The Fig
in
South-Africa

J. de V. Lötter

The Fig in South Africa

This book was first published in Afrikaans by the same author in 2012, updated and translated in English by Sarah le Grange.

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J. de V. Lötter
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Fig. 1: Cheryl Ruiters selling 'Deanna' figs at the Blue Jay Farmstall, just outside Stellenbosch.

Chapter 1

Introduction

Botany

The genus *Ficus* belongs to the Moraceae family, which includes the well-known genera *Morus rubra* and *M. alba*, the mulberry, and lesser known genera such as *Artocarpus altilis* Fosberg, the breadfruit, and *A. heterophyllus* Lam., the jackfruit. Among the *Ficus* species are the edible fig (*Ficus carica*) and various wild fig species of commercial value, for example the rubber tree (*F. elastica* var. *decora*) and ornamental trees such as different varieties of the weeping fig (*F. benjamina*) and the Java fig (*F. microcarpa).*

These genera above share two characteristics: the rubbery latex or milky juice contained by the plants and the aggregate fruit consisting of individual small drupes, termed drupelets, which are borne on a fleshy pseudo-receptacle.

The name *Ficus* is the Latin form of the Persian word *fica.* The Greek word for fig, *sykon*, gave rise to the name of the specific fruit structure of the fig, the syconium.

Wild fig trees are typically evergreen, but sometimes display deciduous traits. Though naturally occurring in areas with a subtropical to tropical climate, figs have great adaptive capacity, though most will not tolerate severe cold and drought.

The edible fig (*F. carica*) is one of approximately 750 *Ficus* species. But as the only species of fig bearing fruit so large and succulent, it captured the human imagination thousands of years ago, resulting in its commercial production around the globe. The common fig is not indigenous to South Africa; its origin is Transcaucasia and the Middle East. Fig trees were distributed from the Middle East to Europe and North Africa in ancient times, reaching the New World in the 16th century and South Africa by the end of the 17th century. This was probably due to the involvement of the Van der Stels, as the fig is not mentioned in accounts of Van Riebeeck's garden before 1700 (Reinecke, 1929).

The focus of this book is primarily the fig industry in relation to the larger South African fruit industry.

The other fig species are referred to as wild figs, some of which are also of commercial importance, especially figs used for rubber production in Asia, or enjoyed for their beautiful ornamental characteristics the world over, including South Africa. In 2003, husband and wife John and Sandra Burrows published

the results of their extensive research on Southern African wild fig species (Burrows and Burrows, 2003). The wild fig species that made history in South Africa receive special attention in this book and are described in Chapter 6.

History

Earlier Writings on the Fig

Some of the oldest texts mentioning the fig are in Sumerian and date back to 2900 BC. These texts describe the use of fig leaves and fruit for medicinal purposes. Numerous images on early Assyrian, Egyptian and Cretan monuments revealed by excavation prove that the fig has been cultivated for its fruit from ancient times in the Middle East – as early as 4 000 years ago in Egypt. Tradition has it that the fig was the favourite fruit of Cleopatra (69 – 30 BC), who reigned over Egypt from 51 BC, and that the venomous snake responsible for her death was concealed in a basket of figs *(Fig. 2)*. The fig is also one of the fruit mentioned on many occasions in the Bible. Arguably the best known tale is that of fig leaves serving as Adam and Eve's first pieces of clothing (Gen. 3:7).

Along with olives, grapes, dates and nuts, figs were some of the most important staple foods of earlier civilisations in the Middle East, and therefore held in high regard, judging by the number of times figs were referred to in the Bible. Even the authors of the Book of Proverbs and the Song of Songs make reference to figs. In Proverbs 27:18 the author states the truth: "Whoever tends a fig tree will eat its fruit," (English Standard Version), and in the Song of Songs 2:13 the yearning: "The fig tree forms its early fruit; the blossoming vines spread their fragrance. Arise, come, my darling; my beautiful one, come with me," (New International Version).

When they returned from Canaan, the Israelite spies brought pomegranates, grapes and figs as proof of the fertility of the country (Numbers 13:23). Deuteronomy 8:7, 8 states: "For the LORD your God is bringing you into a good land – a land with brooks, streams, and deep springs gushing out into the valleys and hills; a land with wheat and barley, vines and fig trees, pomegranates, olive oil and honey," (New International Version).

The value of dried figs as food is confirmed by the account of Abigail including 200 cakes of dried figs in the rest of the provisions for David's men (1 Samuel 25:18). Micah, in turn, prophesied: "Everyone will sit under their own vine and under their own fig tree, and no one will make them afraid," (Micah 4:4), and again: "What misery is mine! I am like one who gathers summer fruit at the gleaning of the vineyard; there is no cluster of grapes to eat, none of the early figs that I crave," (Micah 7:1).

Clearly the prophets were familiar with aspects of fig cultivation: "All your fortresses are like fig trees with their first ripe fruit; when they are shaken, the figs fall into the mouth of the eater," (Nahum 3:12). In the New Testament Jesus also

Fig 2: In ancient times already, figs were regarded as edible fruit by the Egyptians, as this tomb illustration of fig harvesting shows.

revealed his knowledge of the bearing habits of fig trees, and the parable of the fig trees that do not bear fruit (Matthew 21:18 and Luke 13:6 – 8) probably refers to the uncertain bearing habits of seedling fig trees that is also observed today. In his prophecies Jesus refers to the future using the fig tree as example: "Now learn this lesson from the fig tree: As soon as its twigs get tender and its leaves come out, you know that summer is near," (Mark 13:28 and Luke 21: 29, 30).

The fig has been well known in Greece and Italy since the earliest times. According to estimates, figs have already been grown as a domesticated fruit crop in the Middle East at least 12 000 years ago, as fig trees are propagated without difficulty (Flaishman *et al.*, 2008).

Figs also feature in early literature; the Greek writer and poet Hesiod (c. 700 BC) referred to the

fig centuries before the Christian era, and Aristotle (384 – 322 BC) described the fig insect *psen*, which 'stings' the green fruit, thereby preventing fruit drop, though he was not aware that this was a pollination and fertilisation process that induced fruit set. Theophrastus (372 – 287 BC), his student, shared this view, but indicated that seedling fig trees yielded inferior fruit, and he described methods for the vegetative propagation of superior cultivars. The Roman Pliny (4 – 79) described 29 select fig cultivars in his *Natural History*.

Understandably, many of the earlier authors devoted their attention to the fig, as it was already a well-known edible fruit at that stage. From the earliest days, the many – sometimes mystical – features of the fig and the fig tree created and played a prominent part in legends in the Middle East, Greece and Italy. For instance, the Romans believed that Bacchus, the god of wine and winemaking in Greek mythology, presented the fig to humankind as a gift. Consequently the first figs of the season were sacrificed to Bacchus, and in sculptures and images he was portrayed wearing a crown of fig leaves.

The fig also became the symbol of fertility. In India the fig tree was regarded as the tree of worshippers of the phallus (male sex organ). Even in present-day Italy, the gesture *fico*, placing the thumb between two fingers, is used as a sexual sign referring to the phallus. The female genitals were also known as *fico*. In Roman times women wore these symbols as good luck charms *(Fig. 3)*

Fig 3: An example of a pendant showing the fico gesture, worn as a good luck charm by women. The gesture whereby the thumb is placed between the index and middle fingers symbolises the phallus.

Recent History

In 2005 the world production of figs amounted to one million tonnes, of which 25% was produced by Turkey, the biggest global producer of figs, particularly dried figs.

Worldwide there is a stable demand for dried figs, but the trade in fresh figs remains limited, due to the poor handling capacity and short shelf-life of ripe figs.

Since the end of the 19th century, a sophisticated tree fruit industry, which was largely dependent on the export market, developed in South Africa.

Though the fresh fig industry was part of the bigger fruit industry, little progress was made in developing the fresh fig production sector. Local researchers tried to establish a dried fruit industry by importing fig cultivars suitable for drying, but the unstable weather conditions during the harvest period in the vast majority of production areas lead to its failure. This topic is discussed in chapter 2.

Few fruit kinds have featured more often in writings through the ages and in scientific publications than the fig. The interesting manner of pollination (caprification) of certain fig cultivars has aroused the interest of laity and scientists alike, who therefore researched and wrote about this topic *(p 56)*. In the USA Condit published his complete scientific treatise on the fig in 1947, and in 1955 he compiled a comprehensive bibliography on the topic, which recorded information from the earliest ages.

More recently Israeli researchers published a highly informative review article on the fig, which provided a thorough bibliography of the latest research on the topic (Flaishman *et al.*, 2008). The first and only scientific report on the pomological aspects of the fig in South Africa appeared only recently as an MSc. Agric. thesis, from the Department of Horticulture at the University of Stellenbosch (Gerber, 2010; Gerber *et al.*, 2010; Theron *et al.*, 2011).

In the meantime a huge demand for dark blue figs with strawberry-coloured flesh has developed in Europe. In addition to good eating quality, the appearance of the figs contributes to their popularity, and these figs are widely used for decorative purposes as well. With sophisticated packaging and transport methods available, local operators recently started to exploit this opportunity by importing some of these cultivars with improved keeping quality. A lucrative air export industry has developed within a decade, resulting in the revival of the fig industry.

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Fig. 4: The author in a nectarine orchard in full bloom on Amalienstein in Ladismith.

Chapter 2

The Growth of the Tree Fruit Industry in South Africa

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All fruit kinds produced on commercial scale in South Africa today are of foreign origin, except the marula, *Sclerocya caffra* Sonder, which has been cultivated commercially since approximately 1980. Jan van Riebeeck, the first governor of the Dutch East India Company (Dutch: *Vereenigde Oost-Indische Compagnie, VOC*) at the Cape, imported the first fruit for growing at the Cape from various areas, and his successors followed his example. Thereafter other cultivars and fruit kinds entered the country by a number of means and people planted the fruit for their own use.

The interest in commercial fruit production was limited, compared to animal and cereal production, until the French Huguenots started to arrive in South Africa in 1687. Their arrival stimulated an interest in grapes and winemaking, including the distillation of brandy, for which there was a small local market, in addition to the marketing opportunities created by ships calling at the Cape. However, it was only much later that this could be referred to as a grape industry, and it was even longer before the tree fruit industry took off in earnest. Tree fruit was produced for own consumption only, and this remained the case for about two centuries, probably due to a shortage of cultivars suited to the area and the lack of a market for the products.

The first real stimulus was the discovery of diamonds in the Northern Cape towards the end of the 19th century, and later gold in the interior, and the completion of the railway line to the interior parts of the country in 1892. This created a relatively large market for wine, brandy and raisins, and to a lesser degree a demand for dried fruit – in other words, only for products able to endure postharvest handling.

Crisis in Agriculture in the Cape Colony

Agriculture in the Cape Colony was largely limited to cereal and animal production and commercial fruit production to the making of wine and raisins. Tree fruit, including figs, was grown in home gardens only, due to the lack of suitable cultivars (for example, only uneconomic seedling peach trees had been planted). Furthermore, knowledge of cultivation and fruit preservation methods was insufficient and leadership in the industry was nonexistent. Even at the first agricultural school in Stellenbosch, where training in cereal and animal production and viticulture was offered, very little attention was paid to fruit tree production. It took a crisis in the agricultural industry in the Cape Colony to motivate political and other community leaders to start seeing reason. Until the last quarter of the 19th century, grape, cereal and small stock farmers in the Cape Colony had been making a fairly comfortable living. However, late in the 19th century, vineyards (which were still established on own rootstocks in the 1880s) began to fall prey to the root insect phylloxera (*Phylloxera vastatrix*). By the 1890s this devastating pest had destroyed most vineyards; as a result, most grape farmers were facing disaster. Fortunately, in South African history good leaders have always presented themselves during times of crisis.

Cecil John Rhodes (5/7/1853-26/3/1902)

Cecil John Rhodes was born in England and came to Natal for health reasons at the age of 17, with a loan of £3 000 from his aunt. He first took up farming in 1871 and later that year went to Kimberley where he became a diamond digger. He adjusted well to this hard and competitive life and soon developed into a resourceful and visionary business man. Before turning 19, he already owned claims to the value of £5 000. As a mining magnate, he became the chairperson of the powerful De Beers Consolidated Mines Pty in 1888, despite a serious health condition (he had

Fig. 5: Cecil John Rhodes (05/07/1853–26/03/1902), who achieved so much in the South African mining industry and politics during his short life, also created trust in the young tree fruit industry by making significant financial investments in the industry from its start.

had a heart attack). In the meantime he had also pursued academic studies in England. He always befriended the right people, among others Charles (CD) Rudd, in his own business enterprise, and the politician John X Merriman. As a giant financial magnate, he spent money on appropriate businesses in the public sector, such as the railways and later also the fruit industry. No-one before or probably after Rhodes has achieved so much in Southern Africa in such a short time. He died at the young age of 49 years.

By 1892 Rhodes was Prime Minister of the Cape Colony, and he knew local agriculture well. With the support of his minister responsible for agriculture, Merriman (15/03/1841–02/08/1926) – also a farmer in Stellenbosch and later prime minister of the Cape Colony (Fig. 6) – Rhodes investigated ways to assist the farmers. Initially the focus was only on combating phylloxera, but due to Rhodes's standing with financial markets and his influence with steam ship companies seeking freight, the attention also turned to tree fruit production for export as an alternative for grape production. In 1892 a large experimental consignment of fresh peaches was transported to England on the *Drummond Castle* with relative success. An enthusiastic Percy Molteno, director of the Castle Shipping Company, and Merriman personally observed the arrival of the fruit in England. As a result, South African producers obtained access to the big fruit markets in the United Kingdom and later also Europe.

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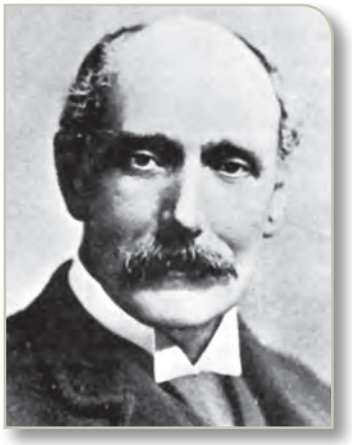


Fig. 6: John X Merriman (15/03/1841–02/08/1926), the politician who also became a fruit farmer.

This success compelled these leaders to increase their focus on the production and export of tree fruit and to involve various experts in this. In 1892 a parliamentary Select Committee on Fruit Production and Export was established to put this into practice. With the assistance of Harry (HEV) Pickstone, Rhodes took the initiative to promote fruit production, becoming a sizeable tree fruit producer himself. This motivated Merriman to establish tree fruit as well, which greatly increased other farmers' confidence in tree fruit production.

H.E.V. Pickstone (4/7/1865-1/11/1939)

Harry Pickstone *(Fig. 7)* was born on an estate in England in 1865. Initially he served in the British armed forces in various parts of the world, including Southern Africa, and the potential of the region greatly impressed him.

After working in Canada for 18 months, and followed by a visit to England, he set off to find employment in the United States of America (USA, America). On the advice of Andrew Carnegie in America, he departed for California, where he battled at first to find employment, and through sheer necessity became a worker on a fruit farm. The work stimulated his interest in the fruit industry to such an extent that he studied fruit cultivation for three years, and distinguished himself as a specialist on farms and in nurseries.

However, he did not forget South Africa and all its possibilities, and he became convinced that it was achievable to produce fruit for export in the country.

After his return to England he met Merriman, then a member of the colonial parliament for Stellenbosch, in Londen. Merriman provided him with a letter of introduction to Charles Rudd, a friend and business partner of Rhodes, at that stage mining magnate and prime minister of the Cape Colony. Pickstone arrived in Cape Town in 1892 and quickly confirmed his belief that fruit could be grown here for the export market, a view that he expressed in the *Cape of Good Hope Agricultural Journal*. This came to the attention of the Secretary of Agriculture and Pickstone soon met the right people who could assist in achieving his vision.

He made his mark by establishing a high-quality fruit tree nursery, Nooitgedacht, with the financial support of Rhodes, and by providing guidance to prospective fruit producers, as an employee of the Department of Agriculture.

Fig. 7: Harry (HEV) Pickstone (04/07/1865–01/11/1939), the American-trained fruit expert, who exercised leadership in the early years of the fruit industry, can be regarded as a true pioneer in the industry.

With the disastrous Jameson invasion of the Transvaal in 1896, Rhodes's unpopular political ambitions finally caught up with him. He was forced to resign as Prime Minister, but he maintained his interest in the fruit industry. In 1897 he summoned Pickstone to enquire about the cost of purchasing the Groot Drakenstein valley wine farms that had gone bankrupt as a result of the phylloxera infestation. Pickstone indicated "around £250 000" and was instructed to buy the farms, giving preference to farms with attractive Cape Dutch homesteads. The group of 29 farms, under management of Pickstone, became known as the Rhodes Fruit Farms.

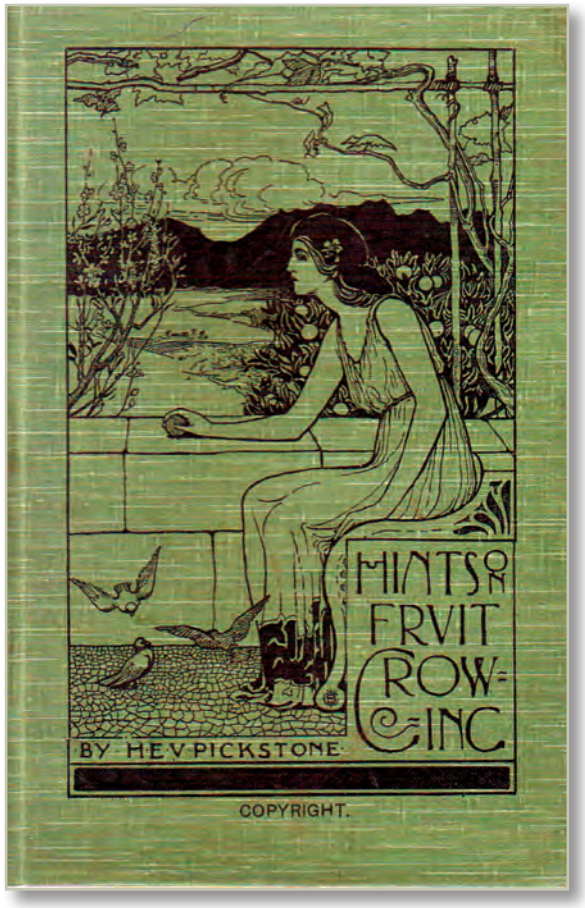


Fig. 8: Since 1895 HEV Pickstone published information about the growing of tree fruit in his Hints on Fruit Growing, which he made available to fruit growers and updated regularly. The publication met the great need of fruit growers for information. This is the ninth edition, which was published in 1928.

Pickstone took the lead in establishing fruit trees in the area, literally guiding producers in tree fruit production in word and deed. With his own large farming enterprise on Kelkiewijn, Groot Drakenstein, comprising citrus, avocados, stone fruit and pears, and his renowned HEV Pickstone Fruit Tree Nursery in the same neighbourhood, he played a leading role in the success of fruit production. He also assisted in founding organisations that enabled growers to maintain the authority over their products, for instance the Western Province Fruit Exporters' Association of South Africa, established in 1899. He was even responsible for establishing a cherry industry in the Eastern Free State.

As a result of his knowledge of fruit growing and his ties with the appropriate owners of shipping companies and politicians, he was able to supply all with valuable information on cultivation, handling and marketing of fruit for decades, until his death in 1939. He personally knew all the role players in the shipping companies that were interested in the transport of fruit, such as the Union Castle Line (specifically Molteno and his family), and those politicians of significance, such as Rhodes, Merriman and others. He undoubtedly played an important part in the establishment of the pear and apple industry in Elgin/Grabouw, and the success of prominent pioneers, such as Dr Antonie Viljoen, Kathleen Murray and the Molteno brothers, can largely be attributed to Pickstone.

Pickstone's regularly updated *Hints on Fruit Growing* was the main guide used on many fruit farms since 1895 (*Fig. 8*), and it certainly made a considerable contribution to the training of fruit farmers.

Pickstone has indeed stood by his vision: South Africa has undeniably become an important fruit export country in the global arena.

P.J. Cillie (Piet Kalifornië) (Piet California) (3/6/1836-27/9/1942)

Piet Cillie (*Fig. 9*), a farmer's son from the Wellington district, with an entirely different background from that of Pickstone, was nonetheless able to provide Pickstone with the necessary support to ensure the success of the South African export fruit industry.

Cillie married Maria Malan, also from Wellington, on 18 June 1877. As his parents were unable to assist him financially, he had to provide for himself from the start. In 1883 he bought his first farm, Welbedag, in Bovlei, and in 1895 his showpiece, Vruchtbaar, in the Boven Valley, which later became the family farm.

He was an energetic and intelligent person who set out to expand his knowledge by collecting articles on farming from overseas journals and studying these with care. Initially he concentrated on the production of high-quality raisins for export, but due to the phylloxera problem he turned to the large-scale drying of peaches, apricots and figs, of which he made a success, as a result of improved drying methods. Pickstone and others came to know of his accomplishments in this area and in 1892 he was requested to present evidence to the Select Committee on Fruit Cultivation and Fruit

Fig. 9: Piet (PJ) Cillie (03/06/1856–27/09/1942), the Wellington fruit grower who became known as Piet Kalifornië (Piet California).

Exports. This gave him the opportunity to explain his opinions on the fruit industry and recommend that a representative be sent to California to study their fruit industry.

Pickstone and Cillie complemented each other well, and in cooperation with Pickstone, Cillie played a leading role in the fruit industry, both as fruit producer and a coordinator of producers. Pickstone had the following to say about Cillie: "Mr Cillie is a highly respected farmer, a man with progressive ideas."

The decision was taken that the Cape Government would send Cillie to California from April to December 1893 to gather information that could be of benefit to the South African fruit industry. In this he proved his worth. He was interested in a wide variety of fruit kinds and regularly sent comprehensive reports from California to

Fig. 10: Delegates and others attending the 7th Annual Congress of Fruit Producers, held on 15 May 1900 in Stellenbosch. From left to right are:

*Front row: 1. CW Mally, 2.***, 3. ***, 4. A Nicholson, 5. ? Perse, 6. Jas Malan, 7. ? Shepherd, 8. ***.*

*Second row: 1. ***, 2. ***, 3. H Cloete, 4. ***, 5. ***, 6. ML Neethling, 7. CWH Kohler, 8. RP Malleson, 9. GJ Krige, 10. ***, 11. Gen. Tanner.*

*Third row: 1. J de Kock, 2. PA Myburgh, 3. C Heatlie, 4.***, 5. ***, 6. PJ Cillie, D son, 7. ***, 8. PJ Cillie, C son, 9. WA Krige, 10. JNP de Villiers, 11. R Taylor, 12. ***.*

*Back row: 1. DJ Joubert, 2. AC Buller, 3. RJ Bulmer, 4. AC MacDonald, 5. AMS Mostert, 6. W van der Byl, 7. HEV Pickstone, 8. RD Koch, 9. ***.*

South Africa, which impressed all. As a result of his activities in the USA, he was aptly nicknamed Piet *Kalifornië* (Piet California) on his return to South Africa.

Back on his own farm, he put his experience and newly acquired information into practice. He also investigated different cultivars and drying techniques in cooperation with the Department of Agriculture and regularly kept other producers informed on the results.

Furthermore, Cillie initiated the cooperative drying of tree fruit and 'Sultana' grapes, which resulted in the founding of *Pionier Vrugtedroërs Bpk* (Pioneer Dried Fruit Ltd).

On his historic, though modern farm Vruchtbaar, he planted a wide range of fruit, but concentrated on the production and drying of peaches, apricots and figs. He was the first to establish fig orchards on a large scale in South Africa. In a report in the *Agricultural Journal* in 1904, FD MacDermott writes: "One of the exceptional characteristics of the 200 morgen Vruchtbaar that Mr Cillie can be proud of is the beautiful orchard of 'White Adriatic' figs; they appear to be very well adapted."

His dried figs had an unrestricted market in Johannesburg as a result of its relatively high quality and he admitted that he had greater success there than on the export market.

Along with Pickstone he was instrumental in the founding of various fruit producer organisations before the end of the century. He contributed significantly to the establishment of the Western Province Fruit Exporters' Association in 1899, an important forerunner to the Fruit Growers' Cooperative Exchange of South Africa and the Deciduous Fruit Board *(Fig. 10)*.

Regularly assisting scientists, he was for instance involved in investigations into certain complex problems affecting citrus trees, co-authoring the *Rapport der Commissie van Ondersoek na de Oorzaken van het mislukking van Citrus bomen* (Report of the commision of inquiry into the causes of the failure of citrus trees) with FT Bioletti in 1904. By this time the South African dried fruit industry, which included dried figs, constituted a very important part of the global dried fruit industry, and in conjunction with IW Tribolet of Elsenburg Cillie devoted considerable attention to figs, especially the important drying fig 'Calimyrna' and its 'Capri' fig pollinators, a novelty in South Africa.

Cillie's visit to the USA created great interest in fruit cultivation throughout the country. As a direct result of his investigations in California, the Cape Government imported 140 cuttings of different fig cultivars in 1902. These cultivars included 'Calimyrna' and 'San Pedro', which required pollination to set fruit, and therefore the pollinator cultivars, 'Capri' figs, and the vector for pollination, *Blastophaga psenis*, were imported as well. Cillie also planted orchards of different fig cultivars and was the source of thousands of

fig cuttings, which he distributed free of charge throughout the Cape Colony, Orange Free State and Transvaal, even sending some cuttings to Australia.

Like Pickstone, he was often officially requested to share his expertise on the growing and packing of deciduous fruit and citrus with farmers during educational meetings, even in areas as far away as Clanwilliam, Piketberg, Oudtshoorn and Graaff-Reinet. He was particularly popular with the 'Sultana' growers along the Orange River, Kakamas in particular, whom he visited regularly at his own expense. He even donated □800 to a nursing home in Kakamas.

The Start of Agricultural Education, with special Reference to Fruit Production

Agriculture was a reasonably important industry in the Cape Colony and role players were convinced from early on that agricultural education, and later higher education, would be required to provide growers with information and train people to undertake research and exercise leadership on a local level.

The earliest organised agricultural education in South Africa was provided by the School of Agriculture at the Victoria College in Stellenbosch. The establishment of such a school was initiated by Prof Albert Fischer, head of the Department of Chemistry and Experimental Physics at the College. Following Government approval, the school opened on 19 July 1887 in Stellenbosch under Fischer's leadership, offering a two-year diploma course. Fridolin Blersch *(Fig. 11)*, a German-educated dairy expert with thorough practical farming experience, was appointed as laboratory assistant. In November 1887 Blersch took over responsibility for the agriculture lectures from Fischer and in January 1888 he was further promoted to become the first principal of the agricultural school.

The courses offered at the school included tree fruit and grape growing and the first four students received their diplomas under the direction of Prof

Fig. 11: Fridolin Blersch (1863–1897), first principal of the Agricultural School in Stellenbosch, which was established by the Stellenbosch College (later Victoria College). He was an exceptionally accomplished and popular lecturer, but died tragically of gastric fever at a young age.

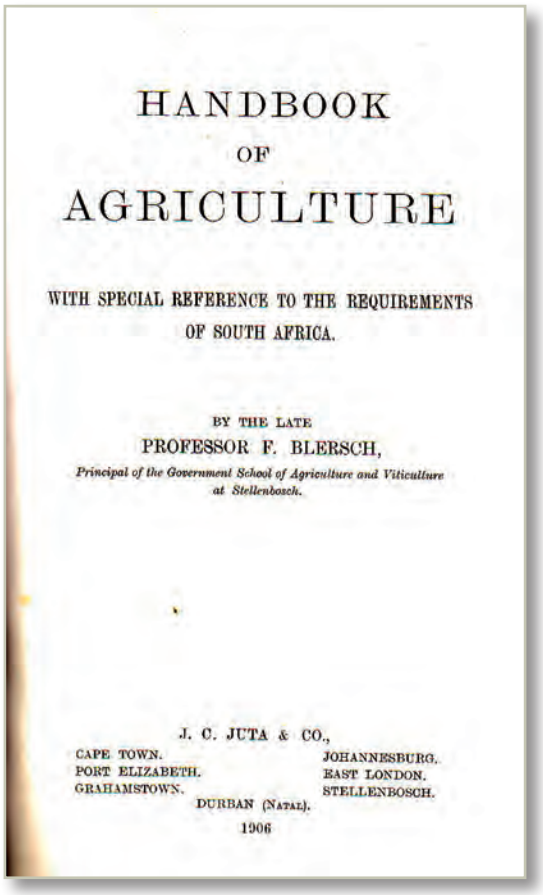
Fig. 12: Weidenhof, home of the principal of the first Agricultural College in Stellenbosch, was close to Dorp Street, where the Stellenbosch railway station is today. The College rented the 6,5 morgen surrounding the house from Blersch for the training of students. Here is the Blersch family in front of the house with one of the trial plots visible in the foreground.

Blersch in 1889. The Victoria College rented the farm Weidenhof *(Fig. 12)* from Blersch for students' practical work and demonstrations. Various crops, including cereals, vegetables, grapes and tree fruit were grown on the farm, which used to be where the Stellenbosch railway station is today.

Blersch was a very proficient scientist and lecturer whose life was tragically cut short by gastric fever in 1897. He had written, among others, the first guide to general farming practices in South Africa, which was published after his death *(Fig. 13)*.

Fischer vacated his chair at the Victoria College in November 1887 to take up the appointment as the first Secretary of Agriculture in the Government of the Cape Colony. This appointment reinforced the position of agriculture in the Cape Government and very effectively promoted agricultural education and research and the coordination of the agricultural industry, especially fruit and grape production.

The influence of the new Secretary of Agriculture was evident in the Government decision to purchase the farm Elsenburg near Stellenbosch and the neighbouring farm Mariendahl for the purpose of agricultural training and research. In June 1888 the agricultural school was converted into a Government school and put under the


HANDBOOK
OF
AGRICULTURE

WITH SPECIAL REFERENCE TO THE REQUIREMENTS OF SOUTH AFRICA.

BY THE LATE
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Principal of the Government School of Agriculture and Viticulture at Stellenbosch.

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CAPE TOWN. JOHANNESBURG.
PORT ELIZABETH. EAST LONDON.
GRAHAMSTOWN. STELLENBOSCH.
DURBAN (NATAL).
1906

Fig. 13: Blersch, Principal of the Stellenbosch Agricultural College, was the first to write a scientific publication that could serve as a guide to farming in South Africa. However, it did not cover fruit production. The book was published after his death.

direct control of the new Secretary of Agriculture. On 1 September 1898 the agricultural school in Stellenbosch was relocated to Elsenburg, and became known as the *Goewerment Landbouwschool* (Government Agricultural School). At the same time, the trial work done on the wine grape farm Groot Constantia was transferred to Elsenburg. Consequently, the school was now independent of other institutes and associated with a research station.

After establishment of the Union of South Africa in 1910, the agricultural school became the forerunner of a range of similar agricultural schools, which were later called agricultural colleges, such as Potchefstroom, Middelburg (Cape), Cedara, Glen and Lowveld.

In contrast to the colleges in the other regions, Elsenburg College offered fruit growing (later pomology) as main subject along with other disciplines. Through the years Elsenburg College has earned a fine reputation as a respectable student training and research institute.

Agriculture as a Subject in High Schools

Higher education in agriculture was introduced at the new University of Stellenbosch in 1918, coinciding with the establishment of agriculture as an optional subject to Matric level in rural high schools of the Cape Education Department. This was generally a great success as it provided the necessary basic knowledge about agricultural science to pupils who wanted to farm, but who did not want to undertake further studies after school. In addition, it also motivated others to continue their studies in agricultural science. The author of this book,

Fig. 14: Today economic production of fruit is restricted mainly to large enterprises, such as the farm Ebenaeser in Vyeboom, Villiersdorp.

for one, was someone who had the privilege of being motivated by a proficient agriculture teacher to undergo tertiary training in fruit sciences at the University of Stellenbosch.

The success of agricultural instruction in schools depended heavily on practical training, which required expensive resources such as arable land, buildings and tools. This was probably one of the reasons for the termination of agriculture as a school subject a few years after the Second World War. However, today agricultural education is offered once more at a number of agricultural schools in different climate regions across the country, specialising in crops suited to those areas. Pupils are trained in the regular mandatory school subjects, as well as agricultural subjects, and they take the national Matric examination with their peers.

Higher education in Agriculture

The relocation of the agricultural school in Stellenbosch to Elsenburg created the need for education in the specialist scientific agricultural disciplines, particularly viticulture and winemaking. This compelled the board of the Victoria College to investigate agricultural training on a higher education level again. In the meantime the establishment of the Union of South Africa in 1910 had expanded the responsibilities of the Department of Agriculture to other regions with different climatic conditions and requirements from the Western Cape. The College authorities came under increasing pressure to establish a faculty of agriculture, but the reluctance of the Government and the circumstances created by the First World War (1914 – 1918) did not simplify this task.

At last, in 1917, the Government approved the introduction of a fourth faculty at the Victoria College, the Faculty of Agricultural Sciences.

Fig. 15: Prof OSH Reinecke (1891–1967) was appointed as the first professor in the Department of Fruit production (later Pomology, and eventually Horticulture) at the newly founded University of Stellenbosch, in 1918. As the first South African to obtain the degree B.S.A. (Pomology) in Canada, he was also the first person involved in the tertiary training of fellow South Africans in this discipline, thus laying the scientific foundation for the industry.

The faculty was to commence its academic duties at the beginning of 1918. At the same time the experimental farms Welgevallen and Mariendahl were acquired and the necessary academic and administrative buildings were constructed.

The information outlining a four-year degree and a two-year diploma course already appeared in the Yearbook of 1918. The degree courses initially made provision for specialisation in agronomy, animal husbandry, plant breeding, agricultural chemistry, veterinary science, entomology, plant pathology, fruit growing (later pomology, and even later horticulture) and viticulture-oenology in the corresponding departments. On 1 April 1918 OSH Reinecke, who had graduated in Canada, having studied pomology (fruit science), was appointed as professor in the Department of Pomology *(Fig. 15)*.

Higher Education in Fruit Sciences

A brisk export trade in deciduous fruit such as peaches, pears, apples (to a lesser extent) and grapes, and citrus fruit already existed at the outbreak of the First World War. The fig industry enjoyed similar interest and had developed a good local market for dried figs, but not for export. Only dried fruit such as raisins were exported with success.

The fruit tree nursery industry was also growing and more and more trees of good quality were supplied to producers. In 1907 already Eustace Pillans, the Cape Colony agriculturist, emphasised in his horticultural report that the nursery industry deserved to be congratulated for the part it had played in the development of the deciduous fruit industry, even though there were still a good many inferior fruit trees and vines to be found in the Cape. This was largely attributable to the efforts of industry leaders such as Pickstone *(Fig. 7)* and Cillie (Piet California) (*Fig. 9*), who had already received substantial support from government fruit experts including P MacOwan, E Pillans, IW Tribolet and RA Davis (also an American fruit expert), and entomologists such as CP Lounsbury and CW Mally.

At this point the deciduous fruit industry was mainly concentrated in the western parts of the Cape Colony, although interest was rapidly growing in other parts of the new Union of South Africa. An increasing number of leading producers, among others Dr Antonie Viljoen (1858 – 1918) of Oak Valley and the Molteno brothers of Glen Elgin in Grabouw (Elgin), and other producers in Ceres and the Hex River region, for example, Mr LM Dicey of Orchard, joined forces with Rhodes Fruit Farms and Cillie of Vruchtbaar in Wellington to reinforce what could already be regarded as a progressive South African fruit industry. In the summer rainfall regions interest in citrus cultivation was growing, and even before the Union of South Africa was established in 1910, citrus had become a successful export crop. Hail and late frost were the undoing of most of the deciduous fruit farms in the summer rainfall regions.

Until that stage producers had had to make use of overseas experts for information on fruit cultivation, but this information was not always pertinent to South African circumstances. Fruit industry leaders recognised the need to create facilities for higher education that would provide local people with the abilities required to serve the fruit industry and train others to do so. After the First World War, the trade in export fruit was continued with great fervour, and the industry was privileged to have access to a fully fledged Department of Fruit production with a full professorship in the Faculty of Agriculture at the new University of Stellenbosch (US). As a result graduates could be trained in pomology (and later horticulture when the curriculum was expanded to include cut flower production).

Prof Reinecke had to undertake the considerable task of developing the courses offered by the Department of Fruit production. These he based on the courses of his *alma mater* in Canada, which included a first year in basic sciences. Aware that lecturing went hand in hand with research, he engaged in various projects with the assistance of his postgraduate students, creating a sound scientific foundation for the development of the South African deciduous fruit industry.

