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OCCASIONAL PAPERS

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PINEAPPLES IN THE EASTERN CAPE

A study of the farm economy and marketing patterns

A Thesis  
submitted to Rhodes University  
for the degree of  
Doctor of Philosophy

by

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INSTITUTE OF SOCIAL AND ECONOMIC RESEARCH

R h o d e s U n i v e r s i t y  
Grahamstown, South Africa

1960

TO

Josette and Colette

## PREFACE AND ACKNOWLEDGMENTS

This study was undertaken and completed under the auspices of the Institute of Social and Economic Research at Rhodes University, and financed through a grant to the Institute by the Carnegie Corporation of America.

Whilst it is the aim in this Occasional Paper to present the information in as scientific a manner as possible, no presumption is made that the reader is a trained economist. The study was possible largely as a result of the generous co-operation of 69 commercial pineapple producers along the Eastern Cape coastal belt. It is to them and their fellow pineapple farmers that this study is mainly directed, with the hope that it may be of some value.

My gratitude to others, however, extends far beyond the 69 pineapple farmers who co-operated in the study. Much basic information was also provided by the pineapple canners of the Eastern Cape. Through their aid it was possible to gain a better insight into the relations between the primary and the secondary industries, the marketing of the canned product, and related problems. I am further indebted to the Division of Economics and Markets of the Department of Agricultural Economics and Marketing, for assistance with the preparation of the questionnaire used in the field survey, and the use of its I.B.M. machines. I am also grateful to Mr. L.J. van Lelyveld of the Department of Horticulture and officer-in-charge of the Pineapple Research Station at Collondale, near East London, for information and advice given from time to time throughout this study.

The Institute was fortunate in obtaining the services of Mr. K.M. Durham to assist with the field survey. His help during a crucial period of the study was most valuable. Mr. E.B. Conway, Director of the Bathurst Farmers' Union, generously offered the assistance of his organisation to facilitate the study. In this respect I am particularly indebted to Mr. Zeiss on whose advice I relied heavily during the early stages. Dr. Linhart of the Wool Textiles Research Institute, advised on statistical techniques, while Dr. W.D. Hammond-Tooke and Mr. R. Ayling of Rhodes University read through the manuscript and suggested numerous linguistic alterations; to them my most sincere thanks. I am also indebted to the late Professor H.R. Burrows of the Institute of Social and Economic Research, Mr. L. Fourie of the Department of Economics at Rhodes, Dr. M.L. van As and Mr. Geo. Gill for reading through the original manuscript. The amendments they suggested were of considerable benefit.

To Mrs. Mostert and Mrs. Elliott of the Institute's secretarial staff I am grateful for typing and computational assistance, especially to Mrs. Mostert who typed the stencils. Her immaculate proof-reading eliminated many mistakes in the final manuscript.

Appreciation is due to Professor D. Hobart Houghton of Rhodes University, who supervised the study, for assistance covering a period longer than its duration. Not only did he originally encourage the undertaking of post-graduate work, but was also the first to introduce me to the academic discipline. Throughout the duration of this study he unselfishly gave of his time and energy to facilitate its completion; his numerous suggestions for change and alteration were invaluable.

Finally, sincere appreciation to all those not mentioned above, who have assisted with some aspect or other of the study; especially to my wife for encouragement and assistance with the proof-reading.

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"The Ananas or Pine-apple is accounted the most delicious fruit not only of these Islands, but of all America. It is so delightful to the eye and of so sweet a scent that Nature may be said to have been extreamly prodigal of what was most rare and precious in her Treasury to this plant."

"The Meat or Pulp which is contained within the rind, is a little fibrous, but put into the mouth is turn'd all to juice: it hath so transcendent a taste and so particular to itself, that those who have endeavor'd to make a full description of it, not able to confine themselves to one comparison, have borrow'd what they thought most delicate in the Peach, the Strawberry, the Muscadine grape, and the Pippin, and having said all they could, been forc'd to acknowledge that it hath a certain particular taste, which cannot easily be express'd."

(From "History of the Carriby Islands" by Charles de Rochfort, published in France in 1658. Translated by John Davis and published in London in 1660.)

## Chapter I

### THE STUDY: ITS OBJECTIVES AND SIGNIFICANCE

The major objective of this study was to seek a better knowledge and greater understanding of the factors associated with successful pineapple farming in the Eastern Cape Region of the Union of South Africa. As no previous investigation equally representative of commercial pineapple farming patterns in the Eastern Cape has been made, this study can be regarded as a pilot survey of the labour structures, rates of production, combination of enterprises, marketing channels and the suitability of various districts in the region of study for the production of pineapples. In addition, the history of the pineapple in South Africa will be traced briefly, and the position the Union holds as a supplier of pineapples on the world market, will be investigated.

The importance of the Eastern Cape<sup>1</sup> as a producer of pineapples in South Africa is well known, but is also unequivocally illustrated by the information in Table 1. According to estimates made by the Division of Economics and Markets for 1955/56 season, no less than 86.5 per cent of the total acreage planted to pineapples in South Africa, was located in this area. Bathurst, East London and Albany, three of the six districts included in the estimate, were particularly prominent. Taken together, they cultivated more than three-quarters of the total area planted to pineapples in the Eastern Cape, and nearly 70 per cent of the total for South Africa. The remaining quarter of the area cultivated in the Eastern Cape was located in the districts of Peddie, Komgha and Alexandria.

Table 1

#### RELATIVE SIGNIFICANCE OF THE EASTERN CAPE REGION AS A PINEAPPLE PRODUCING AREA IN THE UNION OF SOUTH AFRICA

<u>District</u>	<u>Total area (acres)</u>	<u>Per cent</u>
Albany	10,901	18.3
Alexandria	4,834	8.1
Bathurst	16,535	27.7
East London	12,207	20.5
Komgha	2,205	3.7
Peddie	4,876	8.2
<u>Total Eastern Cape</u>	<u>51,558</u>	<u>86.5</u>
<u>Total South Africa</u>	<u>59,630</u>	<u>100.0</u>

Sources: 1955/56 Estimates by the Division of Economics and Markets of the South African Department of Agricultural Economics and Markets.

Prior to World War II, the corresponding acreages to those listed in Table 1, were almost microscopic by comparison. Due to forces and events outside South Africa, the pineapple industry suddenly sprang into prominence immediately after the war, especially in those parts of the country where planting

material ...../

1. Abbreviation: E.C.

material was readily available. Since then, the industry has grown to be perhaps the single most important source of income for the majority of farmers along the Eastern Cape coastal belt.

Shortly after the outbreak of hostilities in 1939, pineapple plantations in Malaya and Formosa, at the time producing more than 20 per cent of the world's total supply were virtually destroyed. Only strict control measures and a general decrease in the consumption of luxury foods such as canned or even fresh pineapples, prevented an immediate upsurge in price on the world market as a result of the sharp decline in production in these, as well as in other countries, such as Hawaii. At the end of the war, the American market continued to absorb, as before, more than 90 per cent of all the Hawaiian production. Great Britain, also a major consumer of both fresh and canned pineapples before the war, was at the end of the war without its Malayan sources of supply. At the same time, a low gold and dollar reserve made it impossible to obtain any surplus which might be available in the Americas.<sup>2</sup> This left South Africa and Australia in the enviable position of being able to sell at high prices as much as they could produce.

With a steadily rising price level and optimistic rumours that the future promised to be even brighter, South African production increased sevenfold in the ten years after the war. Not only did this occur through the expansion of existing plantations, but many acres never before touched by the plough were brought into production and people from all walks of life came to seek their fortune in the Eastern Cape. As may well be imagined, the pineapple boom was accompanied by some of the most daring land speculation in the history of this country. When prices suddenly began to decline, after a peak during the 1953/54 season, bankruptcies increased, and to-day only the more conservative newcomers and old established family farms are still left in production.

The changes of the last decade have not been restricted solely to an increase in production. During the 1955/56 season, the Bathurst district still had the largest number of acres under pineapple cultivation and the bulk of all pineapples for canning in the Eastern Cape were transported to factories in Port Elizabeth. Since then, however, a number of significant changes have come about. The headquarters of the pineapple research station was moved from Bathurst to Collondale near East London, and two of the largest canning companies in South Africa announced the opening of new factories in East London. More recently, one of these companies further announced the intention to close down their factory in Port Elizabeth and concentrate all canning operations in the East London factory.

In the light of these changes, which are of vital importance to the pineapple farmer, it has become necessary to know more about the commercial success of the producing industry in the various districts of the Eastern Cape. It is hoped that this study will add to the scanty body of statistical knowledge available on the economic aspects of pineapple production, and be of use as a future guide to farmers, extension officers, agricultural policy makers, and all other individuals concerning themselves with this industry and region.

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Chapter II ...../

2. Small quantities of fruit were actually received from the United States during 1946 and 1947 under a programme of aid for Western Europe.

Chapter II

HISTORICAL INTRODUCTION: PINEAPPLE FARMING IN SOUTH AFRICA  
WITH PARTICULAR REFERENCE TO THE EASTERN CAPE

Most historians are agreed to-day that the early home of the pineapple was probably Brazil. Ananas Microstachys, the wild Brazilian pineapple, appears to be a primitive ancestor, which to the ordinary observer looks "... as if some Burbank had hybridized our cultivated pineapple plant and a grass".<sup>1</sup> Other writers, however, particularly Moise Bertoni, are of the opinion that some primitive forms of the pineapple occurred in Paraguay, the original home of the Guarani Indians. This belief is based primarily on the origin of the name Anana. "The name Anana is derived from the Guarani language in which 'A' signifies fruit in general and nana meant excelling. ... The Guaranis, Bertoni states, spread the plant and name from Paraguay in their successful conquest of Brazil, the Guianas, Venezuela, Columbia, Panama and the Antilles."<sup>2</sup>

Columbus first encountered the pineapple in 1493 on the island Guadeloupe in the West Indies and then, later, on other islands in the same group. One of the first references to it in literature was that by Peter Martyr, a tutor to the children of Ferdinand and Isabella at the Spanish court. According to a free translation from the Decades, published in 1530, he writes: "The most invincible King Ferdinand deigns to eat another fruit from the same lands (America); in appearance, shape and color, this scale-coated fruit resembles the pine cone; but in softness is the melon's equal; in flavour it surpasses all garden fruits; but indeed it is not a tree, but a herb very like the Carduus (thistle) or Acanthus. To it even the King himself awards the palm. I have not eaten of this fruit, because only one of the few brought back was found undecayed, the others spoiled from the long voyage. Those who recently partook of them in their native soil extoll with admiration their pleasantness."<sup>3</sup>

The Spanish called the fruit "Pina de Indias"; the "apple" was added by the English. During the eighteenth century, gardeners on the large estates in England displayed great rivalry as to who could grow the best pineapples. The cultivation of the fruit in England was undertaken in large hot-houses that were chiefly erected for this purpose. In 1841 the Paris magazine, Gardener's Chronicle, also reported the growing of Smooth Cayenne in the Royal Kitchen gardens of Versailles. Although the precise origin of this variety is somewhat obscure, it was later reported by the same magazine that the planting material was being imported from French Guiana.

There is reason to believe that pineapples were planted in South Africa for the first time during the time of Jan van Riebeeck.<sup>4</sup> Three years after he had landed at the  
Cape .....

- 
1. Johnson, Maxwell O., The Pineapple, p.1. Paradise of the Pacific Press, Honolulu, Hawaii, 1935.
  2. Ibid, p.1.
  3. Ibid, p.2.
  4. Metrowich, F.C., Assegai over the Hills, Timmins, Cape Town, 1953.  
Clark, L.H., Pynappelbou in die Oostelike Distrikte van die Kaap-provinsie, Departement van Landbou, Pamflet No.102, Pretoria, 1931.

Cape, in 1655, pineapple plants arrived from South America and were planted in the shadow of Table Mountain. Due to what is to-day known as adverse climatic conditions, the experiment failed, and it was not until approximately two centuries later that pineapples were again planted in South Africa - this time in Natal. The origin of the planting material for the second experiment is uncertain.

A public meeting of the inhabitants of the newly formed village of Albert in Natal and neighbourhood was held on May 29th, 1852, under the chairmanship of Alexander Gifford, Esq. on the estate "Compensation", the purpose of the meeting being to discuss the agricultural potential of the area. At the meeting, Mr. Mark J. M'Ken, curator of the Agricultural Gardens at D'Urban "... said that from the experience he has had in Natal, he could speak positively as to the suitability of both soil and climate for the growth of various tropical plants. He had been engaged for the last eleven months superintending the gardens of the Natal Agricultural Society, and during that period had introduced or cultivated several plants successfully, - ginger, turmeric, arnatta, pine apple, arrowroot, tous-les-mois, or French arrowroot, china grass, etc." <sup>5</sup> At the same meeting, Mr. Rathbone, who had previously resided for 16 years in Mauritius, expressed great confidence in the future of Natal as a pineapple-growing area. "Pineapples thrive better here, and possess fine flavour; the Queen Pine, which is the finest description of the pine planted in Mauritius, grows here equal in size to the common Creole Pine." <sup>6</sup> From Mr. Rathbone's statement we gather that pineapples had already been harvested in Natal and could, therefore, not have been one of the plants introduced by Mr. M'Ken during the eleven months of his association with the Natal Agricultural Society. According to the annual report submitted by Mr. M'Ken to the Natal Agricultural and Horticultural Society on August 2nd the same year, it was indicated that there were already more than 1,000 plants established in his gardens by 1852. "Gentlemen, I have great pleasure in laying before you my second annual report. Since my last report dated 22nd August 1851, I have prepared a considerable quantity of land, say nearly four acres, on the hill, where I planted various plants and seeds that have been presented to the Society, and I am truly happy to say that nearly the whole of them have succeeded satisfactorily. ... The Pine Apple plants, of which we possess about twelve hundred, have also done well and from them I hope to have sufficient to supply the subscribers in a few months." <sup>7</sup> Pineapple plants must, therefore, have been brought to Natal before 1850. It is said that the first pineapples were brought to Natal by a group of American missionaries who arrived at Durban about 1830. <sup>8</sup> Although missionaries at the time usually travelled very light, it is not unlikely that they should have brought a few plants with them. These were then planted, they thrived, and had increased to more than 1,000 twenty years later. Another possibility is that pineapples could have been brought to Natal from Mauritius by people like Mr. Rathbone, who came to settle permanently.

Although ...../

5. Van de Sandt, B.J., The Cape of Good Hope Almanac and Annual Register for 1853, p.263, Cape Town, 1852.
6. Ibid, p.264.
7. The Cape of Good Hope Almanac and Annual Register for 1853, Op. cit. 264.
8. Metrowich, Op. cit.

Although Queens were probably the first variety introduced to Natal, Cayennes were also grown at an early stage. In 1866 the Natal Mercury reported "... Mr. Steele has shown us a sample of cayenne, just made by him, having a deep and most beautiful bloom, together with a fine flavour, which is produced by means of picking the pods at a later date than when a lighter colour is required. He expects to have two tons this year. Mr. Steele also pulled in his garden, the other day, an apple weighing ten ounces, and thirteen inches round."<sup>9</sup>

It is almost certain that the first pineapples to arrive in the Eastern Province were obtained from Natal; not with the intention of propagating the fruit in this area, but rather for fresh consumption. Pineapple exports from Natal to the Cape Province took place fairly regularly during the third quarter of the nineteenth century. On 2nd February, 1865, for instance, shipping intelligence reported that 40 sacks of pineapples had arrived in Port Elizabeth from Blain & Co. in the NATALIA screw steamer.<sup>10</sup> This, however, was not the first shipment, for at the time pineapples were already being grown in the Eastern Cape; probably from crowns from fruit imported from Natal at some earlier date. On December 4th, 1865, the Grahamstown Journal reported "... We forgot to mention Mr. Dobson's pineapples. In his hot-house [Uitenhage] he has a number rapidly coming to maturity, and we have no doubt will soon equal [those] imported from Natal." In other words, Mr. Dobson's pineapples which were coming to maturity in 1865 were probably planted during the latter half of 1863. Whether Mr. Dobson was the first to experiment is uncertain, but he was no doubt one of the first to be successful. A letter from Walter Smith, written eleven days after the report about Mr. Dobson's pineapples, indicates that pineapples were then still very much a novelty in this area: "But, sir, however desirable it may be to introduce new fruits, new flowers, trees, shrubs, and grow the aristocratic pineapple, and fill our gardens with all the wealth of the vegetable kingdom, are we at the same time seeking work for our present destitute population by introducing fresh products into the colony to give employment to our people?"<sup>11</sup>

The important event, which eventually led to the establishment of large-scale commercial pineapple plantations in the Eastern Cape, took place in Grahamstown. It is very likely that some of the pineapples that were imported from Natal also became available on the Grahamstown market from time to time, either from Port Elizabeth, but more likely from Port Alfred. "About 1863, Mr. Charles Purdon, the son of an 1820 settler, obtained about 40 pineapple crowns from a hairdresser shop, owned by Mr. Lindsay Green in Bathurst Street, Grahamstown. As an experiment they were planted in the garden of his farm "Thorndon" in the Bathurst district. There they took root, but as they were liable to be raided by stock, were afterwards moved to virgin soil on a hillside. Under these conditions which we now know to be ideal for pineapples, they flourished and bore fruit. Mr. Purdon brought his first three fruits to the Grahamstown market together with a load of firewood. One fruit was handed round in slices for people to

taste .....

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9. Grahamstown Journal, February 12th, 1866.

10. Ibid, February 2nd, 1866.

11. Ibid, December 15th, 1865.

taste the novelty. The other two, when put up for auction, brought in 20s. and 15s. respectively. The load of firewood was sold for 20s. The Purdon family increased their plantings by vegetation propagation, and supplied their neighbours with planting material, so that within a few years a new industry in the region, pineapple growing, was established."<sup>12</sup> The Purdon family, however, was not the only source of planting material. "There were three women, farmers' wives, who used to go down to Port Alfred to sell their produce. One day they saw a few pineapples on a coaster and they arranged with a sailor to bring them a few slips of the pines for planting. He did, and the slips were taken by a Mrs. Hartley to her home in Bathurst. They did not thrive and changed ownership several times."<sup>13</sup> Again Mr. Purdon stepped into the picture. He came to look at the wilting plants and, with the owners' permission, they were collected for him in a sugar pocket in which he took them to his farm and planted them on a natural slope facing the sun. They thrived.

These first pineapples to be planted in the Eastern Cape were Queens. The Cayenne variety was only introduced two decades later and also came from Natal. This time Mr. William Purdon, son of Charles Purdon, bought some fruits from the shop of Mr. J.J. Vroom in High Street, Grahamstown. According to Mr. Vroom's brother, who is still alive and in his 92nd year /1960/, these plants were sold to Mr. Purdon in about 1890. "About 70 years ago, my brother Jim had a seed and greengrocer shop on the corner of Hill and High streets, where Continental Fashions are located at present. Up to that date, about 70 years ago, Purdons had had grown Queen pines in the Bathurst district. My brother had some giant pines in his shop when Mr. Wil Purdon came in and saw the pines; he asked my brother if he could get him some plants. My brother agreed, and sent to Natal to get them for Mr. Purdon."<sup>14</sup>

The early development of the pineapple industry was slow compared with the post World War II era. In the beginning, when production was limited and pineapples enjoyed a high prestige value, only the wealthy could afford to buy this luxury fruit. Market reports for January 1868 show that pineapples sold for 11s. to 11s.6d. per dozen on the Grahamstown market, compared to 2s. per hundred for pears and 1s.10d. per dozen for eggs.<sup>15</sup> In 1879 supplies were still limited and during the off-season pineapples sold for 3s. each on the Grahamstown market.<sup>16</sup> In 1903, pineapples were reported to be growing well in Bathurst, Grahamstown and Peddie, but quantities were still extremely limited by today's standards and are unlikely to have exceeded 50 tons. "Bathurst was found in places to be admirably suited for the growth of fruit trees, and of late years farmers have recognised this and proceeded vigorously to make the best of their opportunities. At the present there are upward of 145,000

pineapples ...../

12. Gill, G.A., The Local Pineapple Industry and its Background, Bathurst Farmers' Union, Grahamstown.

13. Information supplied by Winifred M. Webster, Fort Beaufort, from the papers of the late George Cawood Nelson.

14. From information supplied by W.H. Vroom, Port Alfred.

15. Grahamstown Journal, January 27th, 1868.

16. Ibid, November 19th, 1879.

pineapples planted in the district ..."<sup>17</sup> In discussing the availability of fruit in the Cape during April, May, and June, the same source stated: "The remainder of the supplies for these months is from Natal, whence our market is usually flooded with small pineapples and bananas. A great many of the former are, however, now grown along the Eastern coast of the Cape, and there can be little doubt that this industry will increase year by year to very considerable dimensions. The growers began the proper way, namely by discarding the small, hard skinned and half grown wildling pine that has so long been foisted upon us, and going to Ceylon and the West Indies for the very best sorts procurable."<sup>18</sup> The last sentence would seem to indicate that a better quality fruit was grown in the Eastern Cape, either as a result of careful selection of planting material, or because other varieties were actually imported from Ceylon and the West Indies. It is possible that the writer was referring to the Cayenne pineapple which had only recently been introduced from Natal.

Despite the optimism expressed by writers at the turn of the century as to the future of pineapple production in the Eastern Cape, the expansion of the industry was restricted by the size of the domestic market. At the time, the possibilities of exporting pineapples successfully over long distances, were still uncertain, but the local paper reported favourably on the potential of the export trade, especially if use was made of cold storage. "A lady, who left the shores of South Africa a couple of months ago on a health visit, to England, took with her a couple of dozens of pineapples. They were grown and packed by Mr. C.J. Ansley of Trappes Valley. They were carefully packed in a box, and paper was wrapped around each pine. As they were packed a week before the lady left Grahamstown for Port Elizabeth, quite a month elapsed from the time they were plucked to the date they arrived in England, yet on reaching England they were found to be perfectly sound. The passenger kept them in her cabin during the voyage. If such good results can be obtained without the aid of the refrigerator, what might be expected if pineapples were exported on ships fitted up with cold storage appliances? There would surely be no occasion for pinegrowers to sell their enormous supplies of fruit at the ruinously low prices which they have realised at times during the past few seasons - prices which have proved disheartening to producers."<sup>19</sup>

The value of the fresh export trade fluctuated considerably over the period for which records are available, but remained at comparatively low levels. According to information contained in Table 2, it was only after the first World War that the export value for fresh pineapples began to assume major proportions. However, not much progress was made, and during the depression of the early 1930's and again during World War II, the export trade came to a virtual standstill. It was only after 1950 that the value of this trade for the first time exceeded £100,000. Until the outbreak of the second World War, more than half of the local pineapple production was consumed on the local fresh market,

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17. Burton, A.R.A., Cape Colony for the Settler, J.C. Juta & Co., Cape Town, 1903.

18. Ibid, p.47.

19. Grahamstown Journal, June 30th, 1904.

Table 2

THE VALUE OF FRESH AND CANNED PINEAPPLE EXPORTS FROM  
THE UNION OF SOUTH AFRICA FROM 1911 TO 1959

Year	Value of fresh export	Value of canned export	Total known value of canned and fresh pineapple exports
	£	£	£
1911	826	n.a.	826
1912	1,244	n.a.	1,244
1913	1,687	n.a.	1,687
1914	2,407	n.a.	2,407
1915	879	n.a.	879
1916	365	n.a.	365
1917	295	n.a.	295
1918	247	n.a.	247
1919	366	n.a.	366
1920	1,516	n.a.	1,516
1921	7,789	n.a.	7,789
1922	26,970	n.a.	26,970
1923	9,914	n.a.	9,914
1924	12,660	68,474	81,134
1925	13,855	58,150	72,005
1926	17,418	49,259	66,677
1927	9,748	56,750	66,498
1928	3,059	30,905	33,964
1929	15,414	49,836	65,250
1930	2,835	26,651	29,486
1931	2,322	15,288	17,610
1932	5,931	9,114	15,045
1933	10,406	11,454	21,860
1934	14,439	7,594	22,033
1935	12,878	11,194	24,072
1936	14,420	18,143	32,563
1937	8,726	19,280	28,006
1938	11,923	16,671	28,594
1939	21,414	18,044	39,458
1940	9,711	n.a.	9,711
1941	1,916	n.a.	1,916
1942	2,507	n.a.	2,507
1943	2,007	n.a.	2,007
1944	2,157	n.a.	2,157
1945	1,331	7,788	9,119
1946	1,115	37,814	38,929
1947	50,853	29,076	79,911
1948	2,835	200,562	203,397
1949	3,211	188,801	192,012
1950	89,202	495,347	584,549
1951	325,136	789,356	1,114,402
1952	334,091	578,744	912,835
1953	385,689	1,382,025	1,767,714
1954	223,666	2,372,648	2,596,314
1955	244,214	1,451,981	1,696,195
1956	184,363	2,075,188	2,259,551
1957	142,522	2,376,517	2,519,039
1958	188,428	3,237,540	3,425,968
1959*	159,396	2,518,256	2,677,652

Source: Gill, Op. cit.  
Foreign Trade Statistics. Department of Customs and  
Excise, Pretoria.

\* Preliminary.

but prices received were not satisfactory. It was only the limited capacity of the canning industry and the poor keeping qualities of the fresh pineapple which prevented larger quantities being sold on the export market. In 1922, when pineapples sold for as little as 4½d. per dozen, it was made compulsory for all members of the Bathurst Farmers' Union to export their pineapples through the co-operative.<sup>20</sup> Conditions did not improve much. In a letter from an export agent to the local newspaper it was stated that "... Whilst in London during the past season, our Mr. Holland was very struck with the considerable drawback to increasing to any considerable extent the export in pineapples owing to their non-keeping qualities. The limited quantities that go over regularly are readily disposed of by the overseas agents, including our principals, Messrs. Joseph Travers & Sons, Ltd., but unless the retailers manage to sell them within five or six days after they are taken from cold storage, they made a dead loss on their purchase. In consequence only a small percentage of dealers in fruit can be induced to deal in pineapples at all, whereas if the keeping qualities could be improved, even to give dealers ten days in which to retail their pines, the volume of trade could be expanded out of all proportion to its present restricted limits.... Grocers throughout the United Kingdom as a rule only deal in four kinds of fruit, all good keepers, viz., oranges, bananas, apples, and Almenia grapes. Think of what it could mean in Lower Albany if pineapples could be added to this list."<sup>21</sup>

Pineapple growing was only established on a sound and more permanent basis after the development of the canning industry in the Eastern Cape. The first canning factory was opened at Port Elizabeth by the Schlesinger Organisation of South Africa in September 1919 under the name of the African Canning and Packing Corporation, Ltd. African Cannery did take fruit from individual growers, but it was mainly established for the processing of large tonnages of fruit from the Langholm Estates in the Bathurst district, which was also under the management of the Schlesinger Organisation. Producing mainly Queens, pineapple production on these Estates reached approximately 3,000 ton during its peak production period. With the intention of intensive cultivation and land settlement, plots of five acres of developed pineapple land were sold to people all over the world. In order to facilitate the transportation of their fruit to the canning factory, the management also undertook the building of an eight mile railway link with the main line between Grahamstown and Port Alfred.

At the time optimism was running high about the future of the Langholm Estates and the fruit growing industry in the Eastern Cape. "In recent years Bathurst and Lower Albany have witnessed a great expansion of the fruit growing industry; there is no better example of what can be done by close application, the adoption of scientific methods and a forward policy than that presented by the Langholm Estates, the progress of which cannot be arrested by any ordinary obstacle, however great it may appear to be."<sup>22</sup> Extensive experimentation was carried out at Langholm with fertilisation and improved methods of planting and then often these results were

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20. Grahamstown Grocott's Daily Mail, February 15th, 1922.

21. Ibid, January 12th, 1927.

22. Ibid, January 12th, 1922.

the only available guide on pineapple cultivation that the government horticulturist had at his disposal. In 1932 Mr. S.H. Clark, the government horticulturist in Port Elizabeth stated "...that he was a great believer in the use of paper mulch when planting out as experiments with this at Langholm had shown an average increase of 14 ounces in the fruit and 33 per cent in total crop."<sup>23</sup>

The run of Langholm as a fruit growing concern was not as long as people had originally anticipated. The five acre plots were found to be uneconomical and the settlers left them lying fallow. The wide fluctuations in temperature and the decreasing value of pineapples on the export market, also made the growing of pineapples on the main estate an unsuccessful undertaking. In 1935 the management was reorganised, the plots were bought back where the owner was prepared to sell and all pineapples were destroyed to make way for cattle grazing.

Despite the expansion of production in the area, the suitability of Bathurst and Lower Albany for pineapples was never accepted by all. In 1927, Mr. Joubert, then principal of the Grootfontein College of Agriculture, gave the results of experiments which had been conducted at Bathurst. He considered Bathurst to be entirely a sheep district. The numbers of sheep in the district had increased by more than 17,000 to 21,000 over the previous five years. The area was not suited to the growing of wheat, but barley, he thought, could do well. "If the district is never to be anything else than a thriving sheep farming and barley growing area it will do well."<sup>24</sup> Mr. Joubert's recommendations were not received without demur. A week later a letter in the local paper accused Mr. Joubert, *et. al.*, of forgetting about the fruit growing in Bathurst. "Take our pineapples, which are stated by experts as equal to any produced in the world."<sup>25</sup> However, even as late as 1936 pineapples were still not listed amongst the agricultural products of prominence in Albany, Bathurst and Alexandria. The products listed were: barley, oats, wheat, mealies, kaffir corn, potatoes, tobacco, ground nuts, lucerne, butter and cheese, wool and mohair.

Although the export value of canned pineapples was relatively high during the first year for which information is available (see Table 2), it declined steadily until 1939 when the trade came to a virtual standstill for the five years during World War II. It was only in 1945 that exports were resumed on a small scale, but the insatiable demand for canned products in the United Kingdom soon forced the prices received by farmers from the canning factories to increase to twice the pre-war level. Supplies proved to be extremely elastic for production increased more than tenfold in the post-war decade. In 1951 the export value of fresh and canned pineapples for the first time exceeded £1,000,000, after being less than £100,000 only three seasons earlier. This, of course, is not an accurate reflection of the total value of pineapple production in so far as the quantities consumed domestically are not included. For the years up to the second

World ...../

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23. Grahamstown Journal, July 27th, 1932.

24. Ibid, November 10th, 1927.

25. Ibid, November 16th, 1927.

World War approximately half the country's total production was sold on the local market. Thereafter, total production and the export trade increased to the extent where to-day less than one-fifth of the total production is consumed locally as either fresh or processed fruit. If these factors are taken into consideration and allowances are made for price variations, the information in Table 2 provides a useful indication of the growth of the country's pineapple industry.

It is unlikely that the production of pineapples in the Eastern Cape ever exceeded 10,000 tons until after 1945. As such, therefore, its importance in the farm economy of the Eastern Cape coastal belt was negligible until the start of the post-war era.

### Chapter III

#### REGION OF STUDY

In this chapter, with the aid of maps, the location of the region of study will be pinpointed and described to show some relevant geographical details. Attention will be drawn to climatic variations within the region and comparisons will be made with other producing areas in this country, as well as other countries prominent in the production of pineapples. The importance of the right climate can never be overemphasised as it is bound to form the crux of any definition of 'marginality' in pineapple production. Evidence available on climatic variations in this chapter is of too general a nature to be taken as conclusive. It will, however, serve as a reminder that climate must never be taken for granted in an economic discussion of the growing of pineapples; for where climate is unsuitable, even a high price paid to the farmer is seldom high enough to make its growing a successful proposition.

#### Location

The area of study is the eastern portion of the Cape Province, and is located in the south-eastern corner of the Union of South Africa. It forms an integral part of the Cape Province for administrative purposes. The interior of the region is semi-arid in nature and favourably suited to the production of wool and mohair on an extensive scale. The coastal region, on the other hand, has a higher rainfall and a number of commodities can be produced with success. The area includes two major ports, Port Elizabeth and East London, which handle the bulk of South African wool and virtually all its pineapple exports. Both cities support a large industrial community while Port Elizabeth constitutes one of the five major urban markets in the country.

Pineapple growing is virtually confined to a narrow strip along the coast, about thirty miles wide and two hundred miles long. From the neighbourhood of Port Elizabeth in the south-west, it stretches along the coast to roughly the Great Kei river in the north-east. Map 1 shows the region of study and also some of the other pineapple producing areas in the Eastern Transvaal and Natal. In addition to the areas indicated on the map, pineapples are also grown in Swaziland.

An enlarged map of the area (Map 2) shows the districts covered by the survey and the location of the sample farms in each district. Komgha, East London, Peddie, Bathurst, Albany and Alexandria were the only districts from which farms were included in the field survey. The farms, although widely scattered, show an uneven distribution. From two isolated observations in the north-east near Kei Mouth we move down through tracts of native land, where pineapples are at present not grown commercially, to a heavy concentration of farms around East London and in the Kidd's Beach area. Then, again, tracts of native land are encountered between Kidd's Beach and the Great Fish river, which limits the number of observations in the area to three. The farms in the Bathurst district are mainly concentrated close to the railway line between Martindale and Port Alfred. The rest are evenly scattered in the same pattern, which is also characteristic of

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the eastern portion of the Albany district and continued into Alexandria.

The majority of the sample farms fell within a distance of fifteen miles from the coast, with the exception of a few farms in the Albany district. The area is well served with railways, tarmac roads and bus services. The great majority of farms were no more than twelve miles from the nearest railway or bus station (Table 3). Forty-nine farms were, however, further than twelve miles from the nearest town, but none more than thirty-two miles.

Table 3

DISTANCE FROM NEAREST RAILWAY OR BUS STATION AND NEAREST TOWN  
(69 Commercial Pineapple Producers, E.C. 1959)

Distance (miles)	Number of Farms	
	Railway or bus station	Town
3 or less	27	2
3.1 - 6	11	3
6.1 - 9	5	3
9.1 -12	8	12
12 or more	18	49
Total	69	69

Topography and Geology

The area shows a broken to undulating relief with relatively good surface drainage; it ranges from sea level to approximately 2,000 feet.<sup>1</sup> With the aid of numerous "spruits" and rivers, usually entrenched in meandering valleys cut into the elevated peneplane surfaces of the region, the surface run-off finds a way out to the sea. The slope of the ridges generally ends abruptly in these natural drains and prevents the accumulation of transported material along the water courses.

The geology of the area consists mainly of lower Beaufort beds of massive yellow-weathering and felspathic sandstone.<sup>2</sup> This alternates with either blue, green, purple, or red mudstone and shales, intrusive dolerites and later formations. The dolerite intrusion consists of inclined sheets with wide outcrops and a shallow dip, as well as relatively steeply dipping dykes. Most of the later formations are aeolian in origin and have in many cases been consolidated.

Red ...../

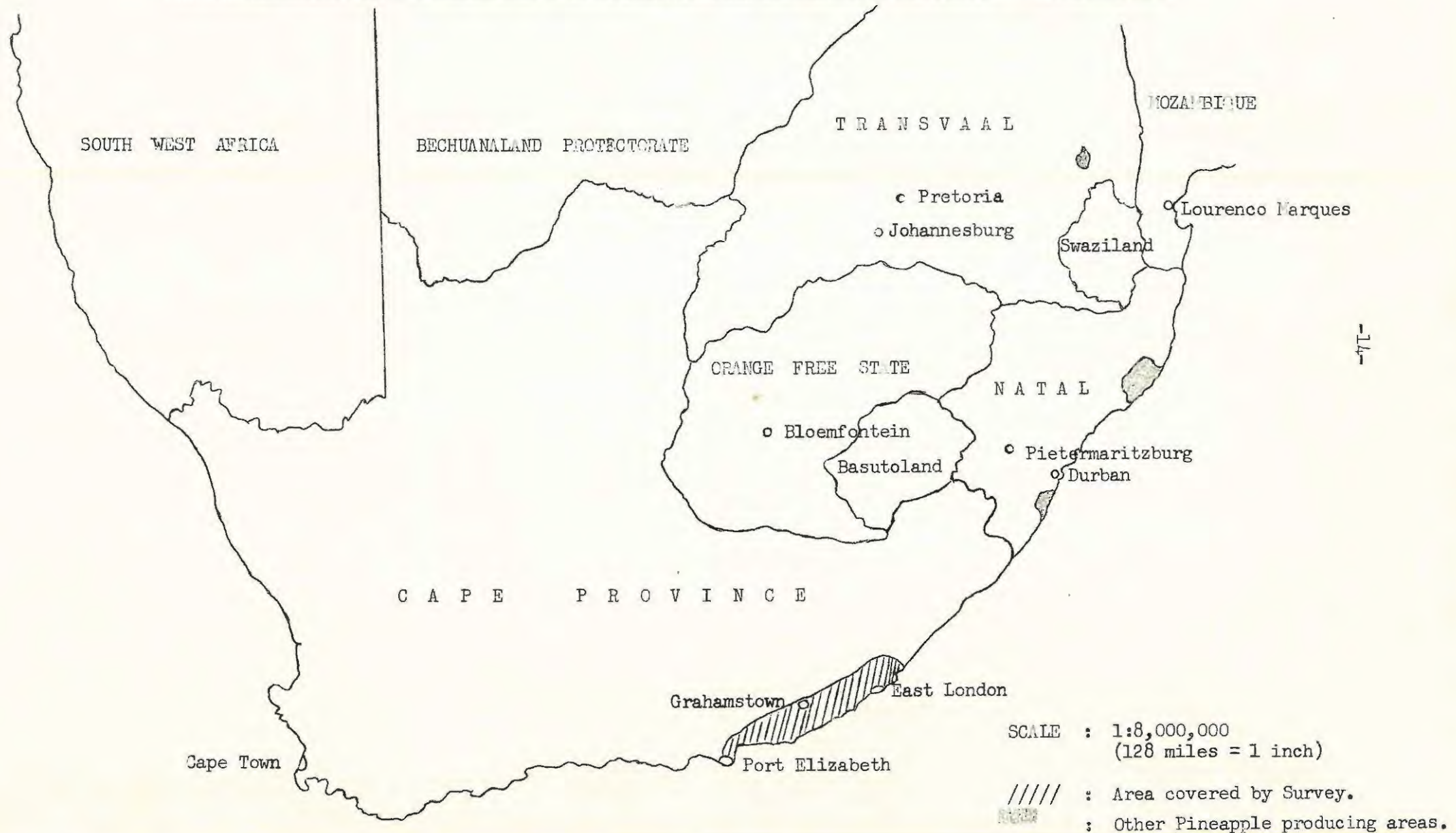
1. Van der Merwe, C.R. - Soil Groups and sub-Groups of South Africa, Department of Agriculture and Forestry, Chemistry Series No.165, Government Printer, Pretoria, 1941.

