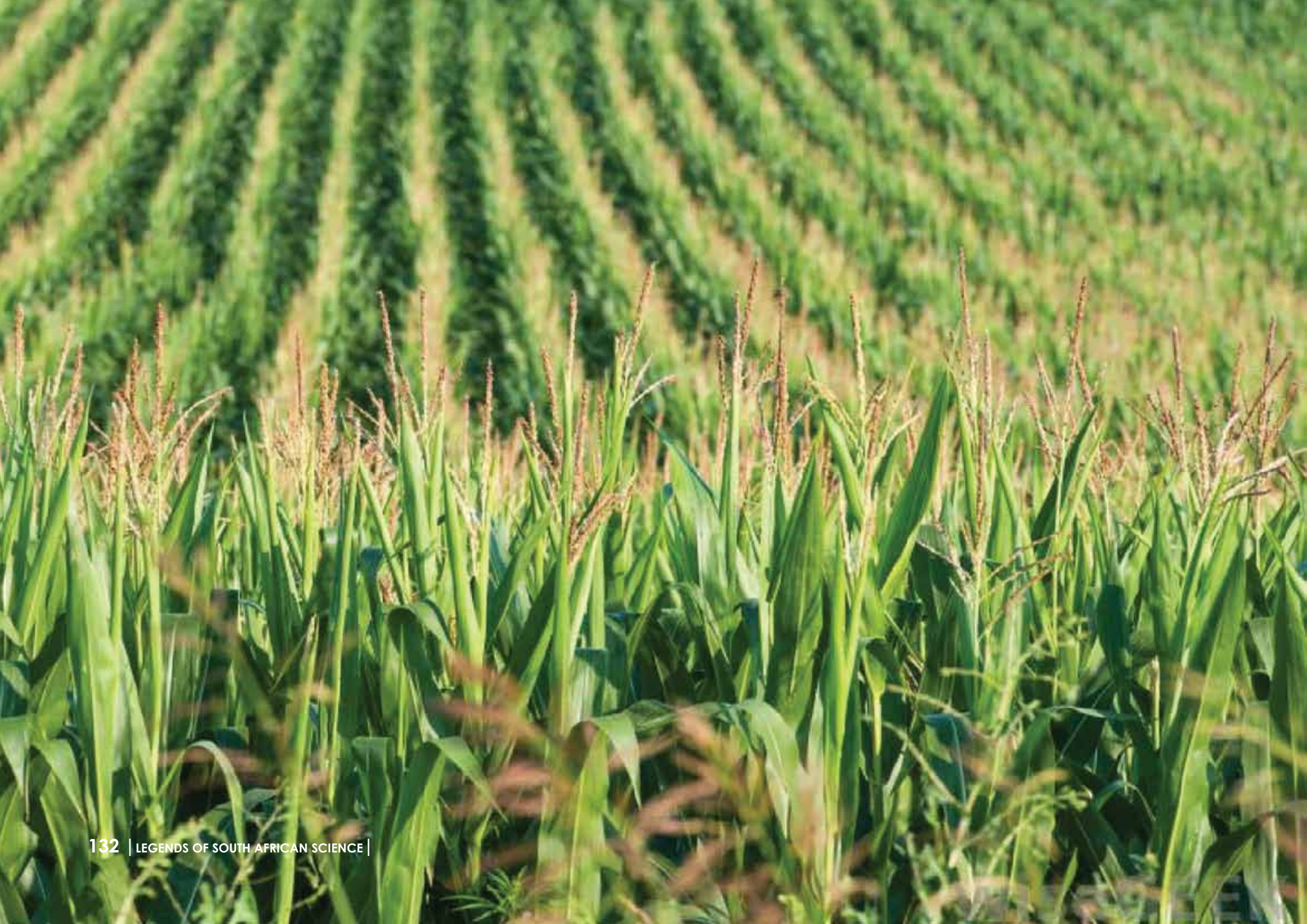
His initial interest in the mycotoxins of *Fusarium* began when he observed cases of equine leukoencephalomalacia (LEM), leading to brain damage of diseased horses. This he believed to be the result of the ingestion of infected maize. Many years of intensive research at the MRC laboratories in Tygerberg enabled this hypothesis to be proved, although the specific toxin responsible had not been identified. After over 20 years of concentrated research by Marasas and his team, the mycotoxin named Fumonisin (from *Fusarium moniliforme* toxin) was identified and characterised. This momentous discovery lead to international recognition of the team responsible, and fumonisin became the subject of much research across the globe.