He was awarded a doctorate in 1930 for his study of the pollination requirements of pome fruit, and this work later served as a standard guide to students and researchers abroad. He also initiated research on the fundamental constraints on the deciduous fruit industry, such as delayed foliation due to high winter temperatures, selection of suitable cultivars, pruning and training of trees, canning and drying of fruit, and the pollination requirements of cultivars. One of his great successes was the selection of the seedling Kakamas canning peach in 1933, a cultivar that is still the most important canning peach planted today.

On 1 October 1926 the Faculty of Agriculture amalgamated with the Elsenburg Agricultural College to establish the Stellenbosch-Elsenburg Agricultural College of the University of Stellenbosch (SEAC). Lecturers of the agriculture faculty became full-time government officials, while also remaining full-time university lecturers. This once again brought all agricultural training and research under central control, which put an end to unnecessary duplication of staff and rivalry, and permitted better use of the research facilities and farms. Government paid the salaries of the lecturers and the expenses of the experimental farms. Not all the lecturers agreed with this decision, and Reinecke and some of his colleagues chose not to become government officials. They continued as full-time staff of the University only. (In 1973 this arrangement was cancelled, and the Faculty of Agriculture was separated from the Department of Agriculture. The staff members were no longer government officials, though there was some opposition to this decision within the Deparment of Pomology.)

Founding of Research Institutes and the Retirement of Prof Reinecke

When competing with other countries, increasing scientific knowledge and management skills in the growing, handling and marketing of top-quality deciduous fruit such as pome fruit (apples and pears) and stone fruit (peaches, plums, apricots and cherries) are required. Therefore, the expansion of the deciduous fruit industry went hand in hand with a growing need for specialist research.

This necessitated the establishment of an institute that could undertake long-term specialist research and that included all the supporting disciplines, for instance, soil science, pest control, and fruit physiology. Though some professional

Fig. 16. The building Government erected for the Western Province Fruit Research Station (WPFRS) on the campus of the University of Stellenbosch (US). The staff moved in in 1941, using it till the end of 1957 when they moved to bigger facilities in the vicinity of the old golf course. After the building had been renovated in 1982 and renamed the Al Perold Builing, it was home to the Department of Horticulture at the US for more than a decade.

jealousy initially existed among a number of government officials, various scientists and industry leaders jointly negotiated for an institute of this kind, and eventually the Western Province Fruit Research Station (WPFRS), a government organisation of the Department of Agriculture, was established in Stellenbosch. Reinecke's staff – all of them government officials – and his research projects – all on government experimental farms – were transferred to the WPFRS in 1940. In 1941 the staff moved into the new building, which is now known as the AI Perold Building (*Fig. 16*). (The WPFRS later became the Fruit and Fruit Technology Research Institute (FFTRI), and eventually ARC-Infruitec/Nietvoorbij).

As a result, Reinecke had to relinquish most of his influence and leadership with regard to research in the deciduous fruit industry. An even greater disappointment was being overlooked for the position of the first director of the WPFRS, as he was not a government official. The position was awarded to a soil scientist, Dr MS du Toit, also a pioneer in establishing the institute. Unfortunately the bureaucracy involved in this forward leap in the deciduous fruit industry robbed it of its most ingenious fruit expert and research leader when he was at the pinnacle of his career. Reinecke remained a lecturer in the Department of Pomology, and his engagement in fruit industry problems was greatly reduced. He retired in 1961, after 43 years of service in the Department of Pomology, and died in 1967.

Many of Reinecke's students followed in his footsteps as lecturers, some of whom were promoted to professors and departmental heads, and continued his work.

In the meantime, the Second World War (1939 – 1945) had come to an end, and the world trade in horticultural crops was growing significantly. This posed a number of challenges to scientists, not only in terms of a larger variety of crops, but also in the cultivation, storage, handling and marketing of fruit, as well as the training of the scientists involved. By that time basic scientific knowledge of, for instance, plant physiology and anatomy had increased significantly worldwide. Combined with the modern laboratory facilities that had become available, this enabled lecturers at tertiary institutions and scientists at other research institutes to provide better guidance in research and education of students. At the same time the South African fruit industry increased in scale, intensifying the need for knowledge of horticulture and the supporting disciplines, but also in part supplying the means to finance this. As a result, the Department of Horticulture at the University of Stellenbosch (and other universities) experienced a rise in student numbers, and consequently had to increase staff and research facilities to meet the new demands.

It is necessary to focus on one of Reinecke's students in particular, Professor Emeritus DK (Daan) Strydom (born 14/08/1930) (BSc Agric,

Fig. 17: Prof Daan (DK) Strydom (1930 –) (PhD California) was appointed lecturer in Pomology at the University of Stellenbosch in 1960. He laid the foundation for the training of world-class local fruit scientists who could take on the challenges during the period following the Second World War, resulting in the South African fruit industry becoming a major global player.

1951; MSc Agric, 1954). Assisted by funding from the Deciduous Fruit Board, Strydom (*Fig. 17*) was awarded his PhD by the University of California in 1959. He was appointed as lecturer at the Department of Pomology in 1960, and was later promoted to head of the department.

Strydom had the opportunity to study at a university that had successfully managed the new challenges following the Second World War. This enabled him to improve the variety and compostion of the basic courses offered to pre- and postgraduate students, thereby laying the foundation for the training of local fruit scientists to the same high standards maintained by the University of California. He became a respected scientist in his own country and abroad, and was able to direct the training of numerous leading, progressive fruit experts, who could transfer knowledge of modern fruit cultivation and handling practices to the industry. They enabled South Africa to compete with the best fruit export countries on the European market, which advanced the rapid expansion of the deciduous fruit export industry after the war.

After retiring in 1990, Prof Strydom remained actively involved in the deciduous fruit industry in South Africa and overseas.

Though grapes are a fruit crop, the scale of the table and wine grape industry necessitated viticulture and winemaking to be managed by an independent department with its own research farm, Nietvoorbij, just outside Stellenbosch. Consequently the Institute for Viticulture and Oenology was later established on Nietvoorbij. As a result, there were two similar institutes in Stellenbosch, which later amalgamated into one research institute (today the ARC-Infruitec/Nietvoorbij).

After the Union of South Africa was established in 1910, interest in fruit cultivation spread to the rest of South Africa; in fact, some of the first apples exported to Europe were from Vereeniging. On the Highveld, hail and late frost resulted in poor fruit quality, quickly bringing

Fig. 18: A modern, intensive planting of pears in the Warm Bokkeveld.

commercial deciduous fruit cultivation in this area to an end. Fruit production in areas with higher temperatures, for example, Limpopo, Mpumalanga and Kwa-Zulu Natal, was limited to tropical and subtropical fruit. Consequently, citrus production developed into an important industry, followed by avocados, pineapples, mangos, litchis, bananas, macadamia and pecan nuts, as well as fruit that are, by comparison, of minor importance, such as olives and guavas.

It soon became clear that only the highest quality fruit would be economically marketable. Government-supported quality standards were compiled for each fruit kind and legally enforced. These standards had been in operation since the First World War, and though producers had realised from the start that compliance was required to obtain the best prices abroad, a few individuals nonetheless refused to participate. It took a crisis in the marketing of fresh fruit

– which brought fruit exports to a standstill during the Second World War – to achieve this goal. To manage this situation, the marketing of all deciduous fruit was to be controlled by the Deciduous Fruit Board, and the marketing of citrus by the Citrus Board.

After the war this marketing system was retained for export fruit and a few fruit kinds on the local market. With a few exceptions, the system was a great success, and the volume and quality of export fruit increased rapidly after the Second World War. The marketing system was abolished at the beginning of 1994 for political reasons.

In the meantime, the market for fruit in Europe had grown considerably. An important factor contributing to this growth was the introduction of retail chain stores, which exposed consumers to a much wider variety of deciduous and subtropical fruit kinds and cultivars.

Supplying Producers with Information

With the expansion of agriculture in South Africa, the countrywide need for specialist bodies to provide information on cultivation and handling of crops became a necessity. Consequently, higher education facilities to train fruit specialists were provided and departments of horticulture were established at other universities, in addition to the department at the University of Stellenbosch. In most cases this was done in consultation with agricultural colleges. The University of Pretoria was first, followed by the University of Natal (Pietermaritzburg), the Potchefstroom University for Christian Higher Education, and the University of Bloemfontein, which made provision for agriculture and some specific horticultural crops. As in the Western Cape, this was followed by the establishment of government research facilities, such as the Research Institute for Tropical and Suptropical Fruit in Nelspruit and the Roodeplaat Institute for Horticultural Crops. To increase efficiency, the Agricultural Research Council (ARC) later assumed responsibility for the coordination and control of these research institutes.

Various producer and scientific associations were founded in the fruit industry, which facilitated cooperation between producers and scientists locally and abroad. In the Western Cape, one such association – the Cape Pomological Association (CPA) – is well worth mentioning, as it has contributed significantly to the progress of the deciduous fruit industry in the Cape. The CPA was founded in 1964 (*Fig. 19*) and its members included producers, scientists (particularly from the SEAC, the FFTRI and the Department of Horticulture at the University of Stellenbosch), traders in products used in the fruit industry, fruit handlers and marketers (Deciduous Fruit Board and Unifruco). The association provided members with a platform to discuss common issues and implement decisions. The organisation still exists,

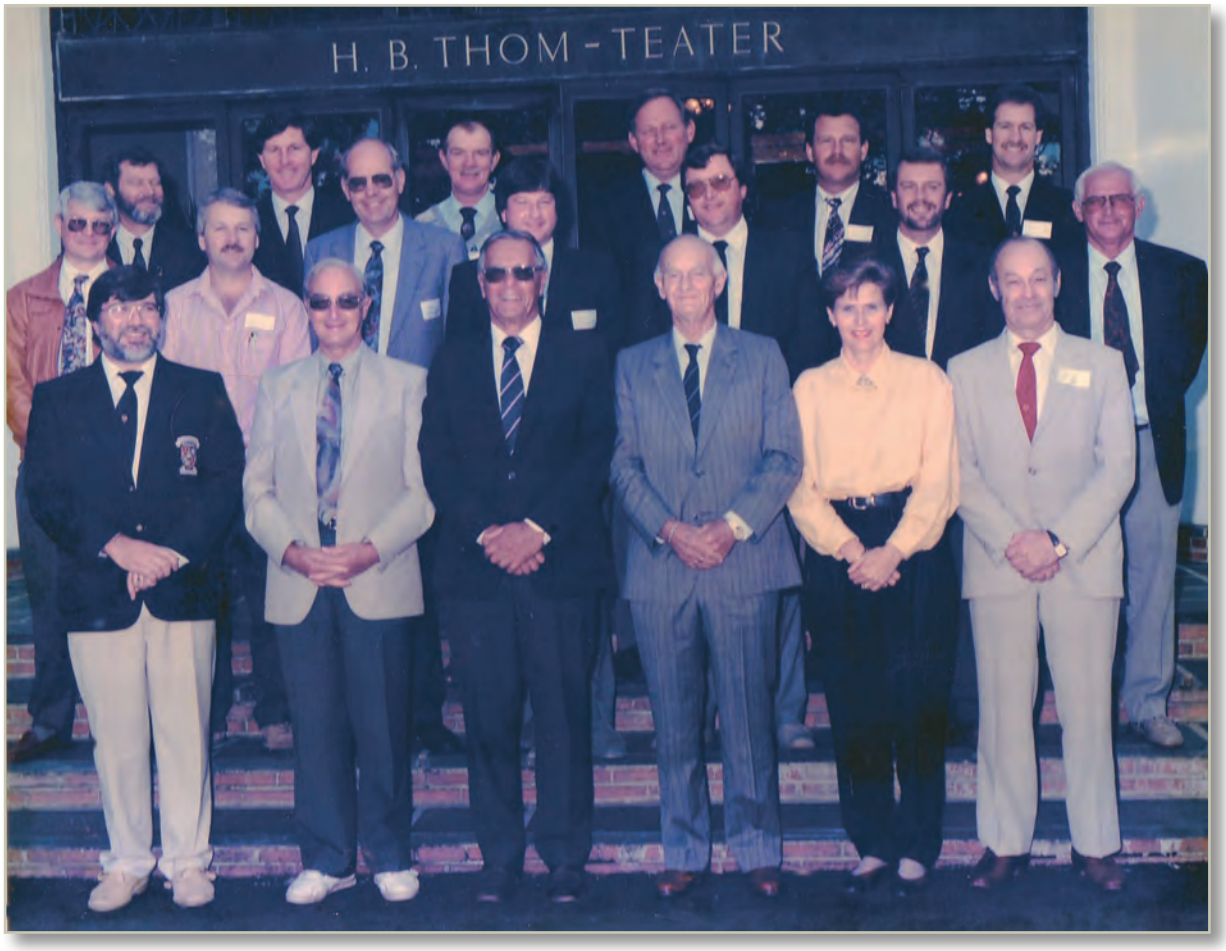

Fig. 19: Cape Pomological Association (CPA) members who played a leading role in the association, and therefore the deciduous fruit industry from 1965 to 1994. From left to right:

Front row: JF Van den Berg (administrative), J de V Lötter, PG Van Breda, JE Mudge, EH Van Rooyen (administrative), D Hofmeyr.

Centre: BG Treptow, D Hobkirk, Dr HJ Van Zyl, M du Preez, RM Zulch, PC Bell, Prof DK Strydom.

Back: R Dalton, JF Jooste, JA Joubert, GP Dall, PD de Wet, PJ Nepgen (administrative).

Absent: BJ Napier (deceased), BR Kearney, PS de Villiers, M Kreft.

though it has undergone considerable changes.

Local fruit experts not only made their mark in South Africa, but some also became members of and have often played leading roles in international associations such as the International Society for Horticultural Science and the American Society for Horticultural Science. In addition, South African scientists regularly presented papers at international congresses. Local scientific associations, such as the Southern African Society for Horticultural Science and others, were equally popular with local and overseas scientists. South African producers and scientists regularly visited fruit-producing countries abroad, and representatives from these countries frequently reciprocated with visits to the local industry, which resulted in excellent cooperation, despite difficult international political relationships at times. During those days few limitations existed and professional expertise and even new cultivars were exchanged freely.

Supplying Producers with Information

Fruit producers and supporting industries have to remain up to date with new developments in the industry. By the end of the 19th and the beginning of the 20th century the *Cape of Good Hope Agricultural Journal* was an indispensable publication in the fruit industry. More and more research reports were published by Elsenburg College. After the end of the First World War *The SA Fruit Grower* became popular, and many experts aired their views and published research and market reports in this publication. This was complemented by Pickstone's information bulletins (*Fig. 8*), articles by Tribolet of Elsenburg and, after 1910, of the National Department of Agriculture, as well as information leaflets of the SA Fruit Exchange and, after 1940, the Deciduous Fruit Board.

Around this time, RA Davis, who worked for the Department of Agriculture in the summer rainfall regions, regularly compiled general fruit cultivation guides for prospective producers in those areas and frequently published articles on fruit cultivation in *Farmer's Weekly*. In 1928 he published his book *Fruit Growing in South Africa,* which supplied fruit producers with information that had been lacking at that stage.

Between 1920 and 1940, Reinecke and others published their research reports in official bulletins of the Department of Agriculture. For his popular publications Reinecke regularly made use of newspapers such as *Cape Times, Cape Argus* and *Die Burger*, and of the magazines *Farmer's Weekly* and *Landbouweekblad.* In addition, the well-known monthly journal and comprehensive guide of the Department of Agriculture, *Farming in South Africa*, which was available in both languages, made a valuable contribution.

In 1950 the first issue of *Deciduous Fruit Grower*, the science-focused, official monthly journal of the Deciduous Fruit Board, appeared. It was published in English and Afrikaans, contained scientific articles

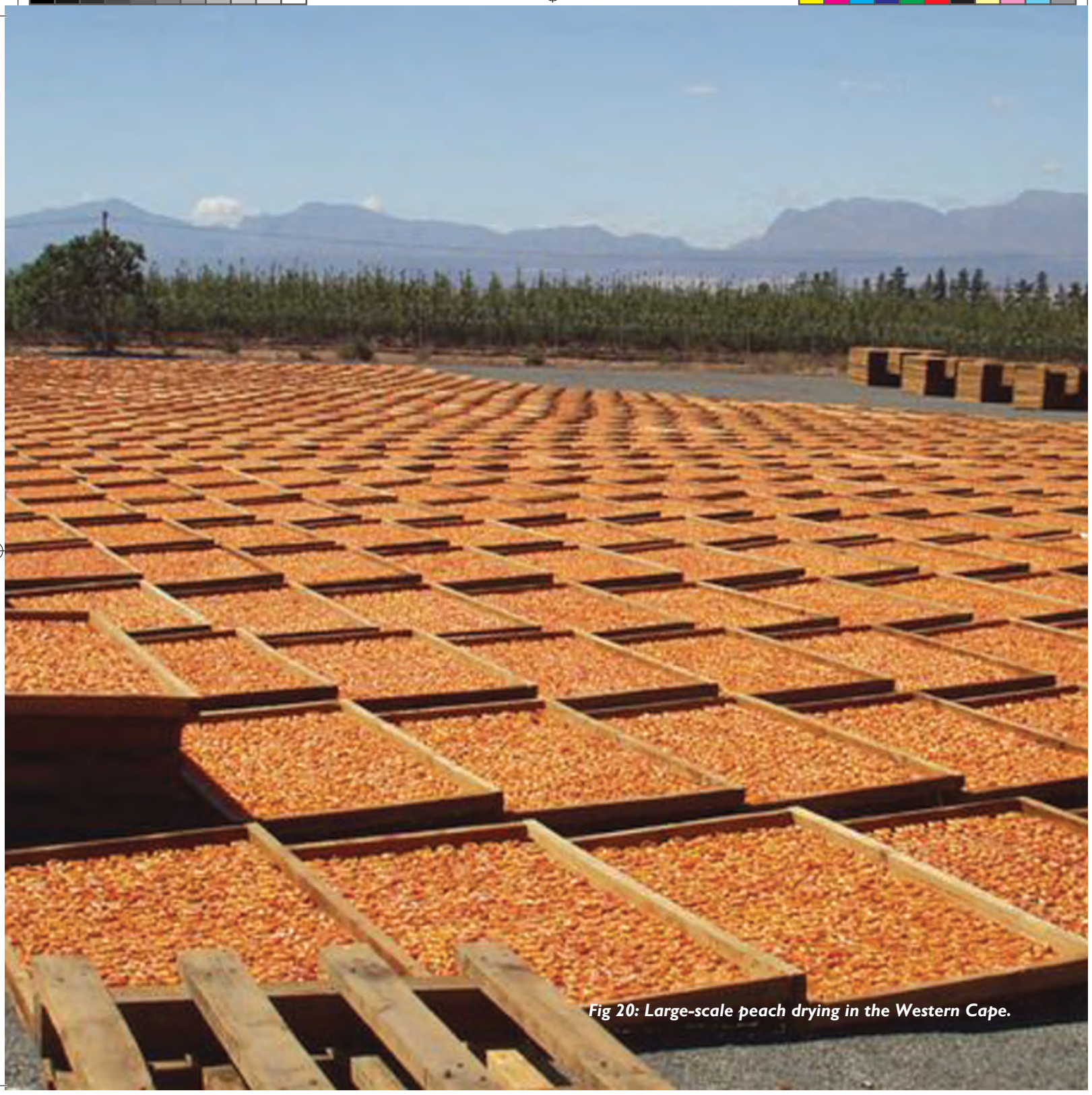

Fig 20: Large-scale peach drying in the Western Cape.

and articles on Deciduous Fruit Board matters, and was distributed free of charge to deciduous fruit producers. Maintaining a reasonably high standard, the journal met a substantial need in the deciduous fruit industry and was held in great respect in other fruit-producing countries. Similar journals were established for the citrus industry and later also for producers of some subtropical and tropical crops in the non-deciduous fruit industry. In the 1970s the specialist journal *Droëvrugte/Dried Fruit* was published to assist the dried fruit producers. *The South African Nurseryman* was published to serve the nursery industry.

Initially government extension services were generally provided free of charge to producers. Later large companies and cooperatives started to appoint specialist extension officers at their own expense, for their own enterprises or for members of the cooperative. Government bodies and the Department of Horticulture of the University of Stellenbosch continued their close cooperation, mainly by means of the CPA.

The Size of the South African Fruit Industry by 1994

The general availability of scientific knowledge about the production, handling and marketing of fruit created a sophisticated fruit industry in South Africa, comparable with the best in the world. South African fruit could compete with produce from foremost suppliers on the world markets and the fruit industry constituted an important part of the economy of the country (Table 1).

From the start, the fruit industry focused on the Northern Hemisphere markets, mainly because of marketing opportunities created by the reversed seasons. The industry became an important earner of foreign currency for South Africa. Together with wine (4%) and other horticultural crops (3%) it constituted more than half of the foreign currency earned in 1995. In the same year the industry also supported more than 2,5 million workers and their dependants, whereas thousands of people were involved in supporting services to the fruit industry, for instance research organisations and fruit handling, marketing and processing businesses.

The Fruit Industry after 1997

The new political dispensation in 1997 resulted in considerable changes in agriculture, especially in the fruit industry. By 1997, fruit industry research that had depended on government funding had been downsized to a few projects, and the mandatory one-channel marketing system for export fruit was swiftly abolished. This cost the fruit industry dearly, slowing down economic growth in the industry for a number of seasons.

However, the new situation had positive effects as well. It created strong aspirations in the industry

TABLE 1: The scope of the South African fruit industry in 1995 in perspective (UNIFRUCO statistics of 1995)

Fruit kinds	Number of producers	Number of workers	Number of dependants	Production (tonne)	Export earnings (R million)
Deciduous fruit	5930	211 000	1 020 000	1 545 000	3 323
Citrus fruit	3 500	100 000	600 000	1010 000	1 361
Subtropical Fruit	1 600	100 000	590 000	620 000	310
TOTAL	**11 030**	**411 000**	**2 210 000**	**3 175 000**	**4 994**

to achieve independence, and all role players made a joint effort to restructure the fruit industry using private initiative and finances. Simultaneously, the industry gained access to a large number of additional potential clients the world over, for instance Russia, the Middle East, the Far East and India, which resulted in a sudden increase in the markets available for the large variety of South African fruit. However, changes in the exchange rate still cause prices on the overseas markets to fluctuate and a weak Rand still elevates the prices.

The new political dispensation also presented new challenges, such as land reform and black empowerment of the previously disadvantaged on fruit farms.

In the meantime the impressive developments in electronics worldwide (*Fig. 21*) ensured that the collection and processing of data and communication could be simplified, information was more easily available, and better orchard practices were achievable, which resulted in increased yields *(Fig. 14* and *18)*. In conjunction with this, fruit handling and marketing improved. As can be expected, the fruit industry is currently experiencing a new period of success, which surpasses the achievements before 1994 by far (with the exception of the number of workers employed in the industry).

A sophisticated fruit industry calls for knowledge, good management skills and vision. Conseqently the fruit industry is highly organised today. In the South African fruit industry (Fruit SA) a distinction

is made between separate industries – tropical, subtropical and deciduous fruit – each with its own industry organisation and administration for its subsidiaries. The Citrus Growers' Association of Southern Africa promotes the interests of citrus producers and the South African Subtropical Growers' Association (Subtrop) that of the tropical and subtropical fruit industries, through subsidiaries focused on specific fruit kinds. Good cooperation exists between the citrus, subtropical and deciduous fruit organisations on matters of common interest, such as negotiations with Government under the banner of Fruit SA.

HORTGRO supports the deciduous fruit industry through a number of affiliate associations, such as the South African Apple and Pear Producers' Association (SAAPPA), the South African Stone Fruit Producers' Association (SASPA), Dried Fruit Technical Services (DFTS), and the Canning Fruit Producers Association. Also serving the broader horticultural industry, HORTGRO is involved with smaller affiliates representing the following fruit kinds and associations: protea flowers, cherries, olives, SA honey bees, honey bush tea, berries, pomegranates and figs. The South African Table Grape Industry (SATI) has terminated its partnership of many years with the fruit industry and SATI itself supplies services to table grape producers.

Specialist service organisations include the South African Plant Improvement Organisation (SAPO), which manages all aspects concerning plant material on behalf of fruit producers, and Culdevco, which manages the marketing and commercialising of locally bred pome and stone fruit cultivars of the ARC.

HORTGRO Science manages all aspects of research for the fresh pome and stone fruit industry. For this reason the activities of the Cape Pomological Association (CPA) – arranging field days and the annual congress – have also been assigned to HORTGRO. The Fresh Produce Exporters' Forum (FPEF) is the representative body of all fresh fruit exporters, whereas the Perishable Products Export Control Board (PPECB) has to ensure that appropriate product handling standards are applied.

In addition to these industry-directed associations, the Department of Horticulture of the University of Stellenbosch still plays a leading role in the training of students and the associated research by postgraduate students.

Land reform legislation, though essential, requires great effort from the whole of the fruit industry. The success of black economic empowerment projects depends on sustainable farming enterprises that can enable the previously disadvantaged to become commercial farmers in their own right. Various deciduous fruit and citrus producer organisations have initiated such projects, and some can already be regarded as successful.

The bimonthly *South African Fruit Journal* provides industry-focused and scientific information to both deciduous and citrus fruit producers.

Fig. 21: Apple and pear production require modern, electronically driven packing facilities, such as this facility of the Du Toit Group.

All these services are funded from levies on the fruit marketed.

The Fig Industry as Part of the Tree Fruit Industry

Figs are popular dessert fruit, and trees are well adapted to South African conditions. Consequently, the fig has been a common fruit kind on farms, small holdings and in private gardens since the 18th century. At first it was not cultivated commercially, but used only for dessert purposes or processed into dried figs or green or ripe fig preserve. Formal orchards were not established, but single trees were planted individually or in rows next to existing vineyards or fruit orchards. Originally the cultivars were limited to the purple 'Adams', 'Black Genoa', 'Cape Black' and 'Eva' figs, the 'Kaapse Bruin' and the 'Cape White' figs. Besides their dessert quality, 'Adams' figs were also suitable for drying. The 'Cape White' fig could be dried and used for preserves.

At end of the 19th century extensive progress was made in the fig industry, similar to the advances experienced in the rest of the fruit industry when Piet (California) Cillie returned form California with propagation material of several new fruit cultivars, including figs. During the first decade of the new century he was instrumental in establishing these new fig cultivars in South Africa. Cillie took the lead by planting a number of hectares of 'White Adriatic' figs on his farm Vruchtbaar in Wellington, becoming the first fig producer in the country to plant trees in a large orchard. He dried and marketed the fruit successfully.

Other important fig cultivars that became available to producers at this point were 'White Genoa', later a popular commercial cultivar, and 'Calimyrna', a Californian selection of the Turkish 'Smyrna' drying fig, as well as its pollinators, the 'Capri' fig cultivars. However, 'Calimyrna' never achieved popularity, due to its complicated pollination requirements, and it was never planted commercially. A considerable number of other fig cultivars, for example 'Castle Kennedy', 'Panache' (syn. Tiger fig), 'New Brunswick' and 'Black Mission', were imported, but never planted commercially, though some occasionally became popular home garden cultivars.

tree fruit industry
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Although no reliable statistics regarding the figs established during the first three decades of the 20th century are available, it is known that fig plantings significantly increased countrywide, but particularly in the Western Cape and Little Karoo, throughout this period. Reinecke's survey in 1927 – the first official fruit tree census – showed that a total of 68 126 fig trees had been planted in the Western Cape. 'White Genoa' was the most popular cultivar, 'White Adriatic' the second most important and the 'Cape White' the third. Together the three cultivars comprised more than 75% of the total. These numbers also included trees that had not been planted commercially, but were found in home gardens and in hedges or avenues.

Fig. 22: Initially fig trees were planted adjacent to wine grapes to facilitate regular irrigation. In March figs and grapes were harvested simultaneously. Transport was also shared – in this case a mule cart.

The tree survey of Micklem and Kriel in 1952 illustrated that the number of 'White Genoa' trees had increased by more than 25% and that the 'Cape White' fig trees had approximately doubled in number, compared with the previous census. The total number of fig trees had increased to 147 010. It was worth mentioning that 'White Adriatic', which had been planted as a drying fig before the war (for instance by Piet California), had fallen out of favour completely, as high-quality dried figs could not be produced consistently under the unfriendly weather conditions. About half of the trees of both cultivars, 'White Genoa' and 'Cape White', were not bearing fruit yet, which indicated a special interest in these two fig cultivars. It can be concluded that from this point onward the fig industry essentially comprised two cultivars only; the remainder of the cultivars were found in home gardens. During the thirties, the fruit canning industry, which was coordinated by the South African Fruit and Vegetable Canners' Association (Pty) Ltd., was established. The canners were in search of fruit kinds that could support their operations, which mainly handled canning pears, peaches and apricots, during periods when these fruit were in short supply. This became particularly important when the production of the new 'Kakamas' canning peach started to increase from 1934.

During this time, and until after the Second World War, major expansion was seen in commercial fig plantings, undoubtedly due to the interest of the canning factories (Langeberg Coop Ltd, H Jones & Co (SA) Ltd, RFF (Pty) Ltd, Del Monte (Pty) Ltd, and Ceres Fruit Juices and Canning Company (Pty) Ltd) in the green breba crop (early crop; Afrikaans: *voorvye*) of 'White Genoa' and the ripe figs of the same cultivar and 'Cape White' for preserves. The increased demand for processed fruit during the Second World War certainly played a large part as well.

From early on fruit experts tried to stimulate the fig industry through various publications that encouraged producers to plant figs (Davis, 1928; Burger and De Wet, 1931; Joubert, 1939; and Du Preez, 1943 and 1955). Though the tree fruit industry experienced a period of unequalled growth after the war, this did not extend to the fig industry. In 1983 the FFTRI compiled a development plan for the South African fig industry and indicated there was "…a need for considerable expansion of the South African fig industry. This could only be realised if the necessary economic incentives were available to the prospective producers."

Though there was a market for figs in all its facets, producers did not take advantage of it, as the other fruit presented better financial opportunities.

After the Second World War figs, which battled to produce 3 to 15 tonne (t) per hectare, and had to compete with the rest of the fruit industry at much lower prices per tonne, could not make the grade. As a result, the only existing fig orchards were replaced with canning and dessert apricots, peaches, plums, pears or apples. The situation deteriorated to such an extent that the canning factories, even after purchase prices had been raised, sometimes did not receive enough green figs for preserves, and teams of workers had to be sent to buy fruit from people who had fig trees in their home gardens and who were willing to have the trees harvested in exchange for cash. Langeberg Coop Ltd even supplied some farmers with 'White Genoa' trees to plant these on a contract basis, to ensure sufficient volumes of figs could be obtained for processing.

By the beginning of the seventies about 800 t of figs were marketed locally every year (though amounts varied between years) as dessert figs (10%), green figs for preserves (5%), ripe figs for jam (80%) and dried figs (5%). By the end of the same decade fig production had decreased by about 40%, though the amount of green figs produced had almost doubled to 60 t (Anon., 1983). This decrease continued throughout the eighties, local production of dried figs almost running dry, though green figs remained fairly popular. However, these figures did not include the figs that had been produced in the highly active home industries and were sold in farm stalls by the roadside. However, judging by the substantial amount green fig preserve produced every year and the roughly 100 t of dried figs that are

imported annually, figs have remained a popular fruit kind with consumers.

Fig production and harvesting are less popular than that of other fruit. The picking of figs is not a well-liked activity, as the milky substance (latex) produced by the fruit can cause irritation, necessitating the use of gloves, which can be particularly uncomfortable, since harvesting takes place during the hot time of the year.

As ripe figs were very susceptible to injury, producers tended to pick the fruit too early in an attempt to curb injuries during handling. Fruit that had been picked prematurely failed to ripen properly, resulting in a poor product. Ripe figs, which have a relatively short shelf-life, require cooling to improve the shelf-life. However, cooling facilities were expensive and not always available. Additionally, when the humidity is high, figs can easily decay on the tree. This can be aggravated by poor orchard sanitation. Consequently, figs were excluded from the export market in most production regions and no substantial local market developed.

Recently the unsaturated market abroad for dark-coloured figs with a strawberry-coloured flesh started drawing attention locally, eventually resulting in drastic changes in the South African fig industry. In 2002 the fig producing and marketing organisation Alternafruit (Pty) Ltd imported a variety of new, dark-coloured fig cultivars, which set fruit parthenocarpically, into South Africa. Today, the production of these figs in different parts of the country is growing, and the fruit is exported as fresh figs to Europe by air. All indications are that a stable fig industry could develop in South Africa, provided that fig producers joined forces by establishing a fig producers' organisation.

Fig. 23: A full-bearing fig orchard under overhead netting, which serves as protection against birds and certain insects.

Chapter 3

Pomology of the Fig
(Ficus carica)

The morphology and physiology of the fig (F. carica) differ considerably from that of other fruit kinds; consequently the environmental needs, biology and cultivation practices applicable to the fig require special attention, and are the focus of this chapter.

Environmental Requirements of the Fig

- Temperature

The fig can be described as a warm-temperate-climate fruit. Though figs thrive by nature in a relatively warm environment, the buds do have a moderate winter chilling requirement, and it is a mistake to regard figs as subtropical fruit. The fig therefore differs from wild fig species, which are evergreen and can be described as tropical and subtropical.

In temperate climates figs are deciduous, and the buds display clear endodormancy (winter rest). Some measure of chilling, though little, is required to release dormancy of the buds. The chilling requirements of cultivars can vary.

At relatively high winter temperatures fig trees could fail to undergo growth cessation and not shed all their leaves in winter. For this reason figs can be grown in regions with low chilling accumulation; however, bud break could still be irregular from time to time, which could reduce the crop (Flaishman *et al.*, 2008).

In countries such as Brazil, the second largest fig-exporting country in the world, figs are grown successfully in subtropical and tropical areas, between 30°S and 18°S, in comparison to around 22°S to 35°S in South Africa. To manage insufficient winter chilling, bud break is forced by the application of hydrogen cyanamide (e.g., Dormex®). It has been reported that this treatment can induce bud break successfully in figs, and that harvest time can be manipulated by the timing of the application, which can result in larger crops (Pasqual *et al.*, 2003). Likewise, researchers in Israel successfully treated their important breba-crop cultivar, 'Nazareth', with hydrogen cyanamide, which resulted in the distribution of the breba crop over the largest part of the year. In addition, such an early application of gibberellic

acid (GA) prevented the troublesome early fruit drop in breba figs (Yablowitz *et al.,* 1998).

In South Africa, Gerber (2010) studied three new fig cultivars in an attempt to identify rest-breaking agents that could be suitable to release dormancy in the lateral vegetative buds on one-year-old shoots. Dormancy was largely due to apical dominance.

The chemical rest-breaking agent thidiazuron (Lift ®), applied at 6% concentration in spring, can generally be used to release dormancy in lateral buds of 'Bourjasotte Noire' and 'Col de Damme Noire'. The results obtained with other products were not convincing enough to be used in recommendations (Theron *et al.*, 2011).

However, drought or very low temperatures in spring can delay bud break and new growth; in other words, cause ecodormancy or ecologically induced rest. As it becomes colder in the cooler regions in autumn, vegetative growth in fig trees declines and could cease completely, though fruit will still ripen at temperatures of 12 °C.

Most fig cultivars are slightly more resistant to cold than orange trees, and ripe wood can endure -7 °C in winter. Young trees and trees with leaves, though, are much more sensitive to cold, and new shoots will die at -1 °C in spring. According to Baud *et al.* (2005), the cultivars 'Brunswick' and 'Brown Turkey' are more resistant to cold than other cultivars.

High-quality fruit develop when summer temperatures are relatively high (32 °C to 37 °C; the highest temperature is intended for figs that are to be dried), but excessively high temperatures (above 44 °C to 47 °C) result in fruit with a tough texture and are therefore not favourable for commercial fig production. In general, fruit size will be enhanced under cooler climatic conditions, but locally it could become too cold in autumn to achieve optimal ripening of the late fruit borne on the tips of shoots.

● Humidity

Warm, dry weather during harvest is essential. Moist, humid weather during this time create favourable conditions for decay organisms such as *Botrytis cinerea* and yeast fungi such as *Saccharomyces* species, which are carried by vinegar flies (*Drosophila melanogaster)* and other insects, and respectively cause decay (rot) and souring in figs. Any moisture, for instance dew or light rain, occurring on ripening figs will be absorbed unchecked by the fruit. This creates an imbalance in moisture pressure inside the fruit, which causes cracking and splitting of the fruit. These cracks and splits expose the fruit to insects and disease organisms causing decay, and such fruit have to be removed from the orchard immediately. Circumstances of this kind place the biggest restriction on the cultivation of figs in the Western Cape and summer rainfall areas. In these areas, only cultivars that ripen early should be considered. Only 'White Genoa' and 'Deanna' or 'Ephesus', and possibly 'Black Genoa', should be given any thought when planting figs in home gardens in these areas. In

Fig. 24: Adams' fruit usually split in humid weather.

these areas orchard sanitation is critical and should be done conscientiously on a daily basis.