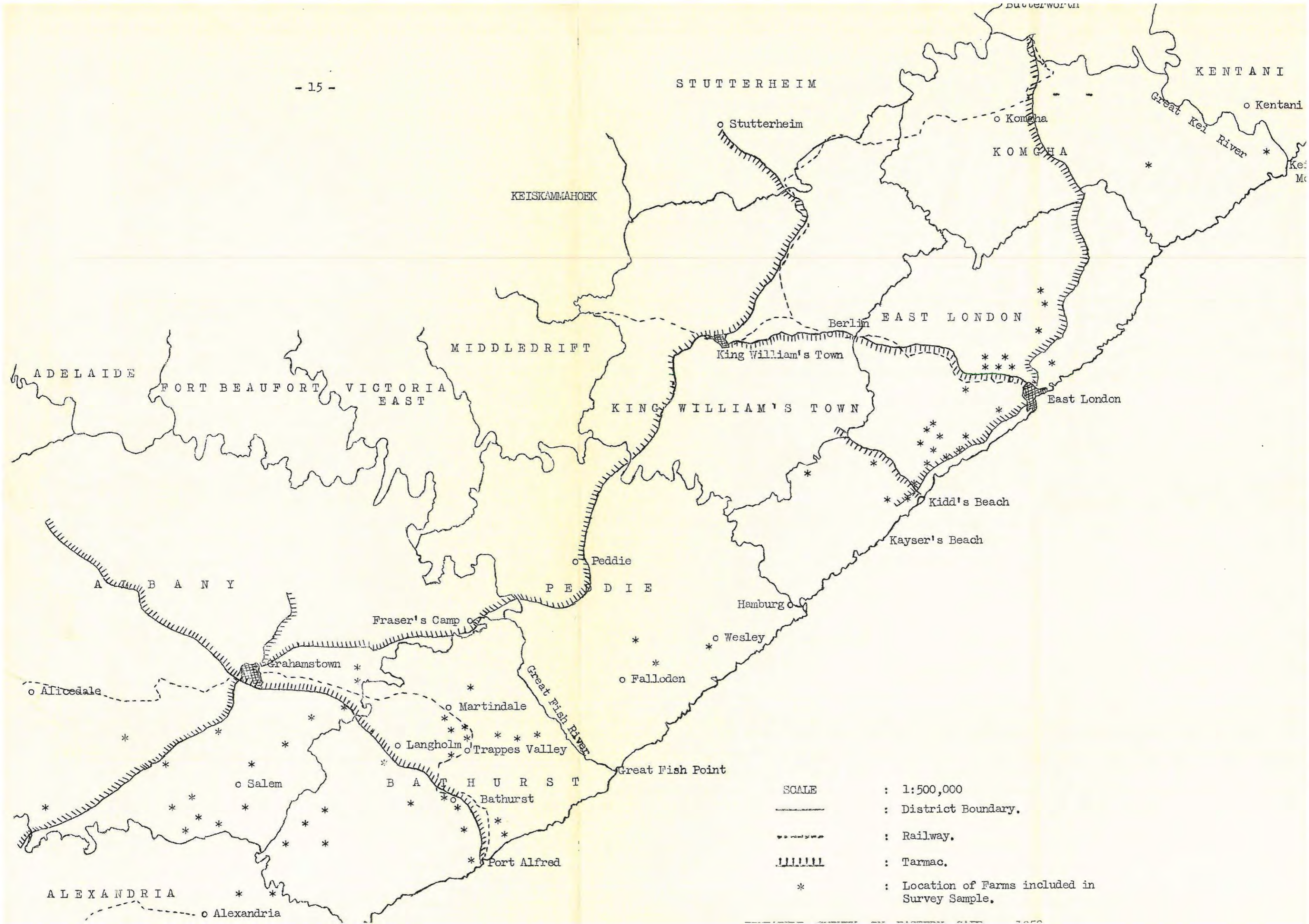
Davies, R.J. - A Sample Survey of Farming Types in the Divisions of Albany and Bathurst. Unpublished M.Sc. thesis, Rhodes University, Grahamstown, 1954.

2. Bader, C.J. - The Soils of the Eastern Cape; their classification characteristics and suitability for the cultivation of pineapples, Pineapple Research Station, East London, 1959.

MAP 1.

PROVINCIAL MAP OF THE UNION OF SOUTH AFRICA : AN INDICATION OF PINEAPPLE PRODUCING REGIONS.





- SCALE : 1:500,000
- : District Boundary.
- : Railway.
- ||||| : Tarmac.
- \* : Location of Farms included in Survey Sample.

Red and black doleritic soils and red sandy loams, derived from shale, are usually preferred for pineapple cultivation because of their high fertility and adequate drainage. Calcareous soils might make the pineapple chlorotic if the lime horizon is too close to the surface, while the grey sandy soils are usually poorly drained, especially if the slope decreases. Peard and Bader attach considerable importance to good drainage in the selection of soils for pineapple cultivation.<sup>3</sup>

### Rainfall

Most of the rain in the area can be expected during the summer months, but this changes significantly as one moves north-east from Port Elizabeth. Table 4 shows that, despite variations in the altitude of the stations, an increasing percentage of the downpour occurs during the summer months as one moves from 33°57' to 32°30' south. The precipitation usually occurs in the form of thunderstorms which vary considerably in frequency and intensity. The mean figures recorded in Table 4 completely obscure the seasonal variation that sometimes include prolonged periods of drought, such as occurred during 1927 and 1949. Further into the interior droughts are usually more severe.

Most pineapples in the Eastern Cape are grown in areas with an annual rainfall of between twenty and thirty inches. Great variation, however, exists between the annual precipitation in the Eastern Cape and other pineapple growing countries. Apparently anything from 20 to 80 inches per year is considered satisfactory.<sup>4</sup> Conditions in Queensland, Australia and Hawaii seem to correspond fairly closely, according to the figures given in Table 4, but differ considerably from those in Malaya. Average annual precipitation for the two stations in Natal and Transvaal is slightly higher than would be the average for the Eastern Cape coastal area, but correspond closely with recordings at East London. At the same time, the pattern of an increasing percentage of precipitation during the summer months is still valid at Hluhluwe and Nelspruit lying further to the north.

Table 4 ...../

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3. Peard, R.H. and Bader, C.J. - "Preparation and Planting of a Pinery". Farming in South Africa, June 1956. Official Journal of the Department of Agriculture, Pretoria.
  4. Mathews, W.M.H. - Pineapples in Florida, p.4. Agricultural Extension Serial, Gainesville, Florida.

Table 4

RAINFALL NORMALS IN THE EASTERN CAPE FROM 1921-1950 AND COMPARATIVE FIGURES IN OTHER PINEAPPLE PRODUCING COUNTRIES

Country and Station	Latitude South	Altitude Feet	Average Annual Precipitation Inches	Percentage in Summer
<u>South Africa:</u>				
<u>Eastern Cape:</u>				
Port Elizabeth	33°57'	178	23.6	47.6
Alexandria	33°39'	673	24.6	52.2
Port Alfred	33°36'	201	26.4	54.3
Fraser's Camp	33°17'	1,825	21.0	63.3
Peddie	33°12'	1,006	22.9	65.6
East London	33°02'	149	30.9	62.5
Kentani	32°30'	1,610	43.4	70.4
<u>Natal:</u>				
Hluhluwe	28°04'	91	31.8	75.9

Other Countries:

Australia:

Gympie	26°11'	309	43.3
Cooktown	15°28'	17	67.9

Malaya:

Muar	1°50'	Under 100	91.5
Batu Pahat	"	100	100.0

Hawaii:

Cahu	21°19'	-	40.0
Kauai	22°00'	-	62.2

Source: a) Department of Transport - Weather Bureau. Climate in South Africa, Part II - Rainfall Normals, Government Printer, Pretoria, 1954.

b) Van Lelyveld, L.J. - Report on Official Visit to Principal Pineapple Producing Countries of the World - April-August, 1957. Division of Horticulture, Department of Agriculture, Pretoria.

Temperature

In the choice of an area for the production of pineapples, climatic extremes must be avoided at all costs. It is absolutely essential that the area considered should be

free ...../

5. "Pineapples; Farming for beginners". Farming in South Africa, May 1956.

free from any frost or temperatures rising above 95° for any length of time.<sup>6</sup> Plants are extremely sensitive to frost. Any prolonged periods of cold weather can easily mean that the plant will stand for three years, instead of the usual two, before the first crop can be harvested. On the other hand, the duration of excessive heat for any length of time will lead to the internal decomposition of the fruit tissue. This is because the pineapple absorbs heat and the temperatures inside the fruit are usually much higher than that in the immediately surrounding atmosphere. The best possible<sup>7</sup> range of temperatures for the pineapple is from 70 to 90°F.

Violent temperature fluctuations which lead either to frost, sun-scorch or both, introduce a significant element of risk for a great many pineapple producers in the Eastern Cape; a risk which must be offset in normal seasons by a handsome reward if the pineapple producing industry is to be a paying proposition in the long-run. This introduces price as a factor to be considered in the definition of 'marginality' in pineapple production; it will be discussed at length in a later chapter.

In Table 5 the columns marked "M" give the mean monthly temperature for each month of the year for three stations in the Eastern Cape and three in Hawaii. The columns marked "R" give the temperature range between the maximum and minimum temperature for each month of the year. The latter information, however, was only available for the three Eastern Cape stations. From this table it would appear that there are not only considerable fluctuations between the minimum and maximum monthly temperatures for the three Eastern Cape stations, but the annual range of the mean is considerably higher than in the case of the three Hawaiian islands. From the relatively large differences between winter and summer temperatures and the wide monthly fluctuations in temperature, it can be deduced that neither frost nor sun-scorch is an infrequent occurrence in the region of study. It should be noted, however, that both monthly and annual fluctuations were lower at the East London station. Frost and internal sunburn are virtually unknown as pineapple "diseases" in Hawaii. Even evidence of external sunburn is usually only found on fruit that have been leaning over to the side.

Table 5 ...../

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6. Van Lelyveld, L.J. - "Pineapples; Sun Scald - Most Dreaded Enemy". Farming in South Africa, January 1957.

7. Mathews, W.M.H., Op. cit. p.4.

Table 5

THE MEAN AND RANGE OF MONTHLY TEMPERATURES AT THREE STATIONS WITHIN THE REGION OF STUDY, AND A COMPARISON WITH THE MEAN TEMPERATURES ON THREE HAWAIIAN ISLANDS, OF

Month	Eastern Cape						Hawaii		
	Bathurst		Langholm		East London		Cahu	Kauai	Molo-kai
	M	R	M	R	M	R	M	M	M
January	71	49	70	50	70	45	70	70	69
February	72	49	72	51	71	45	70	70	69
March	69	49	69	50	69	44	70	70	69
April	66	50	66	52	66	46	72	71	70
May	62	50	62	52	63	50	74	73	72
June	60	50	59	51	60	52	76	75	74
July	59	50	58	52	59	52	77	76	76
August	60	52	59	54	61	51	77	77	76
September	61	51	60	52	62	48	77	77	76
October	62	50	62	52	64	46	76	75	75
November	65	49	65	51	67	45	74	73	72
December	68	49	68	51	69	45	72	71	71

Whole Year:

Average	65	50	64	52	65	47	74	73	73
Range of Mean	15		14		12		7	7	7

Source: a) Department of Transport - Weather Bureau, Climate of South Africa, Part I - Climate Statistics. Government Printer, Pretoria, 1954.

b) Van Lelyveld, L.J. - Op. cit. p.115.

The farmers' impression of climatic conditions during the period of study, (Table 6), indicates that it was a very good year for the area on the whole. Forty-five per cent of the sample farmers said that the climatic conditions were above average, while a further 35 per cent indicated that the conditions were at least normal. The remaining 20 per cent complained mainly about sunburn rather than lack of an adequate rainfall. These apparently good climatic conditions pertaining during the time of the study must be kept in mind during the later consideration of the financial results of the sample farms.

Table 6

FARMERS' IMPRESSIONS OF CLIMATIC CONDITIONS DURING THE PERIOD OF STUDY

(69 Commercial Pineapple Producers, E.C. 1959)

Climatic Conditions	No. of Farms	Percentage of total
Above average	31	44.9
Average	24	34.8
Below average	14	20.3
Total	69	100.0

Marginality :..../

### Marginality

It is advisable, once again, to reiterate the importance of certain agronomical and meteorological factors. Although usually taken 'as given' by the agricultural economist, these factors are primary, especially in cases where there is reason to doubt the suitability of a particular area for the production of a given commodity.

There is, of course, no fixed margin of suitability that can be laid down for a particular area in the production of any primary commodity, for the margin shifts to and fro as the price moves up and down. Assuming only one commodity, it is possible to say that some areas are more marginal than others at a given level of price. If the existence of an international margin is disregarded, it can be said that within the Eastern Cape some areas will be more suited to the production of pineapples than others. Relatively speaking, then, with a given price level and an adequate rainfall, the better drained the soil, the less the frost and the absence of temperatures above 95°F, the more intra-marginal the area is likely to be for the production of pineapples in the Eastern Cape.

To define these areas falls outside the scope of this study, but their existence is recognised by it.

Chapter IV

METHODOLOGY

In investigating the economic aspects of pineapple production in the Eastern Cape, it is virtually impossible to include the entire pineapple farming population. The alternative is to examine a group of sample farms in either a controlled experiment, or, to make a statistical analysis of an uncontrolled experiment. Under the first alternative the farm will be run as an experimental plot. All possible combinations of enterprises and pineapple cultural practises will be tried until the optimum combination of factors of production has been determined under fixed conditions. In the second case, the farm is taken as a unit, and, by means of carefully analysing existing conditions, hypotheses can be developed as to the affects of varying farming practices on the financial success of the unit. Recommendations can then be made to the entire population in the area with the aid of information obtained from these experiments.<sup>1</sup>

In deciding on the approach to be adopted for this study, the statistical analysis of actual farms under uncontrolled conditions was preferred for the following reasons:

- a) It is virtually impossible to control factors such as management or climatic conditions for any substantial period of time.
- b) The farm is not a controlled experimental plot, nor does a controlled experimental plot depict conditions on a farm.

The experiment will thus be run in the form of an ex post facto analysis of the conditions on the farm as it existed during a specific period. When dealing with factors external to the farm which affect the industry in its present day position, the time period will become completely flexible.

There are three different ways by which the statistics necessary for an analysis of the primary producing industry can be obtained:

a) ...../

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1. Both methods are inductive by nature in that only generalisations can be made from the study of particular cases. As such it is important to realise the limitations of the inductive method:
    - (a) The conclusions of inductive argument can only hold in terms of probabilities, never with certainty.
    - (b) There is necessary reference to circumstances outside the facts inherent in the premises.
    - (c) It must be assumed that there exists some uniformity in the system of facts to which the premises and conclusions of inductive argument relate.
    - (d) The verification of inductive argument calls for objective reference, i.e., its conclusions must be checked against observation.

Mills, Frederick C. - Statistical Methods, Henry Holt and Company, New York, 1955.

- a) The farmer can be asked to keep cost accounts in co-operation with the research organisation doing the survey. Although this is the most accurate way to obtain information on the farm business, its value is limited by the one-sided response which is usually obtained. Only the more alert and better educated farmers are usually prepared to co-operate, and consequently little is learned about the ways and means of the rest of the population.
- b) A field survey can be carried out. In this case the farmer is asked a series of questions about his own business which he usually answers with the aid of records, from memory, or both. Especially in cases where the farmer has had little formal education, the field survey is the most reliable technique.
- c) Questionnaires can be mailed to the farmers. Although this is the cheapest alternative, the response is usually poor and as one-sided as in the case of cost accounts. The research worker is further restricted in the number and complexity of the questions he can put to the farmer.

Influenced by the limited amount of money available to complete the study, and the likelihood of obtaining a more representative body of information, a field survey was decided upon.

The field survey is usually limited in the degree of accuracy of the information obtained, especially in cases where good records are not available. No questions were asked on matters with which the farmer was not familiar, and grave errors are thus unlikely to have been committed. It is possible, however, that the absence of controlled conditions lead to incidental correlations unknowingly caused by uncontrolled factors, even though the data may be accurate. Moreover, a field survey can reveal nothing about the potential of individual factors of production, but only what has been achieved under existing conditions and combinations.

Although serious, these limitations are the limitations of most social and economic studies.<sup>2</sup> They stem from the fact that social, economic, and meteorological conditions change with the passage of time and that production efficiency is based on the assumption of a given level of conditions, usually the existing ones. It is therefore demanded that continuous reappraisals should be made in the light of ever-changing conditions. These conditions flow from the peculiarities of human and social existence, and cannot be easily eliminated by the only alternative method, i.e., the controlled experiment.

#### Sources of data

The major source of information, then, was the answers of sample farmers to the various questions put to them in a questionnaire and obtained directly by means of an extensive field survey carried out during October and November 1959. These questions covered the existing structure of

production .....

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2. Van As, M.L. - Differential Roles of the Press and Radio in an Extension Program in the Union of South Africa.  
Unpublished Ph.D. thesis, Cornell University, Ithaca, N.Y.  
1959.

production in the region of study and the patterns of marketing adopted by the farmers.

In view of the importance of the canning industry in the marketing of pineapples, separate interviews were arranged with executive officials of all the canning factories in the Eastern Cape that handle pineapples. Their opinions were sought on the ways and means of obtaining a greater degree of stability in the prices paid to the producers, and the legislation at present regulating the fruit- and vegetable-processing industries.

Other sources of information were mainly publications by the pineapple companies of Hawaii, the Commonwealth Economic Committee, and correspondence between the author and individuals connected with the pineapple industries of other countries.

#### Sampling procedure

With less than ten canning factories handling pineapples in the Eastern Cape, no need existed for sampling. Interviews, with top management officials in each factory, were arranged through the Midland Chamber of Industries in Port Elizabeth, and the Buffalo Catchment Association in East London.

In order to obtain a representative sample of pineapple farms in the region of study, a complete list had to be obtained of the names and addresses of the entire pineapple farming population. Such a list, only recently completed by the Bathurst Farmers' Union in Grahamstown with the aid of other co-operative organisations, canning factories, and pineapple exporting companies, was generously made available. It is possible that commercial producers selling on the local fresh market and not belonging to any co-operative organisation, may have been omitted. With approximately 90 per cent of all pineapples produced in the area being sold to canners, and the great majority of all farmers belonging to one or more co-operative organisation, it is unlikely that major omissions were made. The original list contained 545 names and addresses. It was presented for careful scrutiny to extension officers of the Department of Agriculture in Grahamstown and East London and to other individuals well acquainted with the farming communities in the various districts. No further names were added, but thirty-four names of people who had ceased pineapple farming, or had been duplicated on the original list, were eliminated. This left 511 constituting the total known population.

No information was available on the importance of the pineapple enterprise on each individual farm. This made it impossible to make any further eliminations in cases where the income from pineapples was, comparatively speaking, insignificant. All the names remaining on the list were numbered from one to 511, and a sample of seventy-five names, representing 15 per cent of the total population, was selected with the aid of a table of random numbers.

#### Collection of data

As stated earlier, interviews were arranged with executive officials in all canning factories handling pineapples in the region of study. Questions were asked from a standard questionnaire prepared in advance specially of this

purpose ...../

purpose.<sup>3</sup> All answers were reported as carefully as possible, as well as any discussion following on a particular question.

With the objective of covering one complete harvesting and planting season in the farm survey, records were taken for a period which included both seasons. Virtually all harvesting is completed during the first half of the year, and planting in the early summer months of the second half. The South African financial year which runs from the beginning of July until the end of June, therefore, provides complete coverage of harvesting and planting. Moreover, using the financial year also greatly facilitated the gathering of data on income and expenses. It was accordingly decided to take all records for the financial year ending on 30th June, 1959.

A questionnaire intended to obtain detailed records on the entire farming operation and covering some aspects of the operator's social life, was prepared in co-operation with the Division of Economics and Markets of the Department of Agricultural Economics and Markets.<sup>4</sup> The questionnaire was carefully pre-tested and appropriate adjustments made before commencing fieldwork. Each farmer included in the sample was then approached by a fieldworker from the Institute, and the questionnaire co-operatively completed. With the exception of one, all the sample farmers kept some form of records on income and expenses.

#### Data interpretation

In making an assessment of South Africa's position as a world producer of pineapples, extensive use was made of graphic and tabular analysis. This greatly facilitated an understanding of the comparisons necessary in such an undertaking.

The interpretation of production data is presented in the form designed to provide farmers with an indication of the extent to which certain factors influence the maximisation of profits. Whereas most economic data easily lend themselves to numerical expression, most of the information obtained from the field survey was prepared for coding on I.B.M. cards. With the aid of these machines numerous correlations were made between various factors, which were used as independent variables, and the degree of financial success achieved as measured by labour income, the dependent variable.

It is important to point out that correlations alone do not detect or eliminate the extent to which an average may fail to summarise the distribution of any sample group, nor does it overcome some of the other limitations mentioned earlier. The existence of correlation between two variables must neither be thought of as the proof of causation by the independent variable; it may be due to co-variation. The 'dependence' or 'independence' of a variable is based solely on a logical process which determines the statistician's belief that there is a causal relationship between two variables, and his belief as to which is cause and which is effect.<sup>5</sup>

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Assuming ...../

3. A copy of the questionnaire is contained in Appendix I.

4. A copy of the questionnaire is contained in Appendix II.

5. Croxton, F.E. and Cowden, D.J. - Applied General Statistics, p.678, Prentice-Hall, Inc. New York, 1947.

Assuming that the reasoning which determines the nature of the variables was correct, a positive correlation may arise which cannot be regarded as generally applicable for all farms in a given region. No two farm units are exactly alike in the availability of basic resources, the farmer's debt and capital position, and his managerial ability.<sup>6</sup> The interpretation of the farm management data available for the survey can, therefore, only lead to the framing of general principles and not specific recommendations.

Significance of the sample

Altogether 75 farmers were approached, and 69 records were completed in the survey, representing 14 per cent of the known population. As indicated by Table 7, the majority of the sample farms were situated in the districts of East London, Bathurst and Albany, and a small minority in Peddie, Komgha and Alexandria. The majority of all the sample farms derived more than 50 per cent of their annual cash income from pineapples, especially in the districts of Bathurst and East London. Both farms in Alexandria fell within the lowest percentage group, while those in Peddie and Komgha show greater distribution. With the exception of a slight concentration in the first group, Bathurst farms are evenly spread, but there is a definite concentration of East London farms in the group deriving more than 90 per cent of their cash income from pineapples. No fewer than 11 of the 15 farms included in this category were located in the East London district. Taken as a group, the majority of the sample farms seems to have pineapples as an enterprise to be carefully considered in the day-to-day administration of the entire farm business.

Table 7

THE DISTRIBUTION OF SAMPLE FARMS BY DISTRICT AND PERCENTAGE INCOME DERIVED FROM PINEAPPLES  
(69 Commercial Pineapple Producers, E.C. 1959)

Percentage income from pineapples	Number of farms						Total
	District						
	Albany	Alexan- dria	Bathurst	East London	Komgha	Peddie	
49 or less	10	2	6	5	1	0	24
50 - 59	1	0	4	2	0	1	8
60 - 69	1	0	3	1	0	0	5
70 - 79	2	0	2	5	0	1	10
80 - 89	1	0	3	1	1	1	7
90 or more	1	0	3	11	0	0	15
Total	16	2	21	25	2	3	69

Clearly, the percentage of cash income from pineapples does not necessarily indicate the size of the pineapple enterprise. Using tonnage sold as an indication of size, Table 8 shows a concentration in the group selling less than 100 ton annually (29 out of 69), and this concentration is very marked in the district of Albany (10 out of 16). As the tonnage sold increases, the number of farms in each category is seen to diminish steadily, except for the open range selling more than 500 ton. Concentration in Bathurst and East London is mainly in the first two size categories, although the distribution is more even here than in Albany.

Table 8: . . . . /

6. Heady, E.O. and Jensen, H.R. - Farm Management Economics, p.9 Prentice-Hall, Inc., Englewood Cliffs, N.J. 1958.

Table 8

DISTRIBUTION OF FARMS BY DISTRICT AND TONNAGE OF PINEAPPLES  
SOLD PER FARM  
(69 Commercial Pineapple Producers, E.C. 1959)

Tonnage sold per farm	Number of farms						Total
	D i s t r i c t						
	Albany	Alexan- dria	Bathurst	East London	Komgha	Peddie	
99 or less	10	1	7	9	1	1	29
100 - 199	2	1	5	5	0	0	13
200 - 299	2	0	3	4	1	0	10
300 - 399	0	0	2	2	0	1	5
400 - 499	0	0	1	1	0	0	2
500 or more	2	0	3	4	0	1	10
Total	16	2	21	25	2	3	69

The only comparative measures available to test the significance of the sample farms in the production of pineapples for each district and the Union as a whole, was to be found in estimates by the Division of Economics and Markets of the acreage under pineapples during 1955/56. Table 9 shows those districts where the largest number of sample farms were located as being the ones most adequately covered by the survey. Some degree of error must be expected in comparative figures on the regional level, since the estimates by the Division of Economics and Markets were made three years before the survey was carried out. It is unlikely, however, that proportions would have changed to the extent of rendering an intra-regional comparison invalid.

Table 9

RELATIVE SIGNIFICANCE OF THE SAMPLE FARMS IN ACRES PLANTED TO  
PINEAPPLES COVERED FOR VARIOUS DISTRICTS AND THE UNION OF  
SOUTH AFRICA  
(69 Commercial Pineapple Producers, E. C. 1959)

Region	Area planted		Sample farms as per cent of total
	Regional total acres	Sample farms	
Albany	10,901	1,260	11.6
Alexandria	4,836	100	2.1
Bathurst	16,533	2,150	13.0
East London	12,207	2,040	16.7
Komgha	2,205	120	5.4
Peddie	4,876	350	7.2
Total Eastern Cape	51,558	6,020	11.7
Total South Africa	59,630	6,020	10.1

Definitions

The technical terms to be used later in this study could be subject to different interpretations unless their use in this context is clearly defined. The meaning of each, as used in this study, is given below:

a) ...../

a) Receipts, Expenses and Farm Income: Only income derived directly from, and expenses directly connected with, the farm business can be taken into account. Receipts, therefore, consist of total cash sales of all farm products, plus any excess of closing over opening inventory. Expenses, on the other hand, consist of all cash expenses in connection with the farm business, plus the estimated value of family labour (other than the farmer himself), plus any excess of opening over closing inventory.<sup>7</sup> The difference between total receipts and total expenses calculated in this way, constitutes the farm income for the business.<sup>8</sup>

b) Labour Income: The most important definition is that of Labour Income. The term refers not to the return of labour as a factor of production, nor to the gross return per unit of labour employed, but to the net remuneration that the farmer receives after paying all farming expenses. It therefore includes the reward to the farmer both as entrepreneur and as manager and labourer on his own farm.<sup>9</sup> The Labour Income per farm is obtained by deducting from farm income, the interest on the average total capital investment for the year being calculated at 5 per cent. In addition, the farmer has a house and farm products used in the household.

c) Average Capital Investment: Following from the definition of Farm Income, the value of the dwelling house and the non-farm share of the motor vehicle will not be taken into consideration. Average capital investment will thus be the average between total farm capital at the beginning, and total farm capital at the end of the financial year under consideration, excluding the value of the dwelling house and the non-farm share of the motor vehicle.

d) Man-equivalent: The non-white labour force on each farm is made up of several classes of workers, likely to constitute varying degrees of productivity apart from the variation within each group. Before adding the number of days worked by each group respectively to obtain a total for the farm, an attempt

had ...../

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7. The value of family labour is determined on the basis of what it would cost to hire the work done. Interest paid on debt is not included as an expense, for all farms are being put on an equal basis by calculating the interest on average capital investment for each farm at a fixed rate. Strictly speaking, the contributions of the farm to labourers in the form of rations, etc., should also be considered as an income for the farm, and the receipts by labour as an expense. This would increase both total expenses and total receipts somewhat, but cause no change in the calculated Farm Income. Because of the uncertain value of these items and the insignificant proportions they hold in the total cost and revenue structure of the business, they were not included as either a receipt or as an expense - see Chapter VII. Total expenses and total receipts were also equally affected for some farms where the operator could only provide the net receipts for the sale of a product after some expenses had already been subtracted, e.g., transport cost on milk.

8. Labor Income Blank No.40. Prepared by the Department of Agricultural Economics, New York State College of Agriculture, Cornell University, Ithaca, New York.

9. The concept can perhaps be more accurately described as Operator's Earnings, but I have adopted the term and method of calculation as currently used by the Department of Agricultural Economics at Cornell University.

had to be made to reach some degree of uniformity. With the cash wage of the adult male permanently employed as a basis, the days worked by females, seasonal labourers and youths, were adjusted according to the amount of difference in the cash wage paid to each group respectively from that of the permanently employed adult male worker.<sup>10</sup> The adjusted days for each group were then added and divided by 280 to obtain the non-white man-equivalent per farm.<sup>11</sup>

A similar adjustment was not possible between white and non-white labour days. To get the total man-equivalent per farm, the days worked by each of these two groups were simply added together and divided by 280. The procedure followed can be regarded as valid in so far as all farms were treated alike, and as the measure used for inter-farm comparisons only.

e) Effective Yield: The effective yields for the Queen and Cayenne varieties were calculated separately by dividing the tonnage of each variety sold by the respective acreage under production.

f) Yield Index: The yield index for each farm was calculated by weighting the average effective yield obtained for each variety with the respective quantities sold, and then dividing the cumulative total by the total tonnage sold. The weighted yields for all the farms in the sample were then added together and divided by the total number of farms in the sample. The resultant mean was taken as a basis to equal one hundred and used to calculate a yield index for each individual farm.

g) Price Index: A price index was calculated for each farm by weighting the average price obtained for each variety with the respective quantities sold, and again the accumulative total was divided by the total tonnage sold. The weighted prices for all the farms were then added together and the total divided by the number of farms in the sample. The resultant mean was taken to equal one hundred, and from it a price index was calculated for each individual farm.

h) Rate of Capital Turnover: The rate of capital turnover is a measure of the number of years that would be required for gross farm receipts during any financial year to equal average total capital investment for that particular year.

i) Debt Ratio: The debt ratio per farm is expressed as the percentage which total indebtedness constitutes of the fixed capital invested per farm, including the value of the dwelling house.

j) All Farms: This includes all the farms for which a questionnaire was completed in the survey on pineapple production in the region of study, and is composed of:

Group A - Those farms deriving less than 50 per cent of annual cash income from pineapples,

Group B - Those farms deriving from 50 to 89.9 per cent of annual cash income from pineapples,

Group C . . . . . /

10. See assumption (e) on the suitability of cash wages to be used for measuring variations in productivity.

11. Allowing for Sunday and half day on Saturday, 280 working days are left in each calendar year.

Group C - Those farms deriving 90 per cent or more of annual cash income from pineapples.

The farms included in Group C especially, are of considerable significance for the purposes of this study. These farms specialise in the production of pineapples to the exclusion of virtually every other enterprise. As such, wherever possible, comparisons will be made between Group C and all the farms in the study, or, the two other groups which were defined above.

#### Assumptions

It follows from our discussion on methodology so far, that a number of assumptions had to be made during the course of the study. Each of the assumptions is stated below, and the general effect it is likely to have on the results of the final analysis, is briefly discussed.

It will be assumed:

(a) that the operator of each sample farm can be regarded as economically rational, i.e., that he will aim to maximise profits. Ignorance as to the optimum combination of resources will not be regarded as an economic irrationality. A number of farmers, however, had substantial sources of income other than from farming during the financial year for which the survey was conducted. As such, it is likely that in some cases the farm may have been regarded as a convenient object on which to spend money in order to prevent the payment of progressively higher taxes. In most cases also, the farm is not entirely a pounds, shillings and pence proposition, but also a way of life for the farmer and his family. Many farmers reduce the intensity of their operation as the size of the business increases, while others have an operation so small that it hardly justifies consideration as a business enterprise. Agricultural economists recognise this, and it is inside the bounds of these limitations that the assumption of economic rationality must be made;

(b) that the sample selected for the field survey is representative of the entire commercial pineapple farming population in the region of study. The random nature of the sample and the proportionate coverage of the area planted to pineapples in the respective districts, as was shown in the discussion on the significance of the sample, tends to strengthen the validity of this assumption;

(c) that all economic data used in the analysis can be regarded as completely divisible. This is only an assumption of convenience, based primarily on the divisibility of money and will not distort the final results in any way;

(d) that all economic data obtained from the sample farms will be normally distributed. The validity of this assumption is dependent on, and strengthened by, an earlier assumption on the representative nature of the sample;

(e) that the money wages received by non-white workers accurately reflect the variation in their productivity amongst farms and the various age and sex groups. Undoubtedly, individual cases will be open to grave doubt, especially in those cases at the extreme ends of the value range of non-cash receipts by labour. On the whole, however, it is impossible to estimate the degree of error involved in this assumption.

Chapter V

THE ORGANISATION OF THE SAMPLE FARMS

"Experience and economic reasoning dictate that an organisation must be created within the limits imposed by fixed conditions. ... Ordinarily, available financial resources, the characteristics of other fixed assets, personal capacities, prices of products and inputs at the farm, and personal preferences impose joint restrictions on what can be profitably produced."<sup>1</sup> In other words, it can be said that the organisation of any farm will depend on physical, economic and personal factors, but the physical, or more fixed factors, are primary in determining the types of farming suitable to a particular environment.

Physical conditions include land and the agronomical and meteorological conditions which determine its use. "Land is composed of climate, topography, depth of soil, presence and absence of rocks, trees, gulleys, alkali, free water and many other things."<sup>2</sup> The more unfavourable and rigid these conditions are, the more limited the farmer will be in the choice of an enterprise in his particular locality.

Given the physical environment, economic considerations must follow. With the capital at his disposal and a number of enterprises from which to select, it is important that the farmer should consider those that will:

- a) enable him to make the fullest possible use of his labour force throughout the year;
- b) reduce to a minimum the burden of risk he has to carry;
- c) enable him to make the most efficient use of existing farm buildings;
- d) give a fairly even distribution of income throughout the year;
- e) pay all operating expenses, interest on capital at the prevailing rate and a fair wage to the farmer for his labour and management.

In the selection of an enterprise, some degree of personal preference is human, but, because of an earlier assumption on economic rationality, must be limited within the framework set by physical and economic factors. Only when there is an absolutely equal advantage to be had from more than two enterprises, is choice permissible.

The farm business must, however, adjust itself to changes in economic conditions and to research discoveries. The combination of the factors of production, as determined by a survey extending over one financial year, must not be thought of as static. Present conditions are the result of modifications due to experiment and experience extending over many years and will continue to change in the future. In the case of pineapples, as with other farm products, it is not possible

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1. Bradford, L.A. and Johnson, G.L. - Farm Management Analysis, p.72. John Wiley & Sons, Inc., New York, 1953.

2. Ibid. p.72.

to observe these adjustments in the period of one year. The economic life of the Cayenne variety lasts for approximately four years and that of the Queen for six to seven years. Because of the rapid and radical changes which have affected the industry in the Eastern Cape over the last decade, it is likely that the organisation of the sample farms, together with other pineapple farms in the area, is in the midst of a process of change. An indication of the extent of this change is provided in Table 10. During the 1954/55 season, more than nine million Queen pineapples were planted. By 1958/59 the number had decreased to less than one million, although farmers indicated that they intended planting over a million during the 1959/60 season. The changing pattern for Cayenne is not quite as marked. Planting increased slightly after 1954/55, but the rise was only temporary. In 1958/59 actually less were planted than during the 1954/55 season, but farmers indicated that they do not intend to reduce planting further during 1959/60.

Table 10

AGE STRUCTURE OF PINEAPPLE PLANTATIONS IN THE EASTERN CAPE  
(69 Commercial Pineapple Plantations, E.C. 1959)

Year planted	V a r i e t y	
	Queen	Cayenne
	No. of plants (thousands)	
1954/55	9,373	7,359
1955/56	7,340	8,769
1956/57	4,284	9,549
1957/58	2,934	8,610
1958/59	843	7,215
To be planted 1959/60	1,165	7,381

These changes do not greatly affect the results of this study because, so far, there have been no significant change in the marketing outlets. Although there has been some considerable contraction in plantings, particularly of Queens, pineapples still remain an industry of considerable importance.

Size and Land Utilisation

The sample farms range between 20 and 4,800 acres. The grouping of the sample farms by size is given in Table 11. More than half of the farms (61 per cent) were less than one thousand acres in size. A quarter varied between one thousand and two thousand acres and one-tenth were larger than two thousand acres.

Table 11

FREQUENCY DISTRIBUTION OF FARMS ACCORDING TO ACRES OPERATED  
(69 Commercial Pineapple Producers, E.C. 1959)

Size groups	No. of farms	Percentage of total
499 or less	17	24.6
500 - 999	25	36.3
1,000 - 1,499	12	17.4
1,500 - 1,999	7	10.1
2,000 or more	8	11.6
<u>Total</u>	<u>69</u>	<u>100.0</u>

By referring to Table 12, it will be noticed that the farms in the East London district are considerably smaller than the average for the area, and those in the 'other' districts considerably larger.<sup>3</sup> The size of the latter group is attributable mainly to three large livestock farming operations; one each in Peddie, Komgha and Alexandria. The average acreage under pineapples does not differ considerably between the districts, with the exception of Bathurst where farms have, on the average, twenty acres more under pineapple than in the other districts. The more or less equal acreage under pineapples, compared to the considerable variations of the average farm size in each district, results in a significant range of the percentages that pineries constitute of the total farm land in each district. From nearly 15 per cent of total farm land in East London, it decreases to roughly 4 per cent in Peddie, Komgha and Alexandria. 'Orchards and Irrigation' is limited mainly to citrus and vegetable production in Albany, Bathurst and East London. No instances of irrigation of pineapple land were met with during the survey.

Table 12

LAND UTILISATION: FARMS GROUPED BY DISTRICT  
(69 Commercial Pineapple Producers, E.C. 1959)

District	No. of farms	Pine- ries	Orchards and irri- gation	Other dry lands	Im- proved pas- tures	Grazing	Total
Albany	16	79	9	74	9	1,101	1,272
Bathurst	21	102	2	74	11	875	1,064
East London	25	82	5	9	8	457	561
Other	7	81	0	167	6	1,819	2,073
All farms	69	87	5	60	9	871	1,032
		per cent	per cent	per cent	per cent	per cent	per cent
Albany		6.2	0.7	5.8	0.7	86.6	100.0
Bathurst		9.5	0.2	7.0	1.0	82.3	100.0
East London		14.6	0.9	1.6	1.4	81.5	100.0
Other		3.9	0.0	8.1	0.3	87.7	100.0

'Dry lands', excluding pineapples, cover a large acreage in the 'other' districts, but constitute no more than 8 per cent of total farm land. Although less than half the size in Albany and Bathurst, the same category is almost of equal importance in the percentage of farm land covered by it in these two districts. On the East London farms an average of only nine acres per farm is used for other dry lands, or less than 2 per cent of the total area. This category includes the lands set aside for cultivation by native labourers, or for the growing of maize as a source of food for them. The Eastern Cape is not only relatively unsuitable for maize growing, but a number of farmers commented on the wasteful use that is being made of the land traditionally allocated to the native labourers. In a study of farm labour in Albany and Bathurst, Roberts commented that: "The impression is that many workers do not take sufficient care of their vegetable gardens

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3. Because of the small number of farms in Komgha, Peddie and Alexandria and the relatively minor importance of the pineapple as a source of income for the majority of these farms, they were grouped together for the purpose of this analysis.

and their lands to derive as much benefit from them as they might. Partly this is due to distrust or ignorance of modern agricultural methods, but apathy and lack of time are also to blame."<sup>4</sup>

Very few acres were set aside for improved pastures, although there is a direct correlation between the total size of the farms in each district and the percentage of land under improved pastures. The fact that in all four areas grazing, or other land, still constitutes more than 80 per cent of the total, is an indication that farming in the area is not intensive. In many cases it is due to the broken and undulating relief which complicates cultivation, while in others large tracts of land must be set aside for grazing cattle of Bantu farm labourers. The native labourers insist on keeping a few cattle each, not because they regard them as an income earning asset, but as a mark of prestige, a store of value and the 'money' to pay for a wife when they decide to get married.<sup>5</sup>

The farms that derive a larger percentage of income from pineapples are, on the whole, smaller than those with other important enterprises. By referring to Table 13 it will be seen that Group C farms are almost 40 per cent smaller than Group A farms. Both the acreage and the percentage of total land under pineapples show a direct relationship with the percentage of cash income derived from pineapples, while the inverse is true for orchards and irrigation, other dry lands and grazing. The area under improved pastures has no definite relationship with the percentage of income derived from pineapples.