Having identified Fumonisin, the next phase in Marasas' career was to investigate its potential consequences for human health. Findings pointed to the likelihood of this toxin being related to oesophageal cancer, pinpointing cases within the population of the Transkei, where the rate of occurrence was shown to be one of the highest in the world. These cases appeared to be linked to infected maize supplies, a dietary staple in the region, as well as traditionally being used to brew beer.

Subsequently, these findings played a definitive role in the advancement of human health in South Africa and other emerging regions, assisting in the development of risk analyses of food standards for groups such as the World Health Organisation (WHO).

While Marasas spent most of his career as an active researcher at the MRC, he also held a number of visiting appointments. From 1977 until 1978, he was a Visiting Scientist at the *Bundesanstalt für Fleischforschung* based in Kulmbach, Germany. 1981 saw him in the USA, acting as Visiting Professor at the Department of Plant Pathology of Pennsylvania State University. This was followed by an appointment as a Pawlett Visiting Scholar in the Department of Plant Pathology of the University of Sydney, Australia. He returned to the USA in 1992 as a Visiting Professor at Kansas State University in their Department of Plant Pathology. He maintained close ties with Pennsylvania State University, where he was named Adjunct Professor in the Department of Plant Pathology, as well as Kansas State University. He was also appointed as a Distinguished Professor in the Department of Microbiology and Biochemistry, at the University of the Free State in 1989.

In 1998, he was recognised by his *alma mater*, UP, where he was appointed as Extraordinary Professor in the Faculty of Biological and Agricultural Sciences. This honour was also accorded him by Stellenbosch University,



as Extraordinary Professor in the Department of Plant Pathology. Although not based at an educational institution, he was able to make an important contribution to the training of a new generation of scientists in this manner, supervising and sometimes co-supervising some of the leading students of microbiology and plant pathology. He also played an active role in encouraging students from other African nations to continue their studies in this field.

Throughout his career he was esteemed by the scientific community, and held a number of honorary positions. In January 1991, he was made a Fellow of the South African Society for Plant Pathology. International exposure following his work in describing the effects of mycotoxins led to his appointment in 1995 as Expert Consultant to the Joint Food and Agriculture Organisation (FAO)/WHO Expert Consultation on the Application of Risk Analysis to Food Standards Issues by the World Health Organisation, based in Geneva, Switzerland.

Other professional societies he was part of were the International Society for Plant Pathology, where he was involved in committees on mycotoxicology and *Fusarium* respectively; the Southern African Society for Plant Pathology; the South African Council for Natural Scientists. He was also deeply involved in the Pan-African Environmental Mutagen Society (PAEMS), of which he was President between 1995 and 1999.

In conjunction with his research work, Marasas published extensively, and attended a variety of conferences, delivering more than 190 papers throughout his career. He authored three monographs on the topic of *Fusarium* and mycotoxins. These are generally considered to be definitive works in their field. In 2002, data from the Institute of Scientific Information showed that he is also one of the most cited scientists in the world in two categories: agriculture, and plant and animal sciences.

His longstanding contributions to plant pathology were recognised locally and abroad, when in 2001, he was made an Honorary Member of the Southern African Society for Plant Pathology. A Fellowship of the American Phytopathological Society followed in 2005; he is one of only two South Africans who has achieved this.

In spite of his great success as a scientist, and the numerous accolades garnered throughout his career, Marasas is remembered as a humble man of integrity with a "typical South African sense of humour" (in the words of Prof Michael Wingfield, a former student). He was passionate about his chosen profession and worked hard to make a contribution to the community. Together, he and his wife were frequent visitors to the Nieuwoudtsville area of the Namaqualand, where Marasas enjoyed studying the indigenous flora. He passed away in 2012 at the age of 70, mourned by his wife, children, grandchildren and his close friends in South Africa and throughout the world.

He was also a passionate philatelist, collecting myriad stamps, particularly focusing on those depicting fungi and flowering plants. At the time of his death, he had been compiling a book with some of his most cherished specimens – a project which was then taken up by his wife Rika in collaboration with Professors Michael Wingfield and Pedro Crous. Rather than organising the book according to the usual philatelic method of country and year of issue, over 1 000 stamps were classified according to the taxonomic groups to which the fungi depicted belong. The book, titled *Philatelic Mycology: Families of Fungi*, was completed in 2013. It was published by the CBS-KNAW Fungal Biodiversity Centre in The Netherlands – a fitting tribute to this distinguished scholar, bringing together the love of the man for the field to which he dedicated his career.

With acknowledgement to Prof Michael Wingfield.