Figs intended for drying are much more particular than dessert figs with regard to their requirement for a warm, dry, temperate climate. Fresh figs can therefore be grown and harvested under a wider range of ecological conditions. As a result, the Little Karoo remains the only region in South Africa where commercial dried fig growers can achieve a certain degree of success.

Fig trees have a shallow, but effective fibrous root system, which spreads up to three times the diameter of the canopy of the tree. This extensive root system enables the fig tree to survive limited amounts of irrigation water more easily than most other fruit kinds. However, optimal fruit production requires more irrigation water; about 50% of the evaporation pan reading. Note, though, that the use of tensiometers to measure soil moisture is required to obtain a reliable indication of inadequate soil moisture.

Moisture stress during the active growth stage of the fruit can result in reduced fruit size. However, sudden irrigation of trees under severe moisture stress can result in splitting in the ripening figs (*Fig. 24*). After harvest, irrigation can be reduced gradually to limit unnecessary vegetative growth, but the fig tree should not suffer drought. It is not important whether microjets or drippers are used, but irrigation with the latter requires one or two additional irrigation lines to compensate for the widely spread feeding roots, especially on sandy soils. Irrigation water has to be free of sodium, chlorides or boron salts. Though not as sensitive to water-saturated soils ('wet feet') as peaches, fig trees do not take well to soils with surplus free water, which could even be detrimental to fruit quality.

Soil and Nutrition

Soil must be loosened to a depth of at least 1,5 m before planting and adequately supplied

Fig. 25: Fig orchards require clean tillage, as is practised in this orchard on the Oudtshoorn Experimental Farm.

with organic material and phosphate and potash reserve nutrients to promote the development of a deep root system. In home gardens, generous amounts of compost and Bounce Back® (chicken manure less sodium) applied to the plant hole can serve as suitable fertiliser. Figs in commercial orchards have to be fertilised in accordance with the correct fertiliser plan, especially with regard to nitrogen, which should be 1,75% on average, as indicated by leaf analyses (Flaishman *et al.*, 2008). Nitrogen excess results in unnecessary lush growth and has to be avoided. In home gardens the regular application of liberal amounts of lawn cuttings can sometimes provide sufficient nitrogen fertiliser during the season.

Mature fig trees are fairly tolerant of slightly saline soils, but are sensitive to high levels of sodium and boron. Figs also exhibit some degree of tolerance to calcium-rich soil (a soil pH ranging from 6,0 to 7,8 is optimal), and in low-pH soils adjustments using lime are required (Flaishman *et al.*, 2008). However, excessive soil calcium content, as occurs in the dune soils of the West Coast *sandveld* (sandy region), causes zinc and manganese deficiencies, which can only be controlled by foliar micronutrient applications.

Fig trees are sensitive to nematode (*Meloidogyne incognita)* infestation, and it needs to be determined whether a soil (sandy soils in particular) is infested before trees are planted. If the soil is infested, the correct control measures should be applied. Today nematode-resistant rootstocks are available for grafting of fig cultivars, for instance, the fig species *F. cocculifolia* and *F. cauliflora*. The cultivar 'Zidi' is nematode resistant and can also be used as a vigorous rootstock.

Fig trees with their shallow fibrous root systems are very sensitive to competition from weeds and cannot tolerate any form of weeds at all. Absolute clean tilling is essential, preferably by means of chemical weed control and with a hoe, but not with implements such as disc harrows. Any form of mulch is beneficial, but organic material is particularly useful as it can both suppress weed growth and partially supply in the fertiliser requirements of the fig tree.

Fig trees can also be cultivated under controlled growth conditions. Cultivation of figs under 17-netting (as in Israel) or in water culture in a greenhouse (as in Japan) increases yield and fruit quality and facilitates control of insect pests.

The associated decrease in light quality is managed by means of special pruning methods and timing of pruning. In Israel, 'Brown Turkey' produced 25 t/ha with this system (Flaishman *et al*., 2008).

Growth Habit of the Tree

The fig is one of the few *Ficus* species that are deciduous in South Africa. The leaves of the cultivars grown commercially in South Africa are relatively big, simple and lobular, and the depth of the sinuses can vary even on the same tree. For this reason the shape of the leaves is not an accurate measure for describing differences between cultivars in South Africa. The large leaf surface of the fig tree suggests a considerable metabolic capacity, which manifests in the lush growth and bearing capacity of the fig tree.

The fig produces most of its fruit laterally on the current year's shoots. During shoot extension after bud break, three buds develop in each of the leaf axils: a vegetative bud and two reproductive buds on either side of it. The vegetative buds do not develop further, due to strong apical dominance exerted by the terminal bud or shoot growth. The reproductive buds develop into one or two figs per node, depending on the cultivar (*Fig. 26*). As the shoot extends, the figs mature and ripen progressively from the base towards the terminal part of the shoot (*Fig. 27*). Ripening takes place in summer and can continue for a number of months, depending how favourable growing

Fig. 26: Example of a single fig and two figs per node on a shoot.

conditions are, particularly the environmental temperature. Shoot length usually ranges from 1 m to 3 m. The figs borne on these shoots – also referred to as late figs – comprise the main crop of the fig tree.

The Problem of Apical Dominance and Acrotony (Distal Branching of Shoots)

The lateral vegetative buds on the shoots of the fig tree are generally subject to paradormancy in summer (correlative or summer dormancy), mainly due to apical dominance exerted by the terminal buds that prevent the bud break and growth of the vegetative buds during the

current growing season. In the subsequent season, each of the untopped year-old shoots develop a single shoot or multiple apical shoots (acrotony or branching towards the tip of the shoot), resulting in highly unfavourable blind wood or 'bare necks' *(Fig. 28)*. Such shoots complicate the development of the tree structure and consequently also the availability of adequate bearing wood required for regular production of high quality fruit.

The intensity of apical dominance varies between cultivars. Some cultivars that are known for their breba crop, for instance 'Noire de Caromb', exhibit poor apical dominance, whereas 'Bourjasotte Noire' and 'Col de Dame Noire', which bear only second-crop figs, display strong apical dominance (Gerber, 2010).

To manage these attributes, Gerber (2010) determined the most productive shoot length for each of the three cultivars and the actions required to promote bud break in lateral buds under local conditions. In the case of 'Bourjasotte Noire' a variety of shoot lengths ranging from 10 cm to more than 75 cm were suitable to ensure optimal yield and allow for sufficient new growth to bear the subsequent season's crop. Acceptable yield and fruit size were achieved with a shoot length of more than 100 cm in 'Col de Damme Noire', but could not ensure enough bearing wood for the subsequent crop. In 'Noire de Caromb', shorter shoots of 10 cm to 20 cm in length were very productive, but the longer shoots were less so; only shoots of 100 cm and longer though could provide large quantities of bearing wood for the next season (Gerber *et al*., 2010). These results can be used to plan a pruning programme for these cultivars. Information of this kind is also necessary to develop a proper pruning programme for other fig cultivars and for production under different environmental conditions.

Fig. 27: As the shoot grows, figs set laterally on the shoot. As a result, the largest and most mature figs are to be found at the base of the shoot, fruit becoming progressively smaller and less mature towards the apical part of the shoot.

Fig. 28: In the new season untopped, year-old fig shoots develop one or more new shoots terminally, which is known as acrotony. Budbreak does not occur in the existing lateral vegetative buds on the shoot, resulting in a bare shoot, the so-called bare neck.

Breba Figs

Sometimes a number of reproductive buds on the terminal part of the shoot only develop early in the following spring, forming the so-called breba figs (*Fig. 29*). According to Flaishman, *et al.*, (2008), reproductive buds in which fruit development is arrested during growth stage I will overwinter, covered by protective scales, and develop into breba figs in spring. Figs that undergo unimpeded development, ripen and are harvested or drop from the trees.

Besides climate, cultivar also contributes to the variation in the amount of breba figs that develop. In South Africa 'White Genoa' is known for its ability to produce a breba crop and sometimes this constitutes up to 10% of its yield. This cultivar became very popular with canners, as the 'White Genoa' breba figs in October were suitable for producing green fig preserve at a time when canning factories had little other fruit to process. It was the most popular fig cultivar in South Africa for many years, as the main-crop figs were also suitable for making ripe fig jam. However, this created the impression among many South African housewives that only breba figs were suitable for green fig preserve. The contrary, though, is true: any fig on the tree is suitable for making green fig preserve at any time during the season, provided that it is still firm enough and that the fruit is the correct size when picked.

The 'Kaapse Bruin' fig also occasionally bears large numbers of breba figs. Very few other cultivars in South Africa bear more than a small number of breba figs, even though American information indicates that the cultivars do bear breba figs there.

Breba figs are the first figs available for green fig preserve, and also ripen earlier in the season – quite a number of weeks before the main crop – which can guarantee premium prices for these early fruit on the fresh market (*Fig.30*). In Turkey researchers run a breeding programme to develop cultivars that produce larger breba fig crops, as these fresh, ready-to-eat early fruit can be marketed commercially and very profitably on the local market (November/December).

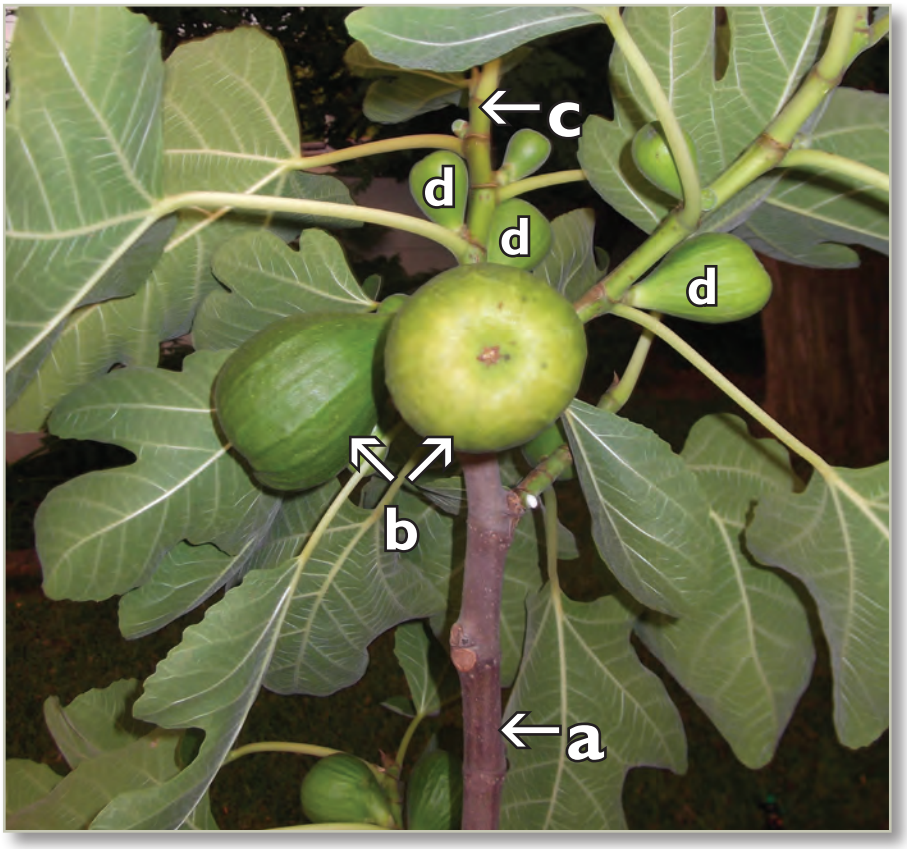


Fig. 29: A 'White Genoa' shoot with breba figs:
a = previous season's growth
b = breba figs
c = current season's growth
d = late crop figs

Fig. 30: Along with other early fruit, breba figs can earn a good profit (as in the case of this Turkish fruit vendor).

In Israel the locally selected cultivar 'Nazareth' is very popular for its early figs is and is planted there commercially for this purpose (Yablowitz *et al.,* 1998).

The best breba figs are borne on medium to short shoots, and vigorously growing shoots bear relatively few breba figs. Fig trees intended for the production of breba figs should therefore not be fertilised and irrigated excessively, and should not be pruned too severely.

Pruning and Training of Fig Trees

Like other fruit trees, fig trees have to be trained into a suitable shape to ensure maximum light exposure of the leaves, and trees have to be pruned routinely to maintain regular production of fruit. Without exception, all fig trees require a trunk of about 30 cm to 40 cm long, which is approximately the height at which the first set of structural or main branches originate *(Fig. 31)*. The trunk is necessary to keep the fruit off the ground, to enable pickers to harvest the fruit from a comfortable height, and facilitate irrigation, weed control and orchard sanitation. It has to be ensured that only one trunk develops and that all shoots that could possibly compete with it are weakened – by topping, in the case of one-year-old shoots, or cutting back, in the case of older shoots – or removed altogether.

Fig. 31: An open-vase 'Adams' fig orchard with good light exposure in Prince Albert.

It is important to decide on the desired tree shape in advance. Worldwide, and in South Africa, the vast majority of commercial fig trees are trained into a vase shape or modified vase shape. It is a simple system and the best known tree training system in fruit growing in the country. Poor implementation of this pruning system can, however, very quickly result in the accumulation of a substantial amount of unproductive wood on the tree, which will cause shading and a drastic decline in steady crops, and will restrict the crop to the outside of the tree.

Similar to other fruit kinds, fig trees can be trained into a central-leader shape to ensure optimal exposure of leaves to light *(Fig. 32)*. This tree shape is well known in deciduous fruit orchards in the Western Cape, and the principles of training are the same for all these fruit kinds. Unfortunately no information is available on commercial fig orchards that have been trained in this manner. The system does require more management skill initially than the vase-shaped training system. To achieve success with the central-leader system, the central trunk has to remain dominant in relation to the lateral branches at all times; therefore it has to be thicker than the lateral branches. Since the young shoots of fig trees tend to bend more easily than those of other fruit trees, the central leader has to be supported during the first three seasons, until the tree has reached its maximum height.

Fig. 32: A 'Deanna' tree trained into a central-leader shape.

Principles of Pruning of Fig Trees grown conventionally in the Vase Shape

- After planting, prune back the young tree to the height at which the structural branches are to be developed (the crown of the tree), about 30 cm to 40 cm high.
- During the first winter after planting, select four to five shoots on the tree – in other words, year-old shoots – to train into scaffold branches, and remove any other shoots below the crown by cutting them right back to the trunk. Attempt to develop scaffold branches that are equally strong, by removing the tips of the most vigorous shoots by hand (tipping) or lightly topping these shoots during the growing season. At the same time remove any shoots growing in the wrong place.
- During the second winter select the main (leader) shoot and two or three suitably positioned side branches on each structural branch. Top the side branches to three or four

nodes, but allow the leader to remain two or more nodes longer than these branches. At this stage, keep in mind that the scaffold of the tree has to attain its intended size as soon as possible. In a vase-shaped tree no shoots, especially no upright shoots, are tolerated in the cavity of the vase and directly below the branches.

- Remove strong shoots that can compete with other shoots on the scaffold of the tree as soon as possible after they have been identified, even in the spring and summer. In young trees many of these shoots can simply be removed by hand, whereas excessively strong shoots can be restrained by removing (pinching) the growing tip with the fingers.
- During the third winter, treat the past season's bearing shoots in the same manner as the previous winter. Ensure that the leader of every side branch remains dominant, and top secondary side shoots, as was done the winter before. Remove surplus growth *(Fig. 33* and *34)*. Basically the same principles are applied to older trees (Fig. 39 / 40).
- If it is found that some of the terminal figs on the bearing shoots do not ripen normally towards the end of the summer, this can be managed during subsequent winter pruning as follows: Increase the number of shoots available on the bearing shoots by topping at more than three nodes to leave a longer shoot (depending on the shoot length) *(Fig. 34)*. The new shoots are expected to be shorter and proportionally bear fewer figs, but the total crop should be the same as before and normal ripening should occur in all figs.
- In a fig tree that grows and bears normally, the severity of pruning does not influence fruit size, as it does in other fruit kinds; in other words, the size of the figs cannot be manipulated by pruning, as it can in stone and pome fruit.

Fig. 33: A two-year-old fig tree before pruning.

Fig. 34: The same two-year-old fig tree after pruning into a vase shape.

Modifications to the aforementioned Pruning Method

- Cultivars bearing Breba Crops

When trees of a cultivar known to bear a breba crop are pruned, for instance 'White Genoa', the same methods as described in the previous section can be applied. Consequently, unnecessary shoots and shoots that could interfere with the tree shape, especially upright, vigorously growing shoots inside the vase of the tree, are removed every year. However, in contrast with the pruning of cultivars that do not bear breba crops, no bearing shoots from the previous season are topped (excluding the leader shoots of branches), but renewal pruning in the subsequent winter is required. Renewal pruning involves the judicious cutting back of a certain number, for instance half, of the bearing shoots on one or two nodes in winter after harvest to rejuvenate them. This provides new shoots that can bear breba figs in the following season.

- 'Deanna'

The cultivar 'Deanna' is known for the strong acrotonic nature of its untopped one-year-old shoots, and quite a number of short, productive shoots can develop distally on these year-old shoots. These shoots are unique in that they bear a considerable number of exceptionally large fruit that ripen first *(Fig. 35)*. Therefore it is recommended that this cultivar is pruned similarly to 'White

Fig. 35: An example of acrotony later in the season, where the shoots are laden with a fig crop (as often occurs in 'Deanna'). Also refer to Fig. 28.

Genoa'. The shoots of vigorous trees can be pruned back as soon as the fruit has been harvested, to develop new growth for the subsequent season.

- Corrective pruning of conventionally trained Fig Trees

Fig trees in which pruning has been neglected for many years or trees that have never been pruned at all often develop a thicket of unproductive shoots that produce very little. A tree of this nature only bears a few fruit on its fringes and the remainder cannot be reached from the ground. Such a tree can be restored successfully by cutting it back to a prominent trunk with scaffold branches that are within reach from the ground *(Fig. 36)*. All shoots older than a year have to be cut back severely

Fig. 36: Corrective pruning of an old fig tree. The right side of the tree has been cut back up to the arrow marked 'a' and has to be pruned back further at arrows 'b' and 'c'. The unpruned part of the tree on the left is to be limited to three scaffold branches and the rest is to be removed. The three scaffold branches will be cut back and pruned to the same height and in the same manner as on the right.

or removed. New bearing shoots should already yield a good crop in the following year. The bigger wounds resulting from these actions have to be treated with a recognised wound-sealing agent (such as *ABE® treeseal pruning grade*) immediately on completion of the work.

To start, identify a single trunk and the scaffold branches that have to be retained and cut away the excess trunks and scaffold branches, down to ground level. Cut back the remaining scaffold branches in order that they end in secondary branches, which then become the leaders *(Fig. 36)*. Thereafter selectively prune the remainder of the branches. Depending on the size of the tree, this undertaking can be a substantial and complicated task. Only someone with knowledge of pruning of fruit trees will be able to complete this work successfully. Therefore, ensure beforehand that an expert, enough workers, and tools such as saws (mostly power saws), loppers and pruning shears are available *(Fig. 37)*. Also decide in advance how to dispose of the pruned wood, as it could create difficulties in a restricted environment. It is best to obtain an expert who is willing to instruct workers step by step on the necessary actions until the work has been completed. Do not assign this task to any worker if guidance is not available, as this could result in new complications.

Sunburn on the remaining branches is a serious problem, which could result from the removal of a large amount of branches and shoots that have previously shaded the bigger branches from the sun. The branches that have remained are not accustomed to direct sun and the exposed bark can suffer irreparable damage from sunburn. It is important to cover these bare branches with white paint to reflect the rays of the sun, in an attempt to prevent sunburn damage. Use any white, cold-water, interior paint with a latex or acrylic base, and dilute with water (1:1) (Lötter, 2003).

Another principle to consider is that follow-up pruning is necessary during the next winter, and to a lesser degree also during the following winters. Normally drastic pruning will result in a considerable amount of vegetative growth in the wrong places and this has to be removed or corrected by pruning early, preferably during the growing period. Usually follow-up pruning has to be done the next season. Failing that, the tree will very quickly revert to the same condition than before pruning, which will negate all the good work.

Fig. 37: Pruning equipment.

- Pruning and Training of Fig Trees under Intensive Growing Conditions

Through the years the fig tree has proven to be easy to 'manipulate'. Environmental temperatures and apical dominance play a great role in this. In warmer fig-producing countries there is an increasing tendency to train fig trees using special pruning and dwarf training systems. As a result, fig trees can be planted intensively to increase the yield per surface area. In addition, intensively planted fig orchards can be provided with affordable overhead protection, by means of transparent plastic for temperature manipulation or netting for insect and bird control.

There are many examples of research in this area that is still in an experimental phase, though some research has already achieved commercial status. An example of this is the moderately intensive plantings of export figs in which Alternafruit (Pty) Ltd and Colors Fruit (SA) (Pty) Ltd have an interest in South Africa.

- The Pruning and Training System suggested by Alternafruit (Pty) Ltd for the Export Market

Trees of the cultivar 'Bourjasotte Noire' (syn. Evita, Great Parisian), currently the most important cultivar grown for export in South Africa, are planted fairly close to each other (5 m x 3 m and

Fig. 38: A three-year-old 'Evita' fig orchard in the Porterville district, before pruning.

sometimes 4 m x 3 m). The tree is pruned and trained to form a single trunk of about 60 cm in height, and encouraged to develop bearing shoots from a number of strong shoots growing at this level. This allows fruit to be harvested without the use of a step ladder. The number of strong shoots permitted to serve as bearing shoots depends on the age of the tree, the required yield, and the degree of shading and wind damage to which trees could be subjected *(Fig. 38)*.

To ensure that enough bearing shoots are available every year, renewal pruning is done annually by pruning back the shoots to stubs of two to three nodes in length. In addition, the less strong shoots are sometimes allowed to bear fruit, but are removed after harvest.

- The Grapevine Pruning System

The grapevine pruning system is applied commercially in Israel and has been described by Flaishman *et al.* (2008). In this system the vigorous vertical shoots used as bearing shoots have their origin close to ground level. The young fig tree is trained to develop four main branches, which are tied down to grow almost horizontally, and bearing shoots are allowed to develop vertically from these branches. At the end of the season each shoot is cut back to a stub, as in the case of grape vines. In Israel, the particularly vigorous growth of the shoots necessitates restriction of the length of bearing shoots to 3 m in height for the comfort of the pickers. 'Kadota' and 'Brown Turkey' trees trained on this system regularly produce crops of about 25 t/ha for the fresh market.

Fig. 39: A branch of a mature 'Black Genoa' tree before pruning.

Fig. 40: A branch of a mature 'Black Genoa' tree after pruning.

- The Chinese Intensive Fig Production System

According to Gerber (2010), Wang *et al.* describe the Chinese system of high-density planting as follows: Strong shoots, which grow on only two scaffold branches facing in opposite directions and borne on a trunk of 30 cm high, are pruned to three nodes in winter. In spring, these pruned shoots give rise to two to three shoots, which bear a large quantity of mature figs in the autumn. The pruning process is repeated on these shoots during the subsequent winter, after removal of excess shoots. This system can be modified slightly to obtain a breba crop as well.

- The Spanish Soil-less High-density Planting

In Spain Melgarejo *et al.* (2007) implemented an ambitious trial growing fig plants in a greenhouse, in which suitable environmental conditions could be maintained. Rooted fig cuttings, two nodes in length and of cultivars not known in South Africa, were planted in a perlite bed, and supplied with a predetermined nutrient solution applied through the irrigation system, which was controlled electronically. Shoots were trained vertically as bearing shoots and fruit developed from the lateral buds. Fruit was harvested already in the season the cuttings were planted. After harvest, the bearing shoots were pruned back to grow and bear fruit again. These trials indicated that it was possible to obtain enormous yields of 80 t/ha with this system.

There is also great interest in this intensive planting and training system in Mexico and America. Melgarejo *et al.* (2007) reported that similar soil-less (hydroponic) trials with figs were implemented in Japan by Kawamata and his co-workers in 2002.

Locally (Rustenburg), a trial is currently conducted in an orchard of 'Bourjasotte Noire', an intensive planting in containers and under cover.

Inflorescence and Pollination, including Caprification

The multitude of flowers of a fig are borne on the inside of a hollow, fleshy torus (syconium), which is often incorrectly described as a receptacle. It differs from the close family member of the fig, the mulberry, which bears its flowers on the outside on a fleshy rachis. Every flower in the inflorescence has its own receptacle. The flowers are in contact with the outside by means of an apical opening, the ostiole of the fig, an important opening that allows entry to pollinating wasps, thereby permitting pollination and fertilisation of figs that cannot set fruit parthenocarpically *(Fig. 41)*.

Most fig cultivars do not require pollination and can set fruit parthenocarpically (set fruit without pollination and fertilisation, and do not produce seeds that can germinate). The syconium of 'Capri' figs, the fig type selected for the pollination of 'Smyrna' figs, bears hermaphrodite flowers (flowers containing both sexes). Edible fig cultivars have long-styled female flowers *(Fig. 42)*. These styles are too long to allow the pollinating wasps

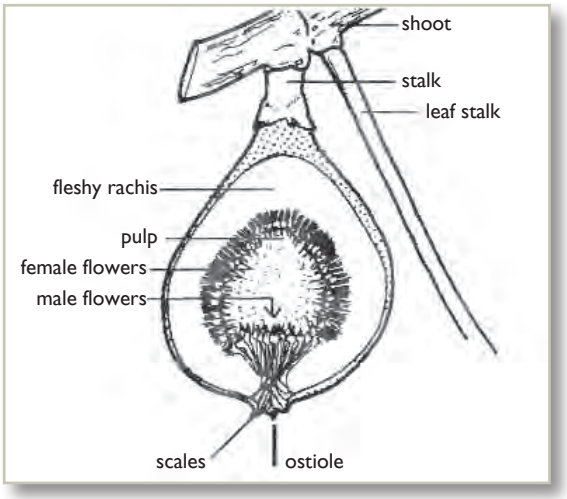


Fig. 41: A diagram of a longitudinal section of the fig fruit (syconium). Only 'Capri' figs contain both male and female flowers. The common edible fig comprises female flowers only.

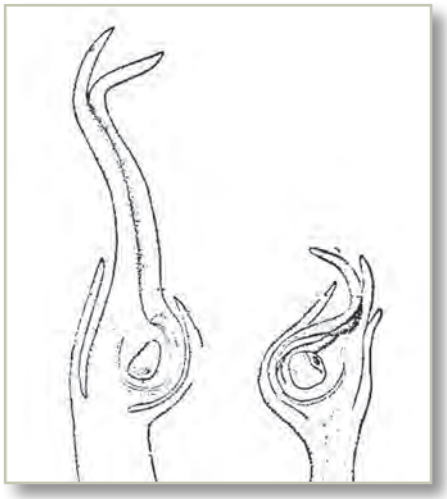


Fig. 42: Diagram of the long- and short-styled female flowers of the fig.

to lay their eggs, in contrast with the 'Capri' figs. Fig species are gynodioecious; therefore certain cultivars are hermaphrodite, whereas other cultivars contain unisexual female flowers only *(Fig. 42)*. However, the 'Smyrna' (syn. Sari Lop) cultivar (in Turkey) and its selection 'Calimyrna' (in the USA) do require pollination to set commercial crops. An excellent cultivar for drying, it is planted for this purpose in Turkey and the USA. As the ripe fruit readily drop from the tree, it can be gathered mechanically in the USA.

All 100 t of dried figs imported annually into South Africa from Turkey are pollinated (caprified) 'Smyrna' figs of which the seeds have the ability to germinate. Some fig cultivars set their breba crop parthenocarpically, but require pollination to set the late fig crop.

Fig cultivars are categorised into four groups according to their pollination requirements:

- Group 1:

  These cultivars require pollination, a process referred to as caprification, and cannot set commercial crops unless provision is made for this. The best known cultivars in this group are 'Smyrna', its selection 'Calimyrna', and 'Zidi' cultivars.

- Group 2:

  The cultivars in this group usually set their smaller crop of breba figs parthenocarpically, but the late main crop requires pollination for

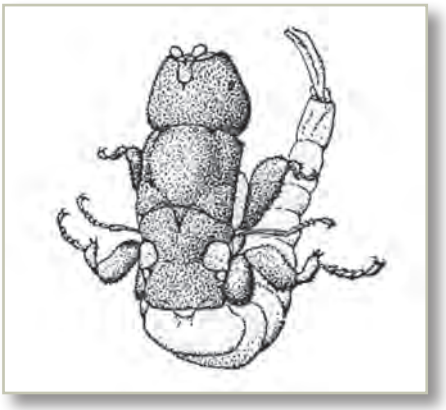


Fig. 43: An illustration of the weak Blastophaga psenes male wasp.

Fig. 44: An illustration of the female wasp indicating the ovipositor.

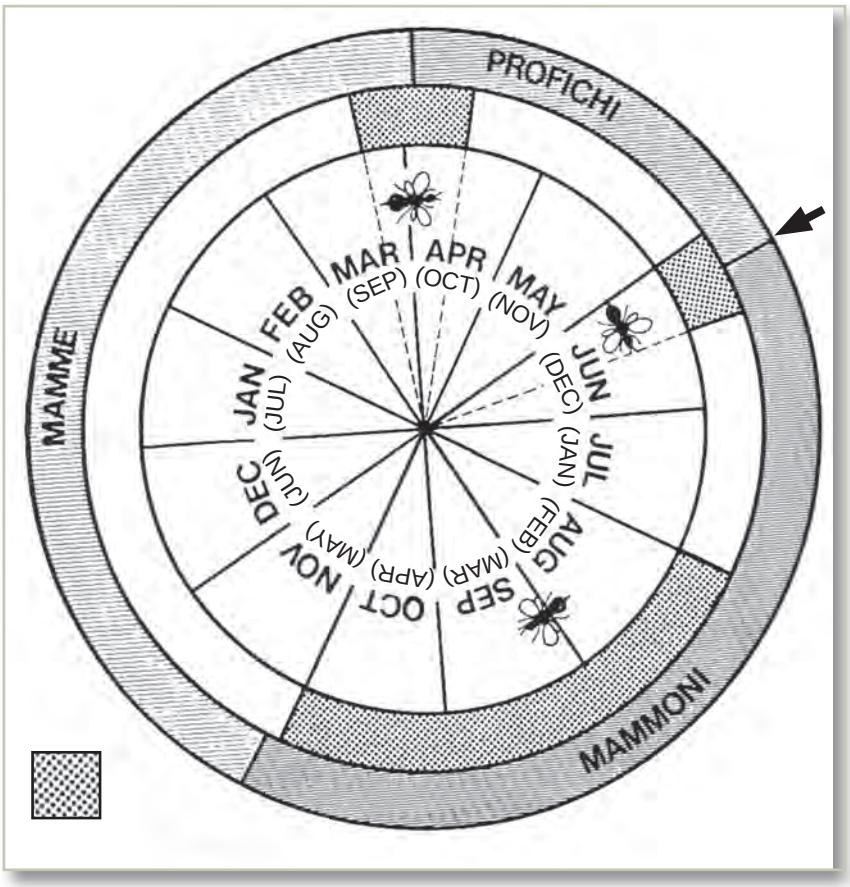


Fig. 45: The life cycle of the Blastophaga psenes wasp in relation to the fruit development cycles of the 'Capri' fig cultivars – the breba crop (profichi), late fig crop (mammoni), and the winter figs (mamme). The corresponding life cycle of the wasp is also indicated, as well as its periods of flight (dark dots). The arrow on the right indicates the caprification period of 'Calimyrna' in the USA. The corresponding months in South Africa are indicated in brackets.

(According to Obenauf *et al.*, 1978, as amended.)

commercial production. These cultivars are known as the 'San Pedro' type. The cultivar from this group that does exist in South Africa, but is not grown commercially is 'Castle Kennedy'.

- Group 3:

  The cultivars belonging to this group are pollen bearers and supply pollen to those cultivars that require pollination to produce commercial crops (Group 1 and 2). They are called 'Capri' figs, and are the source of the term caprification, which describes the pollination process of figs. 'Capri' figs, which had originally been selected in Turkey, bear both male flowers, in the region of the ostiole, and female flowers, deeper within the syconium. These figs are not suitable for eating.

  The wasp *Blastophaga psenes*, which is the vector (carrier) of the pollen, needs 'Capri' figs to complete its life cycle. Various selections of these 'Capri' figs (namely selections 1, 2 and 3, as well as other newer, local selections) become available consecutively through the season to ensure the survival of the wasp during each successive part of its life cycle.

- Group 4:

  This group includes all the best known fig cultivars that set fruit parthenocarpically and are grown commercially in South Africa. These cultivars have long-styled female flowers *(Fig. 42)*. The first figs that could set fruit without pollination became known only around the time of Christ.

Caprification

Caprification refers to the transfer of pollen from the pollen-bearing 'Capri' figs (fig cultivars that had been selected in Turkey) by the vector, the wasp *Blastophaga psenes,* to the female flowers of the cultivars mentioned in groups 1 and 2 above. This wasp is very specific to this process; it is the only species of wasp that can serve as a vector for the fig (*F. carica)*. This corresponds to the wild fig species, which each has its own specific pollen vector that cannot act as vector for each other or for edible figs (Burrows and Burrows, 2003).

The pollination process in figs is closely related to the life cycle of the wasp *Blastophaga psenes* and the 'Capri' fig plays an essential role in the survival of the insect *(Fig. 45)*. The wasps spend the winter as larvae in the late-season figs (or *mamme* figs) of the 'Capri' fig, eventually changing into pupae and emerging in the spring as winged adult wasps. The female wasps crawl through the ostiole of the late 'Capri' fig and fly to the early 'Capri' figs (*profichi*), where they enter through the ostiole and lay their eggs in the ovaries of the female flowers. It is possible to lay an egg in the ovary of a 'Capri' fig flower, as the style of the flower is short enough for the ovipositor of the wasp.

Fig. 46: A 'Capri' fig tree in Turkey.

As soon as she has deposited the egg, the female wasp dies. The egg hatches, and during the development of the larva, which has emerged from the egg, the embryo in the ovary is completely destroyed. Evidently no seed develops in such an ovary.

Thereafter the new-generation wasps visit the later crop (*mammoni* figs), eventually leaving these figs to complete their life cycle in the late-season figs (*mamme*). Various generations of 'Capri' figs are therefore essential to the survival of the wasp.

In addition to 'Capri' figs, the female wasp also visits figs in the vicinity, which contain only unisexual female flowers. In the process the wasp crawls out through the ostiole of the 'Capri' fig, picking up pollen from the pollen-bearing flowers that surround the ostiole, and flies to the figs, which the wasp enters through the ostiole. She attempts to lay her eggs, but fortunately does not succeed, as the styles of the flowers are too long for the ovipositor of the wasp. During her attempt to deposit her eggs, she pollinates the female flowers. This then is this way in which fertilisation occurs in 'Smyrna' and 'Calimyrna' figs, or any other fig cultivar that requires pollination, such as 'Zidi'. The developing embryos can grow normally and produce hormones that stimulate fruit set, and the fig can grow and eventually ripen. For this reason it cannot act as a link in the life cycle of the wasp.

To simplify caprification in a commercial orchard of 'Smyrna' or 'Calimyrna' figs, 'Capri' figs containing the wasps are picked and placed in small gauze-wire baskets, which are hung in the fig trees and replaced once or twice during the season.

American farmers had failed to achieve success with 'Smyrna' figs before the end of the 19th century, when American researchers became convinced after intensive study that caprification was indeed an important practice. They also concluded that the *Blastophaga psenes* wasp was indispensable as a vector and had to be imported into the USA. More recently, it also came to light that caprification could even be beneficial in certain cultivars that set fruit parthenocarpically, by improving fruit set, fruit size and taste, and by changing the skin and pulp colour. On the other hand, caprification could result in

splitting of the figs due to excessive pollination (Flaishman *et al.,* 2008).

The success with 'Calimyrna' in America also came to the attention of Piet California and on his insistence the Cape Department of Agriculture decided in 1902 to import both 'Calimyrna' figs and 'Capri' figs from the USA. In 1907 CP Lounsbury of the Cape Department of Agriculture decided to import the appropriate pollen vector from the USA, with the help of the entomologist CW Malley, and in 1908 he effectively cross-pollinated the trees on Elsenburg (Tribolet, 1913). By this time the intention to produce dried figs was a priority and everyone was hoping that, similar to California, South Africa would achieve great commercial success with 'Calimyrna'. However, due to the time-consuming and expensive process of caprification and the changeable local climatic conditions this could never be achieved.