Table 13

LAND UTILISATION: FARMS GROUPED BY PERCENTAGE CASH  
INCOME DERIVED FROM PINEAPPLES  
(69 Commercial Pineapple Producers, E.C. 1959)

Item	Group A	Group B	Group C	All farms
Average percentage	36	69	95	66
Number of farms*	24	30	15	69
	Acres per farm			
Pineries	55	99	121	87
Orchards & Irrigation	7	4	2	5
Other dry lands	94	53	21	60
Improved pastures	6	12	6	9
Grazing	1,075	837	613	871
Total	1,237	1,005	763	1,032
	per cent	per cent	per cent	per cent
Pineries	4.4	9.9	15.8	8.4
Orchards & Irrigation	0.6	0.4	0.3	0.5
Other dry lands	7.6	5.3	2.7	5.8
Improved pastures	0.5	1.2	0.8	0.9
Grazing	86.9	83.2	80.4	84.4
Total	100.0	100.0	100.0	100.0

\* One farm in Group B should more properly have been classified in Group A. To have done so would have made no significant difference to this or the following tables.

According . . . . /

4. Roberts, Margaret - Labour in the Farm Economy, p.115. Institute of Race Relations, Box 97, Johannesburg, 1958.
5. Ibid. p.115.

According to information contained in Table 14, pineapple production in the Eastern Cape is not nearly developed to the fullest extent. Especially in those districts where the farms are larger, less than half the indicated potential have been realised. These possibilities are, however, not without serious limitations. Not only do climatic conditions favour some areas more than others, but the high labour requirements of pineapple farming must be taken into consideration when further expansion is considered. Then there is the principle of opportunity costs; "The principle of opportunity costs states that profits will be greatest if each unit of labour, capital and land is used where it will add the most to return."<sup>6</sup> If it is true that the existing combination of factors of production on each farm is at the optimum, pineapple production cannot be increased, even though vast acreages of land on each farm may be suitable for that purpose. Only if the marginal revenue derived from an additional acre under pineapples is greater than what can be derived if that acre is used for any other purpose, will its working be economically feasible.

Table 14

POTENTIAL PINEAPPLE LAND BY DISTRICT  
(69 Commercial Pineapple Producers, E.C. 1959)

Item	Albany	Bathurst	East London	Other	Total
No. of farms	16	21	25	7	69
	Acreages				
Present area:					
Total	1,260	2,150	2,040	570	6,020
Per farm	79	102	82	81	87
Potential Area:					
Total	5,960	4,650	5,140	4,570	20,320
Per farm	373	221	206	652	294
Possible increase:					
Total	4,700	2,500	3,100	4,000	14,300
Per farm	294	119	124	571	207

It is not known to what extent the price of pineapples will have to increase in order to bring all potential land in the Eastern Cape into production. However, the fact that these acres were left out of production during the post-war boom would seem to suggest that the agronomic and economic potentials do not necessarily coincide.

Capital investment

It is a difficult undertaking to obtain an accurate assessment from the farmer as to the market value of his land and buildings.<sup>7</sup> Tomlinson observed "that two farms may be exactly alike as to soil types and improvements and if asked

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6. Heady, E.O. and Jensen, H.R. - Farm Management Economics, p.78. Prentice-Hall, Inc. Englewood Cliffs, N.J. 1956.

7. For the purpose of this study, the entire acreage operated was taken as part of the farm unit, whether it was owned or rented. Altogether, three farmers rented all the land they operated, while a further nine rented portions of their land. In calculating Labour Income, rent was taken as an expense, consequently interest was calculated only on that portion of average capital investment which was owned by the operator.

the value of his farm, the one farmer will answer £3 and the other £6".<sup>8</sup> The farmer is usually asked to base his valuation on what a willing buyer will pay to a willing seller and, if a number of properties have been sold in the area recently, the prices realised can be used as a check. Although, in fact, a large number of farms have been sold in the area of study since 1950, the extreme fluctuations in land values since, made it impossible to use the prices realised as a criteria by which to measure the accuracy of the farmer's valuation. In the last few years there has been no market for planted pineapple land as such. The presence of pineapple plants on a piece of land came to be regarded as a handicap rather than a help in its sale; not only because the price for the fruit was very low, but also because canners were not prepared to take fruit from a 'new grower'. In consequence, some farmers were reluctant to value pineapple plantations any higher than ordinary grazing, while others, who undoubtedly paid inflated prices for their land, insisted that it was not worth less than at the time of purchase when prices were at their highest.

The largest single concentration of sample farms, or 39 per cent of the total, fell within the group which had less than £10,000 invested - Table 15. Of those remaining, 26 per cent had less than £20,000 invested, 23 per cent between £20,000 and £30,000, and 12 per cent had an investment of more than £30,000. The table also shows that the pattern of distribution of the sample farms do not vary much from Group A to Group B to Group C, as the percentage of income derived from pineapples increases. With the exception of Group A, where the concentration in the first two categories is reversed, there is a tendency for the number of farms in each group to decrease as the total investment per farm increases. Group B farms show an exceptionally high cluster in the first category where the investment per farm is less than £10,000.

Table 15

FREQUENCY DISTRIBUTION OF FARMS ACCORDING TO THE AVERAGE CAPITAL INVESTMENT PER FARM AND PERCENTAGE INCOME FROM PINEAPPLES  
(69 Commercial Pineapple Producers, E.C. 1959)

Investment per farm £	Number of farms			All farms
	Group A	Group B	Group C	
9,999 or less	7	14	6	27
10,000 - 19,999	9	6	3	18
20,000 - 29,999	5	7	4	16
30,000 or more	3	3	2	8
<b>Total</b>	<b>24</b>	<b>30</b>	<b>15</b>	<b>69</b>
	Per cent	Per cent	Per cent	Per cent
9,999 or less	29.2	46.7	40.0	39.1
10,000 - 19,999	37.5	20.0	20.0	26.1
20,000 - 29,999	20.8	23.3	26.7	23.2
30,000 or more	12.5	10.0	13.3	11.6
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

In ...../

8. Tomlinson, F.R. - The Economics of Peanut and Maize Production on the Springbok Flats. Department of Agriculture and Forestry Bulletin No.196, Economic Series No.27, Government Printer, Pretoria, 1938.

In all the districts land constituted by far the most important capital item - Table 16. The difference in the value of a farm can be attributed to either one of four reasons: a) varying degrees of intensity in cultivation, b) real estate prospects for farms near town and along the coast where a new coastal highway is in progress, c) errors in valuation, and d) the position of each farm in respect of the agronomical and meteorological margin of pineapple cultivation in the Eastern Cape. In a survey of farming organisation in the Molopo region, it was ascertained that land constituted about 56 per cent of total capital invested.<sup>9</sup> A similar survey of citrus farming in the Union showed that more than 80 per cent of the total farm capital in some areas are invested in land.<sup>10</sup>

Table 16

AVERAGE CAPITAL INVESTMENT PER FARM BY DISTRICT  
(69 Commercial Pineapple Producers, E.C. 1959)

Item	Albany	Bathurst	East London	Other	Total
No. of farms	16	21	25	7	69
	£	£	£	£	£
Land	8,807	8,802	11,576	21,971	11,144
Fixed improvements*	2,279	2,090	2,504	3,071	2,383
Fixed Capital	11,086	10,892	14,080	25,042	13,527
Mechanical power	987	1,106	1,602	1,174	1,265
Implements	460	397	635	571	515
Livestock	1,463	1,371	1,092	3,628	1,520
Feed and supplies	12	17	43	41	28
Working Capital	2,922	2,891	3,372	5,414	3,328
TOTAL CAPITAL	14,008	13,783	17,452	30,456	16,855
	Per cent	Per cent	Per cent	Per cent	Per cent
Land	62.9	63.9	66.3	72.2	66.1
Fixed improvements	16.3	15.2	14.3	10.0	14.1
Fixed Capital	79.2	79.1	80.6	82.2	80.2
Mechanical power	7.0	8.0	9.3	3.9	7.5
Implements	3.3	2.9	3.6	1.9	3.1
Livestock	10.4	9.9	6.2	11.9	9.0
Feed and supplies	0.1	0.1	0.3	0.1	0.2
Working Capital	20.8	20.9	19.4	17.8	19.8
TOTAL CAPITAL	100.0	100.0	100.0	100.0	100.0

\* Does not include the value of the homestead, which is valued as follows: Albany £2,150; Bathurst £2,395; East London £2,504; Other £2,271.

In . . . . . /

9. Du Toit, S.J. and Smit, C.N. - Economic Analysis of Farming Organisation in the Molopo Region. Department of Agriculture, Bulletin No.360, Government Printer, Pretoria, 1958.
10. Prinsloo, A.L. - An Economic Survey of Citrus Growing in the Union, 1938. Department of Agriculture, Bulletin No.221, Government Printer, Pretoria, 1941.

In Albany, land composed 63 per cent of total capital as compared to 72 per cent in the 'other' districts. Fixed improvements are, however, of somewhat greater significance in the capital structure of the farms in Albany than in the 'other' districts. In consequence the fixed capital ratios on an inter-district basis correspond more closely.

By referring back to Table 16 for comparison, it will be noticed that those districts with a larger percentage of farm land under pineapples also had a slightly higher percentage of working capital tied up in machinery and implements and lesser amounts in livestock. The same feature is better illustrated in Table 17, where the capital structure is investigated on the basis of the percentage income derived from pineapples. Mechanical power and implements comprise at least 4 per cent more of the total capital in Group C than in any of the other groups. This is even more significant in the light of the higher capital investment in Group C. Investment in livestock, on the other hand, is from 4 to 6 per cent lower for Group C farms.

Table 17

AVERAGE CAPITAL INVESTMENT PER FARM ACCORDING TO THE PERCENTAGE  
INCOME DERIVED FROM PINEAPPLES  
(69 Commercial Pineapple Producers, E.C. 1959)

Item	Group A	Group B	Group C	All farms
No. of farms	24	30	15	69
Percentage income from pineapples	36.0	69.0	94.8	65.5
Land	10,843	10,941	12,033	11,144
Fixed improvements*	2,604	2,165	2,467	2,383
Fixed Capital	13,447	13,106	14,500	13,527
Mechanical power	1,286	991	1,779	1,265
Implements	481	492	618	515
Livestock	1,971	1,450	940	1,520
Feed and supplies	30	27	27	28
Working Capital	3,768	2,960	3,364	3,328
TOTAL CAPITAL	17,215	16,066	17,864	16,855
	Per cent	Per cent	Per cent	Per cent
Land	63.0	68.1	67.4	66.1
Fixed improvements	15.1	13.5	13.7	14.1
Fixed Capital	78.1	81.6	81.1	80.2
Mechanical power	7.5	6.2	10.0	7.5
Implements	2.8	3.0	3.5	3.1
Livestock	11.4	9.0	5.3	9.0
Feed and supplies	0.2	0.2	0.1	0.2
Working Capital	21.9	18.4	18.9	19.8
TOTAL CAPITAL	100.0	100.0	100.0	100.0

\* Does not include the value of the homestead which is valued as follows: Group A £2,704; Group B £2,036; Group C £2,566; All farms £2,384.

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The differences in the total capital for each group are not so much the result of a difference in working capital or fixed improvements, as a difference in the estimated value of land in each group. From Table 13 it will be remembered that Group C farms were almost 40 per cent smaller than Group A farms and yet their land value is 11 per cent higher. Although they are slightly more intensively cultivated, this does not adequately explain the difference in value, for which other factors are undoubtedly more important. The possible influence of some of these factors has already been mentioned, while others are to be discussed at a later stage. Judging from Table 18, the distribution of farms in Group A and Group B follows no definite pattern; if anything, there is a slightly higher concentration of farms in those categories where the investment per acre is relatively low. Group C, on the other hand, shows a steady increase in the percentage of farms in each category as investment per acre increases. Almost half the farms in Group C fell in the '£30 or more' category, compared to an average of 25 per cent for all the farms.

Table 18

FREQUENCY DISTRIBUTION OF FARMS ACCORDING TO INVESTMENT PER ACRE OPERATED AND PERCENTAGE INCOME FROM PINEAPPLES  
(69 Commercial Pineapple Producers, E.C. 1959)

Investment per acre operated £	Group A	Group B	Group C	All farms
	Number of farms			
9 or less	4	4	1	9
10 - 19	13	13	4	30
20 - 29	2	7	4	13
30 or more	5	6	6	17
Total	24	30	15	69
	Per cent	Per cent	Per cent	Per cent
9 or less	16.6	13.3	6.6	13.0
10 - 19	54.2	43.3	26.7	43.5
20 - 29	8.4	23.4	26.7	18.8
30 or more	20.8	20.0	40.0	24.7
Total	100.0	100.0	100.0	100.0

Land values

As mentioned earlier, great confusion existed amongst farmers as to the approximate marketable value of their properties. An incident which was by no means unique, relating to a particular piece of land in the Bathurst district, will help to illustrate the reason for this confusion. In 1951, farmer A was made an offer of £10,000 by farmer B for 1,000,000 Cayenne plants - an article which formerly had, and again today has, no market value. After consultation with his lawyers, farmer A decided it would be to his advantage from an income tax point of view, if he sold the land from which one million Cayenne plants could be obtained, rather than just sell the planting material. He suggested this to B, and the latter made him an offer of £15,000 for 204 morgen which he, A, had acquired in 1934 for £300. In addition A was to retain the right to harvest the crop from those plants for the next three years. B also gained from the deal. He took all the planting material he required and after three years sold

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the same property to C for £12,500. The planting material, for which he had offered £10,000, now cost him approximately £3,000. C did not know anything about pineapple growing, so he decided to work on A's farm in the neighbourhood to gain experience. After six months, however, he got the opportunity and sold the land to D for £21,500. At this stage prices began to drop and it was not long before D found himself in trouble. He was forced into liquidation and his bond holders, not being prepared to accept the property, offered it for sale. Almost six years have passed and the property has still not been sold. It has been re-offered to A, but he is not prepared to pay £5,000 for it.

The uncertainty caused by the wide fluctuations in land prices over the last few years is not the only, or primary, cause of the farmer's difficulty in valuing his land. In the early 1950's the canning factories were so eager to get pineapples that they entered into ten-year contracts with farmers in which they fixed a minimum price and stipulated a minimum quantity to be delivered by the farmer annually. When the pineapple market was approaching a point of satiety and prices began to drop, this same clause apparently became an 'escape clause'. At this time, when the canners were anxious to reduce their purchases, the contract of any farmer who failed to supply the stipulated minimum, was cancelled. Co-operative canners, on the other hand, were equally desirous of obtaining more pineapples at a time when private factories were entering into contracts. No minimum prices were fixed by them, but membership was open to anybody who could supply pineapples. As circumstances began to change for the worse, membership (particularly for those desiring to deliver pineapples) suddenly became more exclusive. Even if a property had been delivering pineapples to the factory for a number of years, and was then sold, the new owner was not permitted to continue delivering to the same factory under the old contract. This, of course, immediately limited the major market for pineapples and made it very difficult to sell a pineapple farm to any one who was not in possession of a contract with a canning firm or a member of a co-operative.

This, then, was the position in which the Eastern Cape pineapple producer found himself at the time of the survey during which he was asked to put a value on his property. His task was further complicated by being asked to value fixed improvements separately from the land. Although this latter is likely to lead to an upward bias of valuations, it can be disregarded in so far as it is not peculiar to pineapple farms only.

Judging from Table 19, rural real estate values have increased considerably since before the war. In the ten years after the outbreak of the war, prices showed a sharp increase and received further stimulation from the pineapple boom which lasted for the greater part of the 1950's. Prices for the three districts included in Table 19 show about equal fluctuations, although at different levels. Real estate values were higher in Bathurst than in Albany and, in turn, higher in East London than in Bathurst. The most remarkable feature of the table is, however, the considerable increase in the turnover of farms during the five years immediately after 1950. No less than forty-one farms, or 59 per cent of those included in the sample, had changed ownership since 1950. Although comparative measures are not available, this feature must be at least partially attributed to the presence of a speculative element in rural real estate in the Eastern Cape at the time.

Table 19 ...../

Table 19

PRICES PAID FOR FARMS IN VARIOUS YEARS BY DISTRICT  
(69 Commercial Pineapple Producers, E.C. 1959)

Year of sale	Albany		Bathurst		East London	
	No. of farms	Av. price per acre £	No. of farms	Av. price per acre £	No. of farms	Av. price per acre £
1939 and before	2	1.1	3	3.9	2	2.8
1940-1949	2	2.9	3	11.1	2	13.8
1950-1951	1	14.4	2	23.2	3	20.3
1952-1953	3	7.4	3	7.8	6	21.6
1954-1955	1	5.0	4	8.8	5	25.2
1956-1957	0	-	0	-	2	64.5
1958	0	-	1	7.9	1	27.7
All farms	9	5.7	16	8.5	21	22.2

With the exception of East London and Albany, at the top and bottom ends of the range respectively, real estate per acre as valued by the farmer does not differ markedly between the remaining districts - Table 20. Conditions to be considered in the valuation of a farm may, however, differ substantially from one farm to the next even within the same district. In consequence, an average figure can only provide a poor indication of what some of the farms in a particular district may be worth. If compared with the prices paid over a period, as recorded in Table 19, the farmer's valuation of his property would appear to be too high. An average value of £10.2 per acre for Albany is higher than most of the prices realised for farms sold in this district when the pineapple boom was at its peak. In Bathurst and East London the farmers valued their properties higher than the average price which was realised for the farms sold in each of these two districts respectively during the five years following 1950. It is possible that mainly farms of lower productivity were sold at the time of high prices because the owner, being aware of this, thought it an excellent opportunity to rid himself of his low profit yielding enterprise. On this assumption, the 40 per cent of the sample farms that were not sold, would have realised considerably higher prices than those that were and any such discrepancy, as mentioned above, would not have been possible. Whilst such an argument may be valid, there is no evidence to support it. Thus the inevitable conclusion is that the farmers included in the study valued their properties above the existing market rate. The extent to which values were inflated, however, cannot be determined from information available.

Table 20 ...../

Table 20

FARMER'S VALUATION OF REAL ESTATE VALUE PER ACRE BY DISTRICT  
(69 Commercial Pineapple Producers, E.C. 1959)

District	No. of farms	Value per acre* £
Albany	16	10.2
Alexandria	2	10.5
Bathurst	21	12.3
East London	25	28.2
Komgha	2	14.2
Peddie	3	14.6
Total	69	15.1

\* Including the value of the homestead.

Indebtedness

According to information in Table 21, only 29 per cent of the farmers had no debt at all, but no less than 16 per cent had a debt of over £8,000. The average debt for the group was £4,384.

Table 21

FREQUENCY DISTRIBUTION OF FARMS ACCORDING TO  
INDEBTEDNESS PER FARM  
(69 Commercial Pineapple Producers, E.C. 1959)

Debt £	No. of farms	Percentage of farms
0	20	29.0
1,999 or less	11	15.9
2,000 - 3,999	15	21.7
4,000 - 5,999	5	7.3
6,000 - 7,999	7	10.2
8,000 or more	11	15.9
Total	69	100.0

The actual amount of debt is not as important as the 'debt ratio' per farm, i.e. the ratio between indebtedness and the real estate value per farm. This ratio need not, and in fact, does not, correspond with the actual money debt per farm. Apart from the farmers who had no debt at all, the percentage of 'All Farms' in each category tends to increase as the debt ratio becomes more unfavourable, Table 22. This has to be explained largely by the heavy concentration of Group C farms in those categories which specify a more unfavourable debt ratio. Group A and Group B farms were not concentrated in any particular category, other than a large number of farmers in Group A who had no debt at all.

Table 22 ...../

Table 22

FREQUENCY DISTRIBUTION OF FARMS ACCORDING TO THE DEBT RATIO  
PER FARM AND PERCENTAGE INCOME FROM PINEAPPLES  
(57 Commercial Pineapple Producers, E.C. 1959)

Debt ratio	Group A	Group B	Group C	All farms
	Number of farms			
0	10	4	3	17
0.1 - 15	2	2	0	4
15.1 - 30	2	7	0	9
30.1 - 45	3	2	2	7
45.1 - 60	1	2	6	9
60.1 and higher	3	4	4	11
Total	21	21	15	57*
	Per cent	Per cent	Per cent	Per cent
0	47.6	19.1	20.0	29.8
0.1 - 15	9.5	9.5	0	7.0
15.1 - 30	9.5	33.3	0	15.8
30.1 - 45	14.3	9.5	13.3	12.3
45.1 - 60	4.8	9.5	40.0	15.8
60.1 and higher	14.3	19.1	26.7	19.3
Total	100.0	100.0	100.0	100.0

\* Twelve properties, either wholly or partially rented, were excluded.

The debt situation for Group C, or those farms deriving more than 90 per cent of cash income from pineapples, is serious. The majority of these farms has a debt ratio of above 45 per cent and their already unfavourable position is aggravated by the fact that they virtually practise monoculture of a perishable product under climatic conditions prone to excessive fluctuations. Tomlinson suggested that "an indebtedness bordering on 50 per cent of the fixed assets of the farm is a rather dangerous ratio and farmers who are heavily in debt should try to reduce that ratio as much as possible during good years".<sup>11</sup>

An interesting relationship was found to exist between the debt ratio per farm and the year in which it was purchased. Table 23 shows that those farmers who acquired their properties before 1950 had a relatively low debt and favourable debt ratio. The 1950-51 period, however, shows a radically different position. The debt ratios for the farms bought during that period average 44 per cent. For the farms purchased between 1952 and 1955 the ratio is still high but 4 per cent lower than for the farms in the second category. The ratio improves by a further 6 per cent for the farms purchased during and after 1956.

Table 23 ...../

11. Tomlinson, The Economics of Peanut and Maize Production on the Springbok Flats, Op. cit., p.35.

Table 23

YEAR OF PURCHASE AS RELATED TO INDEBTEDNESS  
(57 Commercial Pineapple Producers, E.C. 1959)

Year of purchase	No. of farms	Actual debt £	Debt ratio %
1949 and before	22	1,882	16.5
1950 - 1951	6	7,672	43.7
1952 - 1953	15	6,828	39.5
1954 - 1955	10	5,960	39.3
1956 and after	4	6,038	33.3
<b>Total</b>	<b>57</b>	<b>4,800</b>	<b>30.6</b>

Although there are probably numerous factors that might be held responsible for the unfavourable debt ratio of the farms bought after 1950, the speculative range of land values at that time correspond too closely to be regarded merely as coincidental. After 1956, when pineapple prices were beginning to slump seriously the sale of farms decreased and real estate values became more reasonable.

Labour structure

More than 95 per cent of the labour supply on the sample farms was made up of non-white workers. Of the remaining 5 per cent, four-fifths were contributed by the operator and the remaining one-fifth by either the family or hired white labourers. In Table 24 it is shown that the permanently-employed non-white adult male constitutes the most important element in the labour structure. He contributes fully 50 per cent of all the labour performed on the sample farms. Next in importance are the seasonal labourers. This category is primarily made up of members of the family of the permanently-employed adult male who are hired from time to time to assist with harvesting and in keeping the lands free of weeds. Permanently-employed females (not domestic) and youths comprise only 7 per cent of the total.

Table 24 ...../

Table 24

LABOUR STRUCTURE ACCORDING TO PERCENTAGE INCOME FROM PINEAPPLES  
(69 Commercial Pineapple Producers, E.C. 1959)

Item	Group A		Group B		Group C		All farms	
No. of farms	24		30		15		69	
	Days worked	% of total	Days worked	% of total	Days worked	% of total	Days worked	% of total
<u>White:</u>								
Operator	280	4.1	280	4.2	229	2.9	269	3.9
Hired	47	0.7	58	0.9	75	0.9	58	0.8
Family	10	0.2	6	0.1	0	0	6	0.1
<u>White total</u>	<u>337</u>	<u>5.0</u>	<u>344</u>	<u>5.2</u>	<u>304</u>	<u>3.8</u>	<u>333</u>	<u>4.8</u>
<u>Non-White:</u>								
Permanent male	3,616	53.4	3,297	49.6	3,853	48.0	3,524	50.4
Permanent female	352	5.2	55	0.8	205	2.5	187	2.7
Seasonal	2,066	30.5	2,774	41.8	3,125	39.0	2,614	37.4
Youths	397	5.9	171	2.6	534	6.7	325	4.7
<u>Non-White total</u>	<u>6,431</u>	<u>95.0</u>	<u>6,297</u>	<u>94.8</u>	<u>7,717</u>	<u>96.2</u>	<u>6,650</u>	<u>95.2</u>
<u>Grand Total</u>	<u>6,768</u>	<u>100.0</u>	<u>6,641</u>	<u>100.0</u>	<u>8,021</u>	<u>100.0</u>	<u>6,983</u>	<u>100.0</u>
White Man-equivalent	1.2		1.2		1.1		1.2	
Non-White Man-equivalent	22.9		22.5		27.6		23.8	
<u>Total Man-equivalent</u>	<u>24.1</u>		<u>23.7</u>		<u>28.7</u>		<u>25.0</u>	

The white man-equivalent per farm is virtually the same for Group A, Group B and Group C, although for Group C farms it comprises a slightly smaller percentage of the total labour supply. This is due to the higher total labour requirements of Group C farms. On the average they have five non-White man-equivalent more per farm than either Group A or Group B. In virtually every one of the non-white labour categories, Group C farms had a larger number of days worked. The importance of each category, however, changes as the percentage income derived from pineapples changes. The permanent non-white male is more important in Group A than in either Group B or Group C. Seasonal labour, on the other hand, comprises almost 10 per cent more of the total man-equivalent per farm for Group B and Group C than for Group A.

The farmer

a) Education: According to the information in Table 25, only 15 per cent of the farmers for whom information was available, attended either a university or an agricultural college after matriculation. In a survey of the differential roles of the press and radio in an extension programme covering certain districts of the Eastern Cape, van As found that 23 per cent of the farmers had post-matric education.<sup>12</sup> The discrepancy may be due either to different methods of sampling employed, or to the fact that there is no agricultural college to serve the

mixed ...../

12. Van As, Op. cit. p.55.

mixed farming areas of the Eastern Cape coastal belt. Of the remaining 85 per cent, 21 per cent of the total did not receive any schooling after standard six and a further 34 per cent did not go beyond standard eight. The remaining 30 per cent had either completed matriculation or left one year before.

Table 25

DISTRIBUTION OF FARMERS ACCORDING TO NUMBER OF YEARS OF FORMAL EDUCATION RECEIVED  
(67 Commercial Pineapple Producers, E.C. 1959)

Years	No. of farmers	Percentage of total
8 or less	14	20.8
9 - 10	23	34.4
11 - 12	20	29.9
13 or more	10	14.9
Total	67*	100.0

\* No information was available for two farmers

b) Age distribution: The majority of sample farmers were between the ages of forty and forty-nine - Table 26. Of the 35 per cent under forty, about one-third, or 10 per cent of the total, were under thirty. Fourteen per cent were between fifty and sixty, and 16 per cent were sixty years or older. This would indicate that the age distribution of farm operators in the Eastern Cape Coastal belt is roughly normal. In the study by van As, 35 per cent of the farmers were older than sixty, and only 36 per cent were younger than forty-five.<sup>13</sup>

Table 26

AGE DISTRIBUTION OF FARMERS IN THE EASTERN CAPE COASTAL BELT  
(67 Commercial Pineapple Producers, E.C. 1959)

Age group	No. of farmers	Percentage of total
29 or younger	7	10.4
30 - 39	17	25.4
40 - 49	23	34.3
50 - 59	9	13.5
60 or older	11	16.4
Total	67*	100.0

\* No information was available for two farmers

c) Experience in Pineapple Farming: From earlier discussions it is not surprising to find in Table 27 that almost 50 per cent of the farmers gained their first experience of pineapple farming in the last ten years. This is not due to the age distribution, for no more than 10 per cent of the present operators could have been too young to farm by 1950. When referring in the introduction to the rapid expansion of the pineapple industry after World War II, it was suggested that it did not occur merely as the result of the expansion of existing plantations,

but ...../

13. Van As, Op. cit. p.90.

but it was also due to the many formerly extra-marginal areas that were brought into production and the larger number of people from all walks of life that came to seek their fortune in the Eastern Cape.

Table 27

OPERATORS' EXPERIENCE IN PINEAPPLE FARMING  
(69 Commercial Pineapple Producers, E.C. 1959)

Experience (years)	No. of farmers	Percentage of total
4 or less	3	4.4
5 - 9	29	42.0
10 -14	22	31.9
15 or more	15	21.7
Total	69	100.0

Of the thirty-two farmers who started to grow pineapples after 1950, no less than twenty, or 65 per cent, had no previous farming experience whatsoever. When questioned on their respective occupations before they entered pineapple farming, a most unexpectedly wide range of professions was revealed. The following list should provide some indication of the wide-spread optimism that must have existed about the future prospects of the pineapple:

Jeweller and hairdresser	Printer
Professional photographer	Business manager
Navy	Tobacco company worker
Building contractor	Attorney
Engineer	Mines
Poultry breeding expert	Medical practitioner
Bank clerk	Fitter and turner
Trader.	

If reference is made to the circumstances at the time, the optimism of these people was not unfounded. As late as 1954 some canning factories were still entering into ten year contracts with growers in which a minimum price was specified. In September 1955, an economic review of the Union's pineapple industry stated: "In 1953 when canned pineapples went on the free market, the price went up by about 25 per cent. Although these prices have now declined, there is no indication that they will drop any further. The future of the pineapple seems to be in the canning industry and provided there is greater co-operation amongst growers, more intensive advertising and wider cultivation of markets, the prospects of the pineapple industry seem assured."<sup>14</sup> Whether or not these provisos have been fulfilled would appear, however, to be immaterial, because they would not have prevented the collapse in the world market for pineapples that has since occurred. It is this fact which has led to the downfall of so many growers.

d) Acquisition of farm land: It follows logically from the discussion of the limited experience of a large number of farmers and the high rate of turnover in farms since 1950, that the majority of farms should have been acquired through purchase. According to information contained in Table 28, 70 per cent of the farms were bought, 20 per cent were

inherited .....

14. Economic Review, September 1955, p.5.

inherited and 7 per cent were acquired partly through purchase and partly through inheritance. Only three farms, or 4 per cent of the total were rented.

Table 28

ACQUISITION OF FARM LAND  
(69 Commercial Pineapple Producers, E.C. 1959)

Method	No. of farms	Percentage of total
Inheritance	13	18.9
Purchase	48	69.6
Inheritance and purchase	5	7.2
Rental	3	4.3
Total	69	100.0

e) Acquisition of knowledge on pineapple culture: The majority of farmers was vague and unspecific about their sources of information on pineapple culture. About 15 per cent denied any source of information other than personal experience - Table 29. It is possible that these farmers have never had direct contact with technical officers or technical bulletins issued by the research stations. It is unlikely, however, that they have not discussed the pro's and con's of certain techniques with a neighbouring farmer at some stage or another, and should, therefore, preferably be classified with those who listed 'other farmers' as a source of information. The latter category was by far the most important. Almost half the farmers in the sample (47.8 per cent) derived benefit from the advice from other farmers. If we then add those who said they had no particular source of information other than their own experience, the size of this group increases to more than 60 per cent.

Table 29

SOURCES OF INFORMATION ON PINEAPPLE GROWING  
(69 Commercial Pineapple Producers, E.C. 1959)

Source	No. of farmers	Percentage of Total
None	10	14.5
Other farmers	33	47.8
Research station	15	21.7
Technical advisors	13	18.8
Press	11	15.9

Only a comparatively small percentage of farmers has had direct contact with the research station or with a technical advisor. This need not necessarily be regarded as an indication that the diffusion of technical knowledge is limited. It is almost certain that some of the 'other farmers' listed are either people who have been in contact with technical officers, or with other farmers who had been.

The press was the least frequent source of information, according to the farmers. Although a series of articles on the various aspects of pineapple growing appeared in at least two widely circulated farming magazines, not many farmers seem to remember having benefited from them. Van As found that more than 90 per cent of the farmers in his study

subscribed ...../

subscribed to at least one farming magazine, but that these magazines were not the most effective means of communication with the farmer.<sup>15</sup> Government officials reached the largest number of farmers; posters the least. Of the mass media, newspapers were the most successful, but only came third after government officials and other farmers. Newspapers were followed in effectiveness by farming magazines and the radio. In comparison to the study by van As, the lesser significance of government officials in spreading information about pineapple growing must be ascribed to the fact that no specific program was ever implemented to do so. The importance of other farmers as a source of information and the lower degree of success achieved by farming magazines is, however substantiated by the present study.

f) Domestic facilities: Most of the farms had good homesteads. Even where signs of dilapidation were obvious, the structures were generally spacious and equipped with a number of modern facilities, as the table below will indicate.

Table 30

AVAILABILITY OF MODERN FACILITIES ON SAMPLE FARMS  
(69 Commercial Pineapple Producers, E.C. 1959)

Item	No. of farms	Percentage of total
Radio	69	100.0
Electricity	45	65.2
Refrigerator	61	88.4
Running water	54	78.4
Motor car	53	76.8
Telephone	62	89.9

At least one link with the outside world was assured as all the farmers had radios. No questions were asked about newspaper reading, but it is expected that the majority of farmers subscribed to at least one. Van As found that only 9 per cent of the farmers in his survey did not receive a newspaper at all.<sup>16</sup>

Of the items listed in Table 30, electricity had the lowest incidence. Only 65 per cent of the farmers reported dwellings lighted by electricity. On more than 90 per cent of these farms, the current was supplied by batteries charged by a small engine of 32 volts or less. This compares very unfavourably with the position in other countries. As early as 1935, 95 per cent of the farmers in France, 90 per cent in Japan, 85 per cent in Denmark and 100 per cent in Holland received electricity from a central station.<sup>17</sup>

Refrigerators were well represented and 88 per cent of the housewives could claim the use of one, mainly, of

course ...../

15. Van As, Op. cit. p.194.

16. Ibid. p.50.

17. Loomis, C.P. and Beegle, J.A.: Rural Social Systems, p.125. Prentice-Hall, Inc., New York, 1950.

course, of the paraffin type. Running water in the kitchen and bathroom was not quite as common; it had only been installed in 78 per cent of the houses.

At least three-quarters of the sample farms possessed a motor vehicle in addition to either a truck and/or a tractor. The farmers who did not have a motor car, all had a truck of some description. Rural sociologists are of the opinion that the automobile appears to be one of the products of technological advance most appreciated in the rural districts and ranks higher in the scale of desires of farm people than of urban residents.<sup>18</sup>

Only 10 per cent of the farms were without a telephone and next to the radio, therefore, it was the convenience most commonly possessed.

g) Recreation: One-fifth of the farmers had no particular form of recreation, while several of the remainder had more than one. Fishing, cricket and tennis were the most popular forms of entertainment. Shooting ranked fourth and was followed by golf and bowls. The remaining 7 per cent indicated various forms of entertainment ranging from poetry and play-reading to swimming.

Table 31

FARMERS' RECREATIONS  
(69 Commercial Pineapple Producers, E.C. 1959)

<u>Item</u>	<u>No. of farmers</u>	<u>Percentage of total</u>
Bowls	3	4.3
Cricket	19	27.5
Fishing	22	31.9
Golf	6	8.7
Shooting	7	10.1
Tennis	16	23.2
Other	5	7.2
None	15	21.7

A number of farmers had private tennis courts and several clubs have been organised. Many of the farmers also own either a house or bungalow at the seaside and frequent fishing trips are arranged for the weekends.

h) Marital status: Only six of the operators were not married. Of the six, one was an elderly spinster who stayed on the farm with her aged mother. She had both a telephone and a motor car and was assisted in the farming by her neighbouring brother.

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18. Loomis, C.P. and Beegle, J.A., Op. cit. p.124.

Plate 3

Abandoned pineapple  
land with homestead  
in background





Chapter VI

PINEAPPLE CULTURE AND MARKETING ON THE SAMPLE FARMS

Two main varieties of pineapple are planted by farmers in South Africa and the Eastern Cape, i.e., the QUEEN OF PINES and the SMOOTH CAYENNE. A number of other varieties are grown at the Pineapple Research Station near East London, a few of which thrive particularly well under local conditions. The scarcity of planting material to propagate these varieties, however, prevents their establishment in large plantations.<sup>1</sup>

The Queen variety is grown mainly for fresh consumption and sold on the fresh fruit market both locally and overseas. Because of the high requirements set for fruit marketed overseas, the limited local market, the short period over which the entire crop ripens, the perishability of all pineapples, etc., it is virtually unavoidable that large-scale producers of Queens send a certain percentage of their crop to the canners. Cayennes, on the other hand, are not as sweet-flavoured as Queens, but are very suitable for canning. The large size of the fruit, its square-shouldered cylindrical shape and shallow segments make it possible to obtain a higher recovery with the use of mechanical peelers than is the case with Queens.

In evaluating the characteristics of a number of pineapple varieties, Mathews lends great prominence to the canning qualities of the Cayenne and the palatability of the Queen.<sup>2</sup> Not only is the Cayenne tender and juicy, but it is on the whole heavier than any other variety and has enough fibres to can well - Table 32. Queens are not only 'sweet and rich' with a 'crisp and tender' texture, but have excellent shipping endurance qualities.

Table 32

THE FRUIT CHARACTERISTICS OF A NUMBER OF PINEAPPLE VARIETIES

Variety	Normal Season*	Weight	Flesh Colour
Red Spanish	May-June	3-5 lbs.	White
Natal Queen	June-July	1-2½ lbs.	Yellow
Pernambuco	June-August	2-4½ lbs.	White
Smooth Cayenne	July-September	5-8 lbs.	Slightly yellow
Abakka	July-September	4-6 lbs.	Yellow

Variety	Flavour	Texture	Shipping endurance
Red Spanish	Sweet & spicy	Coarse & juicy	Excellent
Natal Queen	Very sweet & rich	Crisp & tender	Excellent
Pernambuco	Very sweet	Very tender & juicy	Good
Smooth Cayenne	Sweet but tart	Tender & juicy	Good
Abakka	Sweet	Tender & juicy	Poor

\* All varieties will produce some fruit out of their normal season and can be forced to fruit at other seasons. The seasons given are peculiar to Florida.

Source: Mathews, Op. cit. p.5.

Balance ...../

1. 'Pineapples - Selecting good Planting Material.' Farming in South Africa, July 1956, p.46.

2. Mathews, Op. cit.

Balance of structure

Of the sixty-nine farmers included in the sample survey, 11.6 per cent sold Queens only, 14.5 per cent Cayennes only and the remaining 73.9 per cent a combination of the two - Table 33. Altogether then, 61 farmers sold Cayennes and 59 farmers sold Queens. Of the eight farmers who sold Queens only, four had Cayenne plants that were not in bearing yet. This increases the number of farms which grew both varieties from 51 to 55. None of the farmers who grew Cayennes only had Queen plants which were not in bearing. Of all the sample farmers, then, there were 65 growing Cayenne and 59 growing Queens. The larger percentage of farmers growing Cayennes, as compared with those selling them, can be taken as a further indication that Cayennes are increasing at the expense of Queens.

