

In Memoriam*

Johannes (Jan) Toerien
(1941 – 2010)



Jan was born in the Cape Province of South Africa in 1941, graduated from the University of Stellenbosch in 1965 and started his scientific career in the South African office of Chesterford Park Research based in Cambridge UK. In 1971 he joined Ciba-Geigy and in 1973 he started his career with Westfalia Estates (a major producer of avocados and timber) near Tzaneen in South Africa.

At that time *Phytophthora cinnamomi* root rot was rife not only at Westfalia Estates but also in the avocado industry throughout the world and the control methods available were very limited. Jan set about finding effective yet practical control methods. He wrote in his memoirs “The California Avocado Yearbooks became the ‘avocado bible’ to me and I studied it in depth.”

In 1976 he undertook a study tour to Israel and California where he was well received by a large number of researchers. A breakthrough came when Prof. George Zentmyer showed him some *Phytophthora* cultures. He observed a dramatic inhibition in one culture treated with a Ciba-Geigy product.

Back home he perused this observation with Ciba-Geigy who formulated a wettable powder based on the codified fungicide in Prof.

Zentmyer's collection. This resulted in the registration and commercial application of Ridomil. Jan states "the trees recovered fantastic" but soon Jan and his team observed a progressive *Phytophthora* resistance to Ridomil.

This prompted Jan to look for a *Phytophthora* resistant rootstock and thus was instrumental in laying the foundation for the current successful rootstock selection program at Westfalia. Soon there were a large number of rootstocks showing potential and Jan exchanged 10 of the most promising ones with Dr. Mike Coffey in California. Among the most successful rootstocks to date coming from this program is the Dusa (Merensky 2), now grown worldwide.

In the meantime he and the Westfalia team developed the phosphorous acid tree injection treatment. This treatment was met with much skepticism, but proved to be the long term commercial solution. Soon the Westfalia avocado trees were saved from *Phytophthora*.

Jan writes in his memoirs "Now we had healthy trees and were confident that we could produce good quality fruit. This however was not the case and we looked at every possible cause, from mineral nutrition to cooling rates, to air circulation through pallets and cold storage conditions." This work resulted in two postharvest treatment protocols for South African avocado.

First, he looked into high carbon dioxide shock treatments prior to shipping. This approach was followed because Controlled Atmosphere (CA) shipping containers were not yet developed. This technique drastically reduced chilling injury and reduced quality losses but was difficult to implement. All these problems were however solved with the advent of CA containers.

Secondly, he proved that too fast cooling induced chilling injury and he and his team developed a step-down temperature regime from picking to marketing. This in itself resulted in a dramatic improvement in market quality of Westfalia avocados in the European market.

Jan also contributed to the world avocado knowledge by frequently sharing information with the worldwide community through publications of articles in both the South African Avocado Growers' Association Yearbook and the California Avocado Society Yearbook. In 2007 he prepared two articles reviewing the development of the phosphorous acid tree injection technology and a tribute to its developer, Dr. Joe Darvas for the California Avocado Society Yearbook.

He authored many scientific papers and his belief in the impor-

tance of collaboration and sharing of information led to him to initiate the quadrennial World Avocado Congress, the first of which was hosted in South Africa in 1987. He was also a founding member of the World Avocado Society in 1991 and elected as its first president.

In 1998 Jan and his wife Zenta moved to Australia from where he consulted to avocado producers in Australia, South Africa and Chile. In 2000 he and Zenta bought 'Rosehill Estate' in the Childers region of Queensland. The avocado and litchi orchard had been neglected but Jan and Zenta applied their expert knowledge and a lot of hard work to rejuvenate the property. This included replacing the irrigation system, topworking 'Fuerte' trees to 'Hass', correcting nutritional problems, establishing a canopy management system and tackling a serious *Phytophthora* root rot problem. Today the orchard produces some of the best quality avocado fruit in Australia.

Jan was a board member of Natures Fruit Co. and became actively involved in the push to get avocado exports more firmly on the agenda for the Australian industry, becoming a founder member of the Avocado Export Company. Both organizations benefited greatly from Jan's wealth of experience in growing, packing, storage and export.

Jan Toerien laid a sound technical foundation for super plant material, for modern production procedures and for practical post harvest protocols benefiting the international avocado industry. Jan made many friends all over the world. He will be honored as the cornerstone of the South African avocado industry and a motivator of the quadrennial World Avocado Congress. He shared all his knowledge and experience with his friends and colleagues in the global avocado village.

Jan was a Christian man of great integrity, ability and humility he left his mark on all he knew and he will be sadly missed by the avocado industry around the world and the communities in which he lived both in South Africa and Australia.

Jan was a beloved team leader, always motivating, always caring and always praising even when things went wrong. His team members had the highest respect for him and still remember him as an excellent and practical scientist, with an outstanding ability to challenge the minds of other experts.

Most important of all his qualities and abilities was his unconditional love for his wife Zenta and two children Christo and Karla. A family man in the true sense of the word, he was always supporting, caring and loving.

** Contributed by Jan's family and friends Gawie Eksteen and Martin Slabber*