The Fig Fruit: Morphology and Growth, Physiology and Harvest Maturity

The fig develops from a complete inflorescence. The rachis of the inflorescence is sometimes referred to as the receptacle, but this is incorrect, as each flower in the inflorescence actually has its own receptacle *(Fig. 41)*. The fig fruit is known as a syconium; a fleshy, aggregate fruit on which multiple ovaries are borne on the inside of an enlarged, hollow flower axis. A unique characteristic of the fig fruit is its ostiole, the apical opening that connects the hollow internal part of the fruit with the outside world. Every female flower of the fig has a single ovule in its ovary, which produces a drupelet (small drupe) when pollinated and fertilised.

• Fruit Growth

Fruit growth in the fig follows a double sigmoid growth pattern similar to stone fruit, namely two active growth periods separated by a period of slower growth *(Fig. 47)*. Though the duration of the growth stages could differ between cultivars and between the main and breba crops of the same cultivar, Stage I and Stage II normally last around five to six weeks and Stage III three to five weeks. Cell division occurs in Stage I, and during this stage the fruit has a greater sink strength for nutrients, hormones and water than in Stage II. During Stage III, the shortest stage, fruit growth is most rapid; 70% of the total dry mass and 90% of the total sugar content accumulates in the fruit during this stage. At the same time the largest increase in colour and decrease in fruit firmness occurs. The fruit growth pattern of early figs (breba figs) is similar to that of late figs (Flaishman, *et al*., 2008).

Observations indicate that environmental factors such as temperature have a greater influence on fruit size than does pruning. According to Chandler (1957) American researchers did report though that single ring-barking of 'Black Mission' figs in June/July (South Africa: December/January) resulted in bigger crops of larger figs.

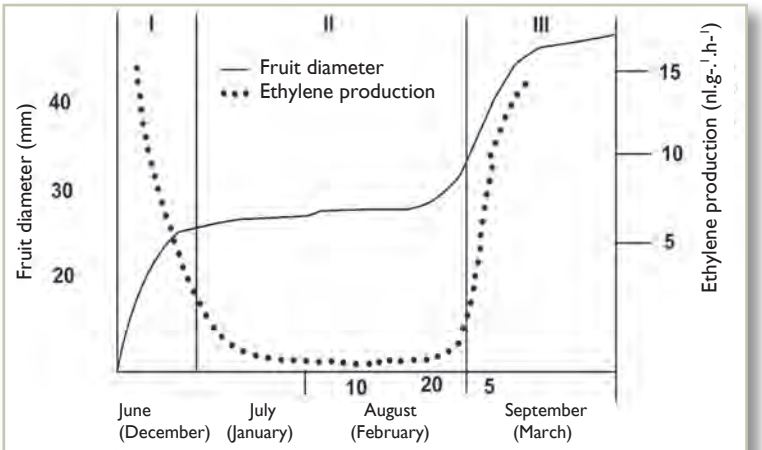


Fig. 47: Double sigmoid fruit growth curve of the fig showing the increase in fruit diameter in relation to ethylene production during the three fruit growth phases. The phases of growth and development are indicated as I, II and III. The respiration rate pattern, based on CO2 production (not indicated here), is similar to that of ethylene development, but shows a sharp decline after the climacterium. (Source: Owino, et al., 2006, as amended.)

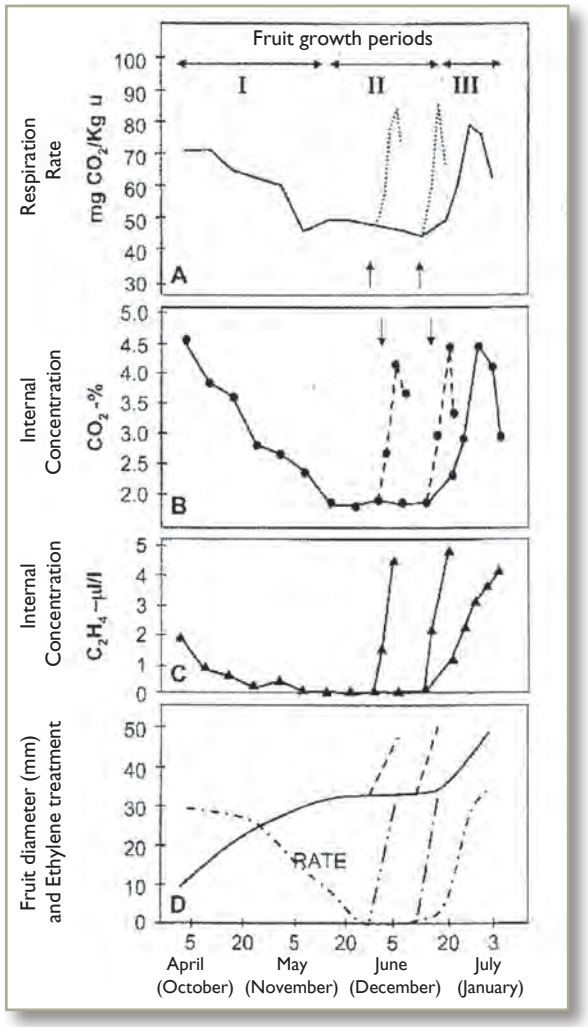
Fruit Physiology

Researchers had been uncertain for a long time whether the fig was a climacteric or non-climacteric fruit (in other words, whether the fruit could continue ripening after harvest or not). American researchers established unequivocally that it was indeed a climacteric fruit, though the respiration rate indicated moderate activity (CO_2 production of 10 mg to 20 mg/kg/hour at 5 °C), and moderate ethylene production (1 µL to 10 µL/kg/hour at 20 °C) (Marei and Crane, 1971).

In addition, the ripening processes in figs are sensitive to the presence of ethylene, but the type of reaction differs, depending on the fruit development stage (Owino *et al.*, 2006). In Growth stage I (cell division), fig fruit growth is inhibited by ethylene, due to the inhibition of cell division, whereas fruit growth is stimulated early in Growth stage II, and both growth and ripening are stimulated in the later part of Growth stage II and in Growth stage III *(Fig. 47)*. In other words, in ripening figs ethylene changes the climacteric character of the double sigmoid growth curve. At the beginning of Growth stage III, or even slightly earlier (climacteric minimum), a rapid increase in ethylene and carbon dioxide (CO_2) production occurs in the fig, and a respiratory peak (climacteric maximum) is reached. At the climacteric minimum the fruit is mature, but not yet ripe, and ripening starts as soon as the respiration rate starts to increase. At the climacteric maximum ethylene still increases, though the fig becomes ready for eating; at the same time CO_2 declines and deterioration due to ageing (overripeness) sets in.

The fig is a highly perishable fruit that is subject to very rapid physiological degradation. The postharvest life of the fruit of certain cultivars is estimated to be seven to ten days, even when

the fruit is stored at low temperatures. The application of ethylene during Stage II of fruit development stimulates both growth and ripening. What is of interest, though, is that in mature, ripe figs the fleshy tissue of the flower axis and the pulp tissue clearly react differently to ethylene (Chessa, 1997, according to Flaishman *et al.*, 2008). This complicates the development of guidelines to determine maturity (ripeness) levels in figs.



Generally, during maturation and ripening on the tree, figs undergo a continuous increase in fruit size and sugar content and colour changes, in conjunction with softening and a decrease in storage potential. After harvest, a rapid decline in firmness and colour changes occur in the fruit, but against expectation, sugar accumulation in the fruit comes to an end. Therefore, figs that have been picked at an unripe stage, never achieve optimum eating quality (Aksoy, according to Flaishman *et al.*, 2008). It can be accepted that the same pattern does not occur in all cultivars; this is indicative of the many inexplicable aspects regarding the physiology of the fig fruit.

Harvest Maturity

It is important to pick figs at the correct stage of ripening.

The quality characteristics used to determine picking and eating maturity of figs are size,

Fig. 48: Autocatalytic production of ethylene and climacteric respiration in figs: Respiration rate (A), carbon dioxide concentration (B), and ethylene concentration (C) in the internal atmosphere of 'Black Mission' figs in relation to their growth (D) and development and to ethylene treatment. The arrows indicate the time of ethylene treatment. Note that the autocatalytic rise in ethylene production is clear in the pre-climacteric figs due to exogenous ethylene treatments. (Source: Marei and Crane (1971), as adapted by Flaishman et al., 2008.)

firmness, skin colour, pulp colour, aroma or flavour (particularly the fig aroma), sugar content and acidity. The loss of fimness and change in skin colour are the easily detectable indicators of ripening. As figs destined for long-distance transport are required to be firm, the fruit is most often harvested at such an immature stage that optimal eating quality is compromised.

For dessert purposes a fully ripened fig has the best eating quality. With such figs the latex will also be less bothersome. Figs can be harvested at a slightly earlier stage (half a day to a full day) and will become fully ripened within a day or two at ambient temperatures. Fully ripened figs in a plastic bag can however be stored in an ordinary refrigerator for up to a week and will become fully edible when stored at ambient temperature for a day or two. Overripe figs are still edible, but are usually too soft for handling, deteriorate very quickly and should not be transported. Fig growers should experiment to establish the ripening stage of each of their cultivars to be able to determine harvesting time, as the ripening patters of figs vary under different conditions.

It is quite dificult for fig pickers to grasp the appropriate maturity standards for picking and they have to be taught a selective approach. Fruit firmness remains the most important measure of picking maturity; skin colour is an inferior additional norm. The *Shore durometer*, which measures firmness, is used in Israel to assist pickers in refining their picking standards. Gloves, a necessity when picking figs, cause further difficulties in the use of firmness as a maturity indicator.

The older figs closer to the shoot base ripen earlier than the younger figs borne towards the tips of the shoots *(Fig. 27)*. All fruit, even those on shoots of 2 m, will ripen in the warmer parts of the Western Cape, though the younger fruit are sometimes smaller than the older fruit. The stalks of fruit borne laterally on the shoots are usually longer than stalks of fruit borne on other parts of the tree. The longer stalk length proves to be a great advantage during harvest.

Fig harvesting in commercial orchards is a comparatively expensive process, as each fruit has to be picked carefully by hand and pickers are exposed to the latex, especially when harvesting green figs for green fig preserve. The irritation caused by the latex to hands and arms calls for the use of gloves, a very unpopular requirement among fig pickers. (The irritation can be remedied to some degree by wearing long-sleeved shirts, rubbing petroleum jelly (e.g., Vaseline) into hands and washing hands regularly with vinegar or spirits.) In home gardens easily replaceable plastic bags can be used instead of gloves. When harvesting full-ripe figs, as required for the local dessert market, fig latex should not create significant difficulties. However, care should be taken not to tear the stalk from the skin of the fruit. This causes rapid decay and renders the figs unmarketable. It sometimes necessitates the use of picking scissors, as in the case of citrus.

'Calimyrna' figs harvested for drying purposes in the USA are allowed to drop to the ground

and are then picked up mechanically. Locally the climatic conditions prevent ripe figs from dropping this easily.

After harvest, figs should be cooled down without delay to ensure maximum shelf-life. According to Flaishman *et al.* (2008), figs can generally be stored for two to four weeks at -1 °C to 2 °C and 90% to 95% relative humidity (RH), depending on the cultivar and the degree of cooling delay after harvest. Certain cultivars, though, still undergo rapid physiological breakdown after seven to eight days, despite cooling. Figs are not sensitive to low, but above-freezing, temperatures and do not suffer cold damage like citrus fruit and bananas. Apparently figs are not yet stored commercially in controlled atmosphere (CA) storage, but proof already exists that levels of 15% to 20% CO_2 improve storage. Sometimes it can be beneficial to store figs for limited periods in suitable plastic bags.

In conclusion, the importance of maintaining the traditional principles for the preservation of figs for the fresh market has to be emphasised. These include selection of suitable cultivars, use of appropriate horticultural practices, harvesting at optimal stage of maturity, and maintaining the cold chain. Currently there is no short cut to prolonging the shelf-life of fresh figs (Flaishman *et al.*, 2008).

Nutritional Value of Fgs

Figs are nutritious and have been a staple food for many people in the Middle East for centuries, along with dates, grapes, olives and nuts. Nutritionists agree that despite cultivar differences, it is beneficial to include figs in the diet, as the fruit can make a reasonable contribution to the recommended daily intake of antioxidants (particularly the purple cultivars), dietary fibre, vitamin B6 and minerals, such as magnesium and manganese. The estimated glycaemic load of the fig is 4. The average nutrient content of 100 g fresh figs (about two large figs) and 100 g dried figs (six to seven figs), as used in the *Food Finder 3* programme by the South African Medical Research Council (MRC), is indicated in Table 2.

Propagating and Re-grafting Fig Trees

Seedling fig trees are only used in a breeding programme to develop new fig cultivars. For commercial cultivation, fig cultivars are propagated vegetatively by means of cuttings. In fig tree cultivation the secret of success is to ensure that a strong root system is established.

The secret of a successful fig tree is to promote a strong root system during this early stage of rooting. Use 2- to 3-year-old hardwood cuttings taken from mature shoots that have already shed their leaves naturally. Cut these into sections of 20 cm to 30 cm, treat the basal part with indole-3-butyric acid (IBA) at 1 000 ppm and plant the

TABLE 2: The nutrient content of fresh and dried figs

	SA '96	USDA '98
	100g fresh figs	100g dried figs
Carbohydrates g	13,5	56,1
Sugars (fructose, sucrose, glucose) g	13,5	56,1
Dietary fibre g	4,1	9,3
Protein g	1,2	3,1
Fat g	0,92	1,2
Energy kJ	353	1209
Vit B6 [Pyridoxine] mg	0,135	0,224
Calsium mg	44	144
Iron mg	0,5	2,2
Magnesium mg	31	59
Potassium mg	237	712
Manganese mcg	122	388

MRC (2012): Correspondence with J Chetty: Registered Dietician for Food Compilation: SA Foods, Nutritional Intervention Unit. PO Box 19070, Tygerberg, 7505

cuttings in a mixure of washed sand and perlite (1:1). Placing cuttings in a bottom-heated mist propagation bed will further promote rooting.

In the nursery, transfer the young trees to 2,5-litre planting bags with suitable soil and a handful of organic fertiliser (such as Bounce Back®), for planting the next winter. Though untreated fig cuttings will also achieve high rooting percentages, an additional season in the nursery is required to ensure a strong enough root system.

Rooted cuttings can also be planted in open ground but the transfer of such trees to the orchard is very detrimental to the roots, resulting in poorer trees than that in planting bags.

Fig trees easily form suckers, which sometimes develop from buds on the tree roots. These suckers can also be used as propagation material, but they tend to produce suckers themselves. However, suckers are troublesome and need to be removed from the fig tree regularly, at great expense. Therefore suckers are not recommended as propagation material for commercial orchards.

Fig trees are usually propagated on their own rootstock. Figs are sensitive to nematode infestation *(Meloidogyne* species), and where this occurs, nematode-resistant rootstocks can be used. In the USA, *F. cocculifolia* or *F. cauliflora* are known to be nematode resistant, and in Israel the North African cultivar 'Zidi' is recommended to manage the situation.

Though never of commercial value, it is possible to graft plant material of other cultivars onto young fig trees or branches of older trees to replace the current bearing wood. Budding (grafting of buds) onto shoots or young branches (*Fig. 50)* should preferably take place in spring as soon as the bark of the trees is slipping. Dormant buds should be used, and bud wood should therefore

be cut early in the winter and kept in plastic bags under cooling, to prevent buds from breaking and drying out. Use T-budding, patch-budding or chip-budding methods, depending on bark conditions. Secure the grafted bud with *Plastrip* and cover the entire budded area with *Parafilm*, like on peach trees (Lötter, 2003).

Limit budding of fig trees to young trees, as the thick bark and latex flow of older trees could reduce the success of budding. Instead, severely cut back such trees and use the young shoots that develop as a result of this in the following year. Cover large wounds with a suitable wound sealant (for instance, ABE treeseal® – pruning grade or grafting grade). Regularly remove unwanted growth after budding.

Diseases of Figs

• Souring

The souring of figs is the most common disorder experienced in home gardens in most parts of the country. Souring, which occurs as soon as the figs start ripening, is caused by fermentation of the sugars in the fruit by yeast fungi, forming alcohol and vinegar. The spores of the yeast fungi *(Sacharomyces* species) and certain mould fungi are

Fig. 49: The Liebenberg fig nursery in the Porterville district, with young fig trees in plastic bags.

common in the atmosphere. Insect vectors such as the vinegar fly (*Drosophila melanogaster*) are responsible for the primary infection. These vectors are contaminated with the fungi, and infect the fruit when entering the fig through the ostiole. Fermentation is promoted by humid to damp conditions, which also decrease the sugar concentration, thereby reducing the preservative effect of the sugar. Therefore, due to low humidity, souring is not a significant problem during the early, dry period of the year in the Western Cape, or in areas with a dry climate, such as the Little Karoo.

In addition, the damp, sour conditions lure the vinegar fly, creating the ideal environment for it to lay its eggs. The vinegar fly takes only six to seven days to complete its life cycle, and a large population of vinegar flies soon develops. Consequently the figs are further infected with fermentation fungi, drastically aggravating souring of the fruit. The vinegar fly is better adapted to cooler than very warm climatic conditions and is therefore not a serious pest in the hot months.

It is difficult to control souring in summer rainfall areas and in the Western Cape, but early orchard sanitation, by regularly removing all ripe and infected or split fruit from the trees as well as the ground, actively limits infection. Cultivars that ripen early, such as 'White Genoa', 'Cape White', 'Kaapse Bruin', 'Deanna' and 'Ephesus', are preferred over for instance the later ripening 'Adams' and 'White Adriatic', which are inevitably exposed to a longer damp period. On the other hand, the likelihood of

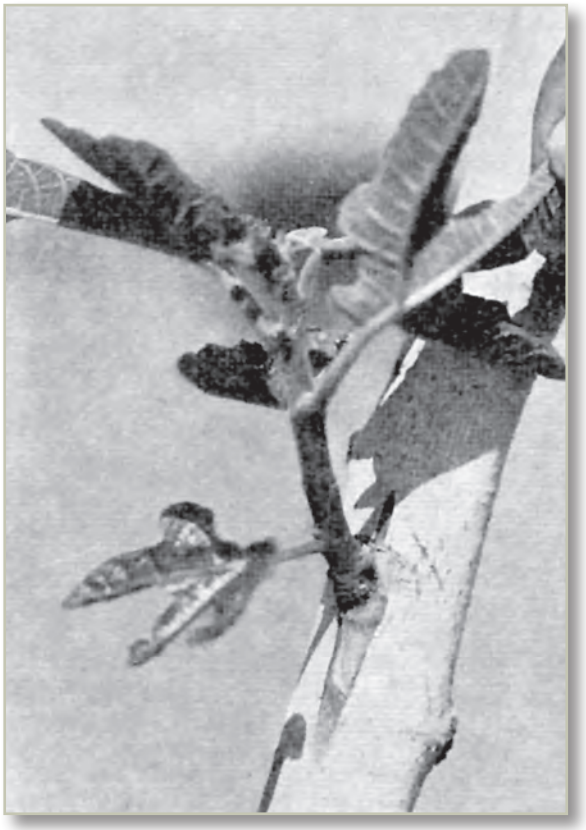


Fig. 50: Though seldom necessary in commercial fig orchards, budding onto shoots or young branches can be done successfully.

infection is very low in 'Kadota' figs, as the ostiole of the fruit is blocked by a sugar drop from early on in the season *(Fig 51)*. It is strongly recommended that this cultivar is considered as a feasible option in the Western Cape.

- Grey Rot (*Botrytis cinerea)*

During the postharvest handling of fresh figs, the fungal disease *Botrytis cinerea* (grey rot) can result in

Fig. 51: 'Kadota' with a drop of syrup.

Fig. 52: Fig mosaic virus infestation.

great losses when the humidity is high. The fungus is transmitted in the orchard by insects, similar to the yeast fungi involved in souring. The disease can be controlled effectively with paper sheets releasing sulphur dioxide (SO_2) in the containers. The use of SO_2 in the handling of table grapes and strawberries and the drying of various fruit kinds is well known in South Africa and should not cause concern when used in figs.

- **Endosepsis (*Fusarium moniliforme*)**

Sometimes endosepsis, decay caused by the fungus *Fusarium moniliforme*, occurs. The fungal spores can be transmitted by any organism that enters the fig through the ostiole. According to Wohlfarter *et al.* (2011), local fig producers suffered extensive endosepsis damage in February 2008 during a cold front, which created favourable damp conditions, where thrips had transmitted the fungus to immature fruit. However, locally endosepsis is less of a concern than abroad, where 'Calimyrna' figs are usually infected by the pollination vector.

- **Rust (*Cerotelium fici*)**

Rust, marked by brown, powdery pimples underneath the fig leaves, is caused by the fungus *Cerotelium fici*, which is distributed by the mite vector *Aceria ficus* (Wohlfarter *et al.,* 2011). When severe, the disease can result in leaf drop. Rust is easily controlled by applying a copper compound* to the trees at bud break and again a month later.

- **Fig Mosaic Virus**

Fig mosaic virus occurs worldwide and is common in South Africa. The disease appears as irregular

patches on the leaves of a few shoots on a tree. Such leaves are often deformed and smaller than normal leaves *(Fig. 52)*. The disease spreads mainly through the use of infected propagation material. Furthermore, certain mites might transmit the virus from infected trees, as happens in the USA (Obenauf *et al.*, 1978), though this has not been proved in South Africa yet. Insects, however, do not act as vectors. To limit the distribution of the disease, only visibly infected shoots have to be removed and propagation material has to be cut from trees that are not infected. Usually the disease does not play an important part in commercial fig cultivation.

Insect Pests of Figs

- Fig Tree Borer (*Phryneta spinator*)

Also known as the longhorn beetle, this indigenous pest of the insect order Coleoptera spread from the northern parts of Africa and the Middle East to Southern Africa many years ago. It now occurs in most parts of South Africa (Wohlfarter *et al.*, 2011) and has reached epidemic proportions in large parts of the Western Cape. It has already killed many fig trees in most home gardens.

Perissinotto *et al.* (2011) stated that an example of the beetle had been found in the Hex River Valley in 1906, but Davis (1911) was the first fruit expert to point out the detrimental effects of this beetle on fig trees. He had to relinquish his experimental fig trees in Warmbad (now Bela-Bela) as a result of fig tree borer infestation, and he described that part of the Waterberg as the central breeding ground of the insect. According to Burger and De Wet (1931) the beetle was still not known in the fruit production regions of the Western Cape in 1931. However, Viljoen (1976) described how a large fig orchard in Tulbagh had to be removed by 1966 because of fig tree borer infestation. It can be accepted that the beetle had also become a pest in other parts of the Western Cape by that time.

Though the fig trees in Karoopoort had not yet been infested with the fig tree borer by 2010, as a result of the remote location of the farm, the borer was already a well-known pest in the vicinity of Prince Albert and Oudtshoorn.

The larvae and beetles of the pest feed on the bark and wooden parts of the fig tree. The larvae *(Fig. 54)* bore into the fig tree trunk, initially close to the ground, into the area underneath the bark where they feed on the soft tissue in the bark. Later they also bore into the wooden parts where they complete their life cycle. As the tree grows older, they infest any part of the tree bark that is thick enough. Infestation is easily observed when the faeces of the larvae, which resembles sawdust, appears on the bark and the ground below.

The female beetle *(Fig. 53)* lays her eggs on the bark of the fig tree in summer and the young larvae appear 10 to 18 days later. They eat into the bark, consuming the soft part of the bark, and later tunnelling into the wood. Larvae become

Fig. 53: The beetle of the fig tree borer **(Phryneta spinator).**

Fig. 54: The larva of the fig tree borer.

fully grown in about 2,7 to 2,8 years. They then move back to below the bark where they pupate and develop into mature beetles in about 89 to 99 days. After mating with the male beetles, the females continue the infestation process (Robertson, 2011).

Although the insects infest weak trees without restraint, vigorous trees are infested just as easily. Though most damage is caused by the larvae, the beetles feed on the bark of the young parts of the shoots, damaging young fruit and leaves and their stalks, which results in malformed fruit that it is unfit for use *(Fig. 56)*.

The indigenous host of the borer is the Cape Willow (*Salix mucronata),* but often the larvae also bore into the trunks of the common willow species, as well as pears and peaches. The beetles frequently feed on the young bark of many other species, for example grape vines and seringa trees. It is strange, though comforting, that the borer has not yet been observed in any of the wild fig species, and determining the reason for this should be an interesting study.

Control of the fig tree borer is not simple. When a commercial fig orchard has been established, any old fig trees in the vicinity – within a radius of 2 km – must be removed before the end of the winter or, even better, burned, especially if infestation has been observed in these trees.

In home gardens the most effective measure is to locate and destroy the larvae at a young stage. The larvae that are still in the bark can be removed with a sharp knife or a chisel. This is time-consuming and often destroys the bark of the tree *(Fig. 55)*. Therefore, the cuts should be limited to vertical wounds where possible, as horizontal wounds heal with greater difficulty than vertical wounds. Locating and destroying the larvae that are already in tunnels in the wood is more difficult and destructive. A piece of wire can

be used to kill the larvae by pushing the wire into the tunnel, or an aerosol or a solution of insecticides can be pumped into the openings with a special pump.

Preventative Control Measures

The important principle is to stop the beetles from laying their eggs on the bark of the tree and to prevent the survival of the young larvae hatching from these eggs. Remove and destroy any fig trees or fig tree stumps in the vicinity of the orchard in time, as these could serve as a possible source of infestation. This also applies to individual, heavily infested trees in the orchard. If the large roots are removed along with the rest of the tree, re-infestation cannot occur. Replace the tree during the next winter with a young tree, and ensure this tree receives ample nutrition and irrigation. Diligently catch and destroy all beetles observed in the vicinity.

As soon as the trees are older than a year, and if beetles are present, apply a broad-spectrum insecticide (for instance Ripcord®) to the stems. Applications are to be made every three weeks from September to April. As the trees age and the bark on the branches grows thicker, applications have to be extended to the scaffold branches as well. Take into account that rain and the use

Fig. 55: Damage to the trunk of a fig tree by the fig tree borer larvae.

Fig. 56: The beetle of the fig borer also damages the tree by feeding on the young shoots and fruit.

of certain irrigation systems could result in spray applications being washed away prematurely.

In the drier Little Karoo the mortality of the young larvae is higher, and application of an insecticide is usually not necessary.

In the case of individual or a small number of trees a fine plastic or wire gauze can be used to protect the trunk from borer infestation. Cover the trunk from the root crown below the soil surface to the level of the scaffold branches above the ground. Cover the bottom part of the gauze with soil and close it at the top to prevent entry of the beetles.

Certain systemic insecticides (such as Koh-i-Nor®) are being evaluated for the treatment of older infested trees. The product is applied by means of flood application and is absorbed by the roots, from where it is distributed in the tree, thereby reaching the larvae. Further investigation is recommended.

- Fig Scale (*Saissetia species*)

Soft fig scale (*Saissetia* spp.) is still to be found in a number of neglected fig plantings in the Western Cape, but the pest is usually controlled by its parasite. Infested trees have been rid of scale successfully with a 4% solution of winter oil* (0,7 L oil emulsion in 18 L of water). Addition of 3 dessert spoons of nicotine sulphate* increased the efficacy of the treatment.

- Mediterranean Black Fig Fly (*Silba adipata*)

Since 2000, many home gardeners in the Western Cape have consulted me about the abnormal (up to 100%) drop of young, immature figs occurring in trees of various cultivars. Internal browning and larvae resembling fruit fly larvae were found in the affected fruit. In 2007 Giliomee established that the Mediterranean black fig fly, *Silba adipata,* the cause of this phenomenon, was a totally new and serious pest of figs in South Africa (Wohlfarter *et al.*, 2011).

This insect is not related to the two common fruit flies (refer to 'Common fruit flies' below). Whereas common fruit flies are lured by the sugar in the fruit, the Mediterranean black fig flies are lured by the fig latex, which is in abundance in young figs. The flies deposit their eggs beneath the scales of the ostiole of young, marble-sized fruit. The larvae feed just below the skin and deeper into the tissue, which initiates ripening prematurely, resulting in fruit drop. Infestation drastically declines as the figs ripen and the latex in the fruit is reduced.

Experience in the Western Cape showed that an application of fenthion* during the first week in December and a follow-up application during the first week in January could provide sufficient control in most cultivars. To protect early figs of 'White Genoa', an additional application during the second half of September would be required. Apparently fenthion is phytotoxic in 'Kadota', and application could result in premature leaf drop, but gamma-cyhalothrin* could be effective.

In Israel black fig fly is also a troublesome pest, and intensive fig plantings there are increasingly covered with nets to safeguard it against the insect. Nets of 17 mesh that provide 15% shade when clean provide ideal protection, also against other insects such as common fruit flies and vinegar fly (Yablowitz *et al.,* 1998). The nets also protect against bird damage and fig tree borers.

Common Fruit Flies

Both the Mediterranean (*Ceratitis capitata)* and Natal (*C. rosa)* fruit flies infest ripe figs, but only cause difficulties when fig trees are planted close to popular hosts, such as stone fruit and guavas, in which poor control measures have been applied and a substantial fruit fly population has consequently developed. Normal fruit fly bait treatments usually control the pest sufficiently. In extreme cases, one fenthion* (for instance Fenthion®) application could be sufficient, and could simultaneously control vinegar fly.

Nematodes

Meloidogyne javanica and *M. incognita* are the most important of all the nematode genera that occur commonly in South Africa and could infest figs (Wohlfarter *et al.*, 2011). These authors reported that nematodes had already caused serious losses in figs in South Africa, especially in figs that had been planted on old vineyard soils in the warmer parts of the country.

Nematode-infested soils are best avoided, and old vineyard and peach soils should therefore be analysed before planting to determine possible nematode infestation. The soil can also be treated, but this is a relatively expensive process. Producers should ensure that the nurseries supplying the fig trees are able to certify that their soils are free of nematodes. The use of nematode-resistant rootstocks can be considered on a small scale: for instance, *Ficus cocculifolia* originally from the USA, or the cultivar 'Zidi', of North African origin.

Thrips

Wohlfarter *et al.* (2011) reported that more than one thrips species had been found in figs in South Africa, and that thrips had already acted as vector for the fungus *Fusarium moniliforme* in figs locally. Though no proof has been established yet, thrips might also contribute to russeting in young figs in the Western Cape. This potentially harmful pest should be monitored regularly.

Bird Damage in Figs

Birds usually damage figs in home gardens and limit themselves to the ripe fruit. The degree of damage varies from year to year and depends on the availability of other food sources, such as grapes, in the vicinity. Birds cause comparatively little damage in commercial orchards and are usually restricted to orchards close to woody areas and to the fig trees closest to the veld.

The following birds have been observed to damage figs: Sparrows (*Passer melanurus),* European starlings (*Sturnus vulgaris),* red-winged starlings (*Onychognathus morio)*, and speckled mousebirds (*Colius striatus)*.

Some fig producers who experience problems with birds use the battery-operated, flashing and rotating triangular mirror system (called the

Meerkat) as deterrent. Home garden owners often achieve success by hanging an obsolete CD in the tree, which has the same effect as the mirrors.

* Note that very few chemical products are currently registered for the control of pests and diseases in figs, and it is not the intention of the author to make recommendations in this regard. Reference made to specific agrochemical active substances is merely for the purpose of recording information available in the industry at this point. Safety (withholding) periods of the intended destination countries should always be taken into account when agrochemical substances are applied.

Fig. 57: The guesthouse at Karoopoort in winter. Before the construction of the railway to Kimberley, the guesthouse with its fig trees in Karoopoort was popular with travellers journeying by coach or cart.

Chapter 4

Fig Plantings in South Africa

Historic Plantings

● The figs of Karoopoort

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Driving through Ceres today, over the Theronsberg to the Ceres Karoo – the main road to Calvinia or Sutherland – one passes an old historic house on the left, at the foot of an interesting, folded mountain range, which is a part of the Watervalsberg. The road, tarmac for some distance, runs about a kilometre alongside an avenue of fig trees on the left of the road, terminating not far from the end of the fig tree avenue in a gateway through the mountain that leads to the wide expanse of the Bokkeveld Karoo (now also called the Ceres Karoo). This is Karoopoort, which played a part in the history of Ceres as the main road to the interior of the country before completion of the railway to Kimberley. Karoopoort is also the divide between the cooler Koue Bokkeveld and the warm, dry Ceres Karoo. Karoopoort lies on the government farm Uitkomst, which is currently leased.

Initially field cornet Martin Bruel, of French descent, lived on the farm. According to Lichtenstein he was running a neat and orderly farm with vineyards and grain fields in 1806. In these early times travellers camped on their own on Uitkomst, having reached the farm by means of the Hex River pass, or returning that way. After the completion of Michells Pass in 1848, the road across the Theronsberg to Karoopoort and into the Ceres Karoo was upgraded to a hard surface, becoming the main road to the interior. This resulted in a huge influx of travellers, mostly fortune hunters involved in the Kimberley diamond diggings, who travelled by mail coach and increasingly used this route. This created a need for accommodation, and the tenant farmer was obliged to provide the travellers with lodging and meals in exchange for payment. According to Dene Smuts and Paul Alberts (1988) it remained the duty of the tenant until 1954. Today the tenant still lives in the original homestead, which is probably at least 200 years old by now (*Fig. 57*).

Dr Henry Lichtenstein, a German medical doctor and naturalist, officially travelled along this route a number of times between 1803 and 1806, sometimes approaching Karoopoort from the south and at other times from the north. In his travel reports Lichtenstein described the quiet and remoteness of the place, but also noted the appeal of the strong stream of fresh water on the farm – a source of refreshment especially to travellers from the warm, dry interior on their way to the Cape – and the lovely oak and poplar trees that grew under irrigation from the stream.

A few years ago the author and the tenant discussed the origin of the fig trees that had been planted next to the stream flowing from the Doring River – the water furrow ran past the house alongside the fig avenue – but the tenant could not shed light on the matter. Trees grown from cuttings of these fig trees indicated that there were more or less equal numbers of 'Adams' and 'Kaapse Bruin' figs. The fig avenue originally consisted of a double row of fig trees and had clearly been planted and maintained by an expert (*Fig. 58, 59* and *60*). Originally the avenue was separated from the road by a neat stone wall constructed from loose stones. Fields, gardens and pastures had probably been established under irrigation in the area between the fig trees and the mountain. A number of pear trees had also been planted among the figs. Judging by the trunk diameter of the remaining stumps, the original fig trees had been cut down many decades after planting and then regrew into the current trees. The trees are estimated to be around 140 years old, and are thought to have been planted around the time of the mail coaches, with the aim to provide fresh or dried figs to the travellers. According to tradition, travellers could help themselves to figs

Fig. 58: The fig tree avenue that runs for about a kilometre along the tarmac road through Karoopoort, as it appeared some time ago.

Fig. 59: Part of the fig tree avenue in Karoopoort with its run-down stone wall between the road and the fig trees.

Fig. 60: The fig tree avenue in Karoopoort in the direction of Ceres.

off the trees. The dry climate prevented figs from spoiling quickly.

The completion of the railway to the interior drastically reduced the traffic through Karoopoort, but years later the arrival of the motorcar (around 1925) partly restored its attraction when the authorities decided to retain and maintain the road as an important route to Sutherland and Carnarvon, as well as Johannesburg.

Motoring associations and the leaders in the Ceres district maintained an interest in Karoopoort with its avenue of fig trees and were responsible for tarring the road running next to the fig tree avenue to prevent trees from becoming covered in dust. In 1988 Dene Smuts and Paul Alberts reported that the fig tree avenue was still in good condition, with the steady stream of water providing for its irrigation.

However, by 2011 neglect had set in. The stone wall was the first to deteriorate and the surroundings lands seemed no longer to be in use. Severe dieback was also noticed in the fig trees and irrigation was apparently not maintained. Furthermore, visitors demonstrated a lack of discipline. On a previous occasion the tenant indicated that the concession allowing everyone to pick figs had had to be terminated, as a few had abused this, stripping the trees of fruit and selling this for own profit in Ceres.

For historical reasons, it would be a great pity if this fig tree avenue had to go to ruin.

Lichtenstein more than once mentioned all the grapes, watermelons and melons, pome and stone fruit, among others cherries, citrus and in particular figs (most of the time in dried form) from the Koue Bokkeveld that had to be transported with great difficulty across the Skurweberge mountain range to Cape Town. He specifically pointed out that the fruit from the Koue Bokkeveld was much tastier than fruit from any other area. Among

others, he mentioned that he had come across a fig tree of which the trunk circumference measured 11 Rhenish feet.

Smuts and Alberts (1988) were aware of a large-scale grape and fig farm on Inverdoorn Estate (Spesbona) in the Ceres Karoo, which was irrigated from a dam supplied by rain water run-off. However, the enterprise later came to an end due to successive periods of drought. Cheetahs are now bred on the farm.