Table 33

PINEAPPLE SALES AND PLANTS STRUCTURE  
(69 Commercial Pineapple Producers, E.C. 1959)

Item	Farms selling each variety of pineapple		Farms planting each variety of pineapple	
	No. of farms	Percentage of total farms	No. of farms	Percentage of total farms
Queens only	8	11.6	4	5.8
Cayennes only	10	14.5	10	14.5
Queens & Cayennes	51	73.9	55	79.7
Total Queens	59	85.5	59	85.5
Total Cayennes	61	88.4	65	94.2
Grand Total	69	100.0	69	100.0

The Cayenne variety predominates in the districts of Bathurst and East London, according to the information contained in Table 34. In both these districts roughly 70 per cent of the tonnage sold annually are Cayennes. In Albany it is only a little more than 40 per cent of the total, while in the 'other districts' both varieties are of equal importance. The pattern also changes as the percentage income derived from pineapples changes. The percentage that Queens constitute of the total tonnage sold decreases from 53.8 per cent to 26.5 per cent as the percentage cash income derived from pineapples increases from less than 50 per cent (Group A) to more than 90 per cent (Group C). On the district level there are exceptions. In Albany, where the Queen variety predominates, the percentage Queens constitute of the total tonnage sold actually increases as the percentage income derived from pineapples increases. In East London there is no definite trend, but Queens never increase to more than one-third of the total tonnage sold.

Table 34

QUEENS AS A PERCENTAGE OF TONNAGE SOLD ACCORDING TO THE DISTRICT AND PERCENTAGE INCOME DERIVED FROM PINEAPPLES  
(69 Commercial Pineapple Producers, E.C. 1959)

District	No. of farms	Queens as a percentage of tonnage sold			
		Group A	Group B	Group C	All farms
Albany	16	36.4	52.6	84.0	58.1
Bathurst	21	61.5	25.8	8.3	33.5
East London	25	26.6	32.1	26.2	27.8
Other	7	69.3	35.5	-	50.0
Total	69	53.8	33.0	26.5	38.8

Planting . . . . /

Planting material

The type of planting material the farmer will use, is to some extent determined by the variety he wishes to produce. According to recommendations by the Pineapple Research Station at East London, the order of importance (economic) for Queen and Cayenne planting material is as follows:<sup>3</sup>

Queen: (i) The parent stump (with its suckers)  
(ii) The suckers alone  
(iii) The top (not economical)

Cayenne: (i) The slips, which are available only once a year, four to seven months after harvesting  
(ii) The top, which is in abundant supply during the summer harvest and to a lesser extent during the off-season  
(iii) The suckers..

The scarcity of planting material that existed until very recently did not allow the farmer a choice of either type or quality in selection. At the time of the survey, planting material had become more plentiful and farmers exercised a definite preference for slips and tops in Cayenne planting - Table 35. To what extent discrimination as to quality in the selection of planting material was practised, is uncertain..

Table 35

CAYENNE PLANTING MATERIAL USED  
(65 Commercial Pineapple Producers, E.C. 1959)

<u>Item</u>	<u>No. of farms</u>
Slips	55
Suckers	31
Tops	57

Although more farmers used tops than slips for Cayenne planting material, the majority expressed a definite preference for slips. Suckers were also used, but to a lesser extent.

For the planting of Queens, farmers made almost exclusive use of the parent stump.

Planting .....

3. Farming in South Africa, July 1956, Op. cit. p.46.

Ibid. May 1956, p.11.

The following description of the various types of planting material is based on information contained in the above-mentioned articles:

The parent stump is the stump which bore the original fruit and grew from the original plant;

The sucker is a pineapple plant which sprouts from the stem of the parent plant;

The top is the crown at the apex which generally is still found on the fruit when it is bought at the market or fruit shop;

The slips are fruitlets developing on the stem immediately underneath the fruit itself. They are not to be confused with the collar slips which grow out from the lower eyes of the fruit.

Planting slope

The majority of pineries in the Eastern Cape are established on sloping ground to ensure the best drainage, and the lay-out is planned to eliminate soil erosion as much as possible. "For this purpose, contour banks not spaced too widely apart are necessary, and these should be constructed where the entrance roads lead into the lands. The contour banks should run into the natural water-courses, the banks of which should always remain undamaged and be protected by means of a cover of grass and shrubs; if the natural cover is poor, grass should be planted."<sup>4</sup>

The majority of farmers planted across the slope, i.e. on the contour - Table 36. In 1956 it was reported that this system of planting was rapidly coming into favour with the progressive producers as it lends itself favourably to the adoption of mechanical means of spraying and cultivation.<sup>5</sup> Another large group of growers planted diagonally across the slope with contour furrows at regular intervals, depending, of course, on the slope of the land. The advantage of this system lies in the rapid drainage of surface water and the greater freedom of movement it allows between the plants from one contour furrow to the next. It does, however, result in a more rapid movement of soil down the slope and requires additional labour to keep the contour furrows free from silt. The advantage that the system has in good surface drainage is relatively unimportant. The internal drainage of the soil is what is vital, and this is enhanced more by adequate subsoiling than by good surface drainage.

Table 36

PINEAPPLE PLANTING SLOPE  
(69 Commercial Pineapple Producers, E.C. 1959)

Slope	No. of farms
Across (contour)	37
Down (with contour furrows)	13
Diagonally (with contour furrows)	29
Flat land	2

Thirteen farmers also planted directly down the slope with regular contour furrows to stop the run-off. Only two of the sample farmers had plantations on level ground.

Planting method

Of the 65 farmers in the sample who grew Cayennes, all made use of double row planting, although three experimented with triple rows to obtain a larger number of plants per acre - Table 37. The spacing of the plants within the rows, as well as between the rows differed considerably. The system most commonly used left one foot between the plants within the rows and then alternate spaces of two feet and four feet between the rows. Other farmers used narrower spacings such as nine inches between the plants and three-and-a-half and one-and-a-half feet between the rows.

Table 37 ...../

4. 'Pineapple farming for beginners.' Farming in South Africa, May 1956, p.11.

5. Peard & Bader, Op. cit.

Table 37

PLANTING METHOD  
(69 Commercial Pineapple Producers, E.C. 1959)

Method	No. of farms	
	Queens	Cayennes
Single rows	28	0
Double rows	31	65
Triple rows	0	3

An almost equal number of farms planted Queens in double rows and single rows respectively. The double row spacing is usually the same as that for Cayennes, while in the single rows, plants were from nine inches to one foot apart in the rows and from four to six feet apart between the rows. As in the case of Cayennes, the number of Queen plants per acre therefore varied considerably from one farm to the next.

According to recommendations by officers of the Pineapple Research Station, the plants should be spaced from fifteen to eighteen inches apart in the rows, with alternate spaces of two and four feet between the rows.<sup>6</sup> The spacing of the plants will, however, depend largely on the general fertility of the soil. "In fertile soil the plants can be planted closer together, because the loss in the average weight per fruit will not effect these large fruits very seriously and in any case, excessively large fruits are undesirable for both the factory and the market. In poorer soils the plants are spaced further apart in order to obtain fruit of better quality."<sup>7</sup>

Farmers were usually well aware of the importance of spacing between plants and rows, but not of the number of plants that such a system of spacing will give per acre. In order to avoid inconsistencies, the number of plants per acre given by various spacings was obtained from experiments conducted by the research station. Whereas these experimental plots were on a small scale and laid out on flat land, allowance had to be made for contour furrows and roads to fit in with the situation on the farm. After consultation it was decided to reduce the experimental figures by two thousand plants per acre throughout.

District and yield

Considerable variations in the yield per acre was found to exist at the district level - Table 38. Although there are more Cayenne plants per acre in Albany than in Bathurst or the 'other' districts, the yield per acre is actually lower. On the other hand, while there are only about 13 per cent more plants per acre in East London than in Albany, the yield in the latter district is almost 90 per cent higher than that of the former.

Table 38 ...../

6. 'Pineapple Farming for Beginners.' Farming in South Africa, May 1, 1956, p.12.
7. 'Pineapples - How and When they are Planted.' Farming in South Africa, August 1956, p.47.

Table 38

AVERAGE EFFECTIVE CAYENNE YIELD PER FARM BY DISTRICT  
(69 Commercial Pineapple Producers, E.C. 1959)

District	No. of farms	Plants per acre	Effective yield (ton)
Albany	14	12,100	5.3
Bathurst	19	11,100	5.8
East London	22	13,700	9.9
Other	6	11,800	6.6
Total	61	12,400	7.3

The yield pattern for Queens at a district level shows much the same variation as that for Cayennes. Although there are only about 14 per cent more plants per acre in East London than in either Bathurst or Albany, the yield per acre is almost 60 per cent higher - Table 39. In turn, East London has on the average 20 per cent fewer plants per acre than the 'other' districts but the yield is about 30 per cent higher.

Table 39

AVERAGE EFFECTIVE QUEEN YIELD PER FARM BY DISTRICT  
(59 Commercial Pineapple Producers, E.C. 1959)

District	No. of farms	Plants per acre	Effective yield (ton)
Albany	16	9,400	1.7
Bathurst	20	9,400	1.8
East London	16	10,900	2.7
Other	7	13,900	2.1
Total	59	10,300	2.1

Assuming a given level of management efficiency and a similar number of plants per acre for all the districts, it is likely that the average yield in Albany will be lower than the average yield in Bathurst, which in turn will be lower than the yield in East London. These variations must be attributed to variations in meteorological and agronomical factors such as temperature, drainage, etc.

Plants and yield per acre

The more plants there are per acre, the higher the yield in tons is expected to be. According to Mathews this is true even though there may be a slight reduction in individual fruit size as result of the thicker settings.<sup>8</sup> In other words, the loss of weight as the result of smaller individual fruits is more than offset by the increase in the number of fruits. Theoretically speaking, this can only be valid up to a certain point. As happens in the case of fertiliser application, yield on a given piece of land will increase to a peak as the number of plants per acre increases, but after that, the larger number of fruit will not be able to offset the loss of weight caused by a smaller individual fruit.

Mathews suggests that for maximum production the

number ...../

8. Mathews, Op. cit. p.7.

number of plants per acre should be within the range of thirteen to sixteen thousand. In a survey of the pineapple industry in Queensland, Australia, it was found that the majority of farmers had between fourteen and sixteen thousand plants per acre.<sup>9</sup> The number of plants which may be planted per acre, as was pointed out earlier, will largely depend on the fertility of the soil. Experiments at Bathurst showed that the yield for single rows, four feet apart and fifteen inches between the plants, is substantially lower than for double rows two and four feet apart. In the case of triple rows it was found that the size of the fruit was so much reduced that the increased number of plants could barely offset the loss of weight from the smaller fruits.<sup>10</sup>

Within the area of study there is a direct correlation between the number of Queen plants per acre and the yield - Table 40. A frequency distribution of the number of Queen plants per acre shows no deviation from the pattern of regular increases in yield as the number of plants per acre increases. From an effective yield of 1.6 ton for less than 8,000 plants per acre, it increases to 1.8 ton for those farms having between 8,000 and 10,000 plants per acre. The yield then continues to increase for the next two categories until it reaches a high of 2.7 ton on those farms where there are more than 12,000 plants per acre.

Table 40

FREQUENCY DISTRIBUTION OF FARMS ACCORDING TO THE NUMBER OF QUEEN PLANTS PER ACRE AND YIELD  
(59 Commercial Pineapple Producers, E.C. 1959)

No. of plants per acre	No. of farms	Effective yield per acre (ton)
7,999 or less	17	1.6
8,000 - 9,999	11	1.8
10,000 - 11,999	15	2.2
12,000 or more	16	2.7
Total	59	2.1

There is also a definite increase in Cayenne yield as the number of plants per acre increases - Table 41. From 5.2 ton for farms with less than 12,000 plants per acre, the yield almost doubles when the number of plants increases to more than 13,000 per acre.

Table 41

FREQUENCY DISTRIBUTION OF FARMS ACCORDING TO THE NUMBER OF CAYENNE PLANTS PER ACRE AND YIELD  
(61 Commercial Pineapple Producers, E.C. 1959)

No. of plants per acre	No. of farms	Effective yield per acre (ton)
11,999 or less	23	5.2
12,000 - 12,999	20	7.8
13,000 or more	18	9.4
Total	61	7.3

At ...../

9. Division of Marketing, Department of Agriculture and Stock, Queensland, 1957. 'An Economic Survey of the Pineapple Industry in Queensland.'
10. Farming in South Africa, August 1956, p.50.

At first, this feature of continuous increases in yield for both the Queen and the Cayenne varieties would seem to violate the law of diminishing returns. This, however, need not be the case. Firstly, it is more than likely that the range of the number of plants per acre for the sample farms does not include the optimum point. In other words, the sample farmers can still increase the yield further by having a larger number of plants per acre. Secondly, by referring back to Tables 38 and 39, we notice that neither the Cayenne nor Queen yields between the districts vary in proportion to the number of plants per acre. Closer investigation of the information in these two tables would seem to suggest that the yield per acre is low where the number of plants per acre are few because it includes mainly farms from those districts where the number of plants per acre are restricted due to less favourable climatic and agronomic conditions. The law of diminishing returns can therefore be more reliably illustrated under controlled conditions as is approached on identical experimental plots.

Percentage Income from pineapples and yield

It is found that the yield per acre is higher for both varieties on those farms which concentrate on pineapples, i.e. Group C - Table 42. Cayenne yield increases from 6.2 ton per acre for Group A to 8.6 ton for Group C, while Queen yield increases from 1.7 ton to 2.4 ton between the two respective groups.

Table 42

AVERAGE EFFECTIVE YIELD PER PRODUCTIVE ACRE FOR QUEENS AND CAYENNES ACCORDING TO THE PERCENTAGE INCOME DERIVED FROM PINEAPPLES

(69 Commercial Pineapple Producers, E.C. 1959)

Percentage Group	No. of farms	Yield	
		Cayenne	Queen
Group A	24	6.2	1.7
Group B	30	7.0	2.3
Group C	15	8.6	2.4
All farms	69	7.3	2.1

An explanation for this feature must be sought in terms of either the more efficient management of the pineapple enterprise on Group C farms, or the location of these farms in the regions more suitable to pineapple production. There is no criterion available by which to measure the managerial efficiency on these farms. Indications are, however, that the majority of those farms deriving more than 90 per cent of cash income from pineapples are situated in those districts where the yield per acre is highest.<sup>11</sup>

Marketing

The extent to which the pineapple producer is dependent on the canning industry has been hinted at earlier, but is substantiated .....

11. Chapter III, Table 7.

substantiated by information in Table 43. No less than 90 per cent of all pineapples marketed by the sample farmers were sold to the canning factories. In the instance of Cayenne, the figure increases to virtually 100 per cent. From an average of 212 tons of Cayenne sold per farm, less than one-and-a-half tons were sold as fresh fruit on either the local or the overseas market; the remainder went to the canneries. For Queens the marketing pattern is quite different. Roughly half the tonnage per farm (46 per cent) was sold on the fresh market locally and overseas and the rest went for canning.

Table 43

MARKETING PATTERN FOR PINEAPPLES  
(69 Commercial Pineapple Producers, E.C. 1959)

Channel	Queens (ton)	Cayennes (ton)	Total (ton)	Percentage of total
Canning	28.5	210.5	239.0	90.4
Fresh export	3.2	0.8	4.0	1.5
Fresh local	20.7	0.6	21.3	8.1
<b>Total</b>	<b>52.4</b>	<b>211.9</b>	<b>264.3</b>	<b>100.0</b>

Table 43 also clearly illustrates the predominance of the Cayenne variety in the pineapple structure of the Eastern Cape. No less than 59 farmers, or 86 per cent of the total, were growing and selling Queens (Table 33), but the tonnage realized was less than 20 per cent of the total average production for the sample farms.

A more detailed analysis is possible by taking the marketing pattern of the two varieties separately. Of the 61 farmers who marketed Cayennes, all sold to the canneries - Table 44. Thirteen of the 61 farmers also sold small quantities as fresh fruit locally and overseas. An average of 230 tons per farm was sold to the canners at an average price of £8.1 per ton. A number of farmers on contract with a certain canning company received £10 per ton, but for the remainder the price fluctuated well below that - to £6 in some cases. Five of the farmers sold an average of 11 tons each on the fresh export market which realised £20 per ton and a further eight sold an average of five tons each on the local market fetching £12.9 per ton. Local exporting companies have been encouraging their members to export the smaller Cayenne fruit. If the factory price continues to sink lower, or remains at the present level for any length of time, the tendency for fresh export is likely to increase.

Table 44

MARKETING OF THE CAYENNE VARIETY  
(61 Commercial Pineapple Producers, E.C. 1959)

Channel	No. of farms	Average per farm	
		Tonnage sold	Price per ton
Canning	61	230	8.1
Fresh Export	5	11	20.0
Fresh local	8	5	12.9
<b>Total</b>	<b>61</b>	<b>233</b>	<b>8.4</b>

Of the 59 farmers who marketed Queens, a larger number sold on the local fresh market than to the canners -

Table 45. Forty-six farmers sold an average of 43 tons each to the canners for which they received £7.5 per ton. Ten exported 22 tons each for sale on the overseas market which realised £25.6 per ton, or £5 more than was paid for fresh Cayennes exported.

Table 45

MARKETING OF THE QUEEN VARIETY  
(59 Commercial Pineapple Producers, E.C. 1959)

Channel	No. of farms	Average per farm	
		Tonnage sold	Price per ton
Canning	46	43	7.5
Fresh export	10	22	25.6
Fresh local	54	26	18.6
Total	59	61	13.8

It is important to note that only a relatively small percentage of either the Queen or Cayenne crop is exported as fresh fruit. Because of the strict regulations on size, degree of ripeness and freedom from disease, selection for the export market has to be undertaken with great care. It is estimated that not more than 10 or 12 per cent of the annual Queen crop is likely to be accepted for export. In addition, exporting involves considerably more work and cost as well as the risk of damage or decay during the time it takes before the fruit is sold.

The sale of fresh pineapples on the local market can be sub-divided into three separate categories:

- (a) Municipal markets
- (b) Private orders
- (c) Roadside selling.

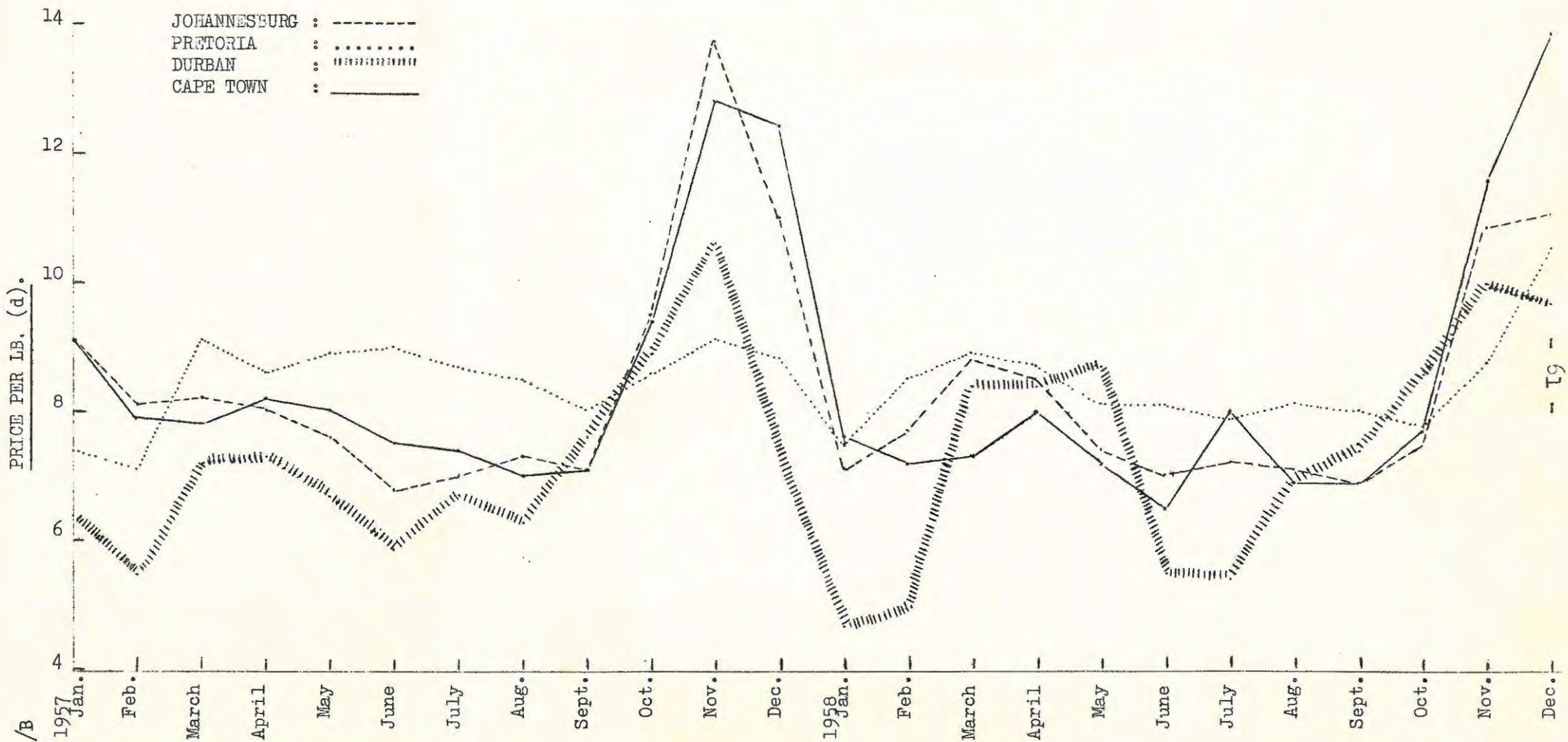
Only a small number of farmers sold significant quantities as private orders, while roadside selling depended almost entirely on the proximity of the farm to a major road. In a few cases, however, farmers took a truckload of pineapples up-country, travelling from town to town until they managed to sell the entire load. This form of selling was mainly undertaken as a last resort by farmers who had no outlet to the canning factories.

The eight urban markets<sup>12</sup> absorb the great bulk of local fresh sales. Without exception the farmers were satisfied with the services provided by market agents in the urban areas and country towns, but complained bitterly about the uncertain nature of the prices. One week a farmer would receive anything from ten shilling to £1 a case while the next week there would be a nett debit on a particular consignment so that he has to pay in to cover transport and other expenses. Prices on the urban markets generally reach a peak during the early summer months and then drop sharply to remain low until the same period the following year - Figure 1. Indications are that in markets closer to the producing areas, e.g. Durban, prices are generally lower and fluctuate more violently. The average price per pound on the Johannesburg market during the two years 1957/58 was 8.34 pennies, or roughly £70 per ton. In Cape

Town ...../

12. Johannesburg, Cape Town, Durban, Pretoria, Port Elizabeth, Germiston, Vereeniging/Vanderbylpark, Springs.

**Figure 1 - AVERAGE MONTHLY PRICE PER LB. FOR PINEAPPLES IN FOUR URBAN MARKETS OF THE UNION OF SOUTH AFRICA - 1957/58.**



SOURCE: COMPILED FROM DATA SUPPLIED BY THE DIVISION OF ECONOMICS AND MARKETS, DEPARTMENT OF AGRICULTURE, PRETORIA. TVL.

Chapter VII

FINANCIAL RESULTS

Farm Receipts

The cash income for the sample farms ranged between £140 and £17,700 sterling. Of the 69 farms, 12 had an income of less than £1,000 and 31 fell in the range between £1,000 and £3,000 - Table 46. The remaining 26 farms were almost equally divided into three categories at £2,000 intervals. Nine farms, comprising 13 per cent of the total, fell in the open group above £7,000.

Table 46

FREQUENCY DISTRIBUTION OF FARMS ACCORDING TO CASH INCOME PER FARM  
(69 Commercial Pineapple Producers, E.C. 1959)

<u>Income Group</u> £	<u>Average per group</u> £	<u>No. of farms</u>	<u>Percentage of total</u>
999 or less	610	12	17.4
1,000 - 2,999	1,845	31	45.0
3,000 - 4,999	4,120	8	11.6
5,000 - 6,999	6,022	9	13.0
7,000 or more	11,526	9	13.0
<u>Total</u>	<u>3,702</u>	<u>69</u>	<u>100.0</u>

On the average, the sample farmers derived 66 per cent of their total cash income from pineapples - Table 47. Altogether, more than three-quarters of the total cash income was derived from the sale of crops. Livestock and the sale of livestock products contributed 19 per cent, while the remaining 4 per cent came from the sale of farm machinery and miscellaneous farm products.

Non-cash sources of income were of minor importance for the sample as a whole. Farm privileges, which include the use of all farm products in the household valued at an estimated farm price\*, totalled £67.<sup>1</sup> After allowances had been made for sales, purchases, depreciation, etc., there was a net increase in farm inventory for the year amounting to £56. This brings the average gross farm income for the group to £3,825.

Total cash income for Group A was approximately £280 higher than for the farms classified under Group B, but still almost £1,400 less than the cash income for the farms in Group C. For the latter group, 95 per cent of the income was derived from the sales of pineapples, compared with 69 per cent for Group B and 36 per cent for Group A. The cash income from the sale of pineapples by Group C farms was more than twice that received by Group B farms and more than three times the amount received by Group A, and accounts primarily for the differences

between . . . . . /

\* Calculated from values obtained from the Division of Economics and Markets, Department of Agricultural Economics and Markets, Pretoria.

1. One year's use of the dwelling, which came to £119, was not included.

Town and Pretoria the average price per pound was 0.1 of a penny higher, which does not change the price per ton substantially. The Durban price was 1.1 penny per pound, or £10 per ton lower than Pretoria or Cape Town. Peak price periods are obviously characterised by a greater scarcity of pineapples for fresh consumption, and vice versa during troughs. This feature of agricultural production and prices was well summarised by the Commission on Co-operation and Agricultural Credit. "It is generally accepted that except on a highly organised or speculative market, where severe fluctuations between seasons are smoothed out, prices of agricultural products are, due to large supplies, generally depressed during the first few months of the crop year, thereafter rising as stocks become depleted until, depending on the incoming crop prices reach their peak during the latter half of the season."<sup>13</sup>

The limited extent of the local market, the perishability of the pineapples, and the fact that Queen pineapples in South Africa ripen during a relatively short period of time, all contribute to complicate anti-cyclical planning in the market for fresh pineapples. The ripening of pineapples can, however, be chemically forced, but to date little has been done by farmers in this respect; this affords a field which remains to be fruitfully exploited.

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13. Report of the Commission of Inquiry in Co-operation and Agricultural Credit, page 11. U.G.16, 1934. Cape Times Limited, Cape Town 1934.

Chapter VII

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(69 Commercial Pineapple Producers, E.C. 1959)

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999 or less	610	12	17.4
1,000 - 2,999	1,845	31	45.0
3,000 - 4,999	4,120	8	11.6
5,000 - 6,999	6,022	9	13.0
7,000 or more	11,526	9	13.0
<u>Total</u>	<u>3,702</u>	<u>69</u>	<u>100.0</u>

On the average, the sample farmers derived 66 per cent of their total cash income from pineapples - Table 47. Altogether, more than three-quarters of the total cash income was derived from the sale of crops. Livestock and the sale of livestock products contributed 19 per cent, while the remaining 4 per cent came from the sale of farm machinery and miscellaneous farm products.

Non-cash sources of income were of minor importance for the sample as a whole. Farm privileges, which include the use of all farm products in the household valued at an estimated farm price\*, totalled £67.1. After allowances had been made for sales, purchases, depreciation, etc., there was a net increase in farm inventory for the year amounting to £56. This brings the average gross farm income for the group to £3,825.

Total cash income for Group A was approximately £280 higher than for the farms classified under Group B, but still almost £1,400 less than the cash income for the farms in Group C. For the latter group, 95 per cent of the income was derived from the sales of pineapples, compared with 69 per cent for Group B and 36 per cent for Group A. The cash income from the sale of pineapples by Group C farms was more than twice that received by Group B farms and more than three times the amount received by Group A, and accounts primarily for the differences

between ...../

\* Calculated from values obtained from the Division of Economics and Markets, Department of Agricultural Economics and Markets, Pretoria.

1. One year's use of the dwelling, which came to £119, was not included.

Table 47

AVERAGE GROSS INCOME PER FARM  
(69 Commercial Pineapple Producers, E.C. 1959)

Item	Group A		Group B		Group C		All Farms	
	£	%	£	%	£	%	£	%
No. of Farms	24		30		15		69	
<u>Cash Receipts</u>								
<u>Crops:</u>								
Pineapples	1,271	36.0	2,244	69.0	4,634	94.8	2,425	65.5
Chicory	221	6.3	101	3.1	-	-	121	3.3
Orchards	239	6.8	33	1.0	2	-	98	2.6
Vegetables	307	8.7	67	2.1	35	0.7	144	3.9
Other	85	2.4	32	1.0	-	-	43	1.2
Total Crops	2,123	60.2	2,477	76.2	4,671	95.5	2,831	76.5
<u>Livestock:</u>								
Livestock sold	527	14.9	337	10.4	6	0.1	331	8.9
Livestock products sold	646	18.3	301	9.2	105	2.2	378	10.2
Total Livestock	1,173	33.2	638	19.6	111	2.3	709	19.1
<u>Miscellaneous:</u>								
Machinery sold	180	5.1	90	2.8	92	1.9	122	3.3
Other cash sales	52	1.5	44	1.4	15	0.3	40	1.1
Total Miscellaneous	232	6.6	134	4.2	107	2.2	162	4.4
TOTAL CASH RECEIPTS	3,528	100.0	3,249	100.0	4,889	100.0	3,702	100.0
<u>Non-cash Income:</u>								
Farm privileges	68		73		53		67	
Net Inventory Increase	170		62		-		56	
Total non-cash income	238		135		53		123	
GROSS FARM INCOME	3,766		3,384		4,942		3,825	

Plate 10

Hoeing by hand - - -



between the total cash income for the three groups. The sale of other crops was of diminishing importance from Group A through Group B to Group C. These other crops, mainly chicory, citrus and vegetables, contributed 24 per cent of the total cash income for Group A, 7 per cent for Group B and 0.7 per cent in the case of Group C.

As may well be expected, the sale of livestock and livestock products was of greater importance to the farmers classified under Group A. One-third of the total cash income of this group was derived from the livestock enterprise as compared to 20 per cent for Group B and 2 per cent for Group C.

Miscellaneous sales, which included farm machinery, planting material, etc., never reached major proportions on any one farm. The highest group average was 6.6 per cent for Group A farms.

Farm privileges averaged at £67 for all the sample farms, but was generally higher for Groups A and B than for Group C. The difference of roughly £20 between the latter and the former two groups can be ascribed partially to the virtual monoculture practised by those farmers classified under Group C.

There was a net increase in inventory of £56 for all the farms. On the group level, however, only Group A and Group B farms showed a net positive change in inventory.

Non-farm income

Only 63 farmers were prepared to divulge information as to their sources of income other than from farming - Table 48. Of the remaining six who were not prepared to co-operate in this particular respect, there is reason to believe that they had substantial sources of income other than their normal farming income.

Table 48

NON-FARM INCOME  
(63 Commercial Pineapple Producers, E.C. 1959)

<u>Non-farm income</u> <u>group</u> £	<u>No. of</u> <u>farms</u>	<u>Percentage of</u> <u>total</u>
None	32	50.8
499 or less	17	27.0
500 - 999	8	12.7
1,000 or more	6	9.5
<u>Total</u>	<u>63</u>	<u>100.0</u>

Thirty-two farmers, or 51 per cent of the group said that they had no sources of income other than farming. Of those remaining, 17 had non-farm income of less than £500 and eight between £500 and £1,000. A small group of six farmers had other sources of income totalling to more than £1,000. It is likely that the six farmers for whom no information was available can be classified in the latter category.

Farm expenses

Total cash expenses for the three groups of farms  
varied ...../

varied in much the same order as their total cash incomes did - Table 49. Group C farms with the highest cash income had the second highest cash expenses. Group A had the second highest cash income and the highest total cash expenses, while the farms in Group B had the lowest cash income and also the smallest total cash expenses. For gross receipts and gross expenses the variation occurred in exactly the same order; Group C with the highest gross receipts also had the highest gross expenditure, and Group B with the lowest gross receipts also had the lowest gross expenses.

Mechanical power and labour were, by far, the two most important items of expense for all the farms. For Group A, both are roughly the same and equal approximately 32 per cent of total cash expenses. For the farms in Group B, these proportions change. Labour at 34.0 per cent of total expenses, is 7 per cent more than mechanical power, which is still the second most important item of expense. In Group C, the gap continues to increase, although mechanical power retains its relative position; labour cost is now 56.2 per cent of total cash expenses and roughly twice the amount spent on mechanical power. It follows, therefore, that the larger the percentage of income derived from pineapples, the higher is likely to be the percentage that labour cost constitutes of the total cash expenses. For all the farms, cash expenses on mechanical power constituted 29 per cent of the total and labour 38 per cent.

Labour and mechanical power constituted no less than 84 per cent of the total cash expenditure for Group C farms. The urgent need for making the most efficient use of labour and mechanical power on all the farms cannot be overemphasised, but particularly so on those farms deriving virtually all their income from the pineapple enterprise.

All the remaining individual items of expense, whether listed separately or as a group together, were of secondary importance compared with the two mentioned above; the one exception being money spent by Group A farmers for the buying of livestock.

The expenditure on fertiliser, in particular, was low. Most farmers indicated that they had curbed fertilization on pineapples considerably since prices had started to slump, while some had stopped altogether. Although it is correct, economically speaking, to adjust fertilization according to variations in the price of the particular fertilisers used, or the price of the product produced, a decision to stop altogether should only be taken after the most careful consideration. Fertiliser experiments at present in progress at the Pineapple Research Station will supply much needed information on the extent to which yield can be improved with the aid of proper fertilization. According to van Lelyveld,<sup>2</sup> however, much still remains to be done before a proper system of fertilization can be carried out in the Eastern Cape.

Non-cash expenses, like non-cash income, were relatively minor. In a few instances use was made of unpaid family labour, which had to be valued on the basis of what it would cost to hire labourers to do the same work and then added to expenses. A net decrease in inventory was recorded only for Group C farms.

The . . . . /

Table 49

AVERAGE GROSS EXPENSES PER FARM  
(69 Commercial Pineapple Producers, E.C. 1959)

Item	Group A		Group B		Group C		All Farms	
	£	%	£	%	£	%	£	%
No. of farms		24		30		15		69
<u>Cash Expenses:</u>								
Mechanical Power	900	32.5	722	27.0	756	27.4	791	29.0
Fixed Improvements	24	0.9	39	1.5	32	1.1	32	1.1
Implements	29	1.0	33	1.2	13	0.5	27	1.0
Livestock bought	295	10.6	154	5.8	28	1.0	176	6.5
Labour	886	32.0	913	34.0	1550	56.2	1042	38.2
Feed bought	105	3.8	130	4.9	10	0.4	95	3.5
Fertilizer bought	70	2.5	55	2.1	52	1.9	60	2.2
Veterinary & dips	54	1.9	51	1.9	31	1.1	48	1.8
Telephone & stationery	21	0.8	22	0.8	16	0.6	20	0.7
Other	388	14.0	556	20.8	272	9.8	436	16.0
<b>Total cash expenses</b>	<b>2772</b>	<b>100.0</b>	<b>2675</b>	<b>100.0</b>	<b>2760</b>	<b>100.0</b>	<b>2727</b>	<b>100.0</b>
Unpaid family labour	7		13		0		8	
Nett Inventory decrease	-		-		140		-	
<b>Gross Farm Expenses</b>	<b>2779</b>		<b>2688</b>		<b>2900</b>		<b>2735</b>	

The average gross expenditure for the sample farms as a group, was just above £2,700 with a range between the separate group averages of less than £300.

Labour remuneration per non-white man-equivalent

Cash wages constituted only 53 per cent of the total annual receipts per non-white man-equivalent - Table 50. The remaining 47 per cent was derived from contributions in kind by the farmer. An average cash wage of £2 per month, or £24 per annum, was paid per man-equivalent. The value of food purchased by the farmer came to £12 and clothing, tobacco, etc., to £2. Other receipts, mainly in the form of medicine and medical fees, equalled £1 per man-equivalent per year. Farm produce consumed and grazing rights for cattle, valued at 1s.6d. per animal unit per month, contributed a further £6 and brought the total to £45 per non-white man-equivalent per year. In addition the worker received a hut, water, wood and a piece of land for growing vegetables free of charge. Housing, fuel and water involves the farmer in little direct cost, yet its value to the worker is considerable. In most urban areas these amenities cannot be acquired for less than 30s. per family per month.<sup>3</sup> It is uncertain to what extent vegetables grown by the labourers and the sale, or slaughter, of their own cattle contribute to the general standard of living of the non-white farm worker in the Eastern Cape. Roberts gained the impression that the economic potential of these gardens and grazing rights are not developed to the full.<sup>4</sup>

Table 50

ANNUAL RECEIPTS OF LABOUR IN CASH AND KIND (PER NON-WHITE MAN-EQUIVALENT)

(69 Commercial Pineapple Producers, E.C. 1959)

Item	Amount £	Percentage of total
Cash wages	24	53.3
Purchased food	12	26.7
Clothing, tobacco etc.	2	4.4
Farm rations	3	6.7
Grazing rights	3	6.7
Other	1	2.2
<b>Total*</b>	<b>45</b>	<b>100.0</b>

\* Not including the use of a hut, water and wood, sale or slaughter of own stock, or produce grown in own garden.

If it is assumed that each permanently employed adult non-white male, who is the basis for the calculation of non-white man-equivalent, stands at the head of a family and that all permanently employed females, youths and 50 per cent of the seasonal labourers form part of these families, receipts per family on the basis of information in Table 50, will equal £68.9 per family per year - Table 51. If an additional allowance is then made for water, wood and housing at 30s. per month, a further £18 has to be added, bringing the total to

£86.9 ...../

3. Roberts, Op. cit. p.57.

4. Ibid, p.59.

£86.9 per year, or £7. 4. 0 per month. Roberts found that the average size of the family on pineapple farms was 6½ individuals and the payment in cash and kind per family was £7. 7. 8.5

Table 51

ANNUAL RECEIPTS IN CASH AND KIND PER NON-WHITE FAMILY  
(69 Commercial Pineapple Producers, E.C. 1959)

Labour Group	Man-equivalent Earnings	
	per family	per group
		£
Permanent males	1.00	45.0
Permanent females	0.06	2.7
Seasonal	0.37	16.7
Youths	0.10	4.5
<u>Total family receipts</u>	<u>1.53</u>	<u>68.9</u>

In addition to the estimated family receipts of £86.9 per annum, allowance must be made for produce grown in home gardens, the benefit derived from the sale or slaughter of stock owned by the labourers, and earnings by members of the family employed as domestic servants.

