

## RESEARCH IN PERSPECTIVE

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The planned co-ordination of SAAGA's research programmes has been running now for ten years. We started with nothing. Ten years ago SAAGA had no research worker, no extension service or even a manager for the organization. Money was scarce and strong opposition was experienced from certain influential bodies. However, the spirit in SAAGA was very positive because experience had shown that the industry needed a mobile and active group of researchers to address *ad hoc* and short term projects. Quick answers were needed for numerous problems in the export chain up to the point of marketing and *Phytophthora* root rot was literally killing the Industry with over 80% of the trees infected and dying. At times the entire load on a boat arrived overseas in a soft condition with most of the fruit showing internal breakdown due to grey pulp and pulp spot. Fruit decay was rife at times. Some of the fruit that I saw at the overseas markets in 1977 was, to say the least, no advertisement to our Industry. Nobody could help us because Israel and California did not experience the same problems. We had to solve these problems ourselves.

My function was to stimulate or create points of research in the country, to utilize existing infra-structures without setting up a SAAGA research centre which is far too expensive for the relatively small avocado industry. We scanned the universities, chemical companies, government and semi-governmental institutions for willing cooperators on research projects, but we found the heart of our research efforts within the SAAGA set-up, viz. Westfalia Estate, Letaba Co-operative, H L Hall and Sons with solid backing from the Universities of Pretoria, Natal and the RAU.

For several years, about 40% of the research budget was taken up by root rot research.

In order to "buy time" and know-how we "imported" Dr G A Zentmyer, one of the greatest names in avocado root rot research at that time. He paid a short visit to us but left us in no doubt that our problems will have to be solved by ourselves. Two significant developments decided the fate of avocado root rot in South Africa. The first was when Westfalia took the lead to establish a *Phytophthora* free nursery and secondly when they appointed a plant pathologist (J M Darvas). These actions were most rewarding because the breakthrough came with an article in the SAAGA Research Report in 1978: Preliminary results on chemical control of *Phytophthora* root rot on avocados, by J M Darvas, J M Kotzé and J C Toerien. This was the first of many reports on the same subject announcing progress on chemical control. The practical implications were enormous because root rot was brought under control and tree improvement was apparent. At that stage other disease-free nurseries became established, using the Westfalia nursery as a model. In close co-operation with Westfalia, the University of Pretoria worked on stem applications of fungicides for root rot control. Dr Darvas took the lead when he developed the stem-injection method based on a technique which is widely used in citrus for the application of antibiotics against greening. Today stem-injection of phosetyl-Al is standard practice resulting in remarkable recovery of the trees. On *Phytophthora* control the best is yet to come and the future looks exciting.

Fruit quality overseas was a high priority in SAAGA's research. It was established that fruit diseases are significantly inhibited by cold temperature and the export temperature was set at + 5°C, but we also discovered that theory and practice differ widely and although a reading of 5°C may be given for a container, the flesh temperatures of the fruit at the various points inside the container may vary dangerously low resulting in cold damage and exceptionally-high, resulting in soft fruit. Pulp spot and grey pulp remained a threat. Efforts to improve cooling and the maintenance of the cold chain received concentrated attention, but the industry felt the need of a senior fruit physiologist all along. Despite numerous efforts we failed to obtain the services of such an important technical man for our industry. It is logical and overdue that a senior fruit physiologist is appointed at the CSFRI. Although very useful contributions were made by the FFRI, Stellenbosch (Dr G Eksteen), D H Swarts (CSFRI), J H E Smith (Letaba Co-op, now Venda), J C Toerien (Westfalia), Prof A H P Engelbrecht (RAU), John Bower (CSFRI) and others, basic and applied research on cooling and fruit physiology must receive urgent attention. Fruit quality is a multi-disciplined subject. It starts in the orchard where cultural practices such as irrigation and fertilisation play an important role. We know that calcium deficiency is involved and also that controlled atmosphere under cold storage conditions can contribute towards better fruit, but well orchestrated research is called for. This is a project of the highest priority.

The Sunblotch disease has been in the avocado industry as a silent terrorist for many years. Research by Dr Da Graca revealed the economic importance of this disease. In 1985 it was decided to eliminate Sunblotch from nurseries with the assistance of the University of Pretoria. A project was launched to index all parent trees with the aid of the high-tech "dot blot" technique as developed by Dr Bar-Joseph of Israel. Lise Korsten supervises this project. A total of 3,000 parent trees will be indexed for Sunblotch by April 1986. This represents the first commercial use of the "dot blot" technique. It is a major step forward for the Avocado Plant Improvement Scheme.

Insect pests are more prevalent now than before. There is a tendency by growers to use

insecticides, but we know that indiscriminant use of insecticides will set the table for insects to have a feast. We must avoid creating entomological problems in future. We need a basic strategy. We need a master plan to encourage biological control. For this purpose Mr. F Honiball was brought into our research programme for next year.

Our industry is certainly one of the most dynamic in the country with a research record which is the envy of our overseas counterparts and similar local industries but we have one important deficiency. Selection and breeding do not receive sufficient attention. Most of our post-harvest fruit problems are related to one cultivar. Fuerte is a bad traveller and very susceptible to fruit rots. At the moment we are heavily dependent on one rootstock. Duke 7. We need resistant rootstocks against root diseases. We need a much higher production. The average production of the industry is below five tons but the potential is over 30 tons. The rootstocks from overseas need to be carefully screened for disease resistance and horticultural characteristics under local conditions. We need a master plan and international co-operation and exchange of breeding materials.

The future of SAAGA's research will depend largely on whether the Avocado Industry will remain a self-disciplined organization or an imposed disciplined board. There are always bidders to take over a smooth running show. We need no take-overs but we depend heavily on co-operation, especially in the field of research.

A World Congress on all aspects of avocados will take place in Pretoria in May 1987. We hope to attract all the leading research workers from all over the world to this International Congress. I believe that we are promoting the science of avocado growing far beyond our borders.

What about the future? Did research make any impact on future expectations and the present health of the Industry?

The answer is a definite "yes".

Without a solution to the root rot problem avocado growing would have become uneconomical by now. One may safely say that the present control measures which were developed to a large extent by Westfalia Estate, saved the Industry. Furthermore, research helped to improve the quality of our export fruit and made sea exports possible. In fact, every aspect of avocado production is receiving attention and is being improved. The progress that is being made at the moment with Sunblotch and the Plant Improvement Scheme lays the foundation of a healthy and prosperous Avocado Industry.