The street figs in Elim

An interesting feature of the Rhenish missionary station Elim, situated in the Overberg between Stanford and Bredasdorp, is the fig trees that had been planted along the streets of the town (*Fig. 61*). The church was founded in 1835, and the community leaders took the initiative to establish fig trees along the streets, two just opposite every house. Apart from being pleasing to the eye, the trees could serve as a valuable source of fruit for the community. Three different cultivars had been

Fig. 61: Fig trees in the streets of Elim.

planted, namely 'White Genoa', 'Adams' and 'Cape White'. After many years of neglect and drought numerous trees have died. A resident disclosed that since Elim turned 150 (the so-called Jubilee in 1985), attempts had been made to plant new trees to replace those that had died, but that the unruly children in the community destroyed these efforts.

Figs in Winterhoek-Wes

The history of Winterhoek, the Viljoen family farm in the Tulbagh district, and the farms into which it had been divided later, reflects the changes experienced in fruit and other cultivation practices over the years. Winterhoek is also the farm where the last large planting of figs had been established.

In 1881 the Viljoens took ownership of the farm Winterhoek, situated north of Tulbagh and comprising around 1 000 morgen. Initially Winterhoek was a stock farming enterprise, but later wine grapes, cereals and small stock were farmed, wine grapes eventually becoming the main crop. The Viljoens made wine in their own cellar and distilled brandy in their own kettle. As was customary on the majority of these old farms, a number of fig trees – 'Adams', 'Cape White' and 'Kaapse Bruin' – had been planted in the Winterhoek farmyard.

Fig. 62: The farm Winterhoek-Wes, family farm of the Viljoens in the Tulbagh district. This photo had been taken after the Second World War and before the earthquake in 1969, which destroyed most of the buildings. Note the 'Cape White' fig orchard beyond the homestead. This was the last big fig tree orchard in Tulbagh, before its removal in 1966.

Albertus Johannes Viljoen (16/09/1867–24/05/1910) and his brother Pieter later divided the farm into two parts; Albertus Viljoen taking possession of Winterhoek-Wes and his brother of Winterhoek-Noord.

Albertus was married to Aletta Margaretha (born Du Toit; 10/02/1873–04/09/1952). She was a cousin of Piet Cillie (Piet California) *(Fig. 9),* the pioneering fruit and fig producer from Wellington.

Albertus and Aletta Viljoen's son, Daniël Albertus Viljoen (03/01/1893–23/071980), recorded a good overview of the farming activities in the Tulbagh valley during his lifetime in his autobiography (Viljoen, 1976). Supplementary information was supplied by his descendants – grandchildren of Daniël Viljoen – who had been born and raised on the farm: Daniël Albertus Viljoen (born 03/07/1949), current owner of the farm Winterhoek-Wes, and Dirk Viljoen (born 25/08/1959), previous owner of Welbedacht, also part of Winterhoek.

When Daniël Viljoen's father died unexpectedly in 1910, the 17-year-old youth had to leave school and assist his mother on the farm Winterhoek-Wes. His mother was of the opinion that advice on tree fruit production had to be sought for the purpose of further expansion of the farm. Consequently she requested her cousin Piet Cillie (Piet California) to visit them and make recommendations. In 1912 he identified land on Winterhoek-Wes that was suitable for growing apricots, prunes, and figs.

Daniël's work on the farm was interrupted for a number of months of mandatory military service during 1914 and 1915 in the former South West Africa (now Namibia) during the First World War (1914 to 1918). Following his return he gradually established orchards on Winterhoek-Wes, including an orchard of 'Cape White' fig trees (*Fig. 62*), which were all bearing by 1920. Tree fruit had been established under dry cultivation, but only the best soils had been selected and each tree had been established in a proper plant hole with farmyard manure. This ensured the development of a sturdy root system, which compensated to some degree for the lack of irrigation water. Weeds were controlled with a disc harrow. No disease or insect control was required. (In the meantime Daniël had married his first love, Maria Magdalena (Malie) Retief (22/03/1889–15/08/1969) in 1917 *(Fig. 63)*.)

Fig. 63: Daniël Albertus (03/01/1893–23/07/1980) and Maria Magdalena (Malie) (neé Retief) (22/03/1889–15/08/1969) Viljoen of the farm Winterhoek-Wes, Tulbagh.

After becoming the owner of Winterhoek-Wes, Daniël Viljoen decided to separate Welbedacht from Winterhoek-Wes to make provision for his descendants. Later, in 1961, he decided to transfer Perdevlei, which contained a steady spring, from Winterhoek-Wes to Welbedacht, which had land suitable for growing a relatively large number of fruit trees. The remaining water was redistributed as well; as a result, rights to the source on Drinkwaterskloof were allocated to Welbedacht, ensuring access to sufficient irrigation water.

The aim of the redistribution of the farms was to divide arable land and irrigation water fairly among the descendants. Though the particulars of the water rights had not been registered in all cases, the honesty of the descendants (up to his grandchildren) and respect for their ancestor ensured that his wishes were honoured and did not cause dispute and discord among the descendants, despite disposal of parts of the land later on.

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Daniël Viljoen was a successful entrepreneur and still regarded the wine industry as the most important farming division. He assisted in the establishment of the cooperative cellar, *Drosdyse Kooperatiewe Wynkelder Bpk*, the administration of which became his calling. Initially tree fruit was produced with varying degrees of success, but fortunately his 'Hanepoot' raisins, which were exported to the USA, ensured their survival. From then on, till after the Second World War, matters improved. The figs were alternately marketed dry or supplied fresh to canning factories for preserves. In 1956 he expanded the fruit orchards on Welbedacht by establishing prunes, 'Goosen' canning peaches and 'Elberta' peaches, at a time the wine industry started to experience difficulties.

Many trees in the 'Cape White' fig orchard on Winterhoek-Wes later suffered severe fig borer damage (p 70), and the orchard eventually became uneconomic. After the 1966 harvest it was removed with considerable difficulty and replaced with 'Kakamas' peaches, which proved to be a greater economic success. Dirk Viljoen related how, even before he went to school, his grandfather had him catch borer beetles in the fig orchard and paid him one cent for two beetles; he said two beetles fitted snugly into a match box!

This fig orchard was probably the last large fig orchard that still existed in the Western Cape. Today the farm is a progressive fruit farm in the possession of the Viljoen descendants.

Frik Lötter (1861–1929) purchases Vredenburg

Frik Lötter was the eldest son of Pieter and Alie Lötter of Stanford, the ancestors of the Ertjiesvlei Lötters. Frik and his family lived in the Duinegrond and Uilenkraals River neighbourhood for many years, trading in property in an attempt to accumulate enough money to improve their circumstances. His ideal was to obtain a farm in the Strandveld outside Stanford, and this became an obsession that his family had to endure.

Then the farm Vredenburg in the Strandveld came onto the market. His granddaughter, Nellie van Dyk (1921–) relates: "The day of the auction, *Oupa* Frik said to *Ouma* Martjie : '…today I am going to buy myself a farm'. And off he went. In the farmyard, close to the homestead on Vredenburg, he settled under an 'Adams' fig tree that day. He had agreed with the auctioneer that he would not bid openly, but every time he cut a notch in the stick in his hand it meant he was going to bid. His eventually won the bid.

Fig 64: The memorable 'Adams' fig tree under which Frik Lötter (1861–1929) from Stanford signed the deed of purchase for his much desired farm Vredenburg in the Strandveld in 1912. In the photo are his descendant Frik Lötter Jr (1965–), the current owner, and his friend.

"Everyone at home was burning with curiosity about what *Oupa* was going to say on his return. But he arrived showing no emotion, and everybody started thinking that he did not buy. But *Ouma*'s curiosity got the better of her and she urged him to tell them who had bought the farm. His modest answer was: 'I don't know, one FP Lötter.' At that there was jubilation in that family as you've never seen before."

The fig tree under which Frik sat while bidding, was regarded as a particularly historic symbol by the Lötter family in Stanford. Nothing was allowed to damage the tree and once special arrangements had to be made to conserve the tree when construction work in the farmyard posed a threat to the survival of the tree. The tree still exists today *(Fig.64)*.

Commercial Fig Plantings

Almost all of the few commercial producers of the traditional fig cultivars are in the Little Karoo, especially Prince Albert. Smaller producers in Oudtshoorn, Prince Albert, Gamkaskloof, Calitzdorp and in the vicinity of Ladismith also produce fresh and dried figs on smallholdings and in home gardens for marketing at farm stalls. Newer, small-scale plantings have been established in Hankey and Stellenbosch, focusing more on fresh fig production and farm-stall sales.

Fig. 65: Dolf Marais in discussion with Dirk Viljoen at a grass-covered drying surface. At the back are the stacks with halved, ripe 'White Genoa' figs that have been set out to dry, following treatment with sulphur dioxide under a tarpaulin. In the front are a number of trays with drying fig paste.

- Dolf Marais and his family farm on Swartbult on the R407 outside Prince Albert, mainly with stud ostriches, pigs and goats (*boerbokke*). He has been planting 'White Genoa' figs for drying purposes since 1970. The plantings are close to his homestead, and drip irrigated with borehole water. Pig manure and a few nitrogen foliar applications provide the necessary nutrition to the trees. Mousebirds and a number of other birds are controlled effectively with shiny, reflective, movable strips *(p. 76)*. Despite many limitations, including slightly saline soils and water, he has managed to grow figs successfully on Swartbult.

  The breba fruit of 'White Genoa' are intended for green fig preserve, and the ripe figs are dried. The ripe fruit are picked in buckets and transported in flat plastic crates to the sorting and packing area. Ripe figs are dried and substandard fruit used in fig paste rolls.

  The high-quality figs are cut lengthwise and placed on their sides on drying trays (fruit are not peeled). The trays are covered with a tarpaulin and the figs are treated with sulphur

Fig. 66: Dolf Marais demonstrates the press with which they press slabs of dried 'White Genoa' figs. In the foreground is one of the stainless steel moulds used in the process.

Fig. 67: On the farm of Dolf Marais in Prince Albert, figs are sorted for grinding into a spreadable pulp (the fruit mincer is in the background).

Fig. 68: Dried figs ready for marketing. At the back are dried fig slabs, which are very popular, and in front two kinds of dried fig spread, each with its own label.

dioxide (SO_2) for 8 hours. Thereafter the figs are placed in the sun on a stretch of kikuju lawn. Cutting the figs in half accelerates drying and simplifies grey mould control.

The substandard fruit are ground to a pulp in a meat mincer. The pulp is spread evenly on wax paper to dry on the drying trays *(Fig. 67)*. Grey rot (*Botrytis cineria)* creates considerable difficulties during the preparation and drying of figs. For this reason, fruit is treated with sulphur dioxide during drying and sodium metabisulphite is used during the preparation of the fig spread (pulp) to control the fungus.

The dried products are kept in a cold store to maintain product quality. Following inspection, the dried figs are pressed into 500 g slabs and covered with attractive wrappers for marketing. Originally the dried figs were pressed into slabs in wooden butter moulds; today this slab-shaped packaging is typical of dried figs produced in the Little Karoo. Marais has designed his own sturdy stainless steel mould, which simplifies pressing of figs under high pressure *(Fig. 66)*. Quite a number

Fig. 69: Pieter Koorts of Weltevreden, Prince Albert, at his 10-year-old 'Adams' fig orchard.

Fig. 70: Packed 'Adams' figs on Weltevreden.

of moulds are required to manage the entire quantity of dried figs, as the compressed fig slab has to remain under pressure for a certain period to maintain its size once the mould is removed. The dried fig spread is cut into squares, which are wrapped in attractive packaging *(Fig. 68)*.

The Marais family takes care of their own product marketing, in a currently still unsaturated market. They intend to extend their fig production in future.

- Pieter Koorts runs the family farm, Weltevrede, in the Prince Albert district *(Fig. 69)*. The farm, which has been in the family since the time of Koorts's great grandfather, is situated about 20 km south of Prince Albert, at the end of the road that turns in the direction of Gamkaskloof at the cemetery in town. However, one cannot enter the Gamkaskloof (called *Die Hel* in

Afrikaans) via this road, as access is prevented by the dam in the Gamka River. The entire valley leading to Weltevrede is home to quite a number of deciduous fruit farms.

Only 'Adams' figs are produced on Weltevrede, though 'Kaapse Bruin' and 'Cape White' figs and other fruit kinds were grown years ago. The farm is well supplied with fresh water for irrigation from the surrounding mountains and has reasonably good soils. The area also serves as a home to small and larger antelope.

The fig trees are planted 7 m x 8 m apart, trained in an open-vase shape and maintained at a limited height. Good care is taken of the trees. Clean tillage is practised and orchards are irrigated by means of a micro-irrigation system.

The figs are harvested from early December (early figs) to May, and the fruit is picked regularly, when well coloured. Figs are packed in attractive single-layer cartons for the fresh market *(Fig. 70)*. Packing is managed with ease by a relatively small staff in a fairly small packing facility. The packed fruit is collected by the purchaser, who distributes it. The subgrade fruit is peeled and dried, and the dried figs are sold above the standard prices to tourists in the Prince Albert fruit stores.

Fruit fly (*Ceratitis capitata)* problems occur late in the season and require control measures.

Fig. 71: Baron Joachim van Plettenberg, Governor at the Cape (May 1774 to February 1785).

The fig borer (*Phryneta spinator*) is present, but is controlled by regularly inspecting the trees and destroying the insects when found. The dry climate ensures that the fig borer does not develop into an unmanageable pest and that vinegar fly *(Drosophila melanogaster*) does not become a problem. Mousebirds can sometimes be troublesome. The most significant difficulty on the farm is the lack of labour, as the farm is quite a distance from social and educational facilities.

Fig. 72: A young 'Evita' fig orchard in the Porterville district.

Fig. 73: A mature 'Evita' fig orchard on Pieter van der Merwe and his son's farm Spera, in Hoeko, Ladismith. The Van der Merwes are descendants of the famous CJ Langenhoven, who grew up on this farm.

Weltevrede lies in a valley that featured in the early history of the Dutch East India Company at the Cape. According to tradition, the area had an historic association with Baron Joachim van Plettenberg *(Fig. 71),* who visited the region in the 18th century. It is possible that he could have been on the farm when he was following the Gamka River to its origin. In September 1778 Van Plettenberg, at that stage the Governor at the Cape, departed for the eastern frontier of the Cape Colony to assess the unrest brewing in that region. After his journey he determined that the Gamka River was to be the border between the Stellenbosch and Graaff-Reinet districts and the Swartberg mountain range separated the two districts from the Swellendam district (Theal, 1890). If the topography of the area is taken into account, one could deduct that he visited the Gamka River and its surroundings on the outward journey, since he stayed at the mouth of the Keurbooms River on his return, naming the area Plettenberg Bay. By November of that year he was back in the Cape.

- The company Alternafruit (Pty) Ltd started the fig export industry in 2002 when the first export cultivars were imported and the first trees planted in 2004. Later Colors Fruit (SA) (Pty) Ltd also joined the fig export market and

Fig. 74: Quality control during the packing of 'Evita' figs in the packing facility on Spera, Hoeko, Ladismith.

Fig. 75: 'Evita' figs packed into punnets on Spera.

Fig. 76: Evita' fig products marketed in Porterville: green fig preserve, chutney, and dried fruit sweets.

today around 150 ha to 170 ha of fig trees have been planted. Production of about 150 tonne (t) export figs per year is expected and the United Kingdom is regarded as the most important market, the other markets being France, the Netherlands and Germany. Volumes of export fruit are expected to increase rapidly to supply an unsaturated overseas market. Most of the fig plantings have been established in the Western Cape, though figs have also been planted in some other parts of the country.

Export figs are limited to the dark purple or black cultivars with strawberry-red pulp. These cultivars, 'Bourjasotte Noire' (the most popular), 'Noire de Caromb', 'Col de Dame Noire' and 'Ronde de Bordeaux', are originally from, the French plant breeder Pierre Baud. The main limitation of these cultivars is their restricted size, which is genetic in nature and not easy to correct with cultivation practices.

The fruit is packed in plastic punnets (*Fig. 75*) and exported by air. Producers pack their own fruit and some now tend to market their produce themselves. A good local market has been established for fruit that cannot be exported, and the local prospects for processed products such as preserve, chutney and fig spreads are promising.

Fig producers currently establish semi-intensive plantings (mainly 5 m x 3.5 m) and restrict the size of the trees by pruning trees back quite severely. At this stage they hope to achieve a pack-out of 10 t/ha to16 t/ha, and a conservatively calculated revenue of R30/kg.

In comparison with the deciduous fruit industry, the fig industry is still small and somewhat disorganised. It would be to the advantage of fig producers to join forces and establish an association that would allow them to become part of HORTGRO, as this would enable them to benefit from existing collective research and advisory opportunities and actions.

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Fig. 77: A variety of fresh figs.

Chapter 5

Fig Cultivars in South Africa

Introduction

The identification of fig cultivars is extremely difficult, as each cultivar has numerous synonyms; many have dozens and some even hundreds of synonyms. This is because so many cultivars have been cultivated in various countries for years, and the different languages very often intensified the confusion. Sometimes certain cultivars are marketed under the name of a synonym, for instance in South Africa 'Bourjasotte Noire' is marketed as 'Evita' or 'Great Parisian'. Additionally, climatic conditions influence the shape and colour intensity of both the skin and the pulp of the fruit. For information from abroad, the highly respected thesis of Condit (1955) was used and supplemented with information available on the internet. Reliable local information on fig cultivars is limited, and Davis (1928), as well as popular publications by Macowan and Pillans (1896), Burger and De Wet (1931), Reinecke (1927), and Du Preez (1958) were used as a guide. This included the photographs Daneel du Preez left the author when he retired and which were subsequently published (Lötter, 1973).

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As a researcher at the Fruit and Fruit Technology Research Institute (FFTRI), Du Preez *(Fig. 78)* obtained his information from an experimental orchard of fig cultivars that had been

Fig. 78: Daneel du Preez was responsible for the fig cultivar orchard on the WPFRS experimental farm Bien Donné, as long as it existed, and compiled the first descriptions of the characteristics of the cultivars (Lötter, 1973).

Fig 79: Rassie van Zyl with the author at a dinner in Turkey in 1997.

Fig. 80: Philip Botma, who took over the responsibility for fig research at the FFTRI from Rassie Van Zyl. Today he is a Director of Alternafruit (Pty) Ltd.

established on the original FFTRI research farm, Bien Donné. This orchard was later removed.

In 1980 a fig cultivar plot had been established on the experimental farm of the FFTRI in Citrusdal, where various new cultivars from abroad were planted to compare their performance with that of local cultivars. EJ (Rassie) van Zyl, technician at the Department of Pomology at the FFTRI *(Fig. 79)*, was responsible for this experimental orchard. Sadly, this orchard went to ruin when the farm was sold shortly after 1994.

In 2002 Philip Botma *(Fig. 80)* succeeded Van Zyl as research official of the ARC-Infruitec (previously FFTRI), assuming responsibility for the research on figs. Van Zyl passed away untimely in 2005. Botma in turn established a new experimental block on Bien Donné with plant material of fig cultivars from the Citrusdal farm he had managed to conserve. However, this orchard has also been destroyed.

Fortunately, acting on the advice of Van Zyl, Bennie Visser, at that point manager of the experimental farm of the Department of Agriculture in Oudtshoorn, established a fig planting in Oudtshoorn on 14 Augustus 2000, using trees that had been propagated from plant material taken from cultivars on the Citrusdal experimental farm. This block of fig cultivars is maintained in a good condition and is the only official experimental fig cultivar orchard in the country today *(Fig. 81)*. No production records exist for any of the fig cultivars, except those gathered by Van Zyl for the

Fig. 81: The experimental fig cultivar orchard on the Oudtshoorn Experimental Farm. This orchard was planted on 14 Augustus 2000 by the manager at the time, Bennie Visser, using propagation material from the ARC experimental farm in Citrusdal. Today it is the only fig cultivar experimental orchard in the country.

cultivars planted on the ARC experimental farm in Citrusdal in 1980 (Table 3).

Botma (now with Alternafruit (Pty) Ltd) and Keith Wilson (Colors Fruit (SA) (Pty) Ltd) supplied information on the origin and characteristics of the dark blue fig cultivars that have been planted for the export market since 2004. Wilson provided a copy of the book by Pierre Baud *et al.* (2005), *Figues*, from which a large amount of previously unknown information about different fig cultivars was obtained.

The original local names of the cultivars (e.g., 'Cape White' fig) are used and the new names are indicated as synonyms.

It is certain that no new fig cultivars originated in South Africa. Therefore, 'Eva' and 'Cape Black' must have come from abroad at a very early stage. With the exception of a few 'Calimyrna' and later 'Zidi' cultivars, fig cultivars in South Africa have always set parthenocarpically and have produced no seeds that could germinate and give rise to seedlings from which possible new cultivars could be selected – until about 30 to 40 years ago,

TABLE 3. Harvest records (average per year, full-bearing trees) of new fig cultivars on the research farm of the ARC Infruitec in Citrusdal, 1990 (according to Rassie van Zyl).

Cultivar	Yield (kg/tree)	Yield (Ton/ha)	Mass (g)/fruit/cm	Trunk circumference (mm)
Tree age: 10th leaf:				
'Kadota'	23,5	15,7	50,3	780
'White Genoa'	22,6	15,1	72,5	494
'Calimyrna'	16,5	11,0	75,0	386
Tree age: 7th leaf :				
'Tena'	12,1	8,1	40,0	364
'Black Mission'	6,8	4,5	28,4	288
'Conadria'	3,5	2,3	33,8	232
'Ephesus' (syn.278/83)	20,6	13,7	88,7	675
'Excell'	15,2	10,1	67,5	375
'Deanna'	59,0	39,3	105,5	1265
'Kadota'	24,3	16,2	50,0	539

Note: The data above should not be viewed as absolute figures, but the comparative values can provide useful information. This includes the yield per tonne, as the planting distances have not been specified.

when fig seedlings started appearing in certain municipal areas in the Western Cape (which have comparatively large fig tree populations). Unquestionably, these seedlings have been derived from seeds of dried 'Smyrna' type figs that are imported annually from Turkey. These figs contain germinable seeds.

Similar to the 'Capri' figs that have been selected from the fig seedlings in Turkey, 'Capri' fig-type seedlings most certainly also developed here to provide a habitat to the pollinating wasp and pollen for pollination. The pollinating wasp *(Blastophaga psenes)* has recently been identified in fig trees in Stellenbosch. Proof that caprification takes place in South Africa is to be found in the germinable seeds in the fruit produced by an 'Ephesus' tree and the higher than average set observed in 'Calimyrna' figs in Stellenbosch. It has been suggested that the regular crops seen in a few 'Calimyrna' and 'Zidi' cultivars in different parts of the Western Cape and Oudtshoorn are the result of coincidental caprification.

Large numbers of the seedlings in the Western Cape produce fruit that cannot ripen and will eventually drop, but which can be harvested at the right stage of development for green fig preserve.

It was not widely known that the green fig preserve champion at the annual Goodwood Agricultural Show in Cape Town (Myra Punt) prepared the winning preserve from such a seedling selection for a few years running.

Fig Cultivars known in South Africa

(Note that fig size is indicated in centimetre in this section.)

- 'Adams' (Davis, 1928; Lötter, 1973)

Origin: Its origin is unknown, but the cultivar was possibly imported from England. 'Adams' is one of the oldest known fig cultivars in South Africa and the earliest text referring to 'Adams' is that of Golding in 1885 (Wallace, 1896).

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Size and shape: The fig is medium to large in size. It is broad-turbinate, with a neck and a prominent medium-long stalk. The ostiole is fairly big, with grey scales (bracts).

Colour: The fruit skin is purple with darker ribs and the pulp is dark red when ripe. The fruit ripens late.

General: The tree is a strong, upright grower. The fruit has good eating quality and can be dried successfully, but from a commercial perspective, dried figs of a lighter colour are preferred. The fruit is prone to splitting due to dew or rain, particularly the late fruit. 'Adams' fig is easily confused with 'Black Genoa', but the latter is harvested two weeks earlier. 'Black Genoa' crop is larger and the fruit usually flatter than that of 'Adams'. The seeds in the 'Adams' fruit are smaller than those found in 'Black Genoa' *(Fig. 83)*.

Fig. 82: 'Adams'.

Fig. 83: The shapes of the 'Adams' and 'Black Genoa' cultivars sometimes cause confusion, as both these shapes can be found in both cultivars. However, the fruit shape on the left occurs predominantly in 'Black Genoa' and the shape on the right mainly in 'Adams'.

Fig. 84: 'Black Genoa'.

- 'Black Genoa' (syn. San Piero. MacOwan and Pillans (1886) mistook 'Genoa' for 'Geneva'.) (Lötter, 1973)

Origin: 'Black Genoa' has been in South Africa as long as 'Adams' has. Condit (1955) determined that this cultivar reached the USA from Italy, via England, under the name 'Negro Largo'. It can be accepted that the 'Negro Largo' mentioned by Davis (1928) is 'Black Genoa' and that it reached South Africa in the same manner as the USA.

Size and shape: The fruit size is medium to large. The fig is fairly broad at the bottom with a short, sometimes slightly slanted neck and a very short to medium-long stalk, and a large ostiole.

Colour: The skin of the fruit is reddish-black with slightly darker ribs. The pulp is dark red with large seeds.

General: The cultivar is often confused with 'Adams'. The tree is a heavy bearer. Fruit is harvested mid-season and become very soft when overripe, but it is an exceptional fruit for the home garden.

- 'Black Mission' (syn. Mission; Franciscana) (Condit, 1955; Lötter, 1973)

Origin: This is the first fig cultivar the Spanish clerics brought from Spain to the mission stations in California. It became an important cultivar in California, but was imported into South Africa only at the end of the twenties of the previous century.

Size and shape: The fruit is medium sized and pear shaped with a fleshy stalk.

Colour: The fruit skin is purple to black and the pulp colour is strawberry to red.

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General: The fruit is harvested late mid-season, and

Fig. 85: 'Black Mission'.

has a prominent fig taste. In the USA fruit is both dried and marketed fresh. Trees can become very large.

- 'Calimyrna' (syn. 'Lob Injir', 'Sari Lop' (Condit, 1955; Lötter, 1973)

Fig. 86: 'Calimyrna'.

Origin: The cultivar is a selection of the white fig cultivar ('Sari Lop') called 'Smyrna' in Turkey, and was named 'Calimyrna' in the USA in 1882. The fig cultivar was imported into South Africa from California at the beginning of the 20th century, through the agency of Piet Cillie (Piet California).

Size and shape: The fruit is large, fairly flat, with a fleshy neck and stalk. The skin is slightly ribbed and the ostiole is large. The fruit has big, germinable seeds.

Colour: The skin is greenish-yellow and the pulp is straw coloured.

General: It is the most popular dried fig in both Turkey and California. To set commercial crops, caprification – and therefore also the presence of 'Capri' figs and the wasp *Blastophaga psenis* – is required. Due to the inconvenience associated with pollination, 'Calimyrna' is not recommended for commercial farming in South Africa.

- Cape White (syn. 'Blanche') (Lötter, 1973)

Fig. 87: 'Cape White' fig.

Origin: It is a French fig, which reached the Cape of Good Hope through England, and is estimated to have been in South Africa as long as 'Adams' has. According to Golding (Wallace, 1896) the "….very sweet early green fig…" was commonly planted with 'Adams' in 1885. Condit (1955)

confirmed that the cultivar 'Cape White' was similar to Californian 'Blanche'. Davis (1910) called it 'White Marseilles', which was, according to Condit (1955), also synonymous with 'Blanche'.

Size and shape: The fruit is moderately small and flat, with a short, fleshy stalk. The ostiole is small with straw-coloured scales.

Colour: The skin is greenish-yellow and the pulp is straw coloured to slightly pink (in cooler regions).

General: The seeds are small and sweet tasting. Fruit is harvested early to mid-season. It is a popular fig for preserve. The tree is a good bearer and can grow large when cultivated in good soils. The oldest 'Cape White' fig tree is in Jonkershoek, Stellenbosch, and is more than 100 years old.

- 'Castle Kennedy' (Condit, 1955; Lötter, 1973)

Origin: The cultivar is from England, but reached South Africa by way of California, with the assistance of Piet California.

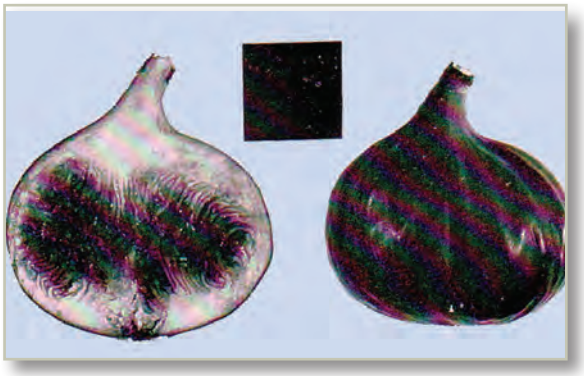

Fig. 88: 'Castle Kennedy'. The square is 20 mm x 20 mm.

Size and shape: The fruit is large, rather flat in shape, similar to 'Calimyrna', and has a fleshy stalk and large ostiole.

Colour: Skin colour is greenish-brown, with darker ribs, and it is white speckled. The pulp of the fruit is light pink.

General: Fruit is harvested mid-season. The tree is a weak grower, but bears tasty early figs that set parthenocarpically. The second crop requires caprification and is therefore of no commercial value in South Africa, due to the pollination requirements. Not a single living tree could be located; therefore no fruit was available to photograph.

- 'Eva' (syn. 'Black Sugar') (Lötter, 1973)

Fig. 89: 'Eva'.

Origin: This cultivar is known only in South Africa, but its origin is unknown.

Size and shape: The fruit is very small (though larger than the 'Cape Black' fig), egg-shaped (ovate), and without a neck. It has a short, though noticeable stalk. The ostiole is medium sized with dull grey-red scales.

Colour: The skin is greenish-purple, sometimes with small white flecks. The pulp is straw coloured.

General: Harvest time is early to mid-season. The fruit is sweet. The tree is a weak grower. The cultivar has little commercial value, but can be planted as an ornamental tree in home gardens.

- 'Kadota' (syn. 'Dottato') (Condit, 1955; Lötter, 1973)

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Origin: This is a very old Italian cultivar, which reached South Africa by way of the USA at the end of the twenties of the previous century.

Size and shape: The cultivar bears small to medium-sized fruit. The fruit is short and egg-shaped (ovate), with a prominent, fleshy stalk. The ostiole is medium to large with light brown scales and is usually blocked by a drop of syrup when the fruit is ripe *(Fig. 51)*.

Colour: The skin of the fig is light greenish-yellow, sometimes with a few white flecks. The pulp is straw coloured, and sometimes slightly yellow-pink in cooler areas.

General: The cultivar is a heavy bearer. The fruit is very sweet and is eaten and processed with its skin. Harvest time of figs intended for jam is early mid-season. It is popular worldwide for jam, green fig preserve, and canning (USA), and in Italy, California, Israel and Chile also as a dried fig. It is well adapted to South Africa. Trees grow vigorously and the long shoots require special attention during pruning.

Fig. 90: 'Kadota'.

- 'New Brunswick' (syn. 'Brunswick', 'Greef's Black'; 'St. 'Domingo') (Condit, 1955; Lötter, 1973; Baud, 2006)

Origin: The origin of the cultivar is unknown, but it was also introduced into South Africa at the end of the 19th century as a result of Piet California's involvement.

Size and shape: The cultivar bears medium-sized, pear-shaped (pyriform) fruit with a fleshy neck and a short stalk. The ostiole is moderately small and surrounded by reddish-brown scales.

Fig. 91: 'New Brunswick'.

Fig. 92: 'Cape Black' fig.

Colour: The skin colour is brown with darker ribs. The pulp is a light, diluted straw colour. The seeds are small.

General: The fruit has a neutral taste and ripens early to mid-season. It is a good bearer and vigorous grower. It has never been cultivated commercially in South Africa, but is present in the fig cultivar orchard in Oudtshoorn. It was also known as 'Magnolia' and 'Madonna' in the USA.

- *'Cape Black' (syn. 'Black Berry') (Lötter, 1973)*

Origin: This cultivar is known only in South Africa, and has been cultivated in home gardens for years. According to Wallace (1896), Golding referred to it in 1885 as a small, black, early fig, which was widely planted. In the Northern Cape it is known by its Afrikaans name, "koffievy".

Size and shape: The fruit is very small (smaller than 'Eva'), round, with a short, fleshy stalk. The ostiole is small and surrounded by black scales.

Colour: The skin is purplish-black with a few flecks, and the pulp is a dark-straw flesh colour.

General: The cultivar is a heavy bearer. By 1927 it was regarded as the fourth most important fig cultivar established in the country, though producers could possibly have mistaken 'Black Genoa' for 'Cape Black' in the tree census. When the fruit is ripe, it does not easily drop from the tree. The fruit is sweet and popular for jam and a dark coloured green fig preserve. It can be eaten and processed with the peel. The tree is a medium-weak grower. The cultivar has always been popular for the home garden, and it ripens earlier than any other cultivar. Like 'Eva', it can be planted as an ornamental tree in gardens.

- ‘Tyger’ fig (syn. ‘Panache’, ‘Bourjasotte Panache)’ (Condit, 1955; Lötter, 1973; Baud *et al*., 2005)

Fig. 93: ‘Tiger’ fig.

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Origin: The cultivar was derived from a mutation of ‘Col. De Signora Blanca’ in Europe and imported into South Africa from the USA in the early 20th century, through the involvement of Piet California.

Size and shape: The fruit is medium-sized, reasonably flat, with a perceptible, fleshy neck and short stalk. The ostiole is large, with dull red scales.

Colour: The skin has attractive alternating yellow and green bands and the pulp is reddish-pink.

General: The fruit ripens mid-season. The tree is a good bearer, but the fruit quality is only moderate to poor, and therefore it is merely an appealing fruit for the home garden. Sometimes the chimera (mutation) reverts back to the parent that bears completely yellow fruit.

- ‘White Adriatic’ (syn. ‘Adriatic’; ‘Verdone’) (Condit, 1955; Lötter, 1973)

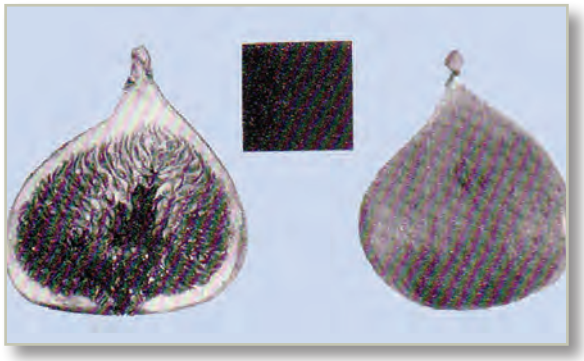

Fig. 94: ‘White Adriatic’. The square is 20 mm x 20 mm.

Origin: The cultivar is of Italian origin and was imported into California in 1865. It was brought to South Africa as a result of Piet California’s intervention, following his visit to the USA.

Size and shape: The tree bears medium to large fruit that are slightly oblique-turbinate, with a short neck. The ostiole is small and surrounded by light red scales.

Colour: The skin is greenish-yellow, with dark green ribs and white flecks. The pulp is dark pink in warmer parts of the country and red in cooler areas.

General: The tree is a fairly vigorous grower, but not as vigorous as ‘Adams’. The fruit is harvested mid- to late season, and is therefore especially prone to fungal diseases in the Western Cape. It is a high-quality dried and fresh fig in the Little Karoo. This cultivar was popular in America as a dried fig, until it was replaced by the higher quality

'Calimyrna' fig. 'White Adriatic' was grown locally (in Wellington) by Piet California for drying, but due to the influence of the inconsistent climate on the late harvest, he could not maintain the required quality standards. In the 1927 tree census it was the second most important fig cultivar in the country, but by 1950 producers had lost all interest in it. (No fruit was available to be photographed.)

- 'White Genoa' (syn. 'Genoa') (Condit, 1955; Lötter, 1973)

Origin: The cultivar was described in England as far back as 1768. Locally Wallace (1896) mentioned "… the large white Italian …" fig that was synonymous with "… the 'White Marseilles'…", which were "…steadily making their way into the public favour." The cultivar was probably brought to South Africa from California in 1893, through the involvement of Piet California. If not, it could probably have reached South Africa even earlier.

Size and shape: The fruit is inverted egg-shaped (ovate) with a thick neck and short stalk. The figs are medium to large. The ostiole is small and surrounded with pinkish scales.

Colour: The skin is yellowish-green and the pulp pink-straw coloured.