If the earnings per man-equivalent can again be used as a basis for measuring, it would appear that family earnings vary considerably from district to district. The average receipts in cash and kind per non-white man-equivalent is more than twice as high for the sample farms in Alexandria and East London than it is in Komgha. Excluding those districts where only a relatively small number of farms were included in the sample, receipts per man-equivalent still range from an average of £39.1 in Bathurst to £54.2 in East London. If allowance is then made for earnings by other members of the family on the basis of information in Table 51, as well as for water, wood and housing at £18 per annum, family earnings on a district level is calculated roughly in Table 52 by increasing the receipts per man-equivalent in each district by 93 per cent; 93 per cent being the difference between annual receipts in cash and kind per non-white man-equivalent (£45) and the estimated receipts per family before allowance has been made for the value of produce grown in home gardens, the sale or slaughter of own stock and earnings by members of the family employed as domestic servants (£86.9).

Table 52 ...../

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5. Roberts, Op. cit. pp. 28 and 47.

Plate 13

Loading fresh pineapples

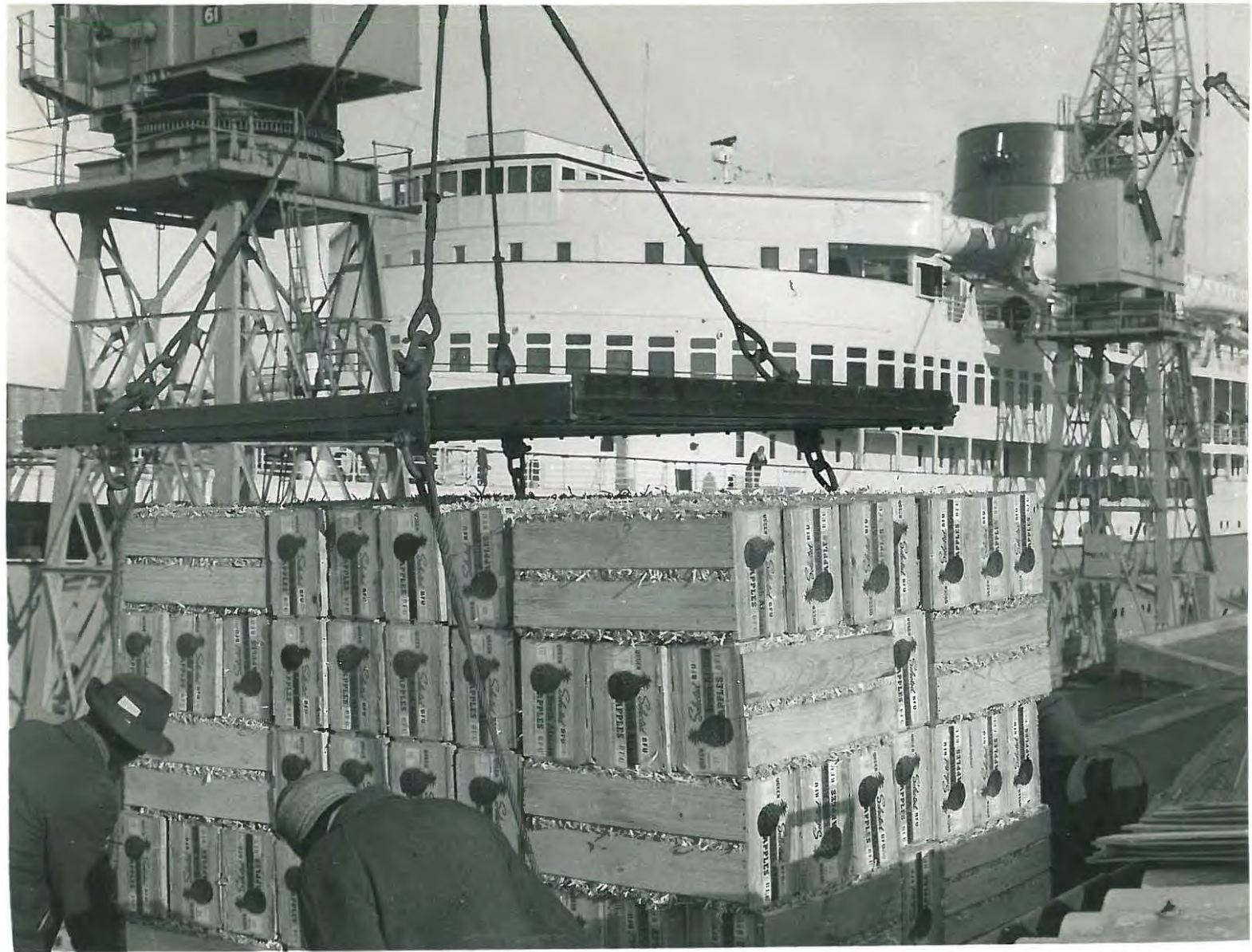


Table 52

ANNUAL RECEIPTS IN CASH AND KIND PER NON-WHITE MAN-EQUIVALENT  
AND PER NON-WHITE FAMILY BY DISTRICT  
(69 Commercial Pineapple Producers, E.C. 1959)

District	No. of farms	Receipts per man-equivalent* £	Receipts per family** £
Albany	16	44.8	86.5
Alexandria	2	54.5	105.2
Bathurst	21	39.1	75.5
East London	25	54.2	104.6
Komgha	2	26.0	50.2
Peddie	3	39.0	75.3
Total	69	45.0	86.9

\* In addition, allowance must be made for produce grown in home gardens and the benefit derived from the sale or slaughter of own stock.

\*\* In addition, allowance must be made for produce grown in home gardens, the benefit derived from the sale or slaughter of own stock and earnings by members of the family employed as domestic servants.

Financial summary

The sample farmers had an average FARM INCOME of £1,023 - Table 53. The farm income for Group C was considerably higher than the average, and that for Group A and Group B somewhat lower. If interest on the average capital investment is calculated at 5 per cent and subtracted from the farm income, the sample farmers received an average return of £209 each for their enterprise, including their own labour, i.e. a LABOUR INCOME of £209 per farm.

Farm privileges, if added to labour income, give the labour earnings per farm, but is not of enough significance to alter the position of the farms substantially.

The return on average capital investment is derived by subtracting an allowance for the operators time, valued for the year, from farm income. If the operators time and labour for the year is arbitrarily valued at £2 per working day and the total subtracted from farm income, it leaves a return of £490 for all the farms, yielding 3.0 per cent on the average capital investment. At 8.6 per cent, the yield for Group C farms, or those farms deriving more than 90 per cent of cash income from pineapples, is the highest and that for Group B farms at 0.5 per cent, the lowest.

When analysing the factors which influenced the degree of financial success achieved by the sample farms, LABOUR INCOME will be used as the measure of success. This measure is preferred to labour earnings and percentage return on capital because of the additional uncertainties introduced in the valuation of farm privileges and the operator's time.

A range of nearly £10,000 existed between the highest and the lowest labour income for the sample farmers. A frequency distribution of the labour incomes for the sample

farmers ...../

Table 53

AVERAGE RECEIPTS, EXPENSES AND LABOUR INCOME ON THE SAMPLE FARMS  
(69 Commercial Pineapple Producers, E.C. 1959)

Item	Group A	Group B	Group C	All Farms
No. of farms	24	30	15	69
<u>Receipts:</u>				
1 Crops	2123	2477	4671	2831
2 Livestock sold	527	337	6	331
3 Livestock Product sold	646	301	105	378
4 Miscellaneous	232	134	107	162
5 Total Cash Receipts	3528	3249	4889	3702
6 Nett Inventory Increase	170	62	-	56
7 Total Receipts	3698	3311	4889	3758
<u>Expenses:</u>				
8 Cash	2772	2675	2760	2727
9 Unpaid family labour	7	13	-	8
10 Nett Inventory decrease	-	-	140	-
11 Total Expenses	2779	2688	2900	2735
12 Farm Income (7-11)	919	623	1989	1023
13 Interest on Capital at 5%	835	759	893	814
14 Labour Income (12-13)	84	-136	1096	209
15 Farm Privileges <sup>x</sup>	68	73	53	67
16 Labour Earnings (14+15)	152	-63	1149	276
17 Operators time valued at £2 per day	558	553	458	533
18 Return on Capital (12-17)	361	70	1531	490
19 Percentage return	2.2	0.5	8.6	3.0

x Not including the years use of the operator's dwelling house

farmers, contained in Table 54, shows that nine operators, or 13 per cent of the total had a negative labour income greater than £1,000. The average for this group was -£1,731 and the range extended from -£3,195 upward. The largest single concentration of farms occurred in the second category with a labour income range of between 0 and -£999. The 30 farms in this group constituted 44 per cent of the total and had an average labour income of -£491. The third category contains 16 farms with an average labour income of £437. The remaining 14 farms all had a labour income of £1,000 or more; the average return to the operator for his labour being £2,692. The range for this group extended from £6,648 downwards.

Table 54

FREQUENCY DISTRIBUTION OF THE SAMPLE FARMS ACCORDING TO THE  
LABOUR INCOME PER FARM  
 (69 Commercial Pineapple Producers, E.C. 1959)

<u>Labour income</u> £	<u>Average</u> <u>per farm</u> £	<u>No. of</u> <u>farms</u>	<u>Percentage</u> <u>of total</u>
-1,000 or less	-1,731	9	13.0
- 999 to 0	- 491	30	43.5
0 to 999	437	16	23.2
1,000 or more	2,692	14	20.3
<u>Total</u>	<u>209</u>	<u>69</u>	<u>100.0</u>

Chapter VIII

FACTORS POSSIBLY DETERMINING THE DEGREE OF FINANCIAL  
SUCCESS ON THE SAMPLE FARMS

In previous chapters it was pointed out that considerable variation existed between the size, income, productivity, etc., of the sample farms. A detailed analysis of the financial structure of these farms also showed a considerable range in the degree of profitability with which each individual farm was operated, as measured by labour income. Proceeding from the assumption of economic rationality applied to all the sample farmers in the chapter on methodology, it now becomes necessary to determine the extent of the influence of certain of these factors on profit maximisation on the sample farms. Eight factors usually are recognised by agricultural economists as being of basic importance for the achievement of this goal:

- (a) Prices
- (b) Size of business
- (c) Crop yields per acre and production per animal
- (d) Selection and combination of enterprises
- (e) Labour efficiency
- (f) Farm layout and building arrangement
- (g) Efficiency in the use of equipment
- (h) Markets and marketing.

For analytical purposes, these factors can be subdivided into primary (causal) and secondary (resultant) factors.<sup>1</sup> Primary factors, such as the price of the farm products and the size of the farms and the yield, work directly to determine labour income per farm. Secondary factors, on the other hand, are only indirectly related to financial success. These latter factors are usually expressed in the form of a ratio, e.g. labour cost as a percentage of cash expense, or the rate of capital turnover. As such they do not affect labour income directly, but rather give a reflection of what has been achieved by the farmer through the use of the primary factors at his disposal. Although obviously not as important in conducting the affairs of the farm as the primary factors, these secondary factors are extremely useful in indicating any maladjustment which may exist in the farm business structure.

No information is available in this study on farm layout, building arrangements and the degree of efficiency achieved in the use of machinery. However, where these factors were not used to the fullest advantage, they will be brought into the analysis in that they are likely to influence disadvantageously the secondary ratios used in the analysis. The influence of the various marketing channels on the financial success of the unit and marketing margins, (depending on the location of the farm),<sup>2</sup> is well realised, but cannot be included in the analysis for lack of sufficient data. Such an analysis would be complicated by the limited number of sample farms deriving a large percentage of total income from pineapples, limitations of the quantities which

can ...../

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1. Tomlinson - The Economics of Peanut and Maize Production on the Springbok Flats, Op. cit., p.60.

2. Waite, W.C. & Trelogan, H.C. - Agricultural Market Prices, p.183. John Wiley & Sons, Inc. New York, 1951.

can be sold as fresh fruit and the fact that the farms in Group C sell virtually all their pineapples through one channel.<sup>3</sup> Some consideration will be given to non-economic factors, although the effects they are likely to have on the maximisation of profits will be reflected partially, at least, through managerial influence on the first five factors listed on the previous page which are discussed below.

Prices

The influence that the level of pineapple prices has on the financial success of any sample farm is, of course, of diminishing importance as the percentage of annual farming income which is derived from pineapples, decreases. No doubt it might influence small-scale growers to increase or decrease their plantings in the short-run, but the influence of price on these units will not be decisive between a positive and a negative labour income. Rather, it will affect the need to re-allocate resources at present employed in pineapple production to other enterprises where the marginal return will be greater, or vice versa where it is smaller. If the pineapple as a source of income in the farming structure is more important than all other enterprises then the resource allocation problem remains the same, but the immediate effect on the financial success of the unit will be greater.

Information contained in Table 55, however, indicates that a relatively higher price is no guarantee of greater financial success. There is no correlation between the pineapple price index and labour income for either Group C or all the farms taken together. It is quite understandable from discussion in the first paragraph that correlation for all the farms will be unlikely, but not so for the 15 farms in Group C. These farms derive more than 90 per cent of their annual cash income from pineapples, so that ordinarily one would expect the influence of price to be considerable, but it does not appear to be at all dominant. In the case of all the farms, labour income is equal to £110 in the first or lowest price index category, then increases to £411 in the second category and again decreases for the third and highest category to £105. For Group C the pattern is just the other way round; labour income is lower in the second category than in the first, and again higher in the third than in the second.

Table 55

PINEAPPLE PRICE INDEX AND LABOUR INCOME PER FARM FOR GROUP C AND ALL THE FARMS (100 - £9.4 PER TON)  
(69 Commercial Pineapple Producers, E.C. 1959)

Price Index	Group C		All farms	
	No. of farms	Labour income £	No. of farms	Labour income £
89 or less	5	1,223	22	110
90 - 109	8	533	23	411
110 or more	2	3,031	24	105
Total	15	1,096	69	209

The ...../

3. 95 per cent of all the fruit sold by these farms went to the canners.

The reason for a lack of association between price and labour income for Group C farms can be explained by giving an extreme yet actual example. The largest pineapple farm encountered in the survey had the largest labour income of all the farms, yet had only a pineapple price index of less than 89. This farmer had 5.6 million pineapple plants. He sold 2,650 tons during the year of the survey and realised a return of 14.8 per cent on average capital investment. The exact prices he received for Cayennes were £6. 3. 0 and for Queens £5. 8. 0. If we remove this farm from our analysis in Table 55, there is correlation between price and labour income, but its presence indicates most emphatically that the present crisis in the pineapple industry is not due to the price factor alone. The importance of price in the farm economy is, however, by no means discounted. Although it is true that at a given level of prices one farm may make more money than another, if all other factors remain the same, variations in the price of a particular product from year to year will lead to variations in the labour income of a particular farm. "The farmer's salvation cannot come only from technical advances in the canneries which will lead to a higher output of canned fruit from each ton of raw material and so make it possible to offer him a higher price; it must come from an increased yield of fruit from each tree, for only in this way can a farmer increase his income without demanding a higher price for his fruit and so eventually restricting the market for the product which he is offering."<sup>4</sup>

It cannot be said in this survey, as was done in a survey of tobacco farming in the Western Transvaal,<sup>5</sup> that variations in price at a point in time are a reflection of variation in the quality of the product. Not only does the price vary from Queens to Cayennes, but also from one marketing channel to the next, or, even within one marketing channel for a single variety. Although it is true that Queens sold on the fresh export market may be of better quality than those sold to the canners, this variety is of so small a quantity that it is unlikely to have much influence on a weighted price index. Cayennes sold to the canners by farmers fortunate enough to have a private contract need not be of better quality than those sold by farmers without the benefit of such a contract, yet the terms of the contract guarantee them a higher price.

### Size

There are various measures of size which can be used to illustrate the relationship between size and financial success in farming. Most frequently farm size is spoken of in terms of the acres operated, or the land input. The reliability of this measure depends to a large extent on the assumption of uniformity in the intensity of land use in the area under consideration. The farm unit is said to be intensive when a large amount of capital is used on a relatively small acreage of land and it is extensive when large acreages of land are used relative to labour and capital.<sup>6</sup> Farm size can therefore be varied by changing the inputs other than land.

The ...../

4. Food Industries of South Africa, August 1958, p.19.
5. Tomlinson, F.R. - Ekonomiese ondersoek van Oondroogtabakboerdery in Wes-Transvaalse Bosproeiingstreek. Departement van Landbou, Pamfelt No.318. Staatsdrukker, Pretoria, 1951.
6. Heady and Jensen, Op. cit, p.451.

The sample farms included some extensive livestock units, with only a small portion of the land cultivated for either pineapples or other crops, as well as other units exclusively dependent on large pineapple plantations. Despite these variations in the intensity of cultivation, information in Table 56 shows direct correlations between size as measured in acres and labour income. For all the farms in the sample labour income increases from -£519 for those smaller than 500 acres to £766 for those larger than 1,000 acres. In Group C this variation in labour income between the various size categories is even more marked. Labour income changes from -£355 for the smallest category to more than £2,200 for the largest group. This relationship, however, is undoubtedly incidental and need not be valid theoretically. It is quite likely that a farm smaller than 500 acres may be a larger pineapple proposition than one of over 1,000 acres simply because the topographical factor on the second farm makes it less favourable to pineapple cultivation.

Table 56

TOTAL ACRES OPERATED AND LABOUR INCOME PER FARM FOR GROUP C AND ALL THE FARMS  
(69 Commercial Pineapple Producers, E.C. 1959)

Acres Operated	Group C		All farms	
	No. of farms	Labour income £	No. of farms	Labour income £
499 or less	6	-355	17	-519
500 - 999	4	1,837	25	101
1,000 or more	5	2,244	27	766
Total	15	1,096	69	209

A more significant relationship is obtained by using acres to measure the size of the pineapple operation only - Table 57. However, this still does not eliminate variations in the intensity of land use on the various pineapple farms. It was shown earlier, for instance, that some farmers have more pineapple plants per acre than others or might apply more capital in the form of mechanical power and fertilizer per acre. Using the area under pineapples has the advantage over the previous measure of size by limiting intensity to the pineapple operation only, rather than the farm as a whole

Table 57

ACRES UNDER PINEAPPLES AND LABOUR INCOME PER FARM FOR GROUP C FARMS  
(15 Commercial Pineapple Producers, E.C. 1959)

Pineries Acres	No. of farms	Labour income £
49 or less	6	-355
50 - 99	3	184
100 or more	6	3,003
Total	15	1,096

It will be noticed that, compared with Table 56, the number of farms in each of the three categories in Table 57 has changed. The number of farms in the first category

remains .....

remains at six, but the number in the last category increases from five to six. If it is valid to suggest that there is a close correlation between total acreage and the size of the pineapple plantations on the farms in Group C, then the six farms in the first category of Table 56 will be the same as those in the first category in Table 57 and the difference between the last two categories will be that one farm in the second category of Table 56 entered the third category of Table 57. Closer investigation supports this supposition for the first category of each of the two tables, but not for the second and third categories.

More accurate methods of measuring the size of the pineapple operation alone are available, e.g., the total number of plants per farm or the tonnage sold annually. Other things being equal, one would expect direct correlation between the number of plants per farm and the tonnage sold. Information on yield and the number of plants per acre, which was discussed in Chapter VI, indicate that such an assumption for the sample farms will not be valid. Consequently, different results will be obtained if size (as measured by the number of plants per acre) and tonnage sold are correlated separately with labour income.

The data in Table 58 indicate a direct correlation between the number of plants per farm and labour income for Group C as well as all the farms in the sample. The steadily improving financial position of all the farms in the sample as the number of pineapple plants increase, need not be due only to the influence of the pineapple enterprise. Of the 17 farms in the third category of Table 58, as many fall in Group A as in Group C so that the scale of an enterprise other than pineapples may also wield considerable influence. It is noteworthy, however, that labour income for the five farms in the third category of Group C is considerably higher than that for the 17 farms in the same category for all the farms. From -£369 for those farms in Group C with less than 500,000 plants, labour income increases to more than £3,500 for those farms with over one million plants, compared with an increase for all the farms from -£294 to £1,433 from the first to the third categories.

Table 58

NUMBER OF PINEAPPLE PLANTS AND LABOUR INCOME PER FARM FOR  
GROUP C AND ALL THE FARMS  
(69 Commercial Pineapple Producers, E.C. 1959)

No. of Plants (000)	Group C		All farms	
	No. of farms	Labour income £	No. of farms	Labour income £
499 or less	5	-369	23	-294
500 - 999	5	151	29	-108
1,000 or more	5	3,506	17	1,433
Total	15	1,096	69	209

Correlation between the tonnage sold and labour income per farm remains positive, although it alters somewhat from the pattern in Table 58 between the number of plants and labour income per farm. In Table 59, all the farms in the sample are now less evenly distributed. More than 85 per cent of the farms are classified inside the first two categories. The result is that labour income per farm increases considerably between the second and the third category, the latter group

including ...../.

including a small number of farms half of which are the large pineapple farms in Group C and were also included in the third category of Table 58.

Table 59

TONNAGE SOLD AND LABOUR INCOME PER FARM FOR GROUP C AND ALL THE FARMS  
(69 Commercial Pineapple Producers, E.C. 1959)

Tonnage sold	Group C		All farms	
	No. of farms	Labour income £	No. of farms	Labour income £
99 or less	4	-390	29	-456
100 - 499	6	78	30	43
500 or more	5	3,506	10	2,632
Total	15	1,096	69	209

Average capital investment is another possible measure of the size of the entire farming operation. Although it is more accurate than acreage, it still does not eliminate all the problems of measurement. A ten-acre unit of vegetables can both use more labour and have a larger volume of production than a farm of 1,000 acres and an equal number of sheep, even though its capital investment may be smaller. It is thus not surprising that labour income and size, measured by means of the average capital investment per farm, do not show a positive correlation, or at least not in the first two categories of Table 60. Twenty-seven of all the farms with an average capital investment of less than £10,000 had a labour income of -£139. On the other hand, 18 of the farms with an average capital investment of between £10,000 and £20,000 had a labour income of -£381. From then on labour income increases considerably for each category showing an increase in the average capital investment per farm. Group C farms show a similar deviation from the pattern of direct correlation, as do all the farms. Labour income is lower in the second capital investment category than in the first, but thereafter steadily increases for the last two categories as the average capital investment per farm increases. The lack of correlation between capital investment and labour income can again be partially explained - this time because of the great difficulty in the valuation of land which was mentioned in Chapter V. With land constituting 66 per cent of the average total investment per farm, any inflated or deflated value placed on this factor will deviate from its accuracy in the measuring of size as well as the financial success of the unit.

Table 60

CAPITAL INVESTMENT AND LABOUR INCOME FOR GROUP C AND ALL THE FARMS  
(69 Commercial Pineapple Producers, E.C. 1959)

Capital investment per farm £	Group C		All farms	
	No. of farms	Labour income £	No. of farms	Labour income £
9,999 or less	6	-189	27	-139
10,000 - 19,999	3	-285	18	-381
20,000 - 29,999	4	1,941	16	754
30,000 or more	2	5,334	8	1,617
Total	15	1,096	69	209

A mere increase in the average capital investment per farm is still no guarantee of an increase in the labour income of the particular farm. In discussing the relationship he found between size as measured by the average capital investment per farm and the operator's earnings in the production of peanuts and maize on the Springbok Flats, Tomlinson suggested that the relationship "... does not mean that the operator's earnings on any particular farm will increase by merely investing more capital on such a farm. On an average the farms with a large capital value are larger in area, have larger crop areas, have more livestock and machinery than the farms with a small capital. Increasing these factors in a balanced proportion will naturally increase the total farm capital and the operator's earnings".<sup>7</sup> Although this statement is true, it is based on a definite assumption which cannot be taken for granted. It is an essential prerequisite to expansion that management must be efficient and capable of handling an increase in the productive capacity of the farm unit.

According to the well known law of diminishing returns, the mere addition of capital, or for that matter any other factor of production, must inevitably eventually lead to a decrease in the marginal return for that factor. Indirectly, the truth of this statement is substantiated by the information in Table 61. Where the capital investment per acre is very low, labour income is negative; where it is very high, labour income is still positive but at a much lower level than it was for the intermediate categories. For those farms with an average investment of less than £9 per acre, the labour income is negative. As the investment per acre increases from between £10 and £19 to between £20 and £29, labour income is increasingly positive. As soon as it goes above £30 per acre, labour income decreases again. This, although correct in principle, is not necessarily generally applicable, for it would imply that in those areas of the Eastern Cape where farming is extensive and the investment per acre consequently low, the chances a farmer has of earning a reward for his labour are only remote. A more accurate approach would, therefore, be to confine the analysis in this respect to those farms following virtually the same pattern of farming, such as the Group C farms.

Table 61

INVESTMENT PER OPERATED ACRE AND LABOUR INCOME PER FARM FOR  
GROUP C AND ALL THE FARMS  
(69 Commercial Pineapple Producers, E.C. 1959)

Investment per operated acre £	Group C		All farms	
	No. of farms	Labour income £	No. of farms	Labour income £
9 or less	1	-497	9	-78
10 - 19	4	523	30	334
20 - 29	4	2,348	13	386
30 or more	6	909	17	4
Total	15	1,096	69	209

Only one farm in Group C had an investment of less than £9 per acre, the labour income for this farm being -£497.

It ...../

7. Tomlinson, F.R. - The Economics of Peanut and Maize Production on the Springbok Flats, Op. cit., p.70.

It then increased in the next category to an average of £523 per farm for four farms and to £2,348 for the four farms in the next category. The remaining six farms had an average capital investment of more than £30 per acre and similar to all the farms in the sample, labour income per farm now decreases considerably to £909.<sup>8</sup> The trend in labour income between the four categories therefore remains the same for the specialised group as it was for the non-specialised group, although it becomes more distinct. The conclusion which can be drawn from this is that, relatively speaking, under-investment per acre is as undesirable as over-investment. Total cost per unit of output must eventually increase where variable resources are added to fixed resources to increase indefinitely the size of the operation and the volume of output. Theoretically speaking, the criterion to be used in deciding on the profitability of a particular investment must be marginal revenue and marginal cost; to what extent will the cost of a particular investment be exceeded by the revenue forthcoming from it and, although a particular venture may be profitable, is it the most profitable way in which money can be used on that particular farm?

Input of labour per farm presents much the same problems as the acreage operated in measuring the size of the farm business. All labour is not of the same productive quality. Although differences at the farm level were partially removed by adjustment according to variations in cash wages for the calculation of man-equivalent, variations between farms still remain. Further, man-equivalent as a measure of size may give a distorted picture in that it is not known to what extent mechanical power may have been substituted for labour without changing production materially. The validity of these basic difficulties is founded on the assumption of the heterogeneity of farming labour and practices in the region of study. The general lack of special pineapple planting and harvesting equipment in use in the Eastern Cape and the overall homogeneity of farming labour in the pineapple belt of the Eastern Cape would tend to diminish but not eliminate, the inaccuracy of man-equivalent as a measure of size. These problems are more valid on an inter-regional than on an intra-regional basis. The productivity of labour, the basic way of paying for it and the extent to which mechanical power has been substituted for labour is likely to differ less between pineapple farms in the Eastern Cape than, for instance, between pineapple farms in the Eastern Cape and Hawaii or Malaya, or, for that matter, even the Eastern Transvaal or Natal.

Man-equivalent is, of course, not a measure of scale for the pineapple enterprise only. Consequently, any correlation valid for all the farms should also be valid for a more

specialised ...../

8. This category again includes the largest farm in the sample which was mentioned under prices. If it is taken out of the analysis, labour income for the five remaining farms decreases to -£120. This one farm, which was purchased during the peak price period in 1952, would therefore have been even more successful if it was bought when prices were lower so that the required interest payment on capital would have been considerably less. Investment per acre would also have been lower, so that it was likely to fall in either the second or the third category of Table 61.

specialised group of farms if there is correlation between size and labour income. In Table 62, we thus find that the labour income position steadily improves for both Group C and all the farms as man-equivalent per farm increases from less than ten to more than 30. The remarkable feature in this table is that the labour income for the farms in the first two categories is negative, although decreasingly negative as the man-equivalent per farm increases. For those farms in the category of more than 30 man-equivalent, labour income is not only positive, but considerably larger than in the previous three categories, especially for Group C.

Table 62

MAN-EQUIVALENT AND LABOUR INCOME PER FARM FOR GROUP C AND ALL THE FARMS  
(69 Commercial Pineapple Producers, E.C. 1959)

Man-equivalent per farm	Group C		All farms	
	No. of farms	Labour income £	No. of farms	Labour income £
9 or less	2	-479	8	-368
10 - 19	5	-157	25	-303
20 - 29	3	113	19	70
30 or more	5	3,569	17	1,386
Total	15	1,096	69	209

The most reliable single measure of the scale, barring extremes of weather on any individual farm, is the value of the total volume of output. Farm receipts, however, are not a primary causal factor in the financial success of the business, but merely serve to illustrate the relationship between volume of business and the financial success achieved on any individual farm. "The volume of output is closely associated to the quantity of resources used, whether the proportions were high in the direction of capital, land, or labour."<sup>9</sup> A possible weakness of this measure, for the pineapple industry in particular, is where large plantings were recently made but which had not yet come into production at the time of the survey. Although virtually all the plantations on the sample farms had been well established and were contracting rather than expanding, at least one farm was encountered where the opposite was true.

Labour income for all the farms increases from -£647 for those with gross receipts of less than £1,000 to -£433 for those farms having gross receipts of between £1,000 and £3,000 - Table 63. The next increase is more substantial. For the seven farms in the category between £3,000 and £5,000, labour income is now positive and equal to £339. The most considerable increase takes place from the third to the fourth category. Those farms with average gross farm receipts of more than £5,000 show a positive labour income of more than £1,600. For Group C farms alone, there is no deviation from the normal correlation although labour income increases only slightly (£4) as gross farm receipts increase from less than £1,000 to between £1,000 and £3,000. The increase in labour income between the second and the third size category is equal to £1,500, and that between the third and the fourth, just

under ...../

9. Heady and Jensen, Op. cit., p.452.

under £2,000.

Table 63

AVERAGE GROSS RECEIPTS AND LABOUR INCOME PER FARM FOR GROUP C  
AND ALL THE FARMS  
(69 Commercial Pineapple Producers, E.C. 1959)

Gross receipts £	Group C		All farms	
	No. of farms	Labour income £	No. of farms	Labour income £
999 or less	4	-390	10	-647
1,000 - 2,999	4	-386	32	-433
3,000 - 4,999	1	1,114	7	339
5,000 or more	6	3,072	20	1,616
Total	15	1,096	69	209

Although all measures of size employed in this study fail on some aspect or another of accuracy, none contradict the positive relationship which seems to exist between the size of the operation and labour income. This applies equally to all the farms in the study and in particular to those in Group C which are all highly specialised pineapple operations.

The benefits to be derived from large scale farming stems mainly from internal economies which lead to a decrease in the cost per unit of output as the volume of production increases. There are also external economies which are supplementary to the internal economies, but over which the farmer has no control and which will not be discussed here. Ordinarily, there are three factors which contribute towards the lowering of costs as the size of the farm increases.<sup>10</sup> Firstly, there is the spreading of total fixed costs over a larger number of units of output as production increases with fixed costs held constant. This represents the downward movement along the cost curve of the firm in the short-run towards a minimum, assuming that the farmer will not go beyond the point of profit maximisation. Although variable costs normally increase, fixed costs remain the same and for the time being at least, the decrease in fixed costs per unit of output more than offsets the increase in variable costs - from there the U-shape of the firms average cost curve in both the long and the short-run. Secondly, if all factors of production are increased in proportion, greater specialisation of labour and supervision becomes possible, which in turn leads to more efficient output at a given level of costs. Although this is a valid economy, some agricultural economists find it far less obvious in agriculture than in some other industries. In a discussion of size as a factor in linear programming for agriculture, Giaever and Seagraves<sup>11</sup> suggest that "... It is difficult to see how either specialisation or management may be explicitly included in farm programming at the present time. Though specialisation of labour is often cited as an

explanation .....

10. (a) Heady and Jensen, Op. cit., p.454.

(b) Stigler, George J. - The Theory of Price, Chapters 6 and 7. Macmillan Company, New York, 1953.

11. Giaever, Harald and Seagraves, James - "Linear Programming and Economies of Size". Journal of Farm Economics, Volume XLII, No.1, February 1960, p.103.

explanation of economies of size in industry, examples are much less obvious in agriculture. Limited benefits from specialisation are obvious in such functions as dairying, egg gathering and washing, and harvesting some crops. Little empirical effort has been directed explicitly at measuring economies from this source. Even less attention has been given to defining and measuring economies in management and the learning process". (This statement is to be at least partially refuted at a later stage.) Thirdly, there are marketing economies which may be very important in agriculture. Advantages are often to be had in the form of price discounts or special contracts in the buying or selling of produce by a large operation.

The greatest disadvantage of the larger farm is that it faces a bigger risk than the smaller units, whether it be the risk of low prices or unfavourable weather conditions. "In an absolute sense, the range over which income varies between high profit and loss periods is greater for the farm with large capital than for the smaller unit."<sup>12</sup>

Although the problem of poverty at the farm level, both locally and overseas, is mainly due to a large number of undersized units, an increase in size through the acquisition of more land, regardless of other factors, is no guarantee of greater financial success in farming. In fact, the presence of inefficiency to any marked extent in the organisation of the unit will make it impossible to increase profits through the addition of either fixed or variable capital. An increase in the size of the operation in such an instance will only add to the problems of low profit rather than solve them. An increase in the size of the farming operation is only justifiable where a relatively high level of productivity and efficiency has already been achieved, especially where the increase in size is planned through the acquisition of more acres.<sup>13</sup> To increase the size of the pineapple enterprise in certain areas of the Eastern Cape where a comparatively high level of productivity is seldom possible because of adverse climatic conditions, will increase the hazards of this type of farming, even if management itself is relatively efficient. In other parts of the same region where the occurrence of temperature extremes (primarily) are less frequent, considerable benefit is to be derived from an increase in the tonnage sold, even if the price level is relatively low.

### Yield

The influence of productivity on the labour income of the farm, as measured in terms of the pineapple yield index, will be more applicable to those farms in the sample where a relatively high percentage of total income is derived from pineapples. According to information in Table 64, there is a direct correlation between yield index and labour income for Group C farms. For the five farms with an average yield index of below 100, labour income is negative to the extent of £424. As the yield index increases to between 100 and 119, labour income increases by approximately

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£600 ...../

12. Heady & Jensen, Op. cit., p.476.

13. Tomlinson, F.R. - Boerdery in Suid-Afrika, Feb. 1946.  
"Verhoging van Landbouproduksie", Staatsdrukker, Pretoria.

£600 to £200. In the next category there are seven farms with a yield index of above 120 and a labour income of £2,565. The fact that most of the farms in Group C have a yield index of above 100 is due to the inclusion of all sample farms in the calculation of the index, for it was shown in Chapter VI that yield is higher on those farms deriving a larger percentage of their annual income from pineapples.<sup>14</sup>

Table 64

PINEAPPLE YIELD INDEX AND LABOUR INCOME PER FARM FOR GROUP C  
(100 - 7.5 ton per acre)  
(15 Commercial Pineapple Producers, E.C. 1959)

Yield index	No. of farms	Labour income £
99 or less	5	424
100 - 119	3	200
120 or more	7	2,565
Total	15	1,096

Productivity for all the farms can only be measured indirectly by means of a secondary resultant factor such as the rate of capital turnover, i.e. the number of years it takes for farm receipts to equal the average capital investment per farm. In a study where records were only available for one financial year, the reliability of this measure of productivity will largely depend on the extent to which farm income for that particular year can be regarded as 'normal'. Assuming that the year of study was normal in all respects, indications are that the labour income per farm is considerably higher on those farms with a high rate of capital turnover than on those with a low rate of capital turnover - Table 65. In the case of all the farms as well as Group C farms only, the labour income position per farm steadily deteriorates as the number of years it takes for gross farm income to equal average capital investment increases from less than three years to more than seven years. The difference between labour income for the first two categories is definitely less significant than between the second and third and between the third and the fourth categories for both Group C and all the farms.

Table 65 ...../

14. The reader is reminded that the yield index was calculated from a weighted average yield for both varieties. A low yield index is thus not only the result of a low yield for one or both pineapple varieties grown, but may also be due to a relatively large proportion of the tonnage sold belonging to the Queen variety, for which the yield is considerably lower than the Cayenne variety under given conditions.

Table 65

RATE OF CAPITAL TURNOVER AND LABOUR INCOME PER FARM FOR GROUP C  
AND ALL THE FARMS  
(69 Commercial Pineapple Producers, E.C. 1959)

Rate of Capital turnover Years	Group C		All farms	
	No. of farms	Labour income £	No. of farms	Labour income £
2.9 or less	2	3,344	15	1,355
3 - 4.9	5	2,571	20	691
5 - 6.9	2	-382	16	-379
7 or more	6	-390	18	-762
Total	15	1,096	69	209

From information in Table 66, a definite relationship would seem to exist between higher productivity as measured by the rate of capital turnover and the size of the farm. By using man-equivalent as the measure of size, the rate of capital turnover increases from 11.5 years for those farms with less than nine man-equivalent, to 3.5 years for those with more than 30 man-equivalent.

Table 66

MAN-EQUIVALENT AND THE RATE OF CAPITAL TURNOVER PER FARM  
(69 Commercial Pineapple Producers, E.C. 1959)

Man-equivalent	No. of farms	Rate of Capital turnover years
9 or less	8	11.5
10 - 19	25	6.8
20 - 29	19	5.1
30 or more	17	3.5
Total	69	6.1

Labour efficiency

The efficient use of labour is an almost essential prerequisite for increasing the overall productivity on any particular farm. On farms in the Eastern Cape, where labour constitutes the single most important item of expense, particularly on those farms which are highly specialised in the production of pineapples, the most productive use of labour is even more essential.

The efficient use of labour in the production of pineapples can only in practice be measured for Group C farms, where virtually all labour is devoted to one single enterprise. On the basis of the tonnage sold per man-equivalent on these farms, the most striking correlation is found between labour income and the tonnage sold per man-equivalent - Table 67. Labour income per farm increases from -£331 for those farms with less than ten tons sold per man-equivalent, to £586 for those farms selling from 10 to 19 ton per man-equivalent. Then follows an even more remarkable increase of more than £3,500 in labour income for those farms where more than 20 ton was sold per man-equivalent.

Table 67 ...../

Table 67

PINEAPPLES SOLD PER MAN-EQUIVALENT AND LABOUR INCOME PER FARM  
FOR GROUP C  
 (15 Commercial Pineapple Producers, E.C. 1959)

<u>Tonnage sold per</u> <u>man-equivalent</u> ton	<u>Average</u> <u>per farm</u> ton	<u>No. of</u> <u>farms</u>	<u>Labour</u> <u>income</u> £
9.9 or less	7.0	7	-331
10 - 19.9	15.8	4	586
20 or more	28.3	4	4,101
<u>Total</u>	<u>15.0</u>	<u>15</u>	<u>1,096</u>

In areas where it has been possible to develop an advanced system of cost-accounting in co-operation with the farmers, productive work units per farm are calculated as a measure of size, or of the amount of work there is to be done on a particular farm. Labour efficiency can then be estimated by dividing total productive work units per farm by the total number of man-equivalent on that particular farm. Where such a measure is not available and it is not possible to find a common denominator for the volume of physical output as a result of the diversity of enterprises, an alternative method can be found by calculating cash sales per man-equivalent. Correlation of the results for the sample farms with labour income shows a positive relationship - Table 68. Labour income increases from -£627 for sales of less than £100 per man-equivalent, to -£379 for those farms where produce worth between £100 to £149 was sold per man-equivalent. It increases further to £1,324 on those farms where the cash sales per man-equivalent exceeds £150.

