

## The South African Avocado Industry

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The young but dynamic South African avocado industry produced 37,000 tons of avocados in 1987, with an expected crop of 100,000 tons by 1995. The annual production growth rate averaged 19 percent for the past fifteen years.

Fuerte is still the dominant cultivar, but the Hass component is increasing very fast. Europe is the main market for our fruit, with the export season extending from the end of March to early October. Hass plantings in the cooler regions are expected to prolong the season to November.

*Phytophthora cinnamomi* nearly destroyed the avocado industry in the years up to about 1977. Heavy summer rainfall on clay soils and unprofessional nursery management created an ideal situation for root rot. Our only hope for survival was to develop systems to control existing *Phytophthora* and to create healthy new orchards.

Research led to a series of spectacular breakthroughs. If I think back, I must admit that much more was achieved than what we ever thought was possible when it all started.

Producing *Phytophthora*-free plants was the first major step, which was followed by clonal production of tolerant rootstocks like Duke 7 (Toerien, J.C., 1977). Up to this stage, we learnt a lot from the Californians— especially the great names, like Zentmyer, Brokaw, Gustafson, Frolich, and many others from the University of California at Riverside,

Field trials at Westfalia Estate with metalaxyl in 1977 produced the first breakthrough, and we felt that we were starting to win the battle (Darvas, Kotze and Toerien, 1978). Large intensive experiments were soon laid out that confirmed the initial results. Unfortunately, by 1981 it was clear that under our conditions a decreased efficacy could be expected after prolonged usage (Darvas, J.M. and Becker, O., 1984).

Fortunately, experiments with fosatyl-al were started at Westfalia Estate as early as 1977 as a foliar spray, which gave positive but slow control of *Phytophthora* (Darvas, J.M., 1983). Alternate methods of applications like stem-painting (Darvas, J.M., 1983) and aerial application by helicopter followed. Stem-painting gave moderate control, while aerial application disturbed the biological balance.

Even with all the soil amendments like higher calcium, high organic material content, nitrogen in the ammonium form, and moisture control, our orchards were still declining.

The major breakthrough at Westfalia followed in 1981, with the first fosatyl-al trunk injections (Darvas, J.M., Toerien, J.C., and Milne, D.L., 1983 and 1984). Early results were promising, and the technique was very soon adopted and ready to be used. The results were outstanding, and probably represent the turning point in our avocado

history. Large scale trials followed, and the process was soon commercialized.

By 1980, the mode of action of fosatyl-al was described by Bompeix, G., Ravise, A., Raynal, G., and Fettouchi, F., 1980. A discussion in April 1982 at Westfalia regarding phosphorous acid lead to the first phosphorous acid injections. The results were fantastic and exciting. The first results of phosphorous acid trunk injections for control of *Phytophthora* in avocados were presented by Dr. Darvas at the South African Avocado Growers Association (SAAGA) symposium in November 1983 (Darvas, J.M., 1983).

The news traveled fast, and we soon had unexpected problems. First, Rhone-Poulenc claimed patent rights on phosphorous acid and prevented our publication of the results. Second, Professor M. Coffey from U.C./Riverside was reported as saying, "Excitement is very premature over experiments in injecting Aliette® or phosphorous acid to control root rot in avocado trees." "At this point in time, no one in the world knows whether injected Aliette ® will work or not. There have been claims coming out of South Africa that this is the answer. But these claims aren't based on any data," Coffey reports. (Avocado Grower, January 1984).

The excellent results from Australia reported by Pegg and Whiley, 1985, on phosphorous acid for control of *Phytophthora* confirmed the early Westfalia experimental results.

Excellent control of *Phytophthora cinnamomi* in the commercial or chards by injections of fosatyl-al presented the opportunity to accept other new challenges in research.

Higher production in healthy orchards of virus-free propagation material on clonal rootstocks with tensiometer-controlled microjet irrigation on intensively preplant-prepared soils became realistic. High density plantings of up to 800 trees per hectare [170 per acre] followed growth control with anti-gibberellic acid compounds and mechanical tree shaping. Higher production per unit is the most economic production system, and is dependent on an intensive production system (Toerien, J.C., Meyer, N., and Milne, D.L., 1984).

Storage and transport is of vital interest to our industry, which is 10,000 kilometers from our main markets. Preharvest conditions such as leaf:fruit ratio, calcium content, moisture stress, preharvest temperatures, and tree condition are some factors found to influence the storability of avocados apart from cultivar and maturity.

Selective temperature management is a system whereby pre- and post-climacteric phased fruits are treated differently. Controlled atmosphere and CO<sub>2</sub>-shock treatments are alternatives that are used to ensure good quality fruit on distant markets. Ventilation of palletized, containerized shipments are the subjects of much ongoing research. Humidity and moisture loss control could result in better fruit quality.

As the markets become more demanding, the need for processing increases. Much research is being done at present in looking for profitable alternative products. Ready-to-eat avocados are becoming of more importance to many fruit handlers.

Market research and promotion is intensifying; and with larger crops in more competitive markets, it is expected to become of more importance.

The First World Avocado Congress held in South Africa in May 1987 created contact

between producers and research workers from nineteen different countries, and I believe that an exciting era of international cooperation has been initiated. I look forward to a prosperous avocado future with great expectancy.

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