General: 'White Genoa' ripens relatively early to mid-season and is harvested in the drier time of the year. It is popular for its green fig preserve from breba figs and ripe fig jam from the main crop. Of all the cultivars grown locally, 'White Genoa' is the only cultivar that bears a breba (early) crop of up to 10% in South Africa. As green fig preserve was

Fig. 95: White Genoa.

made from the breba figs at a time when canning factories could not obtain much other fruit to process, producers had been encouraged to plant 'White Genoa'. Since the twenties it was the most important fig cultivar in South Africa. If it had not produced early figs, it would never have been as popular, as the quality and the yield were inferior to that of the newer cultivars, such as 'Ephesus' and 'Deanna' (Table 3). Also, it became known that any immature fig could be used for green fig preserve, as long as the fruit is of the correct size and firmness. For these reasons, better cultivars can replace 'White Genoa', unless the breba figs can be marketed as fresh figs.

- 'Deanna'

Origin: This cultivar originated with 'Ephesus' from the 'Calimyrna' line in a breeding programme of Condit at the University of California in the nineties. It was imported by the ARC-Infruitec in Stellenbosch and established in Citrusdal.

Size and shape: It yields a significant percentage of very large, fairly flat fruit with a short, fleshy stalk. The smaller fruit are not as flat, and are longer than they are broad, with fleshy stalks. The ostiole is very large with straw-coloured scales.

Colour: The skin is light green to yellow when the fruit is ready for picking, and later turns bright yellow. The pulp is a uniform, light straw colour.

General: The name of this cultivar refers to the mythical Roman goddess Diana, who was equated with Artemis, the goddess of fertility of Ephesus in Turkey *(Fig. 97)*. 'Deanna' fig trees are vigorous growers and are particularly fertile, hence the name of the cultivar. In preliminary trials in Citrusdal it produced three times the mass produced by 'White Genoa' (Table 3). It is an excellent dessert fruit, it is unequalled as a fruit for the home garden, and it is suitable for preserves and drying in the dry areas. According to Flaishman *et al.* (2008), researchers in India found that 'Deanna' produced a very large crop, was the best fig for drying, had excellent eating quality and had a good storage life. In the Western Cape, however, special provision needs to be made for orchard sanitation to control vinegar flies and *Botrytis*.

Fig. 96: 'Deanna'.

Fig. 97: The goddess Artemis of Ephesus, the fertility goddess equated with the Roman goddess Diana, who gave rise to the name 'Deanna'.

- ‘Ephesus’ (syn. 278-83)

Fig. 98: ‘Ephesus’.

Origin: This cultivar is from the same breeding stock as ‘Deanna’.

Size and shape: The fruit is large, top-shaped (turbinate), longer than it is wide, with a fleshy stalk like ‘Deanna’. Unlike ‘Deanna’, the cultivar does not bear very large fruit.

Colour: The skin and pulp colour is identical to that of ‘Deanna’: light green to yellow skin, which turns light yellow when eat-ripe; the pulp is a uniform, light straw colour.

General: The appearance of the tree and fruit is similar to ‘Deanna’. However, the crop is smaller than that of ‘Deanna’, though larger than the ‘White Genoa’ crop (Table 3). ‘Ephesus’ figs are used in the same manner as ‘Deanna’.

- ‘Zidi’ (Condit, 1955; Flaishman *et al.*, 2008)

Fig. 99: ‘Zidi’.

Origin: This cultivar is of Tunisian origin, and arrived in South Africa around 1980, via Israel.

Size and shape: The pollinated fruit is medium-large, flat egg-shaped (ovate), with a fleshy neck.

Colour: The skin is dark purple and the pulp is dark red.

General: The tree is a vigorous grower, and has exceptionally large leaves. The cultivar requires caprification and is not recommended for fruit production. Its actual value lies in its high resistance against nematodes (*Meloidogyne incognita*) and it can be used as a rootstock.

- ‘Brown Turkey’ (syn. ‘California Brown Turkey’) (Condit, 1955; Baud *et al*., 2005)

Fig. 100: ‘Brown Turkey’.

Origin: Davis (1928) believed that the cultivar was already known in South Africa before Piet California travelled to California in 1893. It probably reached the country by way of the USA.

Size and shape: The tree bears large, egg-shaped (ovate) fruit.

Colour: The skin is light brownish-violet, and the pulp is a dark strawberry colour.

General: The fig ripens late (later than ‘Adams’) and is sensitive to the cold, according to information from the USA. It is more resistant to splitting than ‘Black Genoa’ and ‘Adams’. The cultivar tends to grow vigorously (Flaishman, 2008). It is popular as a fresh fig in well-known fig-producing countries, such as the USA, Turkey and Israel. The latter also markets it as a fresh fruit in Europe. On the farm Lens, in Franschhoek, there is a ‘Brown Turkey’ tree of around 100 years old.

- Capri 1, 11 en 111

Origin: In the USA there are certain seedling selections that are originally from Turkey. In 1912 these selections were imported from California by Elsenburg Agricultural College, together with the wasp *Blastophaga psenes*. Later the ‘Capri’ figs ‘Roeding No. 3’ and ‘Stanford’ were also imported from the USA.

General: The small ‘Capri’ fig fruit is used only for the pollination (caprification) of cultivars such as ‘Smyrna’ and ‘Calimyrna’, as the fruit lacks eating quality (*Fig. 46*).

- ‘Kaapse Bruin’ Fig (syn. ‘Osborn’s Prolific’)

Origin: This cultivar was most probably imported as ‘Osborn’s Prolific’ from England (Davis, 1928). The cultivar ‘Osborne’s Prolific’ discussed by Condit (1955) and mentioned in *Ray’s Figs* (2004) is one and the same. Davis (1911) also refers to it as ‘de gewone Bruinvijg’ (the common brown fig). According to Wallace (1896), Golding mentioned in 1885 that the ‘common brown fig’ was commonly planted.

Size and shape: It is a medium-large, egg-shaped (ovate) fruit. The fruit is distinctly ribbed when immature, but this disappears as the fig ripens. It has a characteristically long stalk.

Colour: The skin is uniformly brown, and the straw-coloured pulp turns pink when the fruit has fully ripened.

General: Fruit ripens early to mid-season. This is one of oldest figs in the country, and is popular for eating

Fig. 102: 'Kaapse Bruin' fig.

Fig. 103: 'Bourjasotte Noire'.

and making jam when fully ripe. The tree bears a light breba crop in South Africa. It is does not grow very vigorously and the tree remains fairly small. The fig tree avenue at Karoopoort consists of the 'Cape Brown' fig, along with 'Adams'.

- 'Bourjasotte Noire' (syn. 'Barnissotte', 'Evita', 'Great Parisian') (Baud *et al.*, 2005)

Origin: The fig has been cultivated since the earliest times in Spain (the town Bourjasotte), Italy and France. According to Condit (1955), the Roman writer Pliny described this as one of the best figs, referring to it as 'Fico Africano'. Condit also mentioned that the fruit of a fig by the name of 'Negro Largo' did not differ from those of 'Barnissotte', but the description of the fig referred to as 'Negro Largo' by Davis (1928), differed markedly from the former, and this was not the same fig. 'Bourjasotte Noire' was imported by the fruit trading organisation Alternafruit (Pty) Ltd from the plant breeder Pierre Baud in France in 2002. It is produced and marketed under the names 'Evita' and 'Great Parisian' (Colorsfruits (Pty) Ltd).

Size and shape: The fruit is medium-large to smallish (about 50 g), and earns good prices, but the market still prefers larger fruit. The fruit is slightly flat, with a small ostiole and a short, fleshy stalk.

Colour: The skin is dark purple with a few white flecks. The pulp is red to dark red.

General: The fresh fruit is popular in the European niche markets, and also has a fairly good local niche as a jam, chutney and fresh fig. The tree is open and a reasonably vigorous grower. The untopped shoots are inclined to be drooping.

- ‘Noire de Caromb’ (syn. Violette Perruquine; Southern Black) (Baud *et al.*, 2005; Eisen, according to Gerber, 2010)

Fig. 104: ‘Noire de Caromb’.

Origin: The cultivar is well-known and particularly popular in Nice, France. It was imported by Alternafruit (Pty) Ltd from Pierre Baud in France in 2002 and is grown and marketed in South Africa as ‘Southern Black’.

Size and shape: It is the same size as ‘Evita’, but more elongated-pyriform (pear-shaped).

Colour: The skin is a reddish-violet colour and the pulp is red.

General: It is marketed similar to ‘Evita’, but is not as popular with producers. Trees do not grow as vigorously as ‘Col de Dame’, but are more vigorous than ‘Bourjasotte Noire’. It regularly bears breba figs, though not in large numbers.

- ‘Col de Dame Noir’ (syn. ‘Col de Signora Negra’; ‘King’) (Baud *et al.*, 2005; Condit, 1955)

Fig. 105: ‘Col de Dame Noire’.

Origin: The cultivar was imported by Alternafruit (Pty) Ltd from Pierre Baud in France in 2002 and is grown and marketed in South Africa as ‘King’. There is no relationship between this fig and the cultivar ‘King’ that had been imported from California in the past, but was never cultivated commercially.

Size and shape: The fig is medium-sized (45 g) and round-oval in shape. It has a short, fleshy neck and short stalk.

Colour: The skin is dark violet and has slightly raised ridges. The ostiole is small with dark red scales. The pulp is dark red and surrounded by a white border just below the skin.

General: The cultivar ripens later than 'Evita' and 'Southern Black', and even later than 'Adams'. The fruit is relatively resistant to splitting and souring. The ripe fruit tends to develop shallow cracks in the skin, but is of high quality, though sensitive to injury during handling. The tree is a very vigorous grower, upright, compact and large.

- 'Ronde de Bordeaux' (Baud *et al.*, 2005)

Fig. 106: 'Ronde de Bordeaux'.

Origin: The cultivar was imported by the fruit export company Colors Fruit (SA) (Pty) Ltd, and was obtained from the collection of Pierre Baud in France.

Size and shape: It is a very small, round fig with a fleshy stalk.

Colour: It has a dark, black skin and pink pulp, and a very sweet taste.

General: Due to the small size of the fruit, it has very little commercial value.

- 'Noire de Barbentane' (syn. 'Goedhalsvy'). (Baud *et al.*, 2005)

Fig. 107: 'Noire de Barbentane'.

Origin: This cultivar is part of the collection of Pierre Baud in France and has been grown in France for generations. The massive fig tree on the residential property of Mr and Ms Goedhals in Stellenbosch (Buitekring 38), is more than 100 years old, and has been identified as 'Noire de Barbentane' by Keith Wilson. It is the only known tree of this cultivar in South Africa.

Size and shape: The fruit is the same size as that of 'Evita', round, with a short, fleshy stalk.

Colour: The skin is dark violet with flecks and the pulp has an attractive strawberry colour and a white border below the skin.

General: The fig has a pleasant taste. Fruit ripen mid-season and do not split as severely as other figs. It has been suggested that the 'Goedhals' tree

Fig. 108: The 'Noire de Barbentane' tree in Stellenbosch is more than 100 years old.

was planted on the original farm that bordered on the historic farm of Rhodes Fruit Farms, Vredenburg (now the Stellenbosch residential area Die Boord). The tree is most probably from the nursery Harry Pickstone had on the farm (*p. 12*). This theory is supported by the discovery of another fig tree bearing similar dark blue figs with red pulp, in the same neighbourhood (about 2 km further in the veld against the Helderberg mountain). The tree is very old, tall and rather overgrown by pines and other trees. It could be that the size of the figs resulted in a negative perception about the cultivar and prevented the planting of more of these trees.

- 'Col. Di Signora Bianca' (syn. 'Col. De Dame') (Davis, 1928; Condit, 1955; Lötter, 1973)

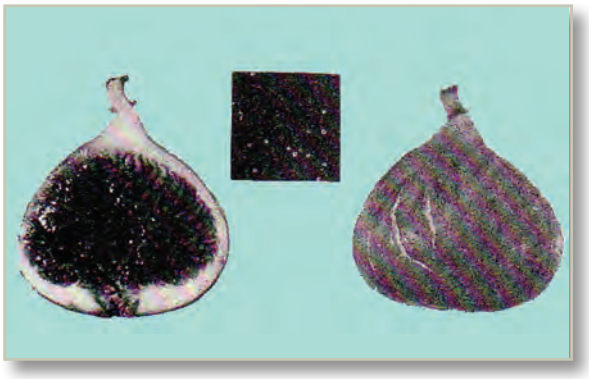

Fig. 109: 'Col. Di Signora Bianca'. The square is 20 mm x 20 mm.

Origin: The cultivar has its origin in England, from where it reached the USA, but it is unclear how it arrived in South Africa.

Size and shape: The fruit is flat top-shaped (turbinate).

Colour: The fruit skin is dark brown and the pulp dark red.

General: The cultivar was originally planted in the trial orchard on the Bien Donné experimental farm. The fruit was of inferior quality and the cultivar was never grown commercially.

- 'Excell' (anon., 1983; "Ray's Figs", 2004)

Origin: The cultivar was bred from 'Kadota' in the USA in 1975.

Size and shape: It is medium-sized, with a round-elongated shape.

Colour: The fruit has a light strawberry-coloured pulp.

General: The cultivar produced well in Citrusdal (Table 3).

Fig. 110: 'Excell.'

- 'Tena' (anon., 1983; Baud *et al.*, 2005; "Ray's Figs", 2004)

Fig 111: 'Tena'.

Origin: Similar to 'Excell'.

Size and shape: The fruit is medium-sized.

Colour: Fruit has a light green skin and straw-coloured pulp.

General: The cultivar produced well in Citrusdal (Table 3).

- ‘Conadria’ (“Ray’s Figs”, 2004)

Fig 112: ‘Conadria’

Origin: The cultivar was bred from ‘Calimyrna’ by Ira Condit at the University of California in 1956, but it does not require caprification.

Size and shape: The cultivar is medium-sized.

Colour: The fruit skin is yellow-green and the pulp a light strawberry colour.

General: The fig is suitable for the dessert market or drying. It produced a light crop in Citrusdal (Table 3).

- ‘Grizzly Bourjassotte’ (syn. ‘Bourjassotte Grisé’) (Lötter, 1973; Condit, 1955)

Origin: The fig is originally from the Spanish town Bourjassotte; from there it was taken to England and eventually California.

Size and shape: It is a medium to large, fairly flat fig, with or without a fleshy stalk.

Fig 113: ‘Grizzly Bourjassott’e.

Colour: The fruit skin is a dark, violaceous colour and the pulp straw coloured (this differs from Condit (1955), who described the pulp as strawberry coloured).

General: The fruit ripens mid-season and has a pleasant, sweet taste. It differs from the fruit of ‘Bourjassotte Noir’ (syn. ‘Evita’), which is much rounder and smaller. A number of trees of this cultivar have been planted in Villiersdorp.

- ‘Brown Ischia’ (Davis, 1911; Lötter, 1973; Condit, 1955)

Size, shape and colour: Condit describes the cultivar as a smallish, top-shaped (turbinate), brown fig with a red-violet pulp.

General: The cultivar bears high-quality fruit, but in the USA it has fallen into disuse. In South Africa it was planted in the first trial fig orchard on Bien Donné, but it was never planted commercially.

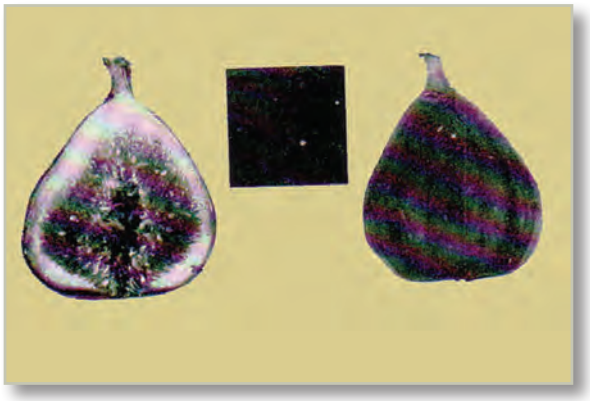

Fig 114: 'Brown Ischia'. The square is 20 mm x 20 mm.

- 'Di Redo'

Origin: The cultivar is also from the breeding programme of the University of California, and has 'White Adriatic' as breeding parent.

General: The cultivar bears large crops, and the fruit can be dried. Fruit ripens very late in the season and therefore turns sour easily.

- 'King' (Flaishman *et al.*, 2008)

Origin: The fig originated in California.

Size, shape and colour: The fruit is large, with a thin, yellow-green skin.

General: The pollination requirements are similar to that of the San Pedro type. The fruit is popular on the fresh markets abroad.

- 'Banana' Fig (syn. Longue d'Août (Long August), Angolan Fig, Figue Banana, Nella) (Baud *et al.*, 2005; Condit, 1955)

Origin: According to Baud (2005), this exceptional fig cultivar is possibly from Turkey, but has been well known in France for some time. Condit (1955) also called it 'Longue d'Août', and mentioned that it was known in the USA.

Size and shape: It is a large (sometimes 50 mm and longer), slanted-elongated fruit.

Colour: The skin colour is green-yellow and the pulp is dark strawberry coloured.

General: The leaves are characteristic, their deep sinuses distinguishing them from leaves of other well-known fig cultivars *(Fig. 112)*. The cultivar bears large crops and is a strong grower. The fig is tasty and has an attractive pulp. It is an interesting fig for the home garden.

The fig possibly reached Angola years ago by way of Portugal. Nellis Zaaiman of Kleinmond summarised the origin of the fig in South Africa as follows: As an employee of the fuel company Caltex in the early seventies, Zaaiman's friend Brian Bam (currently from Wellington) travelled to Angola, among others. There Bam came across an orchard of this extraordinary fig and took a number of cuttings from these trees, which he subsequently planted at his parents' home at the Hardap dam in the vicinity of Marienthal (in what was then South West Africa, now Namibia). Later he planted cuttings from the trees in Marienthal on his

Fig. 115: 'Banana' fig.

Fig. 116: Prize specimen of the 'Banana' fig.

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smallholding in Wellington. This is where Zaaiman saw it for the first time. He in turn took cuttings, which he planted at his home in Worcester. He subsequently sold this property, but unfortunately the new owners removed the fig trees before he could take some cuttings from these trees. In July 2007 he tried to obtain cuttings from Bam again, but he had also sold his property in the meantime and the new owners had completely neglected the trees. Fortunately, there was still one neglected tree, from which he managed to take a few pencil-thin cuttings. To his great delight, he succeeded in coaxing these cuttings to grow in Kleinmond.

In the early seventies, a similar fig was growing in the trial orchard on the FFTRI experimental farm Bien Donné, which Daneel du Preez referred to as a banana fig. This fig tree was removed in later years along with the other fig trees on the farm. It became known that banana figs were grown in Kuils River, close to Cape Town. Recently, in 2011, it was discovered that Schalk Burger of Kleinbrak River was also in possession of a similar cultivar, which he had received from his father-in-law. It is clear that this characteristically elongated fig was wider known in South Africa than initially anticipated, and that it did not necessarily enter the country through Nellis Zaaiman's friend.

Fig. 117: The leaf of the 'Banana' fig.

Fig. 118: Wild fig trees are very attractive ornamental trees. This Ficus macrophylla tree grows just outside Malmesbury.

Chapter 6

Wild Figs (Ficus spp.)

Introduction

The genus *Ficus* comprises about 750 species worldwide, of which 110 are indigenous to Africa, and 48 grow in the warmer parts of South Africa (Burrows and Burrows, 2003). As a result of the popularity of the wild fig in South Africa, it was named Tree of the Year in 1984 (Swart, 1984).

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DNA testing is used increasingly in systematic identification in the plant kingdom, including the identification of wild fig species. Among others it assisted in establishing the relationship between five different wild fig species, which had already been described centuries ago, when a review of the naming of the species was required.

The species that had to be reviewed were the following (the new names appear in brackets): *F. capensis* Thunb. (1786) *(F. sur* Forssk. (1775)), *F. pretoriae* Burtt Davy (1912) *(F. salicifolia* Vahl. (1790)), *F. smutsii* Verdoorn (1935) *(F. tettensis* Hutch. (1915)), *F. sonderi* Miq. (1867) *(F. glumosa* Del. (1826)) and *F. soldanella* Warb. (1906) *(F. abutilifolia* Miq. (1867)) (Burrows and Burrows, 2003). The oldest description was recognised, and the name under which the species had been described initially was applied. Therefore these five species today carry the name indicated in brackets.

Wild fig fruit is usually dry and unpalatable, and compare poorly with edible figs, but it is often sought after by wild animals and certain indigenous population groups. The wood is usually soft and has little or no commercial value. The biggest advantage of wild figs is that the different species are attractive ornamental and shade trees and thrive in most parts of South Africa. For this reason wild fig trees are found in almost all South African towns and cities where ornamental horticulturists have considered indigenous and non-indigenous wild fig species in their planning.

The only limitations associated with some wild figs are that they do not thrive in arid regions and at very low temperatures, and that the roots of some figs could damage the adjacent road surface.

Propagation

Vegetative propagation of indigenous species is easily achievable. The method Geoff Nichols uses for vegetative propagation is explained in Burrows and Burrows (2003) as follows: Take softwood or semi-hardwood cuttings in spring, when the fig trees start growing actively and the sap is flowing. Place the cuttings upright in trays or pots with washed river sand, in a warm place. Depending on the number of cuttings, the tray or pot with cuttings can be placed in a clear plastic bag to reduce drying and maintain heat. The cuttings root within a month and can be transferred to a pot or a bag in about eight weeks. Certain non-indigenous species (e.g., *F. elastica)* sometimes root with more difficulty, and greater success can be achieved in established nurseries where bottom-heating is available and rooting hormones can be used. When suitable shoots are not available for making cuttings, defoliated stubs and thicker shoots – even as thick as the human arm – can be used successfully as hardwood cuttings for rooting, even though they might take longer to root. Desiccation is not as critical a problem in stubs as it is in cuttings. Wild figs can also be propagated by means of aerial layering (rooting of intact shoots on the tree).

Fig–wasp Symbiosis

Researchers determined that every *Ficus* species is associated with its own, specific pollen vector species and no other species can replace it. Likewise the pollen vector cannot pollinate any other *Ficus* species. This left researchers with even more questions.

In his informative article on this topic, Galil (1977) described the results of research that involved various *Ficus* species and their vectors. Until recently researchers worked predominantly with *F. carica* and the pollinating wasp *Blastophaga psenes*, and they accepted that the wasp could easily come into contact with the flowers, involuntarily picking up pollen from the anthers and transferring it to the stigma of the female flowers, as is the case in all other fruit kinds. However, new research with other species (e.g., *F. sycomorus* and its vector *Ceratosolen arabicus,* and *F. religiosa* and its vector *B. quadraticeps*) showed that the vector could experience difficulty reaching the anthers and styles in the protecting syconia in certain *Ficus* species, as the ostiole could be selective and arduous to enter. This prevents normal pollen transfer. The researchers also observed that unique and highly multilateral evolutionary modifications in both the syconium of the fig and the wasp had occurred over the years to manage the problem (Galil, 1977). For instance, the two vectors mentioned had developed special pollen sacs or pockets with lids attached to the thorax, which closed the sacs off to the outside *(Fig. 119)*. Purposeful

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movements by the vectors released the pollen for pollination. Additionally, researchers showed that vectors of many other species had also developed special pollen-handling mechanisms to achieve pollen transfer. Researchers established, among others, that the build-up in carbon dioxide (CO_2) in a syconium usually forced the wasp to leave the particular syconium for another. The following can be concluded about the evolutionary adaptations that the two role players – the fig and the wasp – had to undergo to achieve a harmonious, binding symbiosis..

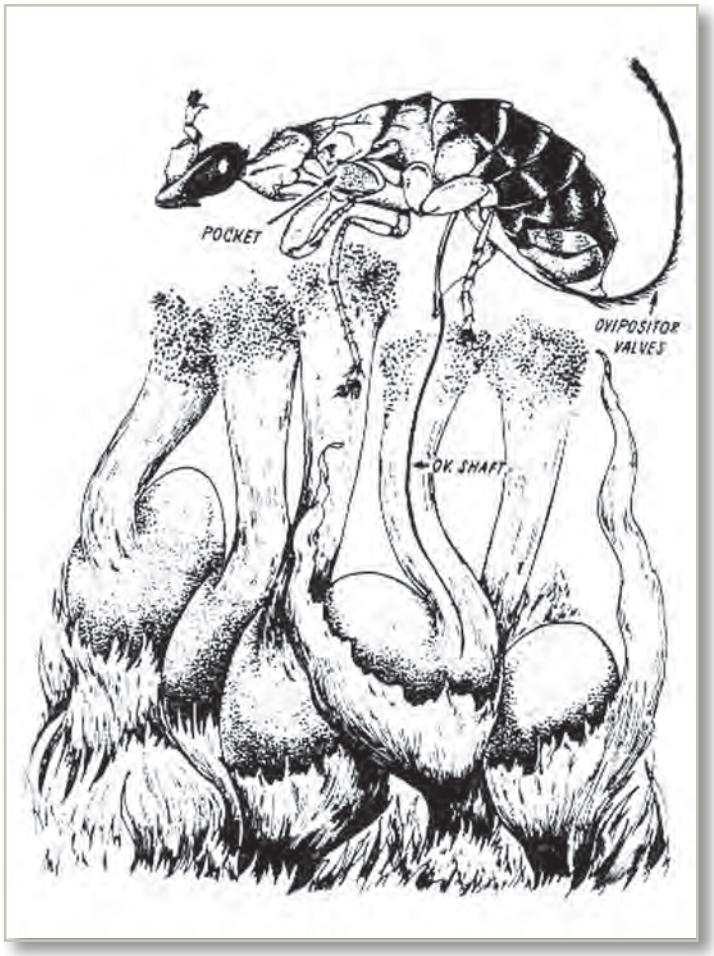

Fig. 119: Illustration of an egg-laying wasp with a pollen sac visiting female flowers in a fig syconium, in this manner pollinating the flowers. (OV shaft = ovipositor shaft) (According to Galil, 1977).

- *Bilateral adaptations facilitated by co-evolution*

This creates the framework for the fig-wasp relationship: the closed hollow, fleshy torus in the form of the syconium for instance protects the vulnerable, weak male wasp, undoubtedly vital to the life cycle of the wasp *(Fig. 43)*.

- *Unilateral adaptations whereby the one partner adapts to the conditions presented by the other partner*

An example of this is the adaptation of the male wasp of *Blastophaga quadraticeps*, the pollen vector of *F. religiosa,* to tolerate a high carbon dioxide concentration in the syconium.

Another example is the adaptation of style length – short and long styles *(Fig. 42)* – in the 'Capri' fig in relation to the length of the ovipositor of the wasp to ensure its survival. To lay their eggs, the wasps require short styles, and in the process the embryo is destroyed

and no seed is produced. If all the styles in the 'Capri' fig had been short, no seed would have been produced and normally the 'Capri' fig would then have become extinct. However, through evolution some 'Capri' figs have developed long-styled female flowers alongside the short-styled flowers. As no eggs can be laid in the long-styled flowers, seed is produced, ensuring the survival of the 'Capri' fig..

- *Adaptations originating from the control of certain vital processes of the one partner by the other*

In fig–wasp symbiosis it is important that the relative development stages of the wasp and the syconium coincide. If the syconia drop too soon, when the wasps are in the larval stage, the insects will remain immature. Conversely, if the syconia are still green and hard when the wasps have reached the adult stage, the insect fauna of the fig would be trapped and destined for extinction. Therefore it is important that the rhythm of ripening of the fig coincides with the rhythm of development of the weaker partner, the wasp.

An interesting phenomenon in the fig–wasp symbiosis is the evolution of the morphology of the female wasp with regard to pollen transport and pollination. The organs and mechanisms developed by the wasp to transfer pollen to the stigma are of no direct value to the insect, which indicates that the main function of this selection is to modify the plant and not the insect. There is, however, a clear benefit for the wasp as well, as pollination is essential to the reproduction of *Ficus* species, without which the existence of the wasp cannot continue. It is therefore possible that the development of the fig–wasp symbiosis started during the Cretaceous period or even earlier, more than 100 million years ago. Over this extended period, evolution resulted in the highly complex pattern of interrelationship between fig and wasp that exists today.

Characteristics and Uses of Wild Figs

Various species of wild figs flourish as potted plants (e.g., *F. natalensis, F. salacifolia* and *F. tremula*) as long as the plants are controlled by means of judicious pruning. Certain wild figs, especially rock figs, can create excellent bonsai trees with roots that display beautiful patterns of growth, for example *F. ingens, F. glumosa, F. tettensis, F. salacifolia* and *F. cordata.*

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Wild fig trees are relatively insusceptible to pests and diseases, and there is no proof of wild figs causing allergic reactions in humans. All the species in the family Moraceae actually have very few toxic characteristics.

Shoots of many wild fig trees and young fig trees generally tend to droop and require some form of support when young to expose the young growth to sunlight. Reproduction is primarily by means of seed, and through the centuries different species

Fig. 120: This rock fig, possibly Ficus glumosa, grows in the vicinity of Bela-Bela (previously Warmbad). The roots (grey in colour) grow right up against rocks (brown in this photo) or stones. Older trees can later develop into large, individual trees.

have adapted to mainly two types of environmental circumstances. In the one instance the seed is deposited by vectors such as birds and small animals. It settles in small cracks in rocks, where it germinates. The tree develops in close contact with the rock, growing vertically and horizontally over the rock, later to establish itself as an independent tree with its own root system. These trees are known as rock figs (e.g., *F. abutilifolia, F. cordata, F. glumosa, F. ingens, F. tettensis,* and *F. burkei)*.

The seed of the other species is deposited by vectors in the forks of the branches of existing, upright-growing trees, where it germinates under favourable conditions, growing upright with, but independently of the mother tree, while simultaneously sending roots down to the ground. This fig tree grows with such vigour that it can later grow independently with its own root system, in time obscuring and crowding the host tree, especially once it has developed well-established roots. This eventually results in the death of the host tree, which has earned this fig the name strangler fig (e.g.,

Fig. 121: Probably Ficus chirindensis, a strangler fig that can grow very tall in Zimbabwe and Malawi. This example in Botswana is a younger tree of which the host is still alive, though its identity is unknown. This wild fig is engulfing its host (in the centre) and will eventually destroy it.

F. petersii, F. chirindensis, F. natalensis, and *F. benghalensis)*.

Many wild fig species can propagate vegetatively. This usually occurs when the branches have expanded to such an extent that they are bent downward by their own weight, later touching the ground, where they form roots by means of layering and develop into new trees (*F. salicifolia* and *F. ingens) (Fig. 130)*. Certain species develop aerial roots, which sometimes reach the ground before the branch has sagged sufficiently to reach the ground. Such roots occasionally develop into supports for the branches, and are also referred to as pillars (*F. benghalensis)*.

Wild fig species can be differentiated based on their fruit-bearing characteristics. Species that bear fruit in clusters (sometimes called broom clusters), for example the broom cluster figs, *F. sycomorus (Fig. 139)* and *F. sur (Fig. 126),* are distinguished from other fig species that bear fruit laterally on young shoots, for instance the Java fig, *F. microcarpa (Fig. 122)*.

Historical Wild Fig Species

Exotic Species

- The most remarkable fig species from the East is probably the banyan tree *(Ficus benghalensis)*, a strangler fig, of which a striking specimen grows in the Durban Botanic Gardens. This species starts life as a seed that is deposited on a host tree by a vector, where it germinates and grows, eventually strangling the host tree as a result of its aggressive growth. The tree develops a strong trunk of its own and aerial roots grow downwards from its horizontal branches to form supporting pillars. These pillars enable the branches to extend over an ever-increasing area. In India the banyan tree is known for a number of medicinal uses.

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- Another well-known, commercially important wild fig species from the East is the Indian rubber tree *(F. elastica)*, of which the latex was once used on a large scale for the production of rubber. However, later the South American tree *Hevea brasiliensis* (Euphorbiaceae) proved to be a much better source of rubber. These trees have now replaced the rubber industry in the East. Apart from its worth in South Africa as a large, attractive ornamental tree, many of its cultivars (for instance 'Decora') have become popular as potted plants, due to their tolerance of low light intensity. In India the Hindu revere the rubber tree, most probably for its earlier commercial importance in the country

- A Malaysian species that has become very popular as an evergreen ornamental tree in South Africa, as in many other parts of the world such as America, Australia and Southeast Asia, is the Java fig *(F. microcarpa,* var. *microcarpa*, type Java) *(Fig. 122* and *124)*, which is sometimes incorrectly indicated by other authors as syn. *F. retusa* and *F. nitida*. Its appearance is often the cause of confusion with the weeping fig (*F. benjamina)*. The pendulous leaves of *F. benjamina*, with a sharp, often variegated point, distinguishes it without difficulty from the Java fig, which has upright, less sharply pointed leaves. In its natural state the Java fig is also a strangler fig with aerial roots, but in South Africa it develops into an attractive, solitary tree without aerial roots and with a relatively smooth trunk. Trees can grow very tall, and can reach up to 22 m in height. The small fruit, which are born in the axils of leaves on young shoots, turn a beautiful pink or red colour when ripe *(Fig. 123)*. The natural pollinating wasp of the Java fig, *Blastophaga saundersi,* does not occur in Southern Africa, and therefore pollination and fertilisation does not take place in this country. As a result, no germinable seed is found in the fruit and therefore there is no danger of it overrunning the environment with seedlings.

The Java fig is popular as a tree for planting next to the street and is planted in Cape Town and towns such as Paarl, Malmesbury,

Fig. 122: The massive Java fig tree (Ficus microcarpa) at the Dutch Reformed church (Moederkerk) in Stellenbosch.

Fig. 123: Fruit of the Java fig.

Fig. 124: The Java fig can be pruned into the desired shape.

Wellington, Stellenbosch and so forth, as it is resistant to winds coming from the sea and can grow in relatively poor soils. Its neat, compact crown of small, shiny leaves lends it a decorative quality, and it can also be grown in containers. At the Coetzenburg sports grounds in Stellenbosch, cars can park in the shade of the beautiful Java fig trees adjacent to the DF Malan Centre. The use of the Java fig tree is sometimes limited by the fact that in shallow soil its roots can disrupt road surfaces. Apart from this, it is quite easy to keep the area around the trees clean.

Indigenous Species

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- **The Cape fig**, also called the **broom cluster fig** (*F. sur,* syn. *F. capensis)*, is a well-known indigenous species. It bears medium-sized fruit (*Fig. 128*), which the children of the local population love to eat. The species name is Arabic, and it is named after the peninsula in Yemen where it had been described for the first time, by Forsskäl in 1775, eleven years before Thunberg described it in South Africa, in 1786.

  However, the bark and latex of this species is better known for a number of medicinal and fertility-stimulating properties. The fig is found throughout South Africa and is one of the largest wild fig trees (12 m in height). It is one of the two wild figs occurring naturally in the most southern part of Africa. Usually the Cape fig does not require rocks or host trees to reach a significant size, and it is to be found in a variety of habitats. It tolerates cold much better than any other wild fig.

  The leaves are characteristically copper coloured when young. The main and larger veins are very prominent, the leaf edges are irregularly serrated, and the petioles are long. The fruit, comparatively large in diameter (20 mm to 30 mm) *(Fig. 129*), are born in clusters

Fig. 125: The clusters of figs drooping down the trunk of a Ficus sur wild fig at the Baxter Theatre in Mowbray, Cape Town, is clear indication of the fruitfulness of this species.

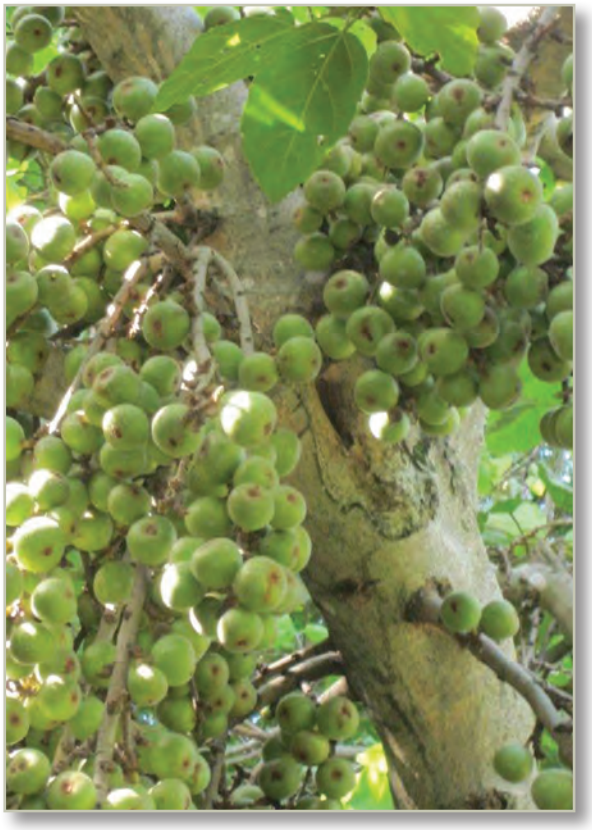

Fig. 126: Even more fruit are borne higher up in the tree in the previous photo (Fig. 125).