Table 68

CASH SALES PER MAN-EQUIVALENT AND LABOUR INCOME PER FARM  
FOR ALL THE FARMS  
 (69 Commercial Pineapple Producers, E.C. 1959)

<u>Cash sales per</u> <u>man-equivalent</u> £	<u>No. of</u> <u>farms</u>	<u>Labour</u> <u>income</u> £
99 or less	22	-627
100 - 149	20	-379
150 or more	27	1,324
<u>Total</u>	<u>69</u>	<u>209</u>

Doubt was expressed earlier, when discussing the economies of scale in farming, as to the benefit to be derived from labour specialisation and, consequently, the more efficient use of labour on large-scale farming operations. In a study of the effect of size on farm labour consumption, Langvatn found that a positive and valid relationship does in fact exist.<sup>15</sup> In his study, working time was classified according to dependence on the size of the enterprise and then

straight ...../  
 of size

15. Langvatn, Harry N. - "An approach to the effect/and combination of enterprises on farm labour consumption." Journal of Farm Economics, Volume XLII, February 1960, p.79. Published by the American Farm Economics Association, Menasha, Wisconsin.

straight line relationships were developed to express total labour as a function of size under conditions of constant technique. These functions were developed and tested for market hogs, breeding sows, beef cattle, feeder cattle and dairy cows. In the analysis it was found that "...transformation of the function to a work-per-unit basis shows decreasing time per unit with increased size of the enterprise. The decline is particularly great with an increase in size of a small enterprise".<sup>16</sup>

Although this was essentially a study of labour consumption on livestock farms in an area where the combinations of labour and capital differ considerably from what is most economical in the Eastern Cape, the principle is likely to remain valid throughout. If this be so, it then follows that:

- (a) Labour can be used more efficiently on large pineapple farms;
- (b) The positive relationship between labour efficiency measures and labour income in Table 67 and Table 68 must be, at least partially, ascribed to the larger size of those farms in the sample where labour was used more efficiently.

#### Combination of enterprises

The need for a most careful consideration of the best possible combination of enterprises stems from the principle of scarcity in economics which necessitates a choice between the various alternatives. On the basis of economic rationality, the final choice will be determined by the profitability of various alternative enterprises suited to a particular environment. This fundamental principle of economics, and its application to agriculture in particular, is clearly expounded by Heady and Jensen.<sup>17</sup> "Most farmers have limited capital. Therefore their task in organising the enterprises of the farm is one of dividing or allocating their limited funds and labour among different enterprises to produce the greatest income or profit. While many farmers own a great amount of capital or have access to large funds, they most frequently have a farm or ranch of limited acreage and must decide on the best combination of crops and livestock to be produced within the boundaries of their limited land area.... Given the need for some combination of enterprises and the fact that the farmer has limited capital, we must decide where each unit of labour, capital and land will bring the greatest return. The answer is given in the principle of opportunity costs, also known as the equal marginal return principle.... The principle of opportunity costs says that we have the best combination of enterprises or practices from our limited resources when they are so organised that we can't change the use of a single dollar or a day's labour without reducing income."

The lack of marginal revenue productivity data for the farming practices employed by each of the sample farms at

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varying .....

16. Langvatn, Op. cit., p.89.

17. Heady and Jensen, Op. cit., pp.77, 78 and 79.

varying levels of output, as well as the divergence of factors 'external' to each of the farms, makes it impossible to indicate either a general or a specific optimum combination of enterprises in this study. All that can be undertaken with the information available is an indication of the need for a particular balance in the farm structure; a balance indicated by varying levels of labour income as the percentage of each cash income derived from a particular enterprise changes.

No specific relationship appears to exist between labour income and the percentage of total cash income which is derived from the livestock enterprise - Table 69. For those farms deriving less than 10 per cent of total cash income from livestock, labour income equals £427. It then, however, decreases steadily as the percentage income derived from livestock increases until the last category where six farms derived more than 50 per cent of total cash income from the sale of livestock and livestock products, and has a positive labour income of £112.

Table 69

LIVESTOCK AND LIVESTOCK PRODUCTS AS A PERCENTAGE OF CASH RECEIPTS AND LABOUR INCOME PER FARM  
(69 Commercial Pineapple Producers, E.C. 1959)

Livestock and livestock products as percentage of cash receipts	Average per farm	No. of farms	Labour income
%	%		£
9 or less	3.5	31	427
10 - 29	19.8	18	102
30 - 49	36.3	14	-96
50 or more	67.8	6	112
Total	19.8	69	209

In Table 70, strong evidence is provided to show that the pineapple enterprise on its own can be very profitable in the Eastern Cape. The only category in Table 70 showing a relatively high labour income is the one containing the 15 farms which derive more than 90 per cent of their annual cash income from pineapples, the average for the group being 95 per cent. The 24 farms deriving less than 50 per cent of cash income from pineapples have a labour income of £84 and the 30 farms deriving from 50 to 89 per cent of cash earning from pineapples, have a negative labour income of £136. Labour income then increases by more than £1,000 to £1,096 for the 15 farms in Group C which derive more than 90 per cent of their cash earnings from pineapples.

Table 70

PERCENTAGE OF ANNUAL CASH INCOME DERIVED FROM THE PINEAPPLE ENTERPRISE AND LABOUR INCOME PER FARM  
(69 Commercial Pineapple Producers, E.C. 1959)

Pineapple sales as percentage of cash receipts	Average per farm	No. of farms	Labour income
%	%		£
49 or less	36	24	84
50 - 89	69	30	-136
90 or more	95	15	1,096
Total	66	69	209

Although .....

Although the pineapple enterprise alone paid well on those farms specialising in its production, to have only one enterprise is risky. This element of risk is greater if:

- (a) The enterprise is a crop rather than livestock,
- (b) the crop be one from which the product cannot be held over for canning,
- (c) the market is relatively far removed from the producer.

If the farmer can assure the delivery of all his fruit to the canneries within a short period after harvesting, the risk of pineapple production alone will be considerably less. In Hawaii, "... the pineapple which yesterday or even this morning was picked from the mother plant, quite possible on another island, this afternoon is ready for the grocer's shelf".<sup>18</sup> However, the farmer in the Eastern Cape still has the vagaries of nature to consider. As such he must regard risk as one of the 'factors of production' in his search for the optimum allocation of resources.

Balance in the farm structure is also necessary between the various factors of production, or even within a given factor of production, e.g., the ratio between working and fixed capital and the percentage which cultivated land constitutes of the total acreage operated.

Although the ratios between fixed and working capital differ from one type of farming to another, the stage is usually reached where eventually any further application of either fixed or working capital will lead to a deterioration in the financial success of the unit. In Table 71, it is seen that those farms with a fixed to working capital ratio of approximately 3:1 achieved the most favourable financial results. In the first category of the table, where working capital is actually more than fixed capital, the farms have an average labour income of -£1. In the second category it increases to £462, but decreases again in the third category. In the fourth category, where the ratio is roughly 9:1 in favour of fixed capital, labour income continues to decrease further to -£1,118.

Table 71

FIXED CAPITAL AS A PERCENTAGE OF TOTAL CAPITAL AND LABOUR  
INCOME PER FARM  
(69 Commercial Pineapple Producers, E.C. 1959):

Fixed capital as percentage of total capital	Average Percentage		No. of farms	Labour income
	Fixed capital	Working capital		
%	%	%		£
69 or less	48	52	10	-1
70 - 79	75	25	27	462
80 - 89	85	15	27	283
90 or more	91	9	5	-1,118
Total	76	24	69	209

Although ...../

18. Elder, Nell B. - Pineapple in Hawaii, p.21. Hawaii Economic Education Series Instructional Booklet No.3, Department of Public Instruction, Honolulu, Hawaii, 1956.

Although the proportions differ somewhat, Tomlinson found similar relationships between the ratio of working to fixed capital and financial results in a study of fresh milk farming in Natal.<sup>19</sup> The financial results were unfavourably effected on farms where fixed capital was proportionately high in relation to working capital. Such cases were found where land was unproductively used or high expenses in elaborate buildings threw the relationship between the two types of capital out of balance. Financial results also deteriorated where working capital was high in proportion to fixed capital, especially on some farms where the acquisition of expensive equipment had been undertaken carelessly and consequently led to a low productive use per input of mechanical power.

Closely related to the ratio between working capital and fixed capital is the ratio of cultivated land to the total farm size. Where cultivation is extensive, fixed capital is likely to be higher in proportion to total capital than when cultivation is intensive. In Table 72 it is shown that where a low percentage of land area is cultivated, as for the farms in the first category, labour income is negative to the extent of £321. In the next category labour income increases by more than £700 to reach £407 as the percentage of the total land area which was cultivated increases. As the percentage of land under cultivation increases further in the next category, labour income is higher by another £190, but then decreases by more than £600 as the area of cultivated land increases to more than 30 per cent of the total farm size. Somewhat similar results were also obtained by Tomlinson in an economic study of peanut and maize production on the Springbok Flats.<sup>20</sup> He found that "... up to a certain point an increase in the percentage crop area per farm means a corresponding increase in the operator's earnings, but beyond that the operator's earnings show a corresponding decline to a further increase in the percentage crop area".

Table 72

CULTIVATED ACREAGE AS A PERCENTAGE OF TOTAL ACREAGE AND  
LABOUR INCOME PER FARM

(69 Commercial Pineapple Producers, E.C. 1959)

<u>Percentage of land</u> <u>under cultivation</u> %	<u>No. of</u> <u>farms</u>	<u>Labour</u> <u>income</u> £
9.9 or less	15	-321
10 - 19.9	30	407
20 - 29.9	12	597
30 or more	12	- 17
<u>Total</u>	<u>69</u>	<u>209</u>

In Table 73 the need for a balance in the combination of the factors of production is shown once again. On those farms in the sample where the investment in mechanical power and implement capital was either very high or very low, labour was either negative or very low. From £40 for those farms

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19. Tomlinson, F.R. - Economic Study of Fresh Milk Farming in Natal, 1947-48, p.32. Department of Agriculture Bulletin No.314. Government Printer, Pretoria, 1951.

20. Tomlinson, F.R. - The Economics of Peanut and Maize Production on the Springbok Flats, Op. cit., p.81.

with less than £10 invested in mechanical power and implements per cultivated acre, labour income increases to £868 for an investment of between £10 and £20 per acre, but then decreases again to -£397 on those farms where the investment per cultivated acre exceed £20.

Table 73

MECHANICAL POWER AND IMPLEMENT CAPITAL PER CULTIVATED ACRE AND LABOUR INCOME PER FARM.

(69 Commercial Pineapple Producers, E.C. 1959)

Investment per acre £	Average per farm £	No. of farms	Labour income £
9 or less	6.5	29	40
10 - 19	14.0	23	868
20 or more	34.2	17	-397
Total	15.8	69	209

According to survey information contained in Table 74, a comparatively high percentage of cash expenses directed to remuneration for labour, does not spell financial ruin. The number of farms in each of the categories remain virtually the same as the percentage that labour cost constitutes of cash expenses increases, but there is considerable variation in the financial disposition of each group. The number of farms in each one of the categories of Table 74 ranges between a low of 16 farms in the second category to a high of 19 farms in the third category. There are 17 farms in the first and fourth categories respectively. Labour income, however, decreases from £121 for the farms where labour costs constitute less than 30 per cent of cash expenses, to -£246 in the third category where it has increased to between 40 and 49 per cent of cash expenses. In the last category, containing those farms where labour constitutes more than 50 per cent of cash expenses, labour income again increases to £1,074. For those farms in Group C, numbers tend to increase as the percentage that labour costs constitute of total expenses becomes higher. At the same time, the increase in labour income on these farms is remarkable. Not one farm in Group C had labour costs constituting less than 30 per cent of cash expenses. However, from -£508 in the second category, labour income increases to more than £1,800 for the nine farms in the group where labour costs constitute more than 50 per cent of total cash expenses. The influence of the nine farms in this category of Group C constitutes more than 50 per cent of the farms in the fourth category for the whole sample in Table 74, and was therefore mainly responsible for the large positive labour income of the 17 farms in that category.

Table 74 ...../

Table 74

LABOUR COSTS AS A PERCENTAGE OF CASH EXPENSES AND LABOUR  
INCOME PER FARM FOR GROUP C AND ALL THE FARMS  
(69 Commercial Pineapple Producers, E.C. 1959)

Labour costs as a percentage of cash expense	Group C		All farms	
	No. of farms	Labour income £	No. of farms	Labour income £
29 or less	0	0	17	121
30 - 39	2	-508	16	-73
40 - 49	4	272	19	-246
50 or more	9	1,819	17	1,074
Total	15	1,096	69	209

The information in Table 74, more particularly for Group C farms, leaves the impression that the higher the percentage of cash expenses in the form of payment to labour, the more successful a farm is likely to be. This is not so, for the point will obviously be reached where a disproportionate input of one factor will eventually lead to a decrease in labour income. This, almost surprising, relationship which emerges in Table 74 for those farms deriving more than 90 per cent of cash income from pineapples, must be ascribed, at least partially, to certain peculiarities in the structure and organisation of these farms, viz.:

- (a) Group C farms pay a higher proportion of wages in a form which constitutes a direct cash expense to the owner.
- (b) It is possible that the larger farms, which are financially the most successful, can afford to pay relatively higher wages which in turn lead to greater productivity.

No direct relationship was found to exist between the percentage that mechanical power costs constituted of the total cash expenses for either Group C or all the farms - Table 75. From -£587, for those farms where this item constituted less than 20 per cent of cash expenses, the remuneration of the operator's increased by more than £1,000 in the next category. It then remains positive for two further categories, although at a fluctuating level. A somewhat similar pattern is observed for Group C farms, where a more homogeneous type of farming is practised. Labour income again increases substantially between the first and the second category, but thereafter decreases for the two remaining categories as the percentage that mechanical power constitutes of total cash expenses increased to more than 40 per cent.

Table 75 ...../

Table 75

MECHANICAL POWER COST AS A PERCENTAGE OF CASH EXPENSE AND  
LABOUR INCOME PER FARM FOR GROUP C AND ALL THE FARMS  
 (69 Commercial Pineapple Producers, E.C. 1959)

Mechanical power cost as percentage of cash expense	Group C		All farms	
	No. of farms	Labour income £	No. of farms	Labour income £
19 or less	1	488	14	587
20 - 29	6	2,126	22	532
30 - 39	6	426	19	143
40 or more	2	319	14	590
Total	15	1,096	69	209

Throughout this analysis of the balance in the combination of enterprises or factors of production on the sample farms, it would not appear as influential a factor as, for instance, size. None the less, its importance can neither be ignored nor underestimated in the planning of the farm structure.

Social

Socio-cultural considerations, such as the age of the operator or his standard of formal education does not show any correlation with the financial success of the sample farms.

Chapter IX

COST OF PRODUCTION

The inclusion in the survey of a relatively large number of farms deriving virtually all their annual income from the pineapple enterprise, makes it possible to calculate the cost of production for pineapples in the Eastern Cape with a fair amount of accuracy.<sup>1</sup> In doing so, it becomes possible to emphasise each cost item separately and provide a clear indication of its influence in the whole cost structure.

The cost of producing pineapples must be subdivided into three distinct sub-sections, i.e., the cost of establishing the pinery, the cost of growing, and the cost of harvesting.<sup>2</sup> The proportions which each of these categories will assume in the total cost structure will depend to a large extent on factors such as topography and the state of development of the pineapple enterprise on a particular farm. In the very recent past, for instance, when there was considerable expansion of the pineapple industry in the region of study and thick bush had to be cleared for new plantings, the cost of establishing a pinery was proportionately high. It was not merely a matter for re-establishing a plantation on an old land after a period of rotation, but actually involved the initial clearing of land never before touched by the plough for altogether new plantings. Now that the period of expansion is beginning to reverse itself, the replanting of pineapples every year is likely to take place on land which has been cleared in previous years and, consequently, the cost of establishing (re-planting) will be lower than it was during the period of expansion. Strictly speaking, the cost of clearing land in order to establish a pinery for the first time, should be carried over a period of years, like depreciation. In virtually all cases this is not being done

by ...../

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1. This statement requires some clarification. Of the 15 farms in Group C which all derive more than 90 per cent of their annual cash income from pineapples, 11 are situated in the East London district, three in Bathurst and one in Albany. The final cost figure will therefore be more representative of the district of East London than of the entire Eastern Cape pineapple belt. As such, this cost of production analysis is favourably biased for, theoretically speaking, the cost of production for these 15 farms will be lower because:
    - (a) these farms are on the average larger pineapples producing units than all the farms in the sample and therefore benefit from the economies of scale which were shown to exist in pineapple production - Chapter VIII.
    - (b) The absolute advantage in yield held by the farms in East London - Chapter VI.
  2. The farmer is responsible for the cost of delivering his pineapples to the bus or railway station from which they are shipped to the canning factory at the expense of the canner. It was not possible to separate the expenses in connection with this marketing function from the total farming expenses - mainly included in labour and mechanical power.

by the farmers, so that the cost of production is likely to be lower than it was during the period of most rapid expansion.

The absence of cost-account bookkeeping by the sample farmers does not make it possible to keep each of the above mentioned sub-sections separate for the purposes of this analysis. The final cost per ton of pineapples sold will thus be an overall average of the three for one complete production cycle, i.e. a period which includes the establishing, growing and harvesting of a pinery. It will also include the cost of marketing undertaken by the farmer which could not be conveniently separated from other cost items.

#### Method

The method adopted for this analysis is commonly used by research workers where specific cost details are not immediately available.<sup>3</sup> All expenses on the farm directly connected with the pineapple enterprise are charged against it, as well as a certain proportion of the overheads. The allocation of overheads is usually made in consultation with the farmer. Depreciation was calculated on mechanical power, other than tractors, implements and tractors and fixed improvements at rates of 12½, 10 and 2 per cent respectively. Interest on the average capital investment in each of these categories was calculated at 5 per cent per year, while the cost of land was fixed at 10 per cent of the value of the land under pineapple cultivation during the year of study.

Allowances also had to be made for the replanting of plantations every year in order to maintain the production of pineapples on a particular farm at a given level, the rate at which replanting has to be done depending on the variety of pineapple under consideration and the economic life of that variety. Where the required rate of replanting is not maintained for the period under consideration, the total acreage under pineapples at a given time will be less than it should have been and vice versa, more than it should have been. In consequence, any deviation from the required rate of planting pineapples to maintain production at a given level will either have an inflating or deflating effect on the real total cost of producing pineapples. This stems from the fact that a pineapple plant does not come into bearing within the first year of planting. If planting was, therefore, not undertaken during a particular year, the tonnage sold would not be immediately effected, but rather the cost of maintaining that same tonnage in future. It has thus become necessary to examine carefully the extent to which each one of the producers in the sample replanted every year, and then to adjust the acreage planted and the cost of production accordingly.

If it be assumed, then, that the productive life of the Cayenne plant is four years and that of the Queen six, the annual rate of replanting for the two varieties will equal 25 and 15 per cent respectively. On this basis the average required rate of replanting was calculated for each farm by weighting the required rate for each variety by the number of plants of that variety on each farm. The actual rate of

replanting ...../

3. Tomlinson, F.R. - The Economics of Peanut and Maize Production on the Springbok Flats, Op. cit.

Ibid., Economic Study of Fresh Milk Farming in Natal, Op. cit.

replanting was then calculated for each variety, and weighted in a similar way and the overall difference between the actual rate of replanting per farm and the required rate of replanting for that farm was established. The difference between the actual and the required rate for each farm, which could be either positive or negative, was then weighted again with the total number of plants per farm in order to derive an average rate of adjustment for the farms included in the analysis, by which cost and acreage planted had to be adjusted. This adjustment rate was equal to -7.9 per cent, i.e., the sample farms replanted 7.9 per cent less than the rate required to maintain production at the present level. The total cost of production, as well as the planted acreage per farm, therefore, had to be increased by 7.9 per cent. To arrive at the cost per ton, it had to be established what tonnage was sold per adjusted acre planted and then the cost per adjusted acre planted had to be divided by the tonnage sold per adjusted acre planted. This came to 4.1 ton.

An outline of the cost structure is provided in Table 76 on the following page. Labour constituted by far the most importance expense item. At £1,672, the adjusted labour cost constituted no less than 47.7 per cent of the total cost of producing pineapples. Mechanical power cost was equal to £1,074, or 30.6 per cent of the total and, as such, was the second most important item. This is followed by the cost of land at £390, or 11.1 per cent, which is roughly equal to the three remaining cost items; implements, fixed improvements and miscellaneous expenses, taken together. This brought the total cost per farm to £3,508 after an adjustment of 7.9 per cent to allow for the lower rate of replanting. The adjusted acreage per farm is equal to 127 and, if divided into the adjusted cost, the cost per acre of producing pineapples is £27.6. If the cost per acre (£27.6) is then divided by the tonnage sold per acre planted (adjusted), the cost of producing one ton of pineapples is £6.7, or, £6.14. 0.

Although calculations in this table indicate why it was possible for the entire group of 15 farmers to earn an average labour income of £1,096, more clarification is required about information on the individual farm. The cost of production of pineapples actually ranged from a low of £4.6 per ton sold to a high of £34.5 and the simple average cost for the 15 farms was £10.3 per ton. The ordinary average price per ton, (weighted for the two varieties) on the other hand, is also higher than the weighted price in Table 76, i.e. £9.4, but actually £0.9 less than the ordinary average cost of production per farm. In other words, it should be obvious that some farmers incurred serious losses in the production of pineapples. A frequency distribution of the 15 farms according to their cost of production is shown in Table 77 together with the price per ton. Six of the farms had an average cost of production of less than £7 per ton, while the price they received equalled £9.1 per ton. A further five had a cost of production of between £7 and £10, averaging £8.6, and received £10.6 per ton of pineapples sold. The remaining four farms all had a cost of production of more than £10 which averaged at £19.3 while the price they received per ton was equal to £8.4.

Table 76 ...../

Table 76

AVERAGE COST OF PRODUCTION PER TON OF PINEAPPLES SOLD  
(15 Commercial Pineapple Producers, E.C. 1959)

Item	Average per farm	
	£	%
Land*	390	11.1
Labour:		
Cash wages	1,002	
Purchased food	528	
Farm privileges	69	
Clothing, tobacco, etc.	73	
Total	1,672	47.7
Mechanical power:		
Depreciation	285	
Interest (5%)	86	
Repairs & spares	281	
Fuel and oil	323	
Licence & insurance	99	
Total	1,074	30.6
Implements:		
Depreciation	44	
Interest (5%)	27	
Repairs etc.	6	
Total	77	2.2
Fixed improvements:		
Depreciation	28	
Interest (5%)	68	
Repairs etc.	30	
Total	126	3.6
Miscellaneous:	169	4.8
<u>Total cost per farm</u>	<u>3,508</u>	<u>100.0</u>
Cost per farm (adjusted)	3,508	
Acreage per farm (adjusted)	127	
Cost per acre	£27.6	
Tonnage sold per farm	527	
Tonnage sold per adjusted acre planted	4.1	
Calculated cost per ton sold (weighted)	£ 6.7 or £6.14. 0	
Average price received per ton (weighted)	£ 8.8 or £8.16. 0	

\* The cost of land was calculated at 10 per cent of its estimated market value.

Table 77 ...../

Table 77

FREQUENCY DISTRIBUTION OF FARMS ACCORDING TO THE COST OF PRODUCTION PER FARM AND THE AVERAGE PRICE RECEIVED PER TON BY THE FARMS IN EACH CATEGORY  
(15 Commercial Pineapple Producers, E.C. 1959)

Cost per ton £	Average cost £	Price received per ton £	No. of farms
7 or less	5.7	9.1	6
7.1 - 10	8.6	10.6	5
10.1 or higher	19.3	8.4	4
Total	10.3	9.4	15

The magnitude of various expense items in Table 76, if arranged differently, gives a different picture of the range of importance of various items in the cost of producing pineapples. In Table 78 it is seen that labour remaining undivided, is still the most important expense item, but is now followed by the cost of interest on the various capital items involved in the production of pineapples. Interest charges constituted no less than 16.3 per cent of the total cost of producing pineapples. These are followed by depreciation on capital items at 10.2 per cent of the total factor cost. More or less together in fourth place are the cost of fuel and oil for mechanical power and the repairs, spares, etc., on mechanical power, implements and fixed improvements. Both these groups, taken separately, comprise 9.2 and 9.0 per cent respectively of the total cost, while the remaining 7.6 per cent is made up of miscellaneous expenses, licences and insurance.

Table 78

THE AVERAGE FACTOR COST OF PRODUCTION OF PINEAPPLES PER FARM, PER ACRE PLANTED AND PER TON SOLD  
(15 Commercial Pineapple Producers, E.C. 1959)

Factor	Per farm £	Per acre planted £	Per ton £	Per cent %
Labour	1,672	13.2	3.2	47.7
Interest	571	4.5	1.1	16.3
Depreciation	357	2.8	0.7	10.2
Fuel and oil	323	2.5	0.6	9.2
Repairs, spares	317	2.5	0.6	9.0
Miscellaneous	169	1.3	0.3	4.8
Licence & insurance	99	0.8	0.2	2.8
Total	3,508	27.6	6.7	100.0

Factors affecting the cost of production

As it was calculated above, the cost of producing pineapples will depend directly on the variety grown. Queen pineapples, for instance, involve less work per acre in harvesting because of the lower yield, while the cost of establishing them should also be somewhat less than that of establishing Cayennes because of the smaller number of plants. On the other hand, the cost of clearing one acre to establish

Queens is no less than that for Cayennes, but with a considerably lower yield, the cost per ton of producing Queens must be higher than that of Cayennes on a given farm. The larger the percentage that Queens are of the total pineapple production on a particular farm, therefore, all other factors remaining the same, the larger the cost of producing one ton of pineapples will be for that farm.

Although the number of farms that were included in the cost analysis is too few in number to be used reliably in a correlation analysis, information compiled in Table 79 tends to support this hypothesis. For the 15 farms included in the sample, the cost of production tends to increase substantially with an increase in the percentage of the total crop sold as Queens. From £7.1 per ton for a large concentration of farms selling less than one third of their crop as Queens, the cost of production increases to £21 per ton for those farms where Queens constitute more than two-thirds of the tonnage sold. Although this is a significant relationship, it must not be taken to imply that Queens cannot be grown successfully - that will depend to what extent the cost of producing Queens is subject to variation within itself as a result of other factors such as size or yield and the level of the price received. Indications are, however, that the farmer who is an exclusive grower of Queens for sale to the canning factories, will find it difficult to pay the interest on his average capital investment and receive a satisfactory return for labour at the present level of prices. To sell on the fresh fruit market, either locally or overseas, holds promise of a more satisfactory gross price per ton, but only at increasing risk and higher marketing costs. Cayennes on the other hand, can at present be sold to canners at a higher price than Queens. At the same time the cost of delivering Cayennes to the canners is no higher than for Queens while the cost of production is actually lower.

Table 79

QUEENS AS A PERCENTAGE OF TONNAGE SOLD PER FARM AS RELATED TO THE COST OF PRODUCTION FOR PINEAPPLES  
(15 Commercial Pineapple Producers, E.C. 1959)

Queens as percentage of total %	Average per farm %	No. of Farms	Average cost per ton £
33 or less	5.3	10	7.1
33.1 - 66	47.9	2	10.3
66.1 or more	83.6	3	21.1
Total	26.6	15	10.3

The size of a particular plantation would appear to be of more importance in the overall cost of production for the pineapple industry than the growth or otherwise of a particular variety. The relationship between size and the financial success of the unit which was emphasised in the previous chapter, is again substantiated in this chapter by the very marked and positive relationship between the cost of production per ton of pineapples and the size of the unit. At a given price per ton, the financial success of the pineapple farming enterprise will increase as the cost of production decreases. It follows then that, with roughly equal prices paid per ton, the larger farms with a lower cost of production will have a better chance of financial success than the smaller farms. In Table 80, it is shown that the

cost .....

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cost ...../

cost of producing one ton of pineapples decreases from £18.8 for four farms in the sample that sold less than 100 ton, to £5.5 for three farms that sold more than 1,000 ton each. Cost decreases steadily between these two extremes as the tonnage sold increases; from £8.2 for six farms selling between 100 and 500 ton to £6.8 for a further two farms selling between 500 and 1,000 ton.

Table 80

COST OF PRODUCTION PER TON OF PINEAPPLES SOLD AS RELATED TO SIZE MEASURED BY THE TONNAGE SOLD PER FARM  
(15 Commercial Pineapple Producers, E.C. 1959)

<u>Tonnage sold per farm ton</u>	<u>Group average ton</u>	<u>No. of farms</u>	<u>Average price per ton £</u>	<u>Average cost per ton £</u>
99 or less	54	4	8.7	18.8
100 - 499	237	6	10.2	8.2
500 - 999	566	2	9.0	6.8
1,000 or more	1,712	3	8.9	5.5
<u>Total</u>	<u>527</u>	<u>15</u>	<u>9.4</u>	<u>10.3</u>

A graphical illustration of the relationship between cost of production and the tonnage sold per farm as shown in Table 80, is contained in Figure 2. On the assumption that the freehand function fitted to the information in Figure 2 approaches the mathematical line of least squares, there would appear to be a steady increase in the cost of production per ton as the actual quantities sold decreases. Production costs first show a less than proportionate increase as the tonnage sold decreases. These proportionate changes, however, increase and when the tonnage sold per farm decreases to less than 250 ton, the increase in cost of production becomes more than proportionate to the decrease in the tonnage sold per farm.

The relationship between the cost per ton of pineapples sold and the size of the operation, as illustrated in Table 80 and Figure 2, lends strong support to the findings by Langvatn which were discussed in the previous chapter. Although he was dealing with labour economies in particular, he found that economies of scale became particularly noticeable with the increase in size of a small operation. In Table 80 the percentage decrease in the cost per ton is by far the greatest between the first and the second category as the tonnage sold per farm increases from 54 to 237 on the average. Thereafter the decrease in cost continues with every increase in the tonnage sold, but becomes less significant. In Figure 2 the distinction is less obvious. However, production costs would seem to decrease rapidly until sales approach the 250 ton mark. From then on the decrease in the cost per ton continues, but at a decreasing rate for every further increase in the tonnage sold.

Limitations

In evaluating the cost of production calculations<sup>in</sup> this chapter, it is important that a number of limitations should be borne in mind:

(a) The final accuracy of the calculation is highly dependent on the accuracy of the farmer's estimates of the

value .....

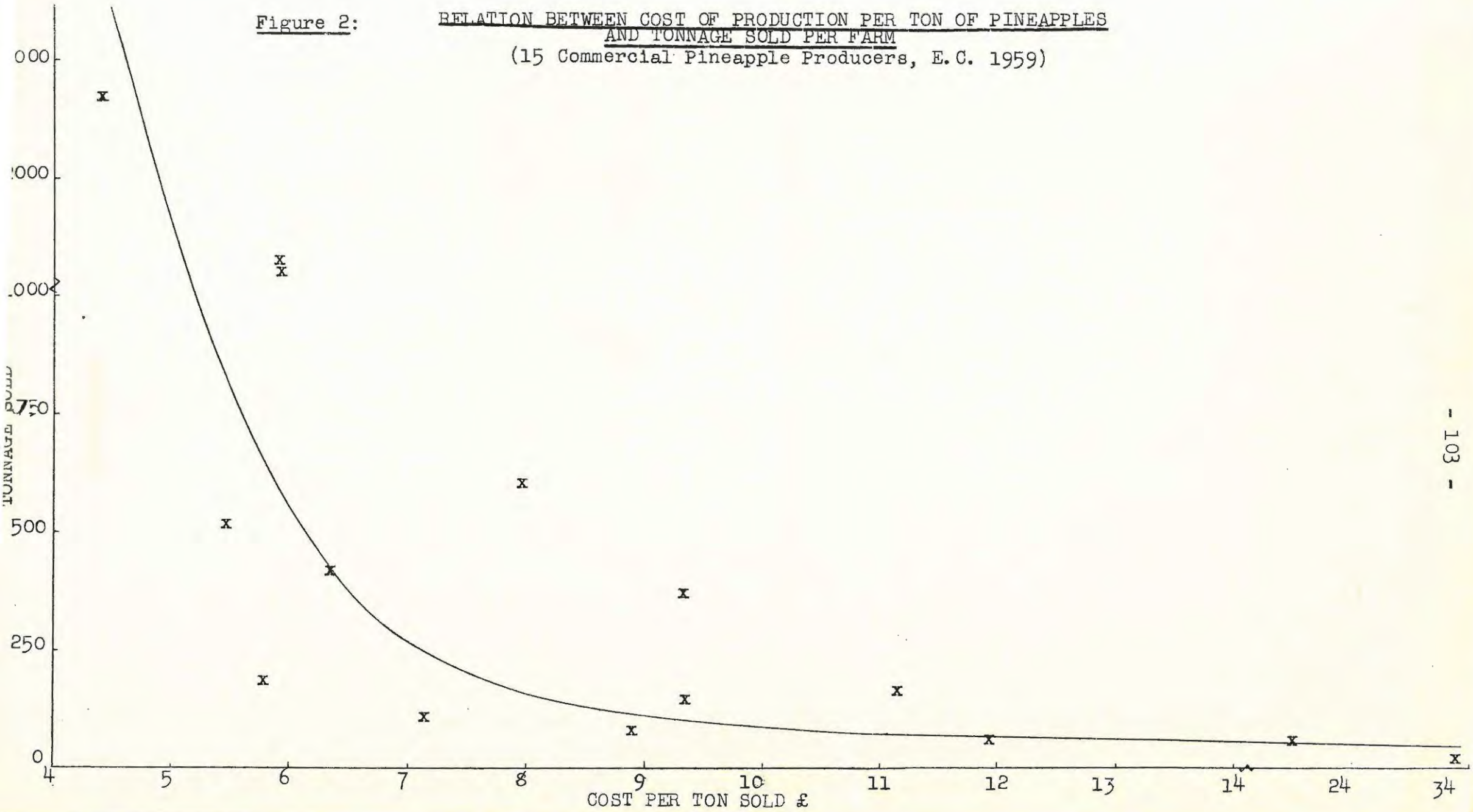
value of his land and the proportions of overhead costs to be charged to pineapples. Any deviation from the true value, or proportion, will have either an inflationary or deflationary effect on the cost of producing one ton of pineapples. Whereas other enterprises were extremely limited, or non-existent, the possible error involved in the allocation of costs to the pineapple industry is conveniently restricted. Inaccuracies of valuation, on the other hand, must be regarded as unbiased and, therefore, likely to have been offset by the valuation on one farm as against another.

(b) The cost per ton sold does not necessarily coincide with the cost per ton produced. This difference is significant in seasons when large quantities of the crop had been affected by sunburn and cannot be sold for canning, or as fresh fruit. Although these tonnages present real production to the farmer, they have no economic value and as such, cannot be considered in calculating the cost of production. This variation in cost will only be reflected in the cost per ton and not the cost per acre, except where the defective fruits are not harvested at all. The cost of producing one ton of pineapples is, therefore, likely to be higher in the long-run on those farms situated in regions where climatic conditions fluctuate more violently i.e., the more marginal areas.

(c) The cost per ton of producing pineapples as calculated is only applicable to a limited area under a given set of cost conditions over a certain period of time. The cost of production will differ in other areas, as well as in the same area at any other period of time due to variations in yield and the prices of factors of production.

Figure 2:

RELATION BETWEEN COST OF PRODUCTION PER TON OF PINEAPPLES  
AND TONNAGE SOLD PER FARM  
(15 Commercial Pineapple Producers, E. C. 1959)



Chapter X

THE SUPPLY OF PINEAPPLES

Pineapples are grown in most tropical and sub-tropical regions. Before the Second World War the chief producing countries were Hawaii, Brazil, Malaya and Formosa. In 1938, Hawaii produced more than half of the world's total supply while the South African contribution constituted less than 1 per cent - Table 81. Immediately after the outbreak of the war, however, the entire production pattern for pineapples changed; the consequences of which are still being felt to-day in the international market for the product. "The war in the Far East had a serious effect on the pineapple growing industry in Hawaii, Malaya, Formosa and the Philippines and the acreages were very much reduced. There was also some reduction in the plantings in Brazil, Australia and South Africa. These losses, however, were offset to some extent of developments in Cuba and Mexico. Since the war, Hawaiian production has been brought back to its pre-war level, and there has been a notable recovery in Formosa, but the area under cultivation in Malaya, the principal Commonwealth producer, is still comparatively small, the planted area at the beginning of 1949 being about a quarter of the acreage in 1938. ... Plantings in South Africa have been heavy since the war, and there has also been some expansion in Australia, where the industry is confined mainly to Queensland."<sup>1</sup> The general description in this quotation accurately depicts the world situation in the production of pineapples over the last two decades as it is set out in Table 81. Malayan production decreased from 120,000 tons in 1938 to zero for the four years from 1942 to 1945. The recovery was slow, and it was twenty years before Malayan producers could attain the pre-war level. A somewhat similar fluctuation took place in Formosa. Although production continued throughout the war on a small scale, it was only in 1958 that the pre-war level was again surpassed. Comparatively speaking, the overall fluctuations in Hawaiian production were less violent than those of either Malaya or Formosa. The fluctuations in terms of the actual tonnage produced, however, were more than those of Malaya and Formosa taken together. Recovery in Hawaii was relatively quick and by 1948 the pre-war level was again surpassed. It is obvious that world production will fluctuate closely with the production in the major producing countries. By 1944, then, it had decreased to virtually half the pre-war level and not until 1948 was the same level recaptured.

South African production did not decrease during the war to any marked extent, and whatever fluctuations did take place may well have been purely seasonal. Immediately after the war, in 1946, a period of considerable expansion set in which had not been checked by 1958; from 9,000 tons in 1938, production had increased to 100,000 tons in 1958 and indications are that it was still higher in 1959. In 1952 South African production for the first time exceeded that of Australia and by 1958 it was almost 25 per cent higher. It remained ahead of Malaya and Formosa until approximately 1955. During these

years ...../

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1. Fruit, 1950, p.43. Commonwealth Economic Committee,  
2 Queen Anne's Gate Buildings, London, S.W.1.

Table 81

## PINEAPPLE PRODUCTION IN PRINCIPLE PRODUCING COUNTRIES, 1938-1958

Year	C o u n t r y										Total	S.A. as % of total
	Malaya	Australia	South Africa	Hawaii	Brazil	Formosa	Cuba	Mexico	Puerto Rico	Philippines		
	(Thousand tons)											
1938	120	28	9	574	131	114	66	35	17	9	1,103	0.82
1939												
1940	70	32	10	595	125	127	74	40	20	-	1,093	0.91
1941	50	30	10	784	125	128	77	50	15	-	1,269	0.79
1942	-	29	9	413	115	68	76	57	16	-	783	1.15
1943	-	30	11	348	123	92	100	60	14	-	778	1.41
1944	-	23	12	223	109	42	84	56	14	-	563	2.13
1945	-	24	10	231	125	17	96	76	17	-	596	1.68
1946	1	31	12	516	114	17	160	99	19	8	977	1.23
1947	5	29	16	554	115	39	160	115	29	12	1,074	1.49
1948	8	40	16	639	124	38	170	122	34	15	1,206	1.33
1949	29	43	25	621	136	40	140	101	35	20	1,190	2.10
1950	41	49	40	690	163	45	100	127	36	50	1,341	2.98
1951	42	51	50	630	164	51	100	132	28	65	1,313	3.81
1952	45	37	45	750	159	62	90	120	20	120	1,448	3.11
1953	55	45	65	750	174	67	80	125	22	110	1,493	4.35
1954	71	62	75	760	187	65	90	122	23	98	1,553	4.82
1955	78	69	70	790	209	63	90	136	27	102	1,634	4.28
1956	122	83	80	790	215	82	100	156	28	105	1,761	4.54
1957	120	69	90	700	236	101	100	150	35	107	1,708	5.27
1958	140	76	100	780	218	136	100	150	40	114	1,854	5.39

Source: Fruit, Commonwealth Economic Committee, 2 Queen Anne's Gate Buildings, London, S.W.1.

years the local production also became increasingly important as a world source of supply. It exceeded 1 per cent of the total for the first time in 1941 and by 1958 had increased to 5.39 per cent. The production of one-twentieth of the world's total supply still leaves South Africa as a relatively insignificant producer, although its production has become substantial enough to be of considerable importance in a particular market where the competition is restricted due to currency restrictions or trade agreements. This aspect of the South African industry will be further pursued in the discussion on demand which follows.

The information contained in Table 81 is converted to index numbers in Table 82 and then graphically presented in Figure 3. In order to show the full extent of the fluctuations in pineapple production from 1938 to 1958, the three years immediately after the war were taken as a base equalling 100. World production reached an all-time low of 52 during 1944, while Hawaiian production decreased from 138 in 1941 to 39 during the same year, when world production was at its lowest. Calculated from the base period, Malayan production stood at 2,400 in 1938. It then decreased to zero for the four years from 1942 to 1945 before recovery set in and total production again reached almost 3,000 in 1958. Formosan production also showed a sharp dip during the war. From 413 index points in 1941, it decreased to 55 during 1945 and 1946 and did not regain the 1941 level until 1958. The South African scene presents a sharp contrast. Compared with the base period, South African production before the war was equal to 60 and then continued to increase unhindered to 667 index points by 1958. The post-war expansion of the pineapple industry in South Africa, considering the level of production before the war, is only surpassed by that of the Philippines.

Strictly speaking, the total supply of pineapples to the consumer should be sub-divided into three distinct categories. Firstly, being a perishable product, most of the pineapples produced in the world to-day are sent to canning factories in the nearby vicinity for processing. From there, they are shipped to markets scattered throughout the world. Secondly, pineapples are sold as fresh fruit on the domestic market and, thirdly, as fresh fruit on the export market.

#### Fresh consumption on local market

In Table 43 of Chapter VI it was shown that only about 8 per cent of the pineapples produced in the Eastern Cape during 1958/59 were sold as fresh fruit on the domestic market. Later, when the demand for pineapples is discussed, it will be shown that this percentage used to be considerably higher before and during the war when total production was much lower. As the production of pineapples in South Africa increased, the local market for fresh fruit offered little room for expansion and the actual quantities bought increased only slightly. With a virtually constant local absorption and a considerable increase in the overall production, it follows that the percentage of the total production disposed of on the local market, must have decreased proportionately.

#### Fresh export

In Table 43 of Chapter VI it was also indicated that only about 1 per cent of all the pineapples grown on the

Table 82

INDEX OF PINEAPPLE PRODUCTION IN PRINCIPAL PRODUCING COUNTRIES, 1938-1958  
1946-1948 : 100

Year	Country										Total
	Mavaya	Australia	South Africa	Hawaii	Brazil	Formosa	Cuba	Mexico	Puerto Rico	Philippines	
1938	2,400	84	60	101	111	368	40	31	63	75	102
1939											
1940	1,400	97	75	104	106	410	45	36	74	-	101
1941	1,000	91	75	138	106	413	47	45	56	-	117
1942	-	88	60	72	97	97	47	51	59	-	72
1943	-	91	73	61	104	297	61	54	52	-	72
1944	-	70	80	39	92	135	52	50	52	-	52
1945	-	73	75	41	106	55	59	68	63	-	55
1946	20	94	80	91	97	55	98	88	70	67	90
1947	100	88	107	97	97	126	98	103	107	100	99
1948	160	121	107	112	105	123	104	109	126	125	111
1949	580	130	167	109	115	129	86	90	130	167	110
1950	820	148	267	121	138	145	61	113	133	417	123
1951	840	155	333	111	139	165	61	118	104	512	121
1952	900	112	300	132	135	200	55	107	74	1,000	133
1953	1,100	136	433	132	147	216	49	112	81	917	137
1954	1,420	188	500	133	158	210	55	109	85	817	143
1955	1,560	209	467	139	177	203	55	121	100	850	150
1956	2,440	252	533	139	182	265	61	139	104	875	162
1957	2,400	209	600	123	200	326	61	134	130	892	157
1958	2,979	230	667	137	185	439	61	134	148	950	171

Source: Calculated from "Fruit", Commonwealth Economic Committee, 2 Queen Anne's Gate Building, London, S.W.1.

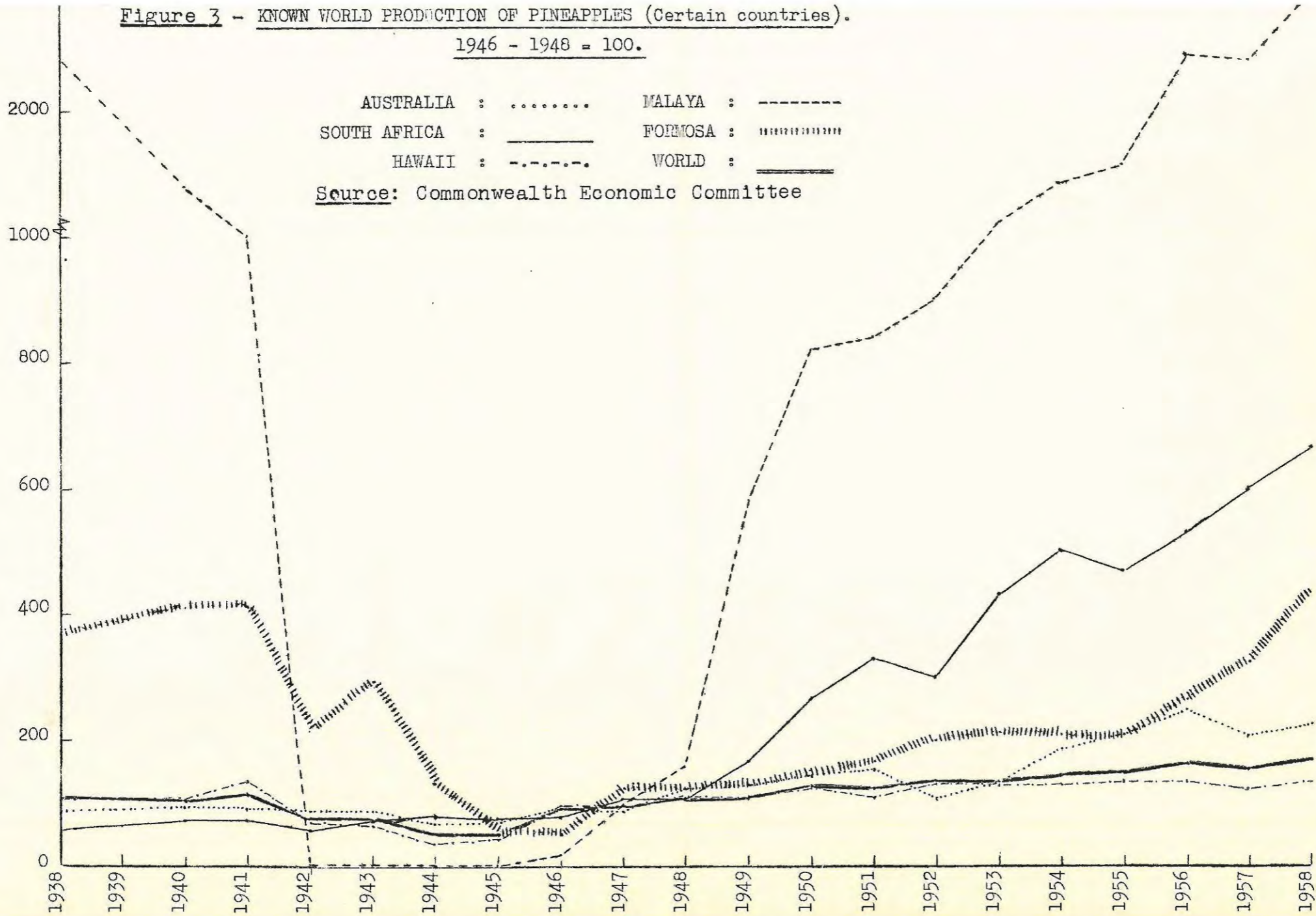
Figure 3 - KNOWN WORLD PRODUCTION OF PINEAPPLES (Certain countries).

1946 - 1948 = 100.

AUSTRALIA : .....	MALAYA : - - - - -
SOUTH AFRICA : _____	FORMOSA :
HAWAII : - . - . - .	WORLD : ==

Source: Commonwealth Economic Committee

INDEX (1946 - 48 = 100).





sample farms visited in the Eastern Cape sold their fruit on the export market. . . Although the quantities of fresh pineapples exported from South Africa has increased considerably in recent years, primarily due to an increase in the size of the total crop, it still constitutes only an insignificant proportion of the world supply. . . In Table 83 it is shown that only small quantities of fresh pineapples were exported from South Africa before and during the war export came to a complete standstill. Fresh export was resumed for the first time in 1947 and increased rapidly after 1950 to reach a peak of nearly 5,000 tons during 1953 when it also equalled 8.5 per cent of the world's total export of fresh pineapples. Although South Africa has become the most important exporter of fresh pineapples in the Commonwealth, it is far exceeded in the actual quantities exported by countries such as Cuba, Mexico and Brazil, who ship mainly to markets in North America.

#### Deliveries for canning

The supply of pineapples for canning is, of course, closely linked to the total production of pineapples. This stems from the fact that the pineapple is primarily a canning fruit. It is not surprising, consequently, that Hawaii also produces more than 50 per cent of the world's total supply of canned pineapple - Table 84. Apart from Hawaii, there is little to choose between a number of countries, all vying for second place. In 1958, however, not one of these countries produced even one-sixth of the total Hawaiian production. Malaya, which comes second after Hawaii, is closely followed by Formosa, South Africa, and the Philippines and Australia, in that order. Less important producers are Cuba and Mexico.

It follows then, that fluctuations in the production of canned pineapple during the war should be similar to fluctuation shown in Figure 3 for the total fresh production. By converting the information in Table 84 to index numbers, using 1946-1948 as the base period, Malaya and Formosa show the most violent fluctuating pattern in their past production of canned pineapple. The most notable feature of South African production is the considerable increase which took place immediately after the war. Its share of the world supply increased from approximately 1 per cent of the total in 1947 to 6.58 per cent in 1958. If Table 84 is supplemented by Table 85, it will be seen that in 1928, Hawaii produced more than three-quarters of the world's total supply of canned pineapple and South Africa less than 1 per cent. During and immediately after the war Hawaii exceeded its 1928 share of total production, but as the recovery and expansion of the pineapple industry in other countries continued, its proportion decreased until it constituted little more than half of the world's total in 1958. During this year, world production of canned pineapple also reached a new height of 22,368,000 cases of 45 lbs. net equivalent.

As production increased, the proportionate contributions by the various countries changed considerably, notably in South Africa, the Philippines and Australia. The five countries listed in Table 85 contributed 99.2 per cent of the world's total supply of canned pineapple in 1928. The total supply then declined steadily until 1948 when a low of 74.0 per cent was reached, mainly as a result of war damage. Since then, there has been a steady recovery of production in these countries and their share of the total supply increased to 87.1 per cent in 1958. South Africa was then the fourth

largest...../

Table 83

## EXPORT OF FRESH PINEAPPLES BY VARIOUS COUNTRIES, 1938-1958

Year	Country									Total	S. A. as % of Total
	Australia	South Africa	Brazil	Cuba	Jamaica	Mexico	Azores	U. S. A.	French West Africa		
	(thousand tons)										
1938	-	0.7	3.6	43.0	-	5.9	3.6	0.8	-	57.6	1.2
1939	-	-	-	-	-	-	-	-	-	-	-
1940	-	0.6	3.3	36.6	-	8.7	0.4	0.8	-	50.4	1.2
1941	-	-	3.0	35.0	-	9.3	-	0.7	-	48.0	-
1942	0.1	0.1	2.0	15.7	-	8.9	-	0.3	-	27.1	3.7
1943	0.1	-	2.2	22.2	-	14.6	-	0.2	-	39.3	-
1944	0.1	-	2.5	33.4	-	1.8	-	0.1	-	37.9	-
1945	0.1	-	2.3	41.5	-	10.0	-	0.1	-	54.0	-
1946	0.1	-	2.3	51.6	-	30.6	-	0.4	-	85.0	-
1947	0.2	1.3	2.6	43.7	-	21.0	0.6	2.8	-	72.2	1.8
1948	0.2	0.2	3.7	23.6	-	37.9	0.9	-	-	66.3	0.3
1949	0.6	0.3	2.2	33.5	-	27.6	0.9	0.4	-	65.2	0.5
1950	0.2	1.1	2.4	37.3	-	30.8	1.2	0.2	-	73.2	1.5
1951	0.3	4.1	4.0	25.2	-	16.4	1.8	0.1	-	51.9	7.9
1952	0.2	4.3	3.2	26.3	-	19.0	1.5	0.2	0.9	55.6	7.7
1953	-	4.8	5.4	26.8	-	16.7	1.5	0.4	0.7	56.3	8.5
1954	-	2.7	9.7	29.6	-	21.7	1.9	0.3	1.0	66.9	4.0
1955	-	2.9	18.9	35.2	-	21.4	1.9	0.7	1.5	82.5	3.5
1956	0.1	2.4	11.8	38.4	0.3	19.8	2.1	0.5	2.0	77.4	3.1
1957	-	2.3	11.0	36.0	0.9	18.8	2.4	0.5	2.7	74.6	3.1
1958	-	3.5	9.8	38.0	1.0	18.7	2.5	-	2.5	76.0	4.6

Source: Fruit, Commonwealth Economic Committee, 2 Queen Anne's Gate Buildings, London, S.W.1.

Table 84

KNOWN PRODUCTION OF CANNED PINEAPPLE IN CERTAIN COUNTRIES AND WORLD TOTAL, 1931-1958<sup>x</sup>

Year	C o u n t r y									World	S.A. as % of total
	Australia	Malaya	South Africa	Formosa	Hawaii	Cuba	Philippines	Mexico			
	(Thousand cases of 45 lbs. net content)										
1931	108	2,296	116	1,232	11,047	165	73	-	-	15,190	0.76
1932	183	2,891	98	1,373	4,604	37	118	-	-	9,347	1.05
1933	238	2,280	87	1,670	7,388	45	75	-	-	11,833	0.74
1934	192	2,601	69	1,546	7,554	36	-	-	-	12,067	0.57
1935	195	2,793	67	1,189	9,045	39	149	-	-	13,530	0.50
1936	257	2,959	73	1,181	9,404	27	181	-	-	14,174	0.52
1937	190	3,230	62	1,200	9,754	168	590	1	-	15,344	0.40
1938	359	2,926	19	1,674	8,487	249	476	4	-	14,292	0.14
1939	388	3,391	20	1,350	9,864	250	992	8	-	16,400	0.12
1940	393	1,921	19	1,614	8,200	300	1,073	16	-	13,639	0.14
1941	361	762	6	1,308	9,165	315	657	24	-	12,686	0.05
1942	225	-	80	1,290	9,721	506	-	18	-	11,934	0.67
1943	373	-	81	206	9,755	647	-	70	-	11,310	0.72
1944	111	-	86	81	8,823	443	-	110	-	9,877	0.87
1945	117	-	79	22	7,553	390	-	132	-	8,662	0.91
1946	164	1	42	79	8,012	960	-	218	-	10,060	0.42
1947	214	113	126	69	8,795	1,200	-	251	-	11,828	1.07
1948	425	152	150	90	10,420	1,840	470	298	-	15,185	0.99
1949	504	352	168	117	10,416	850	963	422	-	15,118	1.11
1950	569	747	272	204	11,314	329	1,127	675	-	16,045	1.70
1951	499	758	328	388	10,953	460	1,559	728	-	16,155	2.03
1952	208	717	233	448	12,508	445	1,489	507	-	17,055	1.37
1953	754	851	495	383	12,228	480	1,798	523	-	18,127	2.73
1954	1,109	1,184	833	916	11,977	500	723	667	-	18,690	4.46
1955	1,347	1,220	583	940	13,726	500	945	592	-	20,753	2.81
1956	1,164	1,753	796	1,039	13,211	700	1,065	468	-	21,083	3.78
1957	925	1,805	1,324	1,240	12,220	850	1,322	421	-	20,752	6.38
1958	1,164	2,006	1,471	1,912	12,939	490	1,409	421	-	22,368	6.58

Source: Basic Facts about Pineapple in Hawaii, p.30. The Pineapple Companies of Hawaii, Honolulu, Hawaii.  
 x: Actual or estimated cases of 45 lbs. net content for years beginning January 1, except Hawaii, June 1 and South Africa, ending November 1.

largest producer of canned pineapples in the world.

Table 85

PRODUCTION OF CANNED PINEAPPLES IN VARIOUS COUNTRIES  
AS A PERCENTAGE OF WORLD TOTAL, 1928-1958

Year	C o u n t r y					Per cent of total
	Australia	Hawaii	Formosa	Malaya	South Africa	
1928	1.6	75.4	5.4	16.4	0.4	99.2
1929	1.2	70.9	7.6	18.9	0.5	99.1
1930	1.2	77.3	5.3	14.2	0.2	98.2
1931	0.7	72.7	8.1	15.1	0.8	97.4
1932	2.0	49.3	14.6	30.9	1.0	97.8
1933	2.0	62.4	14.1	19.3	0.7	98.5
1934	1.6	62.6	12.8	21.5	0.6	99.1
1935	1.4	66.9	8.9	20.6	0.5	98.1
1936	1.8	66.4	8.3	20.8	0.5	97.8
1937	1.2	63.6	7.8	21.0	0.4	94.0
1938	2.5	59.4	11.7	20.5	0.1	94.2
1939	2.4	60.1	8.2	20.7	0.1	91.5
1940	2.9	60.1	11.8	14.1	0.1	89.0
1941	2.8	72.3	10.3	6.0	0.1	91.9
1942	1.9	81.5	10.8	0.0	0.7	94.9
1943	3.3	86.3	1.8	0.0	0.7	92.1
1944	1.1	89.3	0.8	0.0	0.9	92.1
1945	1.4	87.2	0.3	0.0	0.9	89.9
1946	1.6	79.6	0.8	0.0	0.4	82.4
1947	1.8	76.4	0.6	1.0	1.1	80.9
1948	2.8	68.6	0.6	1.0	1.0	74.0
1949	3.3	68.9	0.8	2.3	1.1	76.4
1950	3.5	70.5	1.3	4.7	1.7	81.7
1951	3.1	67.8	2.4	4.7	2.0	80.0
1952	1.2	73.3	2.6	4.2	1.4	82.7
1953	4.2	67.5	2.1	4.7	2.7	81.2
1954	5.9	64.1	4.9	6.3	4.4	85.6
1955	6.5	66.1	4.5	5.9	2.8	85.8
1956	5.5	62.7	4.9	8.3	3.8	85.2
1957	4.5	58.9	6.0	8.7	6.3	84.4
1958	5.2	57.8	8.5	9.0	6.6	87.1

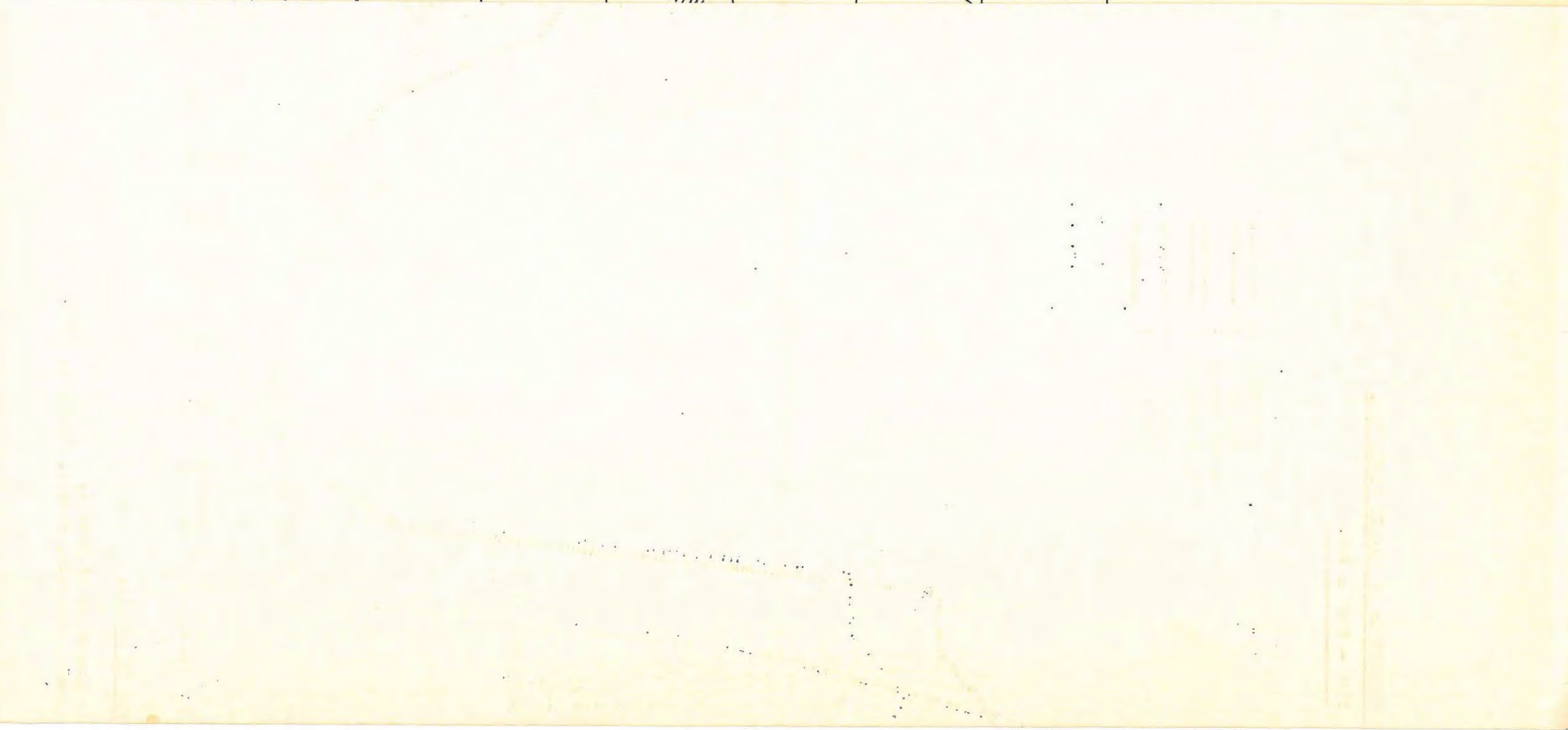
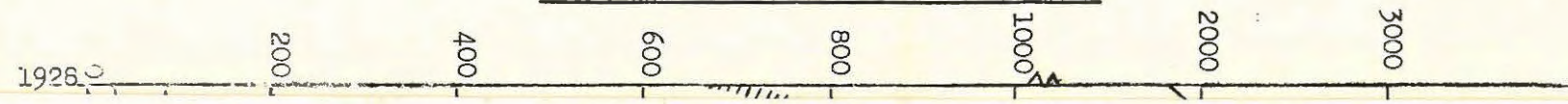
Source: Calculated from Basic Facts about Pineapple in Hawaii,  
Op. cit.

A rapid increase in the production of canned pineapples in South Africa, as elsewhere, is usually an indication of a higher price realised by the canner for his product, which in turn leads to a higher price being offered to the farmer for his fruit in order to attract larger quantities. It also indicates that the farmer did in fact respond readily to the higher price which was offered to him by the canner. No information is available on the change in the price for canned pineapple to the consumer, but the average price paid per ton by South African canners for pineapples supplied by the farmer increased from £4.40, during the 1938/39 season, to an all time high of £19.25 per ton for the 1953/54 season. It then decreased steadily until a new low of £8.8 per ton was reached five seasons later during 1958/59. The increase in purchases by canners corresponded to the rise in prices paid to the farmer, yet, it is more striking and continues at still higher levels five seasons after price had started to decline. Since 1938/39 there has never been a decided downward trend in the

quantity .....

/B

PRODUCTION INDEX (1946 - 48 = 100)





quantity of pineapples bought by the canners. Substantial reductions did occur from one season to another, e.g., 1945/46, 1951/52, 1954/55 and 1957/58, but these may be due almost entirely to adverse climatic conditions. In the 1958/59 season, for instance, a new high of more than 100,000 tons was reached after the decline in supplies for the previous season.

Table 86

PRICES PAID PER TON OF PINEAPPLES BY CANNERS AND  
QUANTITIES BOUGHT BY THEM FROM 1938/39 to 1958/59

Season	Price per ton £	Quantity purchased ton
1938/39	4.40	4,073
1939/40	4.65	3,152
1940/41	5.30	6,606
1941/42	5.45	6,097
1942/43	6.15	4,802
1943/44	6.66	7,064
1944/45	7.28	6,218
1945/46	8.10	3,735
1946/47	11.00	10,122
1947/48	11.45	13,703
1948/49	10.65	13,364
1949/50	13.46	24,915
1950/51	13.20	31,507
1951/52	13.71	16,261
1952/53	14.66	37,389
1953/54	19.25	48,650
1954/55	16.81	30,037
1955/56	15.60	48,029
1956/57	12.79	93,875
1957/58	12.35	72,381
1958/59	8.80	103,114

Source: The South African Fruit and Vegetable Canners Association.

A graphic description of the information contained in Table 86 is supplied in Figure 5. By converting the seasonal price and quantity data to an index, with the three seasons immediately after the war as a base, it is shown that the price at which pineapples were purchased by the canners has never doubled from the base period level in the years since the war - Table 87. A high point of 190 was reached during the 1953/54 season. A downward trend then started and has now reached a level lower than that during the base period. Preliminary information indicates that the price level will be even lower during the 1959/60 season. Purchases, on the other hand, have increased more than ten fold over the base period and were higher than ever before during 1958/59.

Table 87 ...../

Table 87

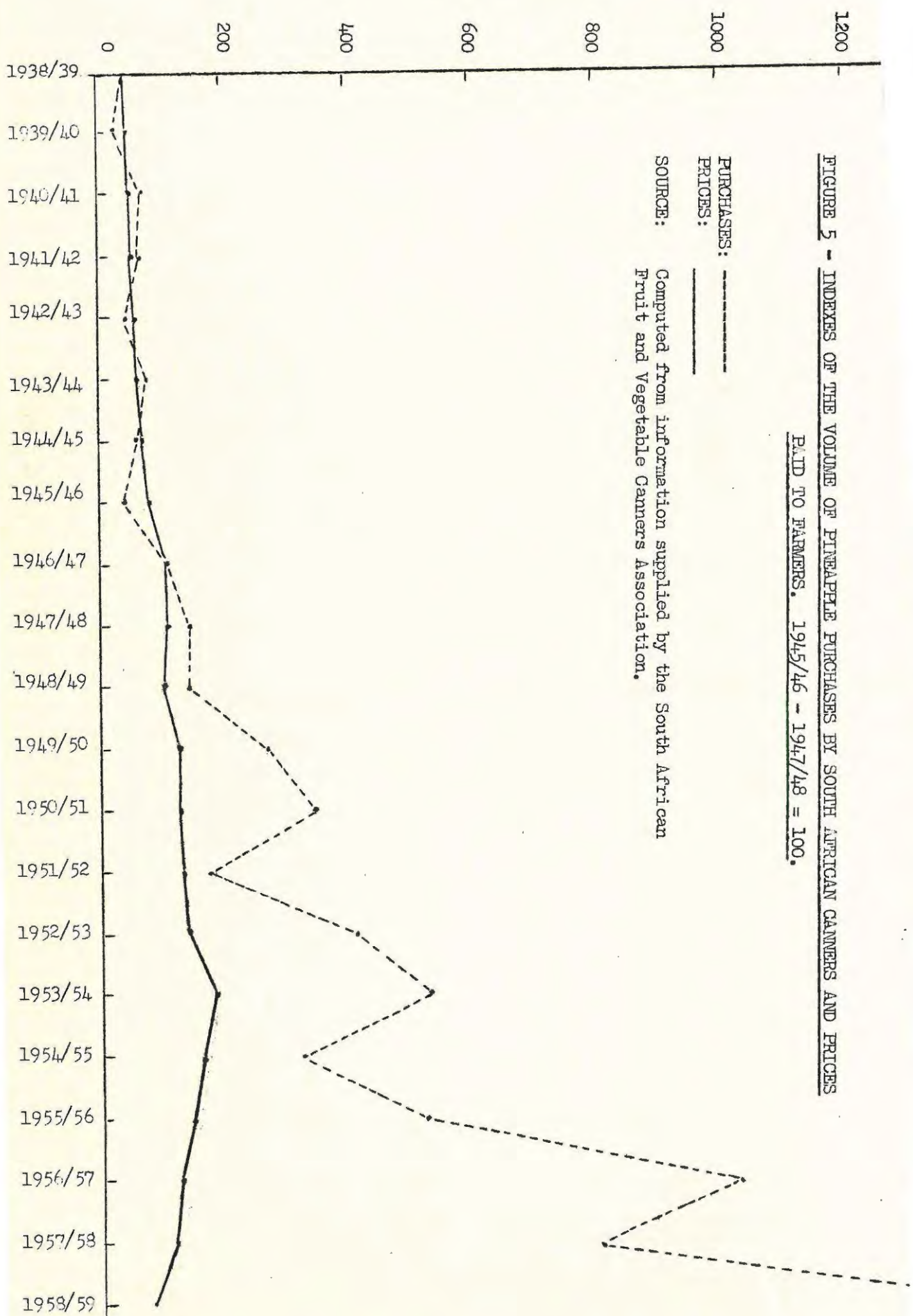
INDEX OF PRODUCTION AND PRICES FOR CANNING OF PINEAPPLES,  
CLINGSTONE PEACHES AND APRICOTS, 1938/39 to 1958/59  
1945/46 - 1947/48 = 100

Season	Pineapples		Clingstone Peaches		Apricots	
	Production	Price	Production	Price	Production	Price
1938/39	44	43	20	48	35	50
1939/40	34	46	47	49	65	49
1940/41	72	52	17	66	68	69
1941/42	66	54	40	67	61	97
1942/43	52	60	34	71	88	76
1943/44	77	65	61	74	103	97
1944/45	68	71	50	72	120	89
1945/46	41	80	91	80	55	92
1946/47	110	108	-	-	117	99
1947/48	149	112	109	120	128	110
1948/49	145	105	95	99	129	99
1949/50	271	132	144	142	125	127
1950/51	343	129	207	148	155	149
1951/52	177	135	157	149	108	177
1952/53	407	144	299	159	182	219
1953/54	530	190	344	159	238	166
1954/55	327	165	467	152	230	144
1955/56	523	153	507	153	276	141
1956/57	1,022	126	510	162	186	139
1957/58	788	121	779	181	188	156
1958/59	1,428	86	649	163	274	128

An interesting comparison can be made between pineapples and two other varieties of fruit namely apricots and clingstone peaches, where a large proportion of the crop is also sold for processing every year. The information from Table 87, portrayed in Figure 6, shows that by using the same base period, pineapple prices increased more than in the case of clingstone peaches, but less than for apricots. After a peak round about 1954, the prices paid by the canners for these three varieties of fruit are now declining, with pineapple prices declining faster than that for apricots and clingstone peaches. The purchases of these fruits, as shown in Figure 7, did not develop along the same lines as their corresponding prices. The most ready response to the changing price conditions was shown by the pineapple farmer, followed by the clingstone peach and apricot farmers in that order. While the deliveries of pineapples to the canner had reached a new height during the 1958/59 season, peach deliveries appear to be declining after a fairly steady increase in the quantities bought up to 1957/58, while apricots had only increased to little more than twice the base period level, despite the greatest increase in price over the base period. It is not certain, however, to what extent climate and a longer production cycle for peaches and apricots may be responsible for a different response to changes in the prices for these fruits.

Although the quantity of pineapples bought by the canner for a given price represents his demand for pineapples at that price, indications are that the quantities purchased by canners in South Africa also represent the actual supply of pineapples by farmers for canning. Farmers, with an acute awareness of changes in the price of a commodity they produce, or that of some other product suitable to their environment, will usually react to these changes in some way or another as

soon ...../



**FIGURE 5 - INDEXES OF THE VOLUME OF PINEAPPLE PURCHASES BY SOUTH AFRICAN CANNERS AND PRICES PAID TO FARMERS. 1945/46 - 1947/48 = 100.**

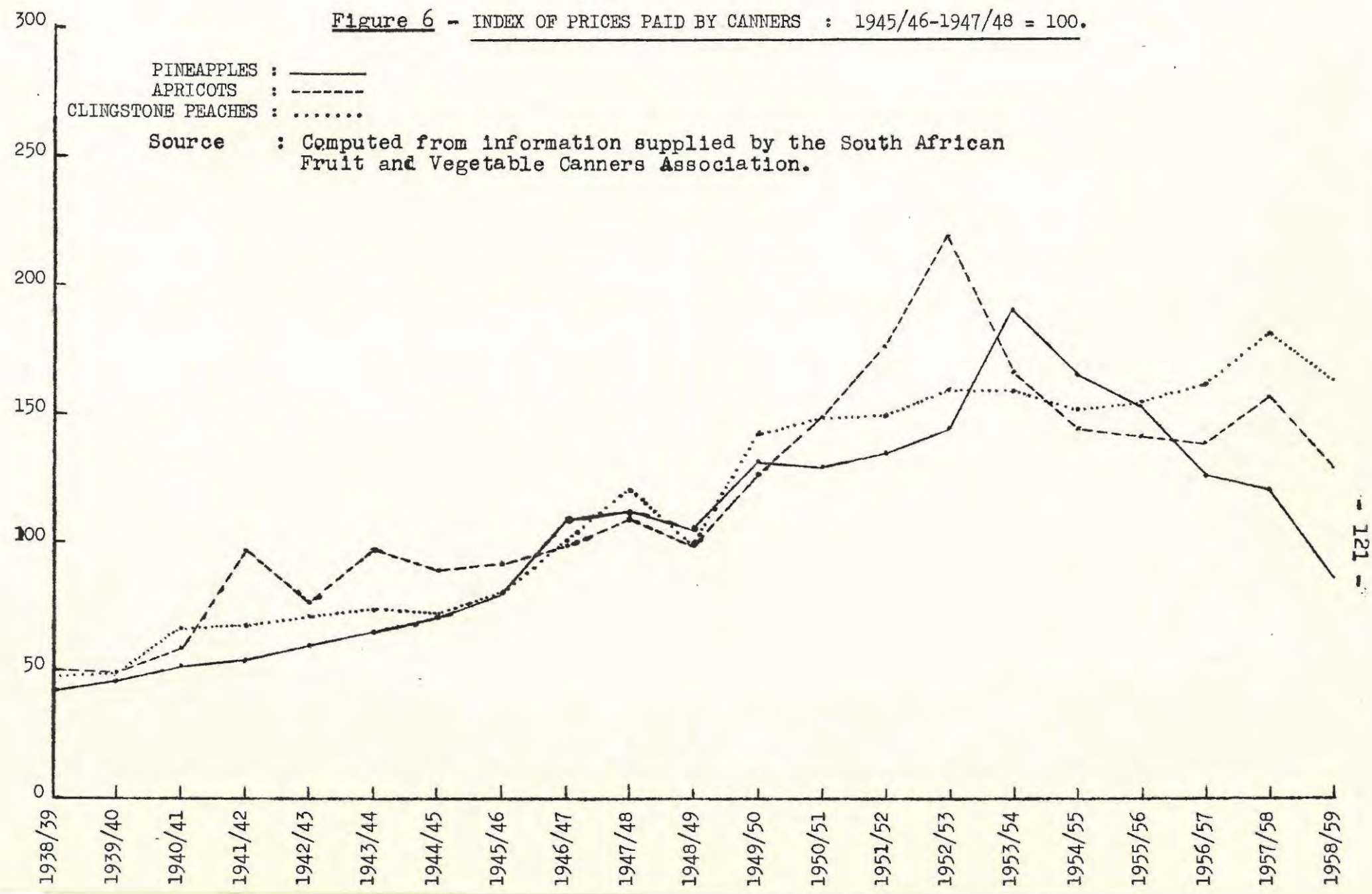
PURCHASES: - - - - -  
 PRICES: \_\_\_\_\_  
 SOURCE: Computed from information supplied by the South African Fruit and Vegetable Canners Association.

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INDEX OF PRICES PAID BY CANNERS.

/B



1957/58  
1958/59



soon as it becomes possible, especially where these price changes are substantial and presumably will obtain for a long period of time.

Most of the pineapple farmers in South Africa belong to co-operative organizations with their own canning factories. As members of such an organization, there is no restriction on the quantity of fruit the farmer can deliver to the canner for a particular price, fixed by the canner, as long as the quality of the pineapples delivered is satisfactory for processing as either fruit, juice, or jam. The majority of the remaining farmers are under contract with a private canning organization to deliver a minimum quantity of fruit at a fixed minimum price over a period of ten years. Provided, then, that these farmers do not break their contracts by delivering less than the stipulated minimum and the quality of their fruit is satisfactory, there is again no restrictions on the quantities they can deliver to the factory. Those producers falling outside the above two categories, can deliver their fruit to other, smaller canners, provided they are prepared to part with their fruit at the price offered by these canners, for the latter are undoubtedly in a stronger bargaining position than their colleagues in the first two categories during times of surplus. The lower price they are likely to pay will, of course, be reflected in the average price paid by all the canners as listed in Table 86. A further possible outlet for those farmers not included in the first two categories, is to sell their fruit through a neighbour who is. Settlement is then arranged privately between the two farmers afterwards.<sup>2</sup> During the time when canners were more reluctant to buy pineapples, grading regulations were enforced more strictly. This led to fruit rejected by the larger canners being taken to one of the smaller canners who was likely to take it at a price.<sup>3</sup> Again, this price will be reflected in the average price for the season. It would appear, therefore, that the purchases of pineapples during a given season narrowly reflect the actual quantities which farmers offer for sale at that price.

The quantities delivered during any particular season are, however, the result of a production decision which had been taken at least two years earlier: two years being the minimum period it would take for pineapples to be planted and come into production in those areas where conditions are most suited for the growing of the fruit. In some cases this lag is likely to be longer than two years, especially if more marginal areas were brought into production as the result of an exceptionally high price during an earlier season, or if altogether new land had to be cleared for planting. This is probably what happened in the Eastern Cape during the recent past when exceptionally high prices were paid by the canners to the farmers for their fruit.