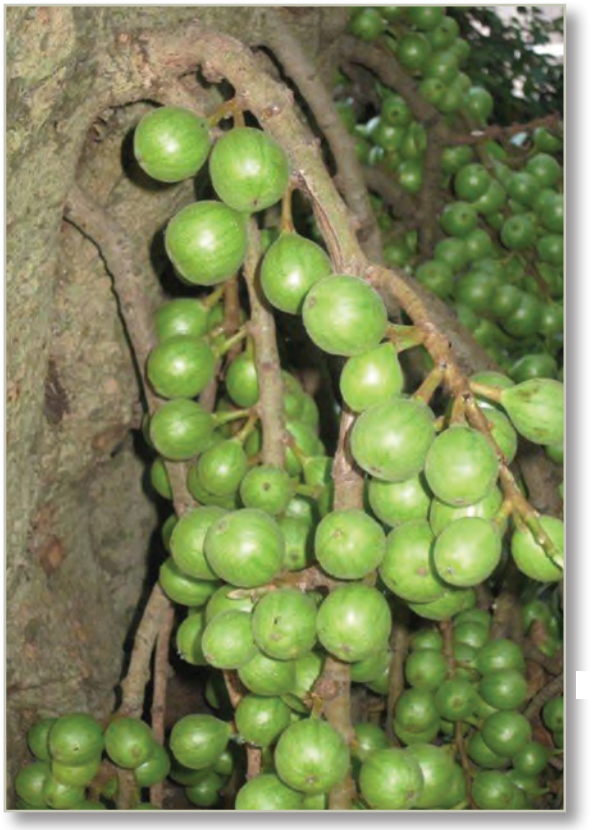

Fig. 127: A single cluster of fruit on the Cape wild fig tree.

of 10 to 100, which are suspended from the main trunk *(Fig. 125)* and main lateral branches *(Fig. 126* and *127),* but smaller clusters of fruit can develop even from exposed roots on the soil surface.

The first figs encountered by the new settlers at the Cape was the indigenous wild fig, *F. sur.* And this was an unpleasant experience. In a journal entry dated 9 January 1653, Jan van Riebeeck wrote: "Over the past two to three days some of our people (including three carpenters) have fallen ill with dysentery. It is probably the result of wild figs that grow locally and are eaten by the local population. Our people have therefore collected bags of these figs and have feasted so excessively that they are now suffering from dysentery." The figs were unquestionably the fruit of the Cape wild fig, which bears the tastiest fruit of all the wild figs.

Fig. 128: Ripe and green figs of the F. sur wild fig.

Fig. 129: The fruit of F. sur in more detail.

When the insect-filled internal parts of the pink figs *(Fig. 128)* are removed, a delicious jam can be made from these fruit. Good ropes can also be manufactured from the inner bark of the trunk.

The Cape fig is sometimes confused with the sycamore fig, but the smooth, hairless fruit and narrower leaves, which have a smooth adaxial (upper) side, differentiates it from the sycamore fig *(Fig. 140)*.

- **The mountain rock-fig** (*F. glumosa*), referred to as ***rooitou*** ('red rope') in Afrikaans, grows up to 15 m tall and is semi-deciduous in dry areas. The fairly thick leaves, with rounded, blunt tips, are characteristic. Young leaves can be hairy. The fruit is borne in the leaf axils, clustered together on the shoots at the ends of branches. According to Fanie and Julye-Ann Venter (2002) the trees are a good food source to kudu, nyala, bushbuck, grey *duiker* and sometimes elephants, which unfortunately strip the bark from the trees. The ripe fruit is popular with fruit bats, bushbuck, *klipspringer*, warthog, baboons and monkeys. The wild fig is also popular in Namibia and is known for the use of its bark by the Ovahimba tribe (related to the larger Herero tribe) in the Kaokoland as an important source of a tanning agent used in leather tanning. The bark of the tree is finely shredded and soaked in water, which is then used in the tannery to obtain leather of the

required red colour (Van Wyk and Gericke, 2000). The bark is also used in central Africa to make fabric for clothes and the fruit is eagerly consumed by children and animals.

- **Moffat's Tree.** The red-leaved rock-fig (*Ficus ingens* Miq.) can grow into shrub-like or large deciduous trees of which the young leaves are copper-red. The leaves, which have long stalks, are relatively long, with a sharp tip, but are heart-shaped on the side of the stalk. The fruit are borne singly or in pairs in the leaf axils. The wood can be used in carpentry. Trees typically grow in rock clefts, flattened up against the bare cliff face, where the roots can force their way across the barren stone. Though sometimes behaving like a strangler fig, it can also develop into a massive solitary trees *(Fig. 130)*. The species is popular as bonsai and container plants.

  Probably the best known tree of this species is the enormous Moffat's Tree, found on the north-western boundary of the Magaliesberg on the farm Bultfontein, close to the old route to the north. Tradition has it that the crown width of the tree measured 36,5 m. In 1828 the missionary Robert Moffat of Kuruman visited the tree at the suggestion of two Scottish pedlars who had discovered it earlier that year, and made the phenomenon known to others. He was on his way to visit the Ndebele chief, Mzilikazi, who at that stage had his kraal next to the Apies River, where the suburb Roseville in Pretoria was later located.

  Mzilikazi was appointed by Shaka as one of his commanding officers in Natal, but withheld from Shaka some of the loot seized during his raids. Shaka discovered this, and around 1823 Mzilikazi and 300 of his supporters had to flee to what was later the Transvaal when Shaka despatched a punitive expedition after him. Mzilikazi knew that part of the early Transvaal well as a result of his previous raids, and by 1825 he had develop a strong Zulu-orientated tribe, the Ndebele, by means of reckless raids on the Batlapin, the Betshuana and neighbouring fugitive tribes.

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  Mzilikazi welcomed visits from traders as well as their merchandise and they motivated him to send two 'ambassadors' to the outside world to learn more about the so-called civilisation. At that stage the small missionary station at Kuruman in the Northern Cape acted as the gateway between the supposed civilisation in the south and the wildernis of the north. As a result Mzilikazi's ambassadors found their way to Kuruman, where they introduced themselves to the missionary Robert Moffat and explained the purpose of their visit. Over a number of weeks the interested Moffat also gleaned from them all he could about the unknown territory north

of the Vaal River. On 9 December 1828 he accompanied the two ambassadors on the journey back to their chief, where he was given a generous reception. Moffat was distressed by the many demonstrations of violence he came across along the way, but could still preach the message of the Bible during his week as a guest of Mzilikazi, despite all Mzilikazi's displays of strength. This introduced a long period of relations with the Ndebele; between Robert Moffat and Mzilikazi, and later between his missionary son, John Moffat, and Lobengula (Bulpin, 1965).

A unique feature of Moffat's Tree *(Fig. 130)*, also known as the Inhabited Tree, was the 17 residential huts that had been constructed

Fig. 130: The enormous Moffat's Tree (Ficus ingens or red-leaved rock-fig) on the farm Bultfontein near the north-western boundary of the Magaliesberg. When Robert Moffat, missionary in Kuruman, visited the tree in 1828, members of the local population were living in 17 huts that had been constructed in the tree to safeguard them against lions. Through Moffat the tree gained fame as the Inhabited Tree. Note that the branch on the left had bent right down to the ground, rooted and developed into a new tree. (This photo is used with the compliments of John and Sandra Burrows, and is from the book Figs of Southern and South-Central Africa (2003).)

on different levels in the tree in earlier times to keep the inhabitants out of reach of troublesome lions. The painter Thomas Baines later made a drawing of the tree, and as a result many other travellers also visited the tree. During the Anglo-Boer War commandos more than once pitched their camp under the tree and 32 of their members had carved their names into one of its big branches. This branch eventually died and was removed.

Similar to the *Wonderboom* (Afrikaans for 'miracle tree') in Pretoria, some of the branches of Moffat's Tree had sagged to ground level and rooted, producing new trees *(Fig. 130)*. The tree still exists on the farm Bultfontein, close to Sun City (Burrows, 2003). Not far from this, on the farm Boekenhoutfontein, was another large *F. ingens* tree, which was known as the *Ossewabrandwag* tree. However, this tree has since deteriorated and gone to ruin.

- **The Namaqua fig tree of Heerenlogement.** Few wild fig tree species have achieved recognition in South Africa as early as the Namaqua fig tree (*F. cordata* Thunb. 1786). The species occurs primarily in the dry west coast regions of the country, such as the Sandveld, Richtersveld and Augrabies. It is a typical rock fig, which likes to grow right up against high, vertical rock faces *(Fig.131, 133* and *135)*.

  More recently this wild fig won additional fame through its association with the historic cave, Heerenlogement, 23 km from Graafwater on the West Coast. Although for most part described as a small cave against the mountain, it is in reality a hollow cliff of about 20 m wide and 10 m deep, below a high canopy of a large projecting sandstone rock, and open to the west (*Fig. 132* and *136)*. From the 17th to the 19th century travellers to the interior usually journeyed along the flat planes of the Sandveld along the West Coast. It was an exhausting journey for humans and animals, especially in summer, and the hollow cliff was a welcome refuge against the wind and weather, with sufficient fresh water available in the vicinity. All kinds of travellers, such as hunters and adventurers, as well as distinguished officials and scientists of those times could restore themselves here. In the 17th century the more distinguished travellers bestowed a certain status on the hollow cliff by naming it the Heerenlogement (accommodation for gentlemen).

  Though South Africans seem to find pleasure in scribbling their names on trees, rocks and walls, there is no other historical place in South Africa with so many inscriptions as the walls of the Heerenlogement. Some of the oldest names that have been carved into the northern wall particularly date back to the beginning of the 18th century. Many names have been weathered away or have been vandalised, but hundreds of the well-known names are still

legible *(Fig. 135, 137* and *138)*. Fortunately the walls of the hollow cliff are today fenced off by a sturdy wire fence to keep people and animals at a safe distance from both the inscriptions and the wild fig tree.

Lawrence Green identified many people from the inscriptions in his book *On Wings of Fire* (Green, 1967). He speculated that one of the most important officials, Olof Bergh, had to have visited the cave as early as 1682, as he had carved his name and the date at another fountain, 8 km south of Heerenlogement.

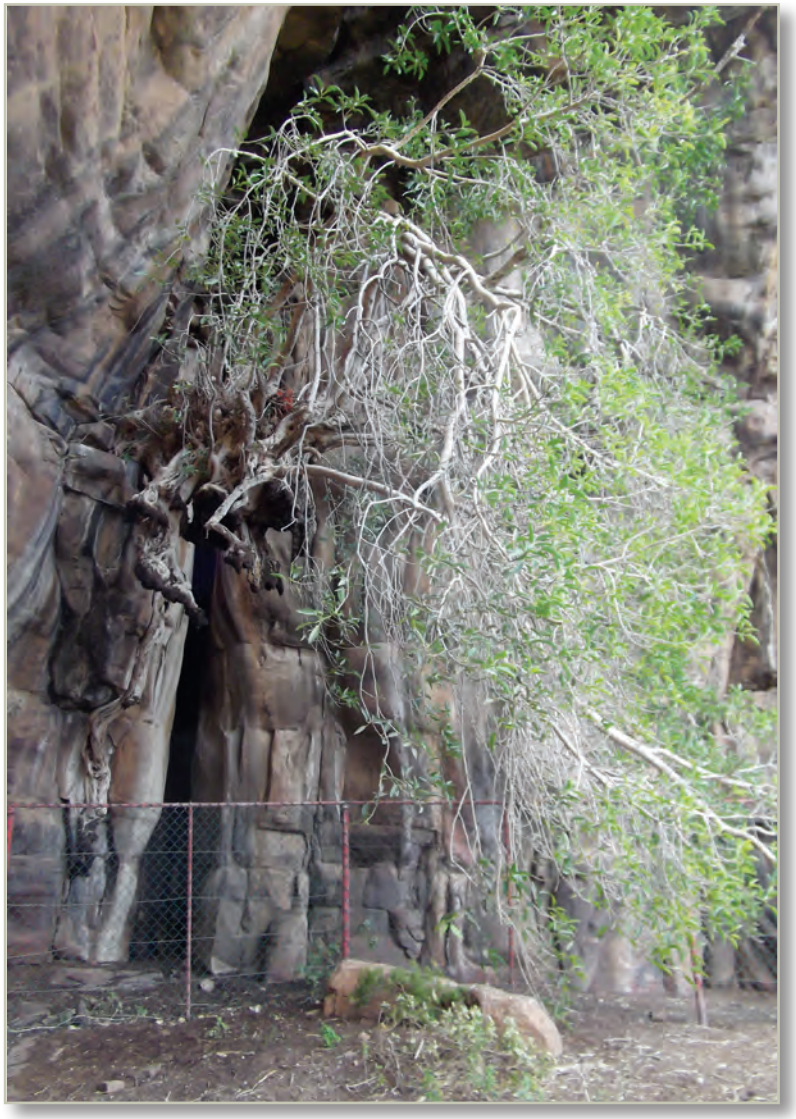

Fig. 131: The famous 275-year-old Namaqua fig tree (Ficus cordata) growing in the Heerenlogement. On the far left the old trunk rises vertically to the point where the main branch expands and droops down to ground level. The tree is definitely supplied by more roots, which grow in the crevices in the rocks (top left). The tree is completely dependent on moisture from the rocks surrounding it. It was still growing in the summer of 2011 when this photo was taken. Years ago it had apparently covered a larger part of the area.

Fig. 132: The location of the Heerenlogement in the vicinity of Graafwater (on the West Coast between Lamberts Bay and Clanwilliam) is indicated by the arrow 'a'. It can be quite a strenuous climb from the parking area to the hollow cliff. Other items of interest at the site include a corrugated iron guardhouse used by the British during the Anglo-Boer War, indicated by the arrow 'b', and an iron chest of more than a metre in length, which is conserved inside the hollow cliff. The chest was found on the farm from which the remarkable Khoi Captain Hendrik Witbooi departed for the then Southwest Africa, and it was most probably from the wreckage of a ship that went to ground in the mouth of the Olifants River. Also still to be seen at the site, are the remains of the so-called wolf cage, which was used to catch hyenas.

This is now known as the Bergh Rock. Though no inscriptions were left, the well-known official Simon Van der Stel and his huge company must undoubtedly have stayed here on Bergh's advice, on their way to Namaqualand in 1685. They must have used both of the fountains (at Heerenlogement and Bergh Rock) to make provision for the sizeable party, including its livestock and mounts.

One of the natural scientists who had used the facilities at the Heerenlogement is the Swedish botanist Charles Peter Thunberg (1743 to 1828), who reached the 'Gentlemen's

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Fig. 133: A mature F. cordata (Namaqua fig) tree growing beside the road between Citrusdal and Clanwilliam.

Fig. 134: Young figs of F. cordata on the current year's growth.

Fig. 135: By 1994 a young Namaqua fig growing against the northern wall of the cliff had covered the writing of visitors. Green (1967) speculated that IT Rhenius, who had carved his name in 1721, was the son-in-law of Olof Bergh, and that he was on an expedition to purchase cattle when he stayed at the site. Note the lovely examples of the leaf shape of the Namaqua fig (F. cordata).

Fig. 136: The entrance to the hollow cliff of the Heeren-logement. A part of the Namaqua fig tree can be seen from the outside, on the right at the entrance (arrow).

Hotel' (in his own words) on a hot summer's day in 1774 in an extremely exhausted state. Thunberg, a student of Linnaeus, travelled to the Cape in 1771, planning to stay a number of years, primarily to learn Dutch, as he wanted to enter Japan to gather plant samples. (At that stage only Dutchmen were allowed into Japan.) During his short stay at the Cape he contributed extensively to the knowledge of our plant kingdom, and this is recognised to this day. He described two well-known wild fig species, the Cape fig (*F. capensis* (now *F. sur)* and the Namaqua fig (*F. cordata*). Thunberg was the first person to mention the Namaqua fig tree in the hollow cliff in 1774: "…[T]here was a small fissure in which a tree had taken root and stood in a very flourishing condition, being above eight feet (2,45 m) in height…" In 1779 he returned to Sweden, along with a few thousand plant samples. The description of the species *F. cordata* appeared in 1786. Many other plants have been named after him. Thunberg rightly became known as the father of Cape botany.

Burrows and Burrows (2003) believe that this Namaqua fig species made history in that it was the first South African indigenous fig species of which a description had been published. This followed from the expedition of Simon Van der Stel to the interior in 1685 when his illustrator, the Dutch botanist Jan Commelin, took notes on and sketched the plants they encountered (among others the Namaqua fig) and recorded this in a book,

Fig. 137: Francois Le Vaillant, the flamboyant French naturalist and explorer, who became well-known as a natural scientist during his three-year stay at the Cape in the second half of the 18th century.

Fig. 137 a: Francois Le Vaillant.

which was only rediscovered in 1996 and published (Burrows and Burrows, 2003).

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Another natural scientist who had visited the Heerenlogement in 1783 and whose name had been engraved in northern wall, was the famous Frenchman Francois Le Vaillant *(Fig. 137 and 137a)*. He was born in Suriname (Guiana in Dutch), the son of the French consul, and had been interested in plants and animals from early on. He came to the Cape in 1781, as a result of his association with the Dutch, and very quickly attracted attention in the non-scientific circles. Francois Le Vaillant was a flamboyant person who wore an ostrich feather in his hat, silver shoe buckles and perfume, and he was frequently accompanied by Kees, his tame baboon; he was a typical show-off, full of bravado (Joan Shrauwen, 1991). This is also reflected in his work. He was an active writer who sometimes made popular statements that appealed to the general public (mostly ladies), but was later found by other scientists to be less accurate. Nonetheless the accurate colour illustrations of his articles impressed scientists. He contributed to South African history by identifying and writing about the Namaqua fig growing on the southern wall of the cave *(Fig. 131)*. Lawrence Green concluded that Le Vaillant was disturbed about the fact that he had had to share his accommodation with various birds during his visit in 1783, writing about it as follows: "They perched in hundreds on a tree, the roots of which were implanted in an enormous crevice, while one of its branches overspread the floor of this natural hall."

As a result of his writing Le Vaillant was better known than Thunberg. On his way to

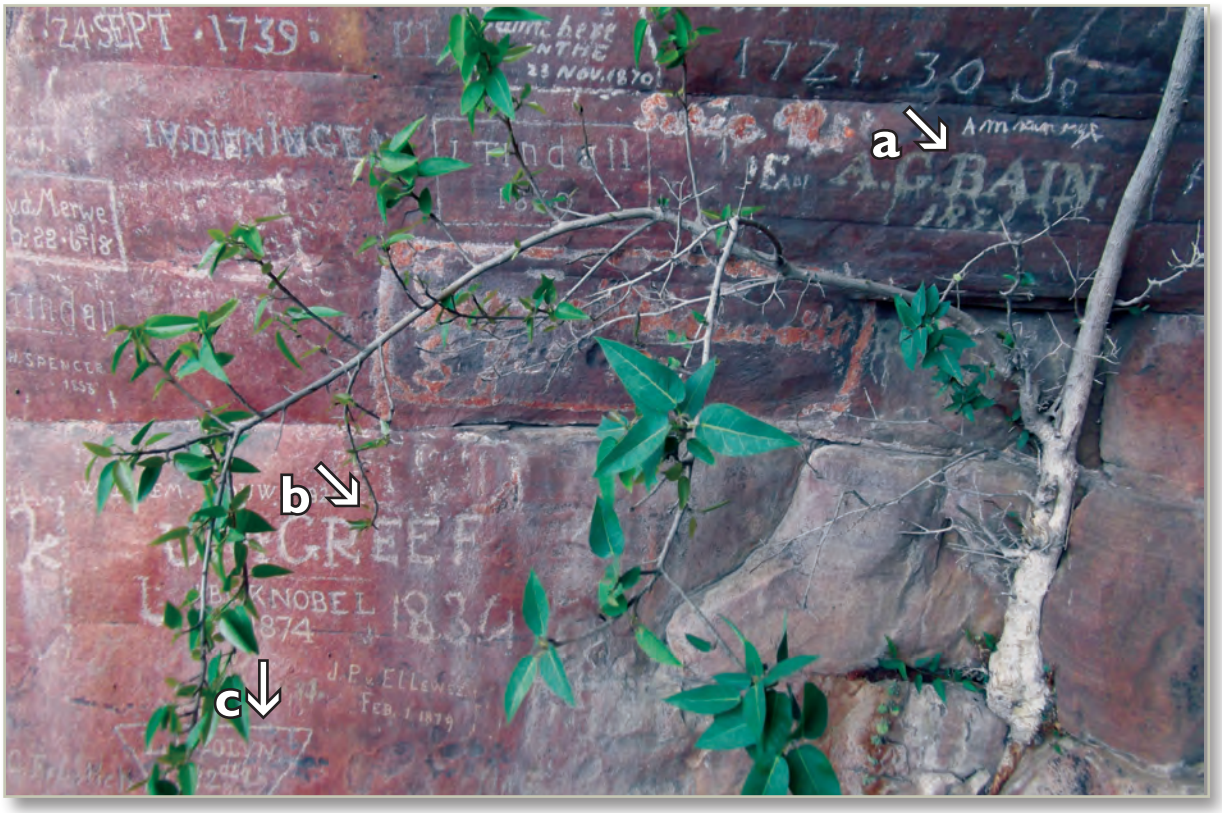

Fig. 138: The young Namaqua fig tree growing against the northern wall of the hollow cliff (refer to Fig. 135) has progressed well during the past 17 years. Some of the names on the wall include that of Andrew Geddes Bain (1854) (arrow 'a'), the famous road engineer, who wrote his name using white paint. Another, LM Greef (arrow 'b'), was identified by Green (1967) as the Assistant Field Cornet of the Clanwilliam district. But the name on the bottom left (arrow 'c') – LJ Colyn (1882) – created quite a stir. He farmed in the area and, acting as a spy for the British in 1902, he joined a unit of General JC Smuts's commando. His betrayal eventually resulted in the death of 17 members of the commando. Shortly after, he was caught by the Boers, put on trial by General Smuts, and executed.

Kamiesberg in 1813, the missionary Reverend Barnabas Shaw, who was familiar with Le Vaillant's description of the tree in the hollow cliff, related the following: "The fissure in the rock described by Le Vaillant was visited, and the tree which he mentioned still spreads its branches over the floor of the so-called *kliphuis* [stone house]." In 1840, another missionary visitor, Reverend Backhouse, described the tree *(Fig. 131)*: "A wild fig-tree hangs into the top of this cave and gives it a pretty appearance."

More recently Prof HHW Pearson of the University of Cape Town and founder of the Kirstenbosch National Botanical Gardens visited the hollow cliff in 1911, on his way to Namaqualand. He was well informed about the fig tree of the Heerenlogement, which he renamed 'Le Vaillant's grotto'. With the available scientific records on this tree, he could prove that this species grows relatively slowly. Exactly a century after his visit to the Heerenlogement, the author of this book could declare that the tree was still alive and in good health. The author visited the Heerenlogement twice; in the winter of 1994 and the summer of 2011 *(Fig. 131)*.

The historic Namaqua fig tree *(Fig. 131)* grows on the southern wall of the hollow cliff, which ends in a deep crevice. The tree had formed a stump at a height of around 3 m, from which a number of complex shoots were growing upwards and downwards, drooping down to the ground. The stump was rooted to the ground by means of a trunk and also directly in the crevice in the rock. It was unclear whether the trunk was still alive. The shoots and leaves, though sparse, still appeared healthy, but the drooping shoots did not cover as much of the ground as described years ago. The canopy of the tree was still plainly visible from the outside.

The tree had not changed significantly since the author's visit 17 years before; it was indeed a marvel that the tree still appeared to be in such a good condition at an estimated age of over 275 years. Should this tree come to harm, another young tree growing on the northern wall has developed well during the 17 years between visits, and could take the place of the old tree if necessary, delighting future generations as did its predecessor *(Fig. 135* and *138)*.

- **Pharaoh's fig.** Another well-known wild fig, which has been recognised for centuries in the Middle East, is the common cluster fig or sycamore fig *(F. sycomorus* L.), a name derived from Greek ('sykon' = fig, 'morus' = genus morus). The tree grows best in the warmer parts of the country and is sensitive to cold. Trees develop into beautiful, large shade trees with thick trunks (up to 2 m thick) and bear a multitude of almost round, large (20 mm to 50 mm), hairy fruit in bunches hanging next to the trunk *(Fig. 139* and *140)*. The fruit is enjoyed fresh by the indigenous population, but is sometimes also dried and stored. Compared to other wild fig species, the sycamore fig – along with the Cape fig *(F. sur) (Fig. 128)* – demonstrates the most potential as a source of food for the indigenous population. The sycamore fig is easily recognised by its yellowish-brown to grey ribbed trunk and branches and its heart-shaped, hairy leaves, with clusters of hairy fruit drooping down from

Fig. 139: Referred to as Pharaoh's fig in ancient times, the sycamore fig (Ficus sycomorus) is a well-known wild fig growing in the warmer parts of the country. It is known for bearing a multitude of fruit on short-stemmed bunches hanging from the trunk. In Southern Africa the fruit is enjoyed by the indigenous people.

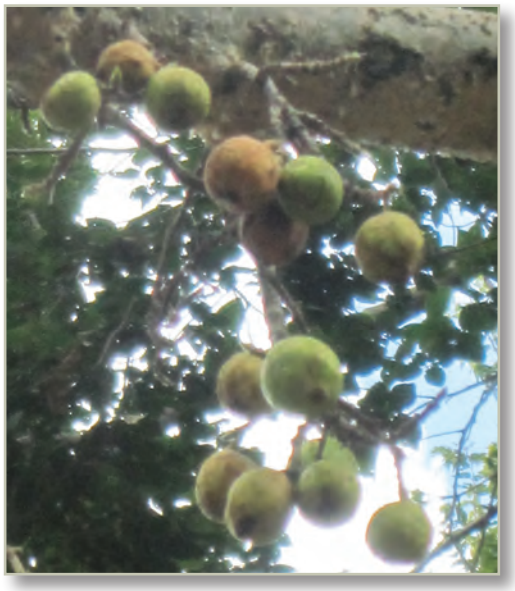

Fig. 140: Sycamore fruit hanging in bunches from the tree. Note that the hairiness of the fruit distinguishes it from F. sur.

the trunk. Strong rope can be made from the inner bark (Venter, 2002).

This fig has been cultivated for its fruit and wood in Egypt for at least 3 000 years. Though the wood is poor, it is the only tree in Egypt that can be used to manufacture large consumer items. The pollinating wasp does not occur in Egypt and the only useful fruit set parthenocarpically, when the small figs have been wounded by scraping. The fruit does not produce germinable seed and the fig is propagated vegetatively only.

Fig. 141: Harry Wolhuter in old age.

Fig. 142: It was under a sycamore tree that Wolhuter pitched his camp in the Kruger National Park, at Pretorius Camp.

The cultivation of sycamore figs was important to the ancient Egyptians; hence the name Pharaoh's figs.

Sycamore figs were as important to the Israelites as the Egyptians, as indicated in the Old Testament (Book of Psalms 78:47, Book of Amos 7:14 and 1 Chronicles 27:28). The sycamore fig is undoubtedly the fig referred to as wild figs in the Bible. Various sycamore fig trees recently became part of South African history. According to Burrows and Burrows (2003), a prominent sycamore fig tree in

KwaZulu-Natal was known as the Ultimatum Tree, and it was declared a national monument in 1950. It is under this tree that the British authorities presented Cetshwayo and his Zulu people with a final ultimatum on 1 December 1878 to honour the border between Zululand and Natal. Cetshwayo ignored the ultimatum, which resulted in the Zulu war of 1879. The tree was growing on the bank of the Tugela River, just below Fort Pearson, where the old ferry used to be, but unfortunately the tree had been washed away during the flood caused by the Demoina cyclone in 1984 and no trace of it remains.

A large sycamore fig tree close to the Pretorius Camp in the Kruger National Park also earned its place in history, as the famous ranger Harry Wolhuter used to pitch his camp under it once the development of the Kruger National Park had started, just after the end of the Anglo-Boer War (1902) *(Fig. 142)*. He became famous in 1903 when he saved himself from a lion that had knocked him off his horse and had started dragging him off to a certain death. While being dragged away by the animal, Wolhuter stabbed the lion to death with his pocket knife (Wolhuter, 1948) *(Fig. 141)*.

- **The *Wonderboom*** (Afrikaans for 'miracle tree'). Another famous wild fig in South African history is the *Wonderboom (F. salicifolia,* Burt Davy, syn. *F. pretoriae*), which grows just outside Pretoria *(Fig. 143)* and has already been referred to as historical years ago by Davis (1928). The species is named after the willow tree (*Salix),* which have leaves closely resembling that of the tree of wonder. Carbon dating indicated that the tree was already 1 000 years old. This fig tree has the ability to propagate itself by means of vegetative propagation. A few hundred years ago its branches started to produce natural layers where they touched the ground. This resulted in the development of nine trunks that had been arranged concentrically around the main trunk and kept the giant tree upright (the original trunk had vanished long ago). The *Wonderboom* occupies almost half a hectare and the highest point is 22 m above the ground. It is one of the best known indigenous wild fig trees in the vicinity of Pretoria, and has become a tourist attraction as a result of its extensive growth. The tree has been declared a national monument.

  According to tradition, a well-known Waterberg commando took shelter under the tree during the Anglo-Boer War, finding cover for all of its several hundred members, 20 wagons and oxen under the tree. This tree is the only one of its kind in the area and it is strange that it has not been vandalised by people through the centuries. Experts believe that a local chief or some of his comrades might have been buried there, which could have rendered the place sacred and as such

Fig. 143: The Wonderboom (miracle tree), the wild fig Ficus salicifolia, near Pretoria.

'untouchable'. For this reason the local population would have kept their distance of the tree out of respect for their ancestors (Burrows and Burrows, 2003).

The *Wonderboom* is often confused with *F. ingens*, but a thorough study of the leaves shows clear differences; the leaves of this species are shorter and broader than the leaves of *F. ingens*. The numerous brightly coloured fruit, which are borne on short stalks and clustered together on the shoots, are eaten by a variety of birds and other animals. The tree also provides excellent shade to animals. When starting a fire by rubbing sticks together, the indigenous population uses its wood as the bottom piece (Venter 2002).

Other Popular Wild Figs

- Another fig species, *F. tettensis* **Hutch.**, syn. *F. smutsii* **Verdoorn**, the small-leaved rock fig, drew the attention when the famous General JC Smuts, Prime Minister of South Africa and recognised botanist, collected the first sample of the species at the Magalakwin River in the Kruger National Park. More recently a thorough study showed that this was the same species as *F. tettensis* and this is now the accepted name. The name relates to the Tete province in Mozambique.

Fig. 144: (left): The common wild fig (Ficus burkei) tree growing at the Administration Building of the University of Stellenbosch (previously the Carnegie Library). Note the roots hanging from the branches, a characteristic by which this species is identified.

Fig. 145: (above): A shoot of the current season's growth of the wild fig F. burkei, with leaves and lateral fruit borne in the leaf axils.

- The **common wild fig** (*F. burkei)* (syn. *F. natalensis*, *F. Cape of Goodhope*) is a popular species that is often planted at houses to provide shade. It is an impressive tree, known for its clusters of roots (so-called beard) that hang down from the branches *(Fig. 144)*. Many types and varieties of this species that differ slightly from each other are found. Examples of common wild fig, which occurs across the country, can be found in Malmesbury, Velddrif, and Tulbagh. A number of the beautiful common wild fig trees grow in front of the Administration Building of the University of Stellenbosch (previously the Carnegie Library) in Ryneveld Street *(Fig. 144)*. This species is more resistant to cold than others. It bears single fruit in the leaf axils *(Fig. 145)*. Unfortunately its roots grow aggressively and can disturb the soil surface and buildings (Burrows, 2003).

- Some other indigenous wild fig species in Southern Africa also display strangling characteristics, for instance **Peter's strangling fig** (*F. petersii* Warb.). It often develops into very large trees and thrives in the warm, drier parts of the country. It is known particularly for its strings of sessile fruit on the shoots. Local people make ropes from the bark of the trees and also use the fruit; as a result they will not cut down these trees as easily as others.

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* **Note:** If more information is required about the Southern African wild figs and their vectors, there is no better, more comprehensive book than that of John and Sandra Burrows, *Figs of Southern & South-Central Africa* (Burrows and Burrows, 2003). This book is the result of 11 years' personal research in this field. The authors summarised their results in a hard cover book containing systematic descriptions and historical information on all the indigenous *Ficus* species. They also cover other *Ficus* species, and even other genera of the Moraceae family in South Africa, Zambia, Zimbabwe, Botswana, Mosambique, Swaziland, Malawi and Lesotho. The book is fully illustrated with sufficient colour photographs of excellent quality; undeniably a true collector's item.

Fig. 146: On the farm of Dolf Marais in Prince Albert, figs are sorted for grinding into a spreadable pulp (the fruit mincer is in the background).

Chapter 7

Utilising Figs

Since the earliest times the fig has been a popular fruit for fresh consumption; few other fruit are as sought-after as fresh figs. For this reason a number of fig trees have always been planted in home gardens throughout South Africa, even though the climate was less suitable for the preservation of the ripe figs.

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Due to their highly perishable nature, figs had been of use only to local consumers in the past. However, the improved technology for storage and air-freighting of figs and the availability of the new darker cultivars have contributed to the development of the sustainable export trade in fresh figs that exists in South Africa today. It also created better prospects for a profitable local market for the various white and coloured fresh fig cultivars and will most certainly bring about a better local fresh fig market altogether.

Initially figs were dried to preserve the fruit for storage or shipping to distant markets. Unfortunately not all cultivars are appropriate for the production of dried figs of acceptable quality. Moreover the best dried fig cultivars, for example 'Smyrna' and 'Calimyrna', need

Fig. 147: Dried 'Calimyrna' figs.

caprification (pollination) to ensure an acceptable harvest, and in addition to that a warm environment with low humidity is required for successful drying. Therefore South Africa is generally not a suitable area for commercial dried fig production, and almost all dried figs consumed locally are imported from Turkey.

Drying of Figs in South Africa

General

In the past commercial fig producers in South Africa were required to pack and market dried figs with other dried fruits through the packer appointed by the Dried Fruit Board, the South African Dried Fruit Cooperative (SAD). This was a very unpopular arrangement and along with the unfavourable climatic conditions in the largest fig producing regions it contributed to stagnation in the drying of figs. Today there is no restriction on any dried fruit marketing in the country.

There are possibilities for dried fig production in parts of the Little Karoo where fresh irrigation water is available and late frost does not cause difficulties. Until recently 'White Genoa' and the 'Cape White' fig had been the only figs used for drying, but 'White Genoa' yields a rather poor product and crop, whereas the small fruit of 'Cape White' creates a handling nightmare. However, new cultivars are now available, such as 'Kadota', 'Deanna' and 'Ephesus', which prove to be suitable for drying in other parts of the world. Figs such as 'Adams', 'White Adriatic' and the 'Kaapse Bruin' fig can also be processed into tasty dried figs, but the dark colour of the pulp and/or the skin is not acceptable to demanding produce buyers. In addition, 'Adams' and 'White Adriatic' ripen later, which prolongs the exposure of the fruit to unfavourable, damp conditions, rendering the fruit unsuitable for drying. 'Calimyrna', which today produces the best quality of dried figs in the world, is also available in South Africa, but this fig requires caprification, an inconvenience that for all practical purposes makes it unsuitable for local dried fig production.

It is important to handle and dry figs in a clean environment. Therefore workers and the equipment used should adhere to high-grade sanitary standards, and suitable facilities should be provided for this purpose in the workplace. Dust is always a problem when sun-drying. Large drying surfaces should preferably have a grass cover and roads should be kept moist. Drying stacks, picking containers and work surfaces should be washed regularly and equipment should be stored in a clean environment. Rejected and spoilt fruit should be removed and buried, where necessary, to prevent vinegar flies and decay organisms from spreading.

Special sulphur houses are available at large-scale fruit-drying operations, but in the case of smaller-scale operations, drying stacks can be treated with

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sulphur dioxide (SO_2) under a tarpaulin cover and the amount of sulphur required and time of treatment can be adjusted proportionally.

When sulphur is burned, SO_2 is released. It accelerates drying as the cell membranes of the fruit are destroyed, exposing fluids to evaporation. Furthermore, SO_2 prevents unnecessary browning of the product and disposes of decay organisms. These benefits can also be achieved with the use of sodium metabisulphite at 30 g/L water, but the sun-drying process will take longer and the dried product will require cold storage to compensate for the preservation effect SO_2 would have provided. When SO_2 is used, it must be taken into account that certain consumers are allergic to the compound and others merely want to avoid it. In most European countries the sulphur content of dried fruit should not exceed the legal maximum levels.

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Drying in an Oven

In some households that do not have drying facilities, small amounts of figs can be dried in the kitchen oven. Similar to rusks, ripe figs can be dried overnight (or over two nights) in a conventional fan oven at 50 °C to 60 °C. The time and temperature has to be monitored to ensure evaporation occurs slowly and evenly and the fruit dries equally on the inside and outside. Oven-dried figs should not be packed within 12 hours after drying.

Drying Methods
(According to Le Roux et al., 1971)

Figs can be dried peeled or unpeeled. Unpeeled figs should be picked when fully ripened for drying; if excess fig latex is present at the stalk, the fig is still too green. Figs infested with vinegar flies and displaying signs of Botrytis cinerea infection, are unsuitable for drying and have to be removed.

Fully ripened figs are soft and should be handled very carefully to avoid damage or bruising of the fruit. Figs are best picked and handled in hand baskets or single-layer containers. To prepare for sulphur fumigation, figs can be arranged on any tray stack suitable for drying of peaches and apricots. Fruit should not touch each other, and stalks should be facing upwards. Stacks are then placed in the sulphur cage. About 3,5 kg sulphur is used for six to eight hours' sulphur treatment, depending on the size of the area.

During fumigation the figs become soft and collapse, consequently becoming broader. If the figs have been packed too tightly, they will come into contact with and stick to each other. This hampers the turning of the semi-dried figs on the trays.

During fumigation, syrup exudes from the fruit through the ostiole, settling on the tray and resulting in fruit sticking to the trays. Therefore figs should be turned over and placed on their

stalk ends two days after fumigation. Some insist that figs should be placed in on their stalks from the beginning. When the fig is turned, the stalk is pushed into the fruit to form a flat surface on which it can rest. It is also advisable to squash the fruit slightly and adjust its shape to ensure that it has a more attractive shape once it has been dried. Turning is also necessary to prevent vinegar fly infestation and fungal infection on the stacks and to achieve uniform drying.

After about two days in the sun, the figs are turned over and treated repeatedly with sulphur, similar to the first time.

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Fig. 148: In the tray on the left a fig spread is drying following treatment with sodium metabisulphite to prevent possible Botrytis infection. The other trays contain fig halves that have been treated with sulphur dioxide under a tarpaulin to promote drying and maintain colour.

Placing the figs on their sides before applying the sulphur treatment is another way of arranging figs on the trays and will reduce the loss of syrup.

If the weather conditions are favourable, the fruit should have dried sufficiently within eight days. When dew starts to occur, it is advisable to stack the trays in the evening.

As a considerable amount of syrup oozes from ripe figs during the drying process, the trays need to be washed regularly.

In the case of certain figs, such as 'Adams', the fully ripened fruit is peeled before drying. The fruit has to be peeled as soon as possible after picking, as figs wilt very easily and the tough skin complicates the peeling process. The common peeling method is to remove the fruit skin superficially on the side of the ostiole with a sharp knife, without removing excessive pulp and crushing the fig, which would result in an unmanageably soft fruit. The skin is then peeled off from the stalk towards the ostiole end.

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Thereafter the peeled figs are treated in the same manner as unpeeled figs, except that the duration of sulphur fumigation is 45 to 60 minutes only. The figs are to be dried until the pulp is completely firm; this should take about five days under favourable weather conditions.

Purple or dark figs can also be dried successfully, but even though the taste might be acceptable, the appearance would compare unfavourably with that of dried white figs, resulting in poor market value.

The principles for the drying of bulk quantities of figs also apply to the drying of small quantities, for instance home drying.

Dried Fig Paste Rolls

Dried fig paste rolls (or fig paste strips) are a popular way to make good use of ripe or almost overripe and slightly damaged figs. Collect and store enough figs in the freezer until conditions are favourable for drying. Pulp or grind the figs and spread the paste evenly, 5 mm to 7 mm thick, on any flat surface, such as a baking tray or dish, a tea tray or drying tray *(Fig. 146* and *148)* that has been covered with greased or oil-sprayed plastic wrap. Place it on the drying rack or tray in direct sun, covering it with another drying tray or cheesecloth to prevent insect infestation. Remove the sheets of fig paste from the plastic wrap once this is possible – after about 6 hours – and place it on the drying rack for another 4 hours for further drying. To prevent excessive drying, a thin layer of honey can be spread over the dried fig sheet. This will also help to roll the sheet tightly into a fig roll or to cut it into strips.

Figs for the Table




Fresh Figs

Figs are the connoisseur's delight, the home chef's friend and a bonus for the health conscious. Serve figs peeled or unpeeled, whole or cut up, in salads, side dishes, as a snack, a light meal or a dessert. Figs are enjoyable in tarts, cakes or fillings.

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The fruit can be decoratively cut into wedges, medallions, or flower or star forms and pleasingly presented. For flower or star forms, cut the fig either at the ostiole or the stem end, keeping the base intact so that it can be opened to expose the contrasting flesh.

Whole figs can be served with other fresh fruit such as watermelon, Hanepoot grapes, plums and prunes. For breakfast or light desserts, serve the figs with yoghurt, whipped cream or crème fraîche. Both the flavour and texture of soft cheeses such as mozzarella, goat's cheese, feta, cream or cottage cheese are complemented by fresh figs. Figs can also be served with soft, ripened cheeses (Camembert, Brie and blue cheese) as snacks and starters. Combine figs with shaved Parmesan, smoked chicken pieces, thinly sliced Parma or Prosciutto ham and salmon or biltong shavings for a more substantial dish.

To enhance the flavour of figs, use fresh lemon juice and honey or a splash of strong, aromatic liquor such as brandy, rum or liqueur, for example Van Der Hum or Cointreau. For a sweet and tangy taste in salad, use both honey and a balsamic reduction with the figs. Seasonings, for instance lemon, orange, ginger, cinnamon, cloves and freshly ground black peppercorns, or herbs such as whole or chopped fresh basil, thyme and marjoram, can be added to figs in baked and savoury dishes.

Figs can be attractively presented using a variety of garnishes with complementing colours. The colour of black or purple figs can be enhanced with purple and red lettuce, roasted beets and dark red ham.

Recipes with Fresh Figs

Flavoursome fig breakfast

- Place fresh ripe figs, trimmed and cut into wedges, into individual dessert bowls.
- Top with freshly squeezed orange juice or berry puree, or sprinkle with rose water, or add a dollop of yoghurt, some honey or lemon zest and stand for a while to blend the flavours.
- Garnish with toasted almond or coconut flakes or pistachios just before serving.

Fig starter with mozzarella cheese and/or ham

- Arrange colourful lettuce leaves, such as radicchio, baby red beet, and spinach, on a platter or individual plates. Cut figs into flower or star shapes and place on the greens.
- Add slices of mozzarella cheese, Parma ham, smoked beef or biltong shavings to taste.
- Drizzle with balsamic reduction and season lightly with freshly ground black pepper and salt.
- Alternatively, wrap whole peeled figs in thinly sliced ham and secure with wooden toothpicks. Serve on a bed of colourful greens.

Refreshing fig puree drinks or desserts

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- Puree fresh, ripe figs in a food processor and add a few drops of lemon juice and sugar or honey to taste. Serve in a highball glass as a smoothie, or as a sauce with ice cream.
- The puree can also be whipped into a milkshake or mixed with an equal amount of Greek yoghurt as a light dessert.
- A mixture of 100 ml cream and 200 ml berry mousse (figs with for instance blackberries) can be spooned over sliced figs for an interesting dessert.
- Alternatively, decorate individual platters with the berry mousse as a coulis and place seasoned fig wedges on top. Serve chilled.

Fig puree with carpaccio

- Chill top quality, ripened beef fillet for 30 minutes in the freezer. Remove all sinews, cut the cold meat on the cross grain into very thin (3 mm) slivers. Drizzle lightly with olive oil. Keep chilled.
- Peel figs and puree with a little Marsala or sweet sherry in a food processor.
- Spoon about 30 ml of the puree on one side of each plate and arrange a few slices or wedges of unpeeled figs on the puree. Drizzle with Marsala.
- Arrange overlapping carpaccio slivers opposite the figs.
- Serve immediately. A mustard sauce can be offered with this tasty starter.

Fig salad with rosemary and goat's cheese

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- Peel and slice fresh, ripe figs in a bowl and toss with rosemary leaves that have been removed from the sprigs.
- Drizzle with lemon juice, olive oil and balsamic vinegar. Stand for an hour or more to marinate.
- Lay baby salad leaves, rocket and diced goat's cheese on a platter. Scatter biltong shavings, thinly sliced Parma ham or smoked chicken over this, and arrange fresh grapes and the marinated figs on top.
- For the dressing, mix 50 ml avocado or olive oil, 10 ml honey, 50 ml cream or sour cream, 5 ml prepared sweet mustard, and a clove of garlic, finely pounded with salt. Add salt and freshly ground black pepper to taste.
- Drizzle it with the dressing and serve.

Fig and Hanepoot dessert

- Sprinkle peeled fig wedges with fine castor sugar and stand for an hour or more. Scoop the liquid that forms over the figs.
- Gently mix fresh, whole Hanepoot grapes with the figs. Drizzle with balsamic vinegar to taste.
- Transfer to a glass bowl and grind black pepper over the fruit. Scoop over full-cream, plain Bulgarian or plain Greek yoghurt. Garnish with a drizzle of honey.

Fig anchoyade

Originally French, anchoyade is a creamy paste of anchovy puree with crushed garlic and olive oil and a few drops of lemon juice with one or more fresh fruit or vegetables. It can be served with raw vegetables or with bread as a pâté.

- Drain a small jar of anchovy fillets and macerate in milk for an hour to neutralise the sharp salinity. Blot the milk and finely chop the anchovies.
- Peel and finely cut a cupful of figs. Add finely chopped garlic (one to three cloves) and a few drops of lemon juice.
- Mix the anchovy paste with the seasoned figs.
- Serve the anchoyade paste with bread sprinkled with olive oil or with chopped onions. It can also be served on toasted cheese bread or bruschetta.

Salad with baked figs and summer vegetables

- Cut figs into quarters and pack snugly into an ovenproof dish, skin side down. Drizzle with olive oil and sprinkle with castor sugar.
- Bake until the figs change colour, but still feel firm to the touch.
- In the meantime, prepare the vegetables. Steam fresh green beans and asparagus al dente, drain and sprinkle with olive oil. Stand to cool.
- Scatter a variety of crispy lettuce leaves on a serving platter and arrange the baked figs, green beans and asparagus on top.
- For added colour and taste, include grilled beetroot slices or wedges to serve.

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Baked stuffed figs with Parma ham

- Halve firm figs. Cut soft blue cheese into squares and put one into each fig. Gently close the two halves again.
- Wrap the fig with a thin slice of Parma ham or rindless bacon and secure with a wooden toothpick.
- Pack wrapped figs snugly into a greased ovenproof dish.

- Sprinkle with salt and pepper and drizzle with a little honey, olive oil and balsamic vinegar to taste.
- Bake at 180 °C until the bacon is cooked or the Parma ham is crisp, about 8–10 minutes.
- Garnish with freshly ground black pepper and chopped mint or rosemary leaves and serve warm, with or without pan juices.
- Alternatively, make a cream sauce: Mix 125 ml chicken stock and 125 ml cream. Heat to reduce to half the volume, and add 250 g diced Roquefort cheese. Simmer to reach a creamy consistency. Drizzle the sauce gently over each fig and serve hot.

Baked fig dessert

- Pack unpeeled, firm figs into an ovenproof dish, with their stalks facing upwards.
  The figs can also be sliced or quartered and baked in individual ramekin bowls. Add a little water.
- Sprinkle with brown sugar or drizzle with warm honey and vanilla, or honey and balsamic vinegar, or just liqueur, brandy, or sherry to taste.
- Cover the dish initially with a layer of aluminium foil to prevent the stalks from burning.
  Bake at 180 °C for 10–15 minutes, basting several times with the syrup that forms.
- Serve hot or cold with yoghurt, crème fraîche, cream or custard.
  It can also be served hot on a waffle with syrup and mascarpone cheese.

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Grilled figs with crème fraîche and mascarpone

- Heat grill in advance.
- Cut ripe figs in half and place open sides up in a greased oven tray.
- Lightly mix 45 ml honey and 30 ml balsamic vinegar and drizzle over the figs.
- Grill until the figs and the honey sauce start to bubble.
- Mix 125 ml crème fraîche and 125 ml mascarpone cheese. Scoop the mix over the warm roasted figs.
  The cheese mix will melt and run over the figs.
- Quickly sprinkle with balsamic reduction and a handful of chopped basil leaves. Serve immediately.

Baked figs and cheese tartlets

- Gently roll out ready-to-bake puff pastry and line small, individual quiche pans.
- Spread 250 g herbed cottage cheese over the dough. Halve ripe figs and arrange on the cheese with the sliced sides facing upward. Drizzle with 50 ml lukewarm honey.
- Finely grate cheddar cheese and mix with savoury biscuit crumbs. Sprinkle fresh marjoram or thyme over the figs. Cover with the biscuit-and-cheese crumbs.
- Bake at 180 °C for about 10–12 minutes until lightly browned and cooked.
  Serve hot as a starter or light meal.

Figs baked in filo parcels

- Cut 3 filo pastry sheets into equal squares. Lightly brush each square with melted butter and place crossways in a greased muffin pan. Repeat to form a star of 3 layers in each muffin cup.
- Using a sharp knife, cut a cross into the top of each fig. Press down or gently squeeze in order to part the flesh. Drizzle with lemon juice and honey, and add pistachio or other nuts.
  Close the fig and brush with melted butter.
- Place each filled fig in a filo star, pinch the pastry ends together to close and brush with melted butter.
- Bake at 180 °C for 7–10 minutes until golden brown. The filo points can be covered with foil to prevent burning.
- Serve warm with vanilla-flavoured crème fraîche or plain yoghurt as a light dessert.
- For a savoury alternative, use crisp bacon, cheese and herbs in the figs.
  Drizzle with lemon and balsamic vinegar.

Fresh fig clafouti

This traditional French country recipe uses orchard-fresh raw or slightly macerated fruit topped with a rich pancake dough and baked in an oven dish or ramekin bowls.

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- Prepare the batter: Sift together 70 g cake flour and 30 ml castor sugar. Mix 250 ml cream and 5 ml vanilla extract, and beat 3 large eggs into the liquid. Blend the flour and egg mixtures and stand for at least one hour to rest.
- Grease a pie dish or ramekin bowls with butter and dust with castor sugar.
- Snugly arrange ripe, peeled figs or stewed or canned figs (drained) in the prepared pie dish or individual ramekins.
- Drizzle with warm honey and Van Der Hum liqueur and grill until the figs begin to soften and caramelise.
- Pour the batter over.
- Bake at 180 °C for 20 minutes in a preheated oven until the batter has risen slightly and is lightly browned. Serve warm with whipped cream as a light dessert.
- The clafouti can also be served cold. Spread with apricot jam and sprinkle with icing sugar and/or toasted almonds just before serving.

Preserved Figs

Extend the season for the use and enjoyment of figs by preserving the fruit. Whole figs, chopped figs and fig puree can be frozen. Canned in sugar syrup or alcohol, figs are an interesting addition to any dessert, whereas jam, preserves, crystallised and candied fruit will liven up a cheese platter or lunch spread. Whole and pureed figs can be dried successfully (p. 150) and enjoyed as fig sweets and fig rolls (p. 151).

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Freezing of Whole and Pureed Figs

- Always use good quality fruit for freezing and store at -4 °C. Thaw slowly when needed. Thawed figs can be pureed for a light dessert or a sauce to be served with yoghurt or ice cream.
- To freeze whole figs, peel the fruit, let it dry slightly and place on a tray, spacing the fruit to allow air circulation. Cover and freeze for approximately 3 to 4 hours until firm.
- To freeze whole figs in a container, sprinkle the peeled fresh figs with sugar and pack snugly into a freezer container. During thawing the fruit will soften as the cells break down and a sweet watery liquid will form. Use this as a delicious sauce.
- Figs can also be frozen in a syrup. Mix and simmer 600 g sugar or 400 ml honey in 1 L water with 10 ml lemon juice or 5 ml ascorbic acid. Cool to room temperature.
  Sliver peeled figs into the cooled syrup. Seal tightly before freezing.
- Puree fresh figs with sugar and lemon juice to taste. Freeze the pulp.

Canning of Whole Ripe Figs

Pick ripe figs and trim the stems neatly. Arrange on a tray, leave for 30–60 minutes to dry in the sun and wind. Prick the figs with a toothpick to allow the syrup or alcohol to penetrate.

Preservation in sugar syrup

- Prepare medium thick sugar syrup (simmer one part sugar and two parts water). Pack the prepared figs into warm wide-neck jars. Pour the warm syrup over and close the lids loosely.
- Sterilise by placing the jars into a large saucepan on a folded cloth. Leave some space between the jars and fill the saucepan with hot water to just below the necks of the jars. Boil for 15 minutes.
- Sterilization in a pressure cooker with a false bottom is also effective. Depending on fruit ripeness, sterilise 5-10 min at 50 kPa (low steam pressure).
- Carefully remove the jars from the boiling water and seal. Wash to remove any stickiness, label and store in a cool dark dry place.
- Use canned figs as a replacement for fresh figs in any recipe or as a light dessert with whipped cream, vanilla fraîche, ice cream or custard.

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Preservation in alcohol

Originally served after dinner or with cake and afternoon tea, this delicacy was popular at the manor houses of the old Cape. Distilled alcohol such as rum, brandy, vodka or witblits can be used for additional flavour.

- Weigh the prepared figs and pack into a wide-neck jar. Add an equal amount of alcohol (for 100 g figs use 100 ml alcohol), or alcohol with fine castor sugar (for 500 g figs use 125 g sugar). Alternatively, prepare a syrup (for 500 g fruit, simmer 500 ml water, 100 g sugar and 100 ml alcohol until dissolved). Fill the jar to the brim with the liquid of choice and seal tightly.
- Store canned figs in a dark place to prevent discolouration.

General Tips for Cooking Fig Preserves and Jam

- Rubber gloves will protect the skin from fig latex irritation.
- Keep green figs in the refrigerator to maintain the quality.
- It is not necessary to soak green (unripe) figs in salt or lime solution. However, larger and softer figs can be soaked to ensure firmness during the cooking process.
- Rinse green figs in warm water. Peeling, scraping or grating is not required.
- To prevent sugar from crystallising, dissolve it in the water before boiling. Add lemon juice or tartaric acid to the syrup only as it begins to boil and again just before the end of cooking time.
- The exact quantity of syrup is determined by the size and type of fig, its stage of ripeness and how densely the figs will be packed. Keep syrup in stock if necessary. Excess syrup can be sealed, stored and used for the next season.
- To prevent syrup from boiling over, do not fill saucepan to more than three quarters, add 1-2 ml cooking oil to the syrup or brush the rim of the saucepan with butter, or place a wooden spoon over the saucepan for the steam to allow the steam to escape on either side. Stir the syrup from time to time.

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- It is possible to halt the cooking process at any point. Cool the partially cooked figs. Commence cooking later in preheated syrup.

- Colour is maintained by not closing the lid of the saucepan and by cooking the figs with young fig leaves.
- When bottling, shake the jar gently when half filled with figs and syrup. Take care not to overfill or force the figs into the jar. Fill the jar with syrup. Let it cool slightly to allow the figs to absorb more syrup. Top up and seal tightly.
- For extra flavour add crushed, whole, dry ginger or fresh ginger chips or a few whole cloves and young green fig leaves to the syrup.
- Place baking paper dipped in brandy or melted candle wax or plastic wrap under the lids to ensure jars are sealed airtight.

  Traditionally jars were sealed with cleaned cattle bladder to ensure freshness.

Recipes for Preserves and Jam

Whole green fig preserve

Gather the following before starting:

- A sharp, thin paring knife to cut crosses and remove the stalks.
- A large saucepan to pre-boil the figs and another to prepare the syrup.
- A colander or slotted spoon to transfer the figs to the syrup.
- Clean, sterilised jars with lids (treated metal or glass). The heat of a microwave oven or dishwasher is sufficient to sterilise jars for preserves and jam.
- Wide-mouth funnel to prevent spillage when filling the jars.

Prepare the preserve:

- Use hard green figs of similar size. They should be slightly hollow to allow the syrup to penetrate. Trim away the wooden part of the stalk. Cut a small cross in the ostiole end and weigh the figs. (If the figs are large and have started to soften, soak overnight in lime water.)
- Add figs to rapidly boiling, salted water. Boil for 10–20 minutes while preparing the syrup. A pinch of baking soda added to the water will shorten the cooking process.
- To prepare syrup for 1,5 kg figs, use 2,5–3 kg sugar and 6 L water. Add 30–50 ml lemon juice or 5 ml citric acid, tartaric acid or cream of tartar. Simmer gently until the sugar is dissolved, then add flavourings to taste.
- Stir the boiling figs occasionally. When ready, the figs should be slightly firm to the touch and not collapse; a match inserted should easily pierce the skin. Transfer the hot figs, drained, to the simmering syrup.
- Boil rapidly in the syrup for about 2 hours without a lid, or the first hour with the lid on, until the syrup forms foamy bubbles, becomes clear and shiny and drips slowly from a spoon. Remove from the heat, let the foam subside and bottle.

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Whole ripe fig preserve

- Peel firm ripe figs and place outside on a tray to dry in the sun and wind.
- Weigh and prick the figs with a toothpick.
- Soak overnight in lime water (15 ml lime powder for 2–3 L of water) to ensure that the figs will not soften excessively during cooking.
- Drain and transfer to the boiling syrup. Then follow the instructions above for green figs.

Smooth ripe fig jam

- Peel the figs, cut or slice as preferred and weigh the fruit.
- Pack 1 kg figs and 600 g sugar in layers in a glass container or stainless steel saucepan.
- Add 100 ml water and 50 ml lemon juice and stand for one to two hours. Keep the fruit cool and avoid fermentation. (Take care when standing figs overnight, as they can sour when warm.)
- Transfer to a saucepan and heat slowly, stirring occasionally until the sugar is dissolved.
- Add the preferred seasoning.
- Bring to a rapid boil in an open saucepan and stir occasionally to prevent burning. Boil for 20–45 minutes depending on the fruit ripeness. When the bubbles appear big and thick, scoop out a little with a wooden spoon and allow to cool for a few moments. If the jam falls from the spoon in heavy, jellylike drops, it is ready.
- Remove the saucepan from the heat, cool slightly, let the foam subside, and bottle

Smooth ripe fig jam in microwave

- Peel and slice 500 g ripe figs, mix with 300 g sugar, 50 ml water and 25 ml lemon juice.
- Grate 1 cm fresh root ginger, peeled, and add to the fruit.
- Microwave for approximately 10 minutes at full power, stirring every 2 minutes, until the sugar is dissolved.
- Microwave for a further 25–35 minutes until the jam has reached the desired consistency.
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Crystallised green figs (dry sugar method)

- Soak 1 kg prepared green figs overnight in lime water (15 ml lime in 2 L of water).
- Drain, rinse and bring to boil in cold, salted water (15 ml salt in 2 L of water). Boil until soft.
- Drain and plunge the hot figs into cold water for 20 minutes. Drain well.

- Pack the figs in alternating layers with sugar (for 1 kg figs, use 2 kg sugar) in a saucepan.
- Sprinkle with a little water, cover and bring to a slow boil.
- Boil for about 2 hours. Do not lift the lid or stir, but shake occasionally to prevent burning.
- Remove from heat and let it stand overnight.
- Bring the figs slowly to the boil again. Keep the saucepan covered and boil until the syrup is very thick and about to crystallise.
- Cool the figs well, then lift out carefully with tongs and leave upside down on a wire cooling rack to crystallise.

Conserve

The term conserve could refer to various types of preserved fruit – from pieces of whole fruit in syrup to a smoother jam. Generally two or more types of fruit are used in a traditional conserve, with apples as a supporting ingredient. The pectin in apples will provide the conserve with a slight jelly-like texture. Crushed nuts and seedless raisins are often added to the fruit mix.

Ripe fig, apple and Hanepoot conserve

- Peel and slice 500 g ripe figs into chunks. Sprinkle with a little water and bring to boiling point only.
- Halve 500 g Hanepoot grapes, preferably seeded, and add to the figs.
- Cover the peels, core and flesh of a few apples with water and boil. When the boiling water becomes glutinous, remove the peels and cores.

- Add the apples and apple water to the just-cooked figs and grapes. Weigh and add 750 g sugar for every 1 kg fruit mix.
- Heat gently and stir until the sugar has dissolved. Add the juice of half a lemon and 1 ml oil. Bring to the boil.
- Cook for about 30 minutes to a smooth-jam consistency. Stir occasionally and remove foam if necessary.
- Bottle and seal.

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Ripe fig and rhubarb conserve

- Layer 500 g rhubarb, cut into small pieces, with 500 g sugar, 125 g bleached sultanas and 250 g ripe figs (halved) in a saucepan.
- Sprinkle with 30 ml lemon juice and stand for a few hours.
- Bring to the boil slowly until sugar is dissolved. Then boil rapidly to a smooth-jam consistency.
- Bottle and seal.

Chutney

Chutney is a sweet and sour fruit paste, originally made in the Cape with fresh or dried fruit or a combination, as the season dictated. It is usually served with meat or savoury dishes. The fruit is simmered with onions and vinegar, sugar and or garlic or chillies and spices to form a pungent smooth jam. It is served with meat, curries and pickles or on sandwiches, as a spread with cheeses.

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Green fig chutney

Ingredients

- 1 kg washed green figs, quartered or sliced, boiled in water for 10 minutes and drained
- 2 sour apples, peeled, cored and diced
- 2 large onions, chopped
- grated fresh ginger or ground ginger and a pinch cayenne pepper
- 2–4 cloves garlic, finely pounded with salt
- 250 ml vinegar, or half grape and half balsamic vinegar, or half white vinegar and half dry white wine
- 300 ml brown sugar
- 15 ml salt and 5 ml freshly ground black pepper
- 15 ml yellow mustard seeds
- 3 ml ground cardamom seeds
- 250 ml sultanas or seedless raisins

Preparation

- Heat the vinegar, sugar and salt, stirring until the sugar has dissolved. Add the cooked figs, fruit and other ingredients and simmer until thick and glossy, approximately 60–90 minutes.
- Taste to ensure sweet and sour flavours are balanced and seasoning is not overpowering.
- Bottle, seal, and stand for 2–3 weeks to blend flavours before using.

Recipes with Green Fig Preserve

Green fig preserve, drained and sliced, is a popular ingredient for cheese cakes, tarts and fruit cake. As a versatile garnish, it also adds flavour to cakes, tarts and canapés and enhances both sweet and savoury dishes. Serve whole green fig preserve with fresh whole-wheat or rye bread and butter. Figs complement the saltiness of good quality Camembert, Brie or blue cheese served with savoury biscuits. Any extra syrup from the preserve can be mixed with brandy or liqueur and used as a sauce for dessert and ice cream or served as a sweet drink.

Green fig and cheese tart

Ingredients

- 65 g butter, melted
- 65 g sugar or castor sugar
- 3 eggs, room temperature, separated and egg whites beaten until stiff
- 2–3 ml vanilla essence
- 125 ml cream cheese
- 125 g sweet milk cheese, finely grated
- A pinch of salt, pinch of ground ginger and freshly ground black pepper
- 30 ml self-raising flour
- 250 g green fig preserve
- 100 ml chopped pecan or other nuts
- Biscuit pie crust

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Preparation

- Cream butter and sugar, add egg yolks and vanilla and beat until light and creamy.
- Combine with the cream cheese and grated sweet milk cheese and fold in the whisked egg whites.
- Scoop into the pie crust. Shred half the figs and sprinkle over the mixture.
- Bake at 180 °C for about 20 minutes and then at 150 °C for 20 minutes.
- Slice or quarter the other half of the figs, and garnish the tart to serve.

Green fig and brandy squares

Crust

- Cream 65 g butter and 50 g sugar. Add 1 beaten egg yolk and mix well.
- Sift 140 g cake flour and 5 ml baking powder. Add to the butter mix and blend until resembling thick breadcrumbs that are just clumping together.
- Press into a prepared oven tray (20 cm x 25 cm).
- Bake at 180 °C for 15 minutes until half cooked. Stand to cool.

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Filling ingredients

- 100 g soft butter
- 100 ml castor sugar
- 2 eggs
- 250 ml crumbed Marie biscuits (about 12 biscuits)
- 5 ml baking powder
- 100 ml finely shredded, drained green fig preserve
- 75–100 ml fig preserve syrup, with a dash of brandy for flavour
- 100 ml chopped nuts (optional)

Filling preparation

- Cream the sugar and butter and whisk the eggs.
- Stir in fine biscuit crumbs and baking powder, then add the figs and nuts and stir to mix.
- Spoon the filling onto the half-baked crust and bake for about 30 minutes at 180 °C or until lightly browned.
- Stand to cool slightly then pour over the syrup. Cool further.
- Cut into squares, lift and place on a wire cooling rack.
- Serve with whipped cream or crème fraîche.

Green fig fridge tart

Crust

- Finely crumb a packet of ginger biscuits and mix with 90 g melted butter and 15 ml golden syrup.
- Press into a pie dish and bake for 5 minutes at 180 °C.

Filling ingredients

- 1 tin evaporated milk and a pinch of salt
- 3 eggs at room temperature, separated
- 90 ml sugar
- 15 ml gelatine, soaked in 30 ml of cold water and dissolved in 15 ml boiling water
- 250 ml chopped green fig preserve
- 125 ml chopped pecan nuts

Filling preparation

- Bring the evaporated milk and salt to a slow boil.
- Beat the egg yolks with half the sugar, and make a custard with the hot evaporated milk. Stir in the dissolved gelatine, and cool slightly.
- Stir in the chopped figs and nuts.
- Whisk the egg whites with the remaining sugar until soft peaks form. Fold carefully into the mixture and pour into the prepared crust. Chill.
- Decorate with thin slices of green figs and serve with whipped cream.

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Green fig and green pepper sauce

Ingredients

- 450 ml chicken or beef stock
- 50 ml brandy
- 50 ml chopped shallots, sautéed in butter
- 250 ml fresh cream
- 30 ml chopped green fig preserve
- 30 ml green pepper corns, drained
- Salt, pepper and fresh thyme leaves to taste

Preparation

- Simmer stock and brandy to reduce to approximately 200 ml.
- Add shallots, cream, chopped figs, and green pepper corns.
- Add thyme, salt and black pepper to taste and reduce further to desired consistency.
- Serve hot with venison or beef steak.

Recipes with Dried Figs

Dried figs, soft and sweet, are a convenient snack, good for the digestion and nutrient rich. It can be served in compote for a tasty breakfast or as a side dish with meaty meals. Combined with other fruit in pies and cakes, it adds texture and flavour and can be used as a substitute for many other dried fruit. Spice up a fig dish with cinnamon, black pepper, cardamom, cloves, ginger or dried naartjie peel – just remember to remove these before serving. Herbs such as thyme and rosemary also blend well with figs. Adding alcohol, such as sherry, Van Der Hum liqueur or Kirsch, towards the end of the cooking process, will give additional flavour to any fig dish.

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Basic dried fruit compote

Baked fruit compote is a traditional stewed dried fruit dish. A combination of dried fruit, whole or in pieces, is soaked in water or in flavoured sugar syrup and then stewed or baked. It can be served hot or cold for breakfast with plain Greek yoghurt, or as a side dish with pork and venison, or as a dessert with whipped cream, crème fraîche, custard, rice pudding or baked custard.

- Rinse the dried fruit in running water.
- Cover with cold water or a flavoured liquid and steep overnight or for 6 hours.
- Add seasoning and simmer the fruit in the water. Increase the liquid if necessary or reduce it without the fruit for a thicker syrup.
- Cinnamon sugar, biscuit crumbs or other sweetener can be added towards the end of the cooking process, or sprinkled over just before serving.

Baked compote with dried figs

Ingredients

- 500 g dried figs
- 1 naartjie with peel, quartered, or dried naartjie peel
- 500 ml orange juice
- 20 ml lemon juice
- 15 ml Van Der Hum liqueur or sweet sherry

Preparation

- Place the dried figs and naartjie fruit or peel in an ovenproof dish, add the orange juice, and cover.
- Bake slowly for 2–3 hours at 140–160 °C until tender. Increase the liquid or reduce it without the fruit for thicker syrup.
- Allow to cool slightly and add the lemon juice and liqueur.
- Serve as a hot dessert with whipped cream.

Replacements or additions

- With Muscadel wine as soaking liquid and star anise flavouring
- With orange or berry juice and spices to taste
- With a blanched almond stuffed into each soaked fig before cooking
- Baked with honey, fresh thyme and lemon juice and some red wine

Baked dried fig muesli

- Use 1 kg rolled or plain oat flakes and mix with 4 cups of two or more of the following: desiccated coconut, wheat bran flakes (All Bran), or oat bran, sunflower and/or sesame seeds, coarsely chopped pecans or almonds and/or dried pumpkin seeds.
- Mix 250 ml (1 cup) each of olive or grape seed oil, boiling water and honey. Pour over the dry mixture and stir to mix well.
- Divide the mixture into two oven trays and spread out.
- Bake at 160 -180 °C for about 20 minutes or until it is dry to the touch and light brown in colour. Stir the mixture during baking if necessary.
- Mix 250 ml dried cranberries (shredded) or seedless raisins with 250 ml soft, shredded dried figs. Stir into the baked muesli mix and allow to cool thoroughly.
- Store in airtight containers to prevent dried fruit from hardening.
- Serve as a snack or with milk or plain yogurt and fresh fruit for breakfast.

Dried fig, ricotta and chocolate strudel

- Boil 375 ml water and 250 g castor sugar for 3 minutes for a sweet syrup.
- Add 150 ml seedless raisins, 300 g chopped soft dried figs, and 5 ml finely grated orange rind.
- Simmer the fruit in the syrup until just plump, and drain.
  Keep the syrup and season with 5 ml vanilla, then cool.
- Brush 4 sheets of filo with melted butter and place them on top of each other.
  (Filo sheets are to be kept between damp cloths to prevent drying out.)
  Sprinkle with half of 400 g ricotta cheese, which has been drained and crumbled.
- Arrange half the fruit, cooled and drained, on the ricotta and sprinkle with 100 g chopped pecans and 100 g chopped dark chocolate. Roll up.
- Repeat to make a second strudel with 4 filo sheets and the remaining ingredients.
- Place the two strudels side by side on a greased oven tray and brush with melted butter.
  Make a few incisions on the top for the steam to escape.
- Bake at 180 °C until light brown, about 20–30 minutes. Lift onto a serving platter and pour over the fruit syrup.
- Let it cool, then dust with icing sugar. Serve slices with whipped cream.

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Dried fig filling

Use for pies, pastry cases or cakes.

Ingredients

- 65 g butter
- 50 g brown sugar
- 200 ml chopped dried figs
- 65 ml almond paste (marzipan)
- 2 ml ground cinnamon
- Pinch of freshly ground nutmeg

Preparation

- Melt the butter and sugar, and remove from the heat.
- Stir in figs, almond paste and spices. Knead drops of lemon juice into the almond paste if dry.

Dried fig squares

Ingredients

- 250 g butter
- 200 g sugar (1 cup)
- 2 eggs, well beaten
- 5 ml vanilla extract
- 200 g finely chopped, soft dried figs (tough stalks removed)
- 250 ml chopped nuts, plus extra to cover squares
- 1 packet Marie biscuits, broken into pieces

Preparation

- Melt the butter and sugar together in a saucepan.
- Move off the heat and stir the eggs carefully into the melted butter and sugar.
- Stir over heat until the mixture thickens.
- Mix in the vanilla, chopped figs, nuts and biscuit pieces.
- Grease a rectangular cake tin (about 20 x 25 cm). Press down firmly onto finely chopped nuts in the cake tin and sprinkle more nuts on top. Refrigerate.
- Cut into squares and store in refrigerator.

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Dried fig and date flan

Pastry

Sift 200 g flour into a bowl. Add 100 g butter, cut into flakes, 30 g castor sugar, 1 egg yolk, a pinch of salt and 30 ml water. Mix to form pastry dough. Cover and leave in refrigerator for 2 hours. Roll out the pastry to line a 23 cm flan tin.

Filling ingredients

- 120 g butter
- 200 g castor sugar
- 4 eggs separated
- Grated rind of 1 lemon
- 1 teaspoon each of ground cinnamon, nutmeg and cloves
- ½ teaspoon salt
- 100 g ground hazelnuts
- 75 g self-raising flour
- 75 g walnuts, chopped
- 75 g dried figs, finely chopped
- 75 g dates, finely chopped

Filling preparation

- Cream the butter and sugar till light and fluffy, add the egg yolks, lemon rind, spices, salt, hazelnuts and self-raising flour.
- Stir in the chopped walnuts, dried figs and dates.
- Whisk the egg whites until stiff and fold into the egg mixture.
- Spread the filling into the pastry case and bake at 180 °C for 55-60 minutes. Cool on a wire cooling rack.




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