It would be difficult to determine precisely how much the production of pineapples for canning responded to recent changes in price because of the numerous other factors which affect the farmers' production decision.<sup>4</sup> The farmers'

plans . . . . . /

2. The field survey included more than one farmer who marketed his fruit in this way. The canners refer to fruit received in this manner as fruit "from across the fence".
3. The varying price at which pineapples of the same grade has been sold to canners in the past has led to serious repercussion on the international market for the South African fruit.
4. United States Department of Agriculture Information Bulletin 204, What makes Farmers' Prices, p.5. U.S. Government Printing Office, 1959.

plans are often upset by exceptional weather conditions which may lead to the production being considerably higher or lower than had been originally anticipated. The improvement in farming techniques also leads to increasing yields which tend to obscure the effects of price changes on future production. The price of potatoes in the United States had been declining for several years up to 1957 and farmers cut their potato acreage in half between 1940 and 1957. However, yield more than doubled to make the 1957 potato crop 4 per cent larger than that of 1940.<sup>5</sup> The farmers' decision to produce is also influenced by his expectation of prices in the future and not only on what he has received in the past, as has been suggested earlier. Finally, it will depend on the relative ease with which he can switch resources from one enterprise to another.

From the information contained in Table 86, it will be possible to plot the long-run supply response of pineapples for canning to a change in price, provided certain assumptions are made which are essential prerequisites for the plotting of such a function to be at all valid. Firstly, it must be assumed that the farmer possesses complete knowledge of the changes of pineapple prices for canning, as well as that of some alternative commodities for which the resources at present employed in pineapple production can be used and that he will react to the actual prices rather than deflated prices. Secondly, it must be assumed that there were no technological changes or improvements which would have led to a decrease in the cost of production and thus enable the farmer to increase production at a given price, or, even at a lower price. This would mean a supply curve sloping downwards from left to right in the long-run.<sup>6</sup> Thirdly, it is assumed that no new areas were brought into the production of pineapples which were then found to be more suitable than the areas already in production. Fourthly, we assume that weather conditions were not responsible for changes in production from year to year. The validity of the latter assumption depends almost entirely on the extent to which the response to price changes took place in areas situated where climatic conditions were less favourable for the production of pineapples.

Experimentation with two and three year lag periods in the supply response to a change in price, showed a closer relationship between price and the corresponding production changes three seasons later. The information adjusted from Table 86, after allowing for a three year lag in the production response to a change in price, is contained in Table 88. The production figure opposite the price quoted for the 1955/56 season is then the actual deliveries of pineapples for canning

during...../

- 
5. What makes Farmers' Prices, Op. cit., p. 6.
  6. Although technological changes are likely to have taken place for the improvement of the yield, the most important change which has taken place in pineapple production in the Eastern Cape over the last twenty years is an increase in the size of some plantations and a larger number of these larger plantations. The analysis in Chapter VIII showed that this is an important factor that would lead to a continuation of production of pineapples for canning even though the price may be lower than a decade ago. What is needed then is a new supply curve in both the long- and short-run, for the marginal cost curve for the industry has changed completely.

during the 1958/59 season and so all other supply data is quoted opposite a price three seasons earlier.

The information in Table 88 is plotted in Figure 8. Along the Y-axis the price per ton paid by the canner is shown and along the X-axis, the quantities sold by the farmers. The year stated on the graph represents the price for that year, ending in June and production for a year ending in June three seasons later, as shown in Table 88 below. The results indicate a curvilinear relationship sloping steeply upward to the right in the beginning and then flatten out for higher production levels. In other words, the farmers' response to a change in price was extremely flexible (elastic) in the long-run at high price levels.

Table 88

AVERAGE PRICE PAID PER TON OF PINEAPPLES BOUGHT BY THE CANNERS AND ACTUAL QUANTITIES SOLD BY THE FARMERS THREE SEASONS LATER

<u>Season</u>	<u>Price per ton</u> £	<u>Sales by farmers three seasons later</u> ton
1938/39	4.40	6,097
1939/40	4.65	4,802
1940/41	5.30	7,064
1941/42	5.45	6,218
1942/43	6.15	3,735
1943/44	6.66	10,122
1944/45	7.28	13,703
1945/46	8.10	13,364
1946/47	11.00	24,915
1947/48	11.45	31,507
1948/49	10.65	16,261
1949/50	13.46	37,389
1950/51	13.20	48,650
1951/52	13.71	30,037
1952/53	14.66	48,029
1953/54	19.25	93,875
1954/55	16.81	72,381
1955/56	15.60	<u>103,114</u>
1956/57	12.79	
1957/58	12.35	
1958/59	8.80	

If a function is fitted to the information in Figure 8, it must be one that will not slope downward from left to right at any stage, but rather become asymptotic in the long-run where any further increase in price will lead to an almost infinite increase in the quantities supplied. At all times this curve should indicate a decrease in price associated with a decrease in production and an increase in price with an increase in production. The ordinary logarithmic function subscribes to this prerequisite and the corresponding curve for the data in Table 88 is shown in Figure 8. Apart from the sharp deviation between the actual and the estimated observations in 1956, when the production (1958/59) was still relatively high while price had already decreased substantially, the function gives a fairly close approximation to the data.<sup>7</sup>

Price ...../

7. The equation used was  $Y = a.X^b$ , where  $a = -.89$  and  $b = .4$ . The parameters  $a$  and  $b$  were estimated by fitting the regression line of  $\text{Log. X}$  on  $\text{Log. Y}$ .

Price information for three seasons for which the production response has not yet been revealed, is available in Table 88. Using the function in Figure 8 as a basis for prediction, deliveries for canning during the next three seasons can be calculated as follows:

1959/60 = 40,000  
1960/61 = 37,000  
1961/62 = 17,000

Preliminary information on the delivery of pineapples during the 1959/60 season indicates that deliveries are unlikely to decrease significantly from the previous season. This is supported by information on the age structure of pineapple plantations in the Eastern Cape, contained in Table 10. Assuming, because of the large percentage of South Africa's pineapples produced in the Eastern Cape, that this information can be taken as representative of the trend of the delivery of pineapples for canning in South Africa, the following pattern of change seems more likely:

1959/60 = 101,052  
1960/61 = 89,936  
1961/62 = 61,156<sup>8</sup>  
1962/63 = 64,825<sup>8</sup>

The reason then why the function in Figure 8 cannot be used to predict the future supply of pineapples for canning, is because of a change in the conditions of supply, i.e., the supply price for pineapples is expected to have decreased. Consequently, a new function is required to explain both the short- and long-term reaction of farmers to a change in the market price for their product. The possible decrease in the supply price for pineapples can be explained in terms of the reversal of two assumptions which were made as prerequisites for the plotting of the function in Figure 8. Firstly, areas more suited to the growth of pineapples did come into production during the eighteen years over which the data for the function applies. Information in Chapter III and in Chapter VI indicates that conditions in the more north-easterly regions of the Eastern Cape which were covered by the survey are clearly more suited for the production of pineapples than the remainder of the area. Plantings in the vicinity of East London, however, only assumed major proportions during the decade after World War II. Secondly, the rapid increase of pineapple prices after the war led to the establishment of relatively large plantations, larger and more numerous than in previous years. It seldom happened that one farm delivered pineapples in excess of three hundred tons before the war. To-day, such a plantation would be regarded as no more than average. Deliveries in the vicinity of 1,000 tons or more from one plantation are no longer an infrequent occurrence. These larger plantations can, as was indicated in Chapter IX, produce at a lower cost per unit than a small plantation in the same ecological region, all other factors being equal. The greater profitability of these large plantations, which was illustrated in Chapter VIII, would make them less responsive to a decrease in price, at least up to a certain point. This leads to the reversal of yet another assumption, namely, that the farmer will respond promptly to a change in

price ...../

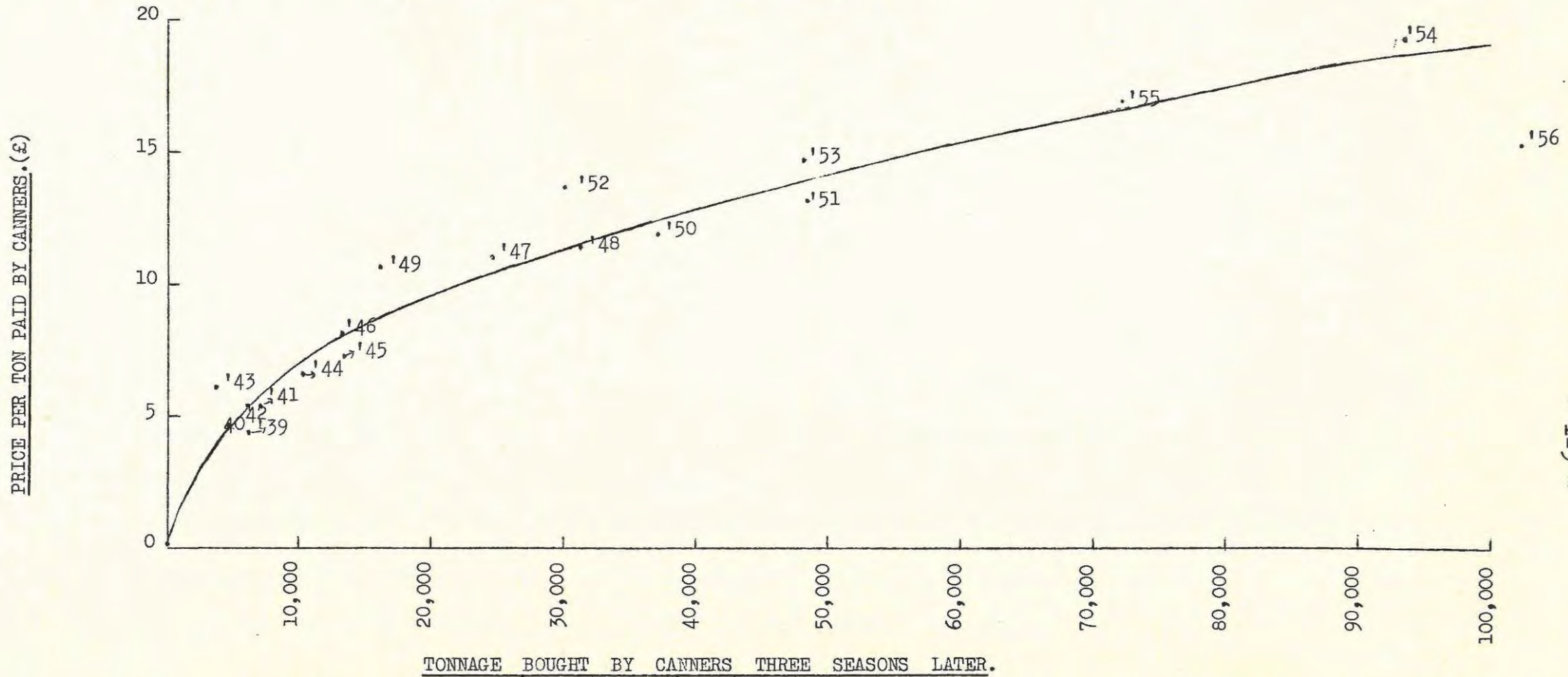
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8. This is based on the anticipated rate of replanting during 1959/60 as was indicated by the sample farmers at the time of the survey.

Figure 8 - LONG-RUN SUPPLY CURVE OF PINEAPPLES FOR CANNING.

PRICE PER TON AND QUANTITIES BOUGHT THREE SEASONS LATER.

(Date represents the price - year ending in June.)



SOURCE: Computed from information supplied by the South African Fruit and Vegetable Cannery Association.

Table 89

PINEAPPLE PLANTING PATTERN IN THE EASTERN CAPE TO THE  
NORTH-EAST AND SOUTH-WEST OF THE GREAT FISH RIVER BY VARIETY  
 (69 Commercial Pineapple Producers, E.C. 1959)

Season planted	North-east		South-west	
	Queens	Cayennes	Queens	Cayennes
	Number of plants (thousands)			
1955/56	2,290	5,625	5,050	3,144
1956/57	2,263	5,434	2,021	4,115
1957/58	1,642	5,403	1,292	3,203
1958/59	258	3,993	585	3,202
To be planted				
1959/60	625	4,450	540	2,931

Total deliveries for South Africa, based solely on the trend of pineapple planting in the Eastern Cape, are likely to decrease slightly during the 1959/60 season, but are estimated to decrease rapidly during the next two seasons until they reach a low of approximately 61,000 tons in 1961/62. During 1962/63 a slight increase in deliveries of about 3,000 ton is possible, due primarily to a higher intended rate of replanting indicated in the north-east for the 1959/60 season. The decline in the south-west, however, will continue. Any further increase in total deliveries during the 1963/64 season will depend almost entirely on an increase in price during 1960/61, the extent of such an increase, and the farmers' responses to it.

Taking each variety separately, the delivery of Queens for canning is likely to decrease by nearly 90 per cent between 1958/59 and 1961/62 as compared to a 30 per cent decrease for Cayennes.

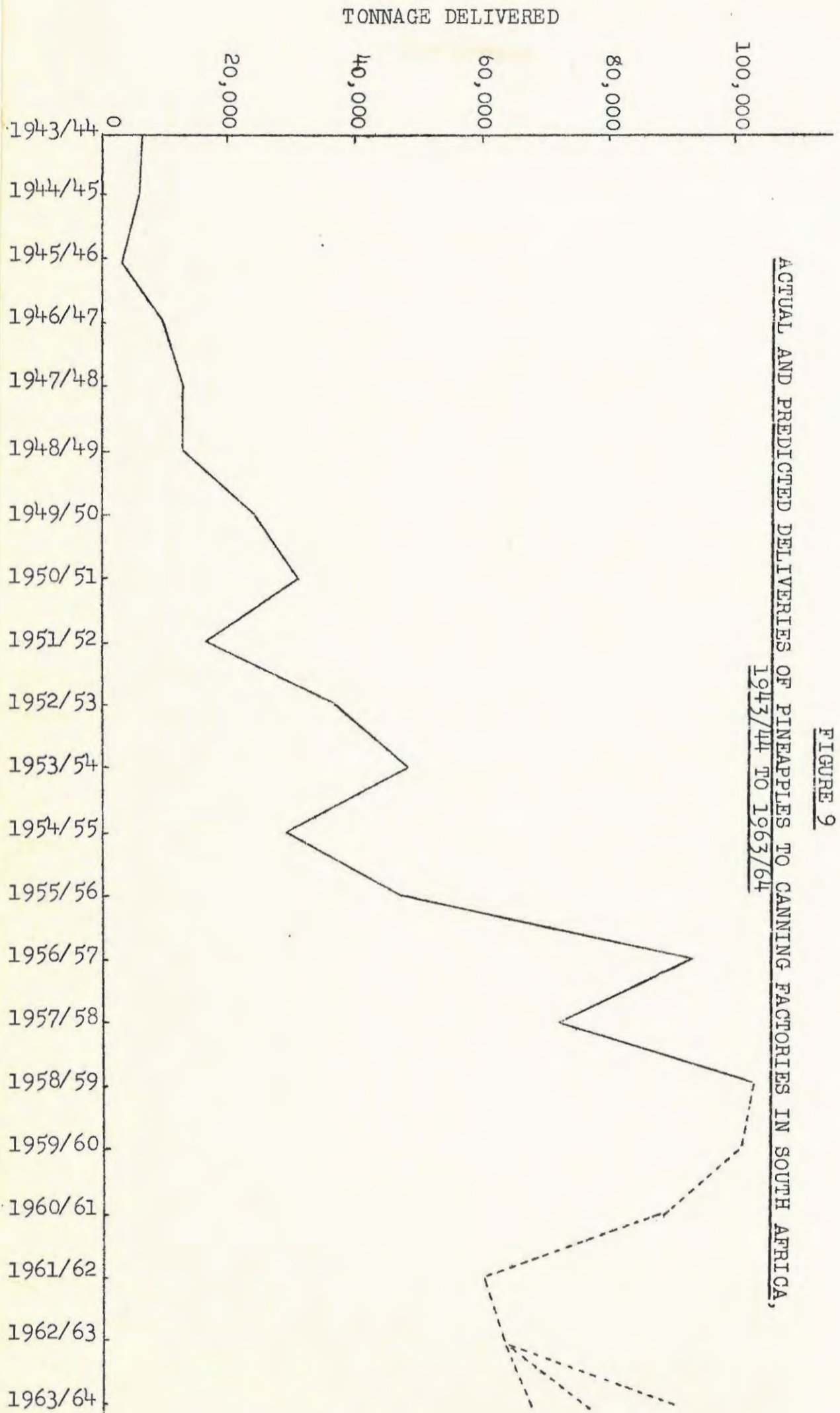


FIGURE 9



Chapter XI

THE DEMAND FOR PINEAPPLES

The relatively small domestic production of pineapples in South Africa cannot be absorbed locally. Of the nearly 15 million people inhabiting the country, no more than one-fifth can be classified in the group that would offer a ready market for the product of the South African canner. At a later stage in this chapter calculations will be made to determine the extent to which local consumption, especially of canned pineapples, can be expanded by means of further economic development. Under present conditions, however, the South African pineapple industry has to dispose of a large surplus of both fresh and canned pineapples on the overseas market against severe competition from other countries in a somewhat similar position, competing for the same custom.

In a discussion of the demand for pineapples, it is important to distinguish clearly between the demand for pineapples at the producer, and the demand for pineapples at the consumer level. "As the demand curve in the consumers market represents the final or real demand curve for the product, we may call this the primary demand curve. The demand in the producers' market is derived from the demand in the consumers market. This is, what sellers of goods going to the retail market are willing to pay is determined by their estimates of what prices the goods will bring less the margins charged by them for their services. The demand curve in the producers' market may in consequence be termed a derived demand curve."<sup>1</sup> The demand curve with which the farmer is faced is thus derived from another curve parallel to, and separated from the primary demand curve by the marketing margin for pineapples, whether they be fresh or canned. Lack of detailed information makes it impossible to distinguish between these two curves at all accurately. The data is more descriptive of the flow of goods from the producers to the consumers market and does not distinguish between them specifically. Especially in the demand of pineapples for canning, attention will only be directed to a stage in the market after the pineapple has already been put into a tin.

The utilisation of the South African pineapple crop

Prior to 1940 more than 50 per cent of the South African crop was consumed as fresh fruit either locally or overseas, for production was relatively limited. It is shown in Table 90 that at the commencement of World War II, the exportation of fresh pineapples was largely discontinued because virtually the 'only' market for fresh pineapples, namely Great Britain, was temporarily shut off from the trade. With the local market remaining restricted in its consumption and in order to avoid waste through decay, the canning industry, for the first time, took more than 50 per cent of the crop.

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Thereafter ...../

1. Waite and Trelogan, Op. cit. p.206.

Thereafter, the proportions steadily increased.<sup>2</sup>

Table 90

PERCENTAGE UTILISATION OF THE SOUTH AFRICAN  
PINEAPPLE CROP FROM 1938 to 1958

Year	Canning %	Fresh export %	Local fresh consumption %	Total %
1938	44	7	49	100
1939				
1940	49	5	46	100
1941	64	-	36	100
1942	61	-	39	100
1943	54	-	46	100
1944	55	-	45	100
1945	50	-	50	100
1946	58	-	42	100
1947	74	6	20	100
1948	85	-	15	100
1949	77	-	23	100
1950	71	3	26	100
1951	48	8	44	100
1952	60	10	30	100
1953	66	8	26	100
1954	52	4	44	100
1955	56	4	40	100
1956	89	3	8	100
1957	92	2	6	100
1958	90	4	6	100

Source: Calculated from information supplied in Fruit,  
Commonwealth Economic Committee, Op. cit.

Canned pineapple fruit and juice

Only a small percentage of all the canned pineapples produced in South Africa was consumed locally in recent years. Compared with 1950, when more than 30 per cent of local production was consumed on the domestic market, the 1959 figures show a decrease of more than 25 per cent so that the domestic market now takes only 6.6 per cent of the local production. The information in Table 91 indicates that the decreasing percentage which local consumption constitute of total production is due to the considerable increase in total production which could not possibly have been absorbed by the local population. While local production increased by more than 1 million cartons, each containing 24 x 2½ cans, local consumption seldom fluctuated by more than 50,000 cases and usually remained at a level lower than 100,000 cases. The

bulk ...../

- The utility of the canning industry to the pineapple farmer is perhaps best expressed in the words of a container manufacturers' advertisement: "On a hot day there is nothing more refreshing than a firm juicy pineapple. Yet, without its tough, protective skin a pineapple is as naked to the ravages of nature as an egg without a shell and that is why the canning industry is so vital to our fruit growers. Without the help of the modern canneries, a glut is as serious as a drought to the fruit grower. But sealed inside a can, fresh, ripe fruit is protected and preserved with all its freshness and goodness."

bulk of all exports went to the United Kingdom, although South Africa has exported to more than 85 countries over the last ten years.<sup>3</sup> Exports to countries other than Great Britain only began to assume major proportions during 1958 and 1959, primarily as a result of large purchases by other Western European countries, particularly Germany.

Table 91

MARKETING OF THE SOUTH AFRICAN CANNED PINEAPPLE PACK  
FROM 1950 TO 1959. (Cartons of 24 x 2½ cans)

Year	Production	Local market sales	Exports		Local market sales as per cent of production
			United Kingdom	Other Countries	
1950	250,293	82,271	219	141,008	32.9
1951	243,767	57,336	39,353	118,880	23.5
1952	181,027	56,953	114,868	52,583	31.5
1953	423,012	56,973	292,171	46,839	13.5
1954	806,588	64,440	619,989	23,983	8.0
1955	559,866	113,509	464,209	14,376	20.3
1956	782,937	57,767	625,299	19,819	7.4
1957	1,282,005	77,626	735,583	37,427	6.1
1958	1,495,220	78,798	1,162,022	253,367	5.3
1959	1,712,433	113,769	651,767	309,762	6.6

Source: South African Fruit and Vegetable Canners Association.

The pattern of consumption for pineapple juice manufactured in South Africa is similar to that for the canned fruit, although at lower levels - Table 92. The production of juice reached a peak in 1954 when more than 500,000 scheme cartons were produced. It then declined sharply and is now fluctuating in the vicinity of 300,000 cartons per annum. Of this production the local market seldom absorbs more than 10 per cent. From 5 per cent in 1951, it increased to 10 per cent during the following year, but has decreased again. These variations depend almost entirely on total production and the actual quantities exported. The United Kingdom provides by far the most important market for the local juice.

Table 92

MARKETING OF SOUTH AFRICAN CANNED PINEAPPLE JUICE  
FROM 1951 TO 1959. (Cartons of 24 x 2½ cans)

Year	Production	Local market sales	Exports		Local market sales as per cent of production
			United Kingdom	Other Countries	
1951	102,105	5,157	51,572	4,186	5.1
1952	98,035	10,217	140,662	7,810	10.4
1953	253,682	11,816	226,492	6,146	4.6
1954	518,608	13,719	420,482	4,753	2.6
1955	259,075	27,308	252,665	17,246	10.5
1956	175,787	18,032	140,777	28,815	10.3
1957	323,730	18,212	182,834	42,362	5.6
1958	273,251	15,589	227,559	50,431	5.7
1959	288,598	12,826	222,296	27,143	4.4

Source: South African Fruit and Vegetable Canners Association.

The ...../

3. Full details of the quantities of canned pineapple exports over the last ten years are recorded in Appendix III together with the country of destination.

Similar information is not available for South Africa, but it is important that local canners should know about, and try to reverse, any such trend if it is known to exist in the United Kingdom market. Although South Africa supplied only 34 per cent of the canned pineapple for this market during 1958, the United Kingdom market still bought by far the largest proportion of the total quantities exported by South African canners - Table 94. From 1.7 per cent of all the canned pineapple sold in the United Kingdom in 1950, the South African share of this market increased to 34.7 per cent in 1958 (see also Figure 11). During the same period, however, the South African canner was dependent on the United Kingdom market to a much greater extent. From 10 per cent of the total South African exports of canned pineapple going to the United Kingdom in 1950, the proportion increased to 87.5 per cent in 1953 and up to 1957, it was consistently higher than 90 per cent. In 1958 South Africa's share of this market suddenly decreased to less than 80 per cent. This proportionate decline in deliveries to the United Kingdom continued in 1959 when there was a further decline of 15 per cent over the previous year.

Table 94

TRADE OF CANNED AND BOTTLED PINEAPPLES PRESERVED IN SYRUP  
BETWEEN THE UNITED KINGDOM AND THE UNION OF SOUTH AFRICA

Year	United Kingdom imports from South Africa as percentage of total imports	United Kingdom imports as percentage of total South African exports
1950	1.7	10.2
1951	13.7	50.9
1952	27.4	74.5
1953	25.0	87.5
1954	27.0	95.1
1955	17.3	96.5
1956	21.6	95.8
1957	30.7	94.6
1958	34.7	79.5
1959*	-	64.5

\* Preliminary

Source: (a) Fruit, Op. cit.  
(b) Foreign Trade Statistics, Op. cit.

Local canners differed substantially in estimating the influence of price and quality respectively on the sale of their product on the overseas market. Some suggested that as long as the quality remained reasonable and the price was right, they would have no difficulty in disposing of their product. Others suggested that if the quality of their product was reasonable, they would be able to command a premium price for it, especially by selling under a buyer's label. This is supported by the fact that leading South African canners are now producing under the 'Del Monte' label, a famous American brand name of high repute especially in the United Kingdom market before the war. In evidence before a Parliamentary select Committee on the export of canned fruit and vegetables, Mr. E.D. Andrews\*\* said that "... before the

outbreak .....

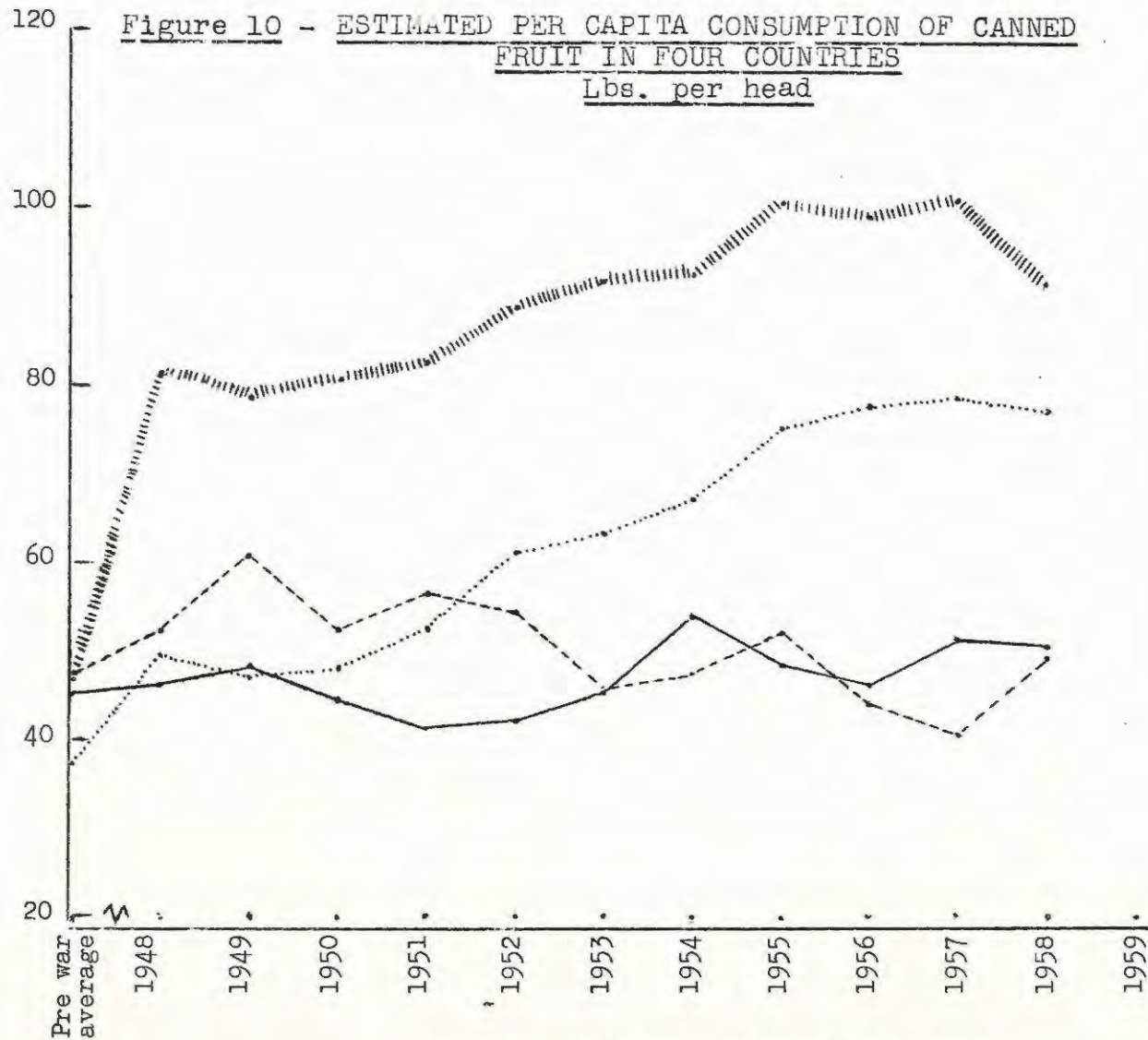
\*\* Mr. Andrews is at present Director of Export Promotion and formerly a Senior Trade Commissioner in London.

LBS. PER CAPITA (FRESH EQUIVALENT).

/B

Figure 10 - ESTIMATED PER CAPITA CONSUMPTION OF CANNED  
FRUIT IN FOUR COUNTRIES  
Lbs. per head

U.K. : ———  
AUSTRALIA : - - - -  
CANADA : ······  
U.S.A. : |||



SOURCE: COMMONWEALTH ECONOMIC COMMITTEE.  
OP. CIT.

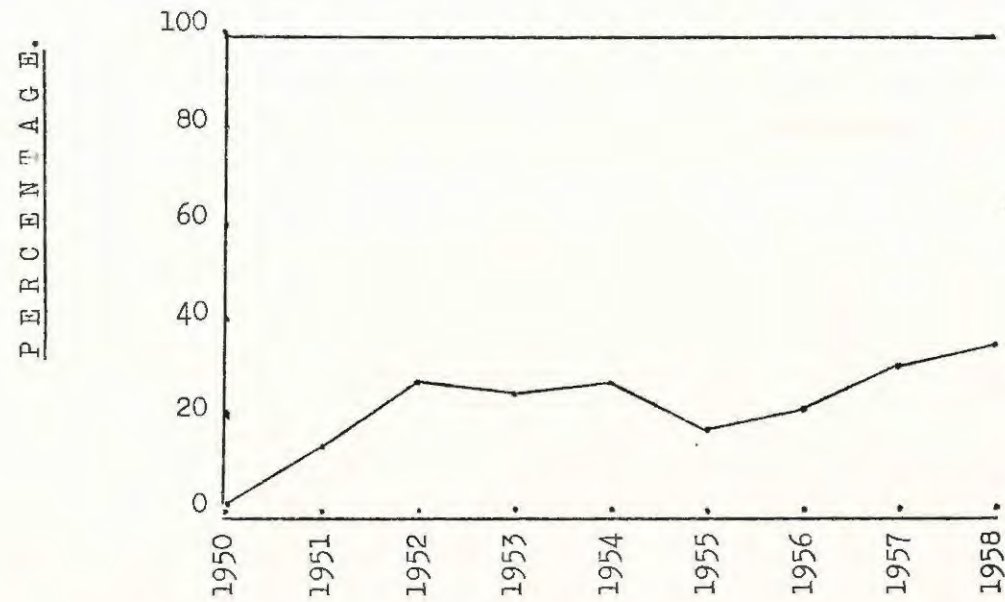
1.  $\frac{1}{x^2}$   
 2.  $\frac{1}{x^3}$   
 3.  $\frac{1}{x^4}$   
 4.  $\frac{1}{x^5}$

The graph shows the behavior of the functions  $y = \frac{1}{x^n}$  for  $n = 2, 3, 4, 5$ . The x-axis is labeled with values 1, 2, 3, 4, 5, 6, 7, 8, 9, 10. The y-axis is labeled with values 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0.



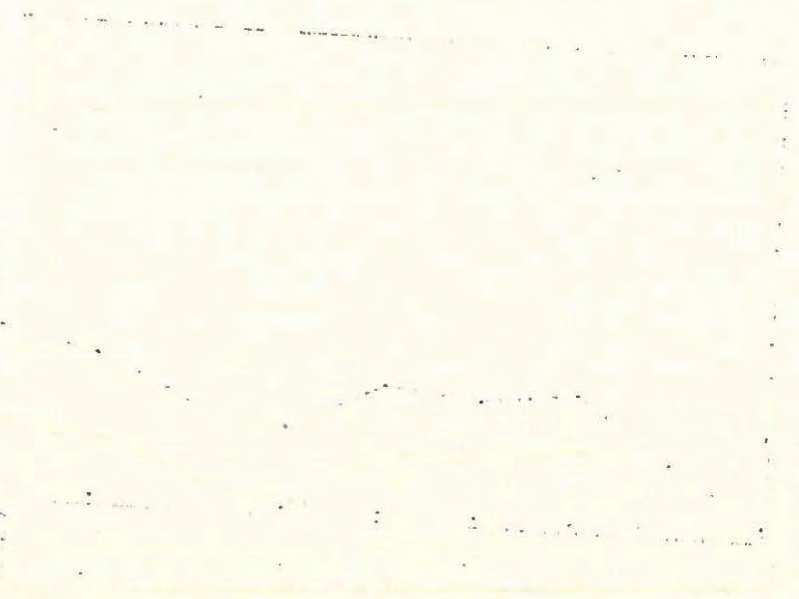
The graph shows the behavior of the functions  $y = \frac{1}{x^n}$  for  $n = 2, 3, 4, 5$ .

Figure 11 - PERCENTAGE OF TOTAL UNITED KINGDOM IMPORTS OF PRESERVED PINEAPPLE  
DERIVED FROM SOUTH AFRICA FROM 1950 - 1958.



SOURCE: COMMONWEALTH ECONOMIC COMMITTEE.  
FRUIT. OP.CIT.

11. 11. 1950



11. 11. 1950

outbreak of the war of 1939-45 and a long time before the Commonwealth canning industries, including those of South Africa, got under way, the predominant influence in the United Kingdom market was California. They sold their very important pack, the 'Del Monte' brand, which was at that time the predominant influence in the canned fruit market. That sold very well indeed and I mention this in order to show that this brand impressed itself on the mind of the English buyer as being the acme of perfection. In those days prices were, of course, relatively low, but the qualities of the American deliveries were, so I was informed by the London trading public, of a consistently high standard. The war, however, brought a complete change in the pattern of the market. The dollar shortage, U-boat warfare, rationing, and other factors necessitating supplies of canned fruit being sought from Commonwealth countries, although at first only on a fairly limited scale. Canned fruits of all kinds, no matter how mixed and conforming only to fairly loose specifications drawn up by the British Ministry of Food, were eagerly sought after and readily supplied by South Africa and other canners in the Commonwealth. With the passage of the war years and a lingering but relaxed rationing system of canned goods, the production of canned fruit in the Commonwealth rose steadily. Only about five years ago rationing in Britain came to an end and Commonwealth suppliers were at last free to supply everything the market demanded. Here it must be borne in mind that until 1958 the Californian product was, owing to acute balance of payment difficulties, practically debarred from the London market. With the disappearance of rationing, the British consumer snapped up as much canned fruit as he could be supplied with and may I add in parenthesis, that quality standards or price were hardly the criteria. Rising Commonwealth production ensued and there existed in the United Kingdom one of the biggest sellers' markets ever for South African canned fruit. It must be said to the credit of South African canners that that opportunity was exploited to the full, but on the debit side it must be pointed out that no great attention was paid to standards of quality approximating at least that of the California 'Del Monte' brand. The insatiable British market and inflationary pressures led to the United Kingdom authorities agreeing to the importation under the United States Mutual Security Aid programme of limited quantities of Californian canned fruit but not without strong resistance on the part of Commonwealth interests. Balance of payment difficulties caused the United Kingdom market to continue to depend for most of its canned fruit needs on Commonwealth suppliers, interspersed as necessity dictated, by supplies from the United States of America under the programmes of aid given to Britain. In 1955, however, there were already indications that the supply of canned fruit from Commonwealth countries was catching up with the demand on the British market. Apricots were already becoming a problem and pineapples were becoming a problem fast. Trade restrictions during 1956/57, lasting until the latter part of 1958, combined with a world trade recession, had the immediate effect of a retraction of trade and the market became suddenly highly selective. Low price levels caused by over-supplies ensued and in no time there was created a very strong buyers' market. The burden of increased supplies and the very real threat that the United States could at any time be given more liberty to supply their traditional market, did two things. In 1956 the Union introduced compulsory export standards for canned fruit and vegetables and during the season 1956-57 we saw the beginning of orderly marketing schemes under the act which is now under revision. In the latter part of 1958, trade restrictions were completely relaxed in the United

Kingdom and the authorities there also removed many other impediments to free trade and finance. But unemployment was rising, factories were working below capacity, intensified competition in canned fruits from the Argentine, Malaya and Japan and the greater liberalisation of American imports with a threat of complete removal of restrictions from imports from that country by the end of 1959 according to a statement made by the president of the British Board of Trade at Ottawa during the latter half of 1958, led to an understandable hesitancy on the part of the United Kingdom traders to commit themselves to Commonwealth supplies. We must bear in mind that at this juncture South African and Australian supplies were just about saturating the contracting British market and traders could afford to wait to see how far price levels would move downwards. We must also remember that there were sizable stocks of canned fruits which had been brought forward from the previous season's purchases and, in addition, the Argentine and Japan were rapidly coming into this competitive market. Substantial price cuts during the latter months of 1958 and the beginning of 1959, i.e. before the South African selling season started, had been made by wholesalers and retailers to move stand-over stocks of South African and Australian canned fruit, especially pineapples. Traders were, therefore, in no mood to take risks with the new season's pack and price indications were, generally, at levels much lower than those indicated under the marketing schemes under the present Act. It was, therefore, not surprising when our season opened to find price levels being from 2s. to 5s. less per carton. The United Kingdom market is and has been the main stay of the South African canned fruit industry but it is now a buyers' market and has many sources of supply to draw upon. It offers very great temptations to suppliers who are prepared to under-quote and it is now fiercely competitive in price as well as in quality. In other words, it is to-day perhaps one of the strongest selective markets which we have."<sup>10</sup>

The fact of the matter is that the South African canned fruit industry, especially in the marketing of pineapples, is highly dependent on an overseas market which has become saturated and highly selective in buying. The improvement of foreign exchange reserves of certain soft currency countries is now re-opening pre-war sources of supply which in the past, and still to-day, enjoy a high prestige value amongst consumers in the United Kingdom. Unless South African canned pineapples can compete favourably with regard to both quality and price, the disposal of canned fruit on the export market is likely to become increasingly complicated and costly.

South African canners revealed that until recently they did little to advertise their product, simply because the 'British consumer snapped up as much canned fruit as he could be supplied with'. Of the six companies visited in the Eastern Cape, only one had an active advertising campaign for the overseas marketing of its products. Others were relying either on a London office, agents, or a personal trip by the manager every once in a while to stimulate the market for their fruit.

Advertising the South African pineapple as such is complicated by the number of companies selling on the overseas

market .....

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10. Report of the Select Committee on the Export of Canned Fruit and Vegetables, June 1959, p.36. Printed by order of the House of Assembly, Cape Times Limited, Parow, Cape Town.

market and the fact that each company usually sells under more than one label. In giving the views of the Marketing Council with regard to the overseas marketing of South African canned fruit and vegetables, Dr. M.S. du Toit, Secretary for Agriculture suggested that the main problem "... with overseas marketing, as put to the Marketing Council, is the tendency to cut prices. It is also said that the great variation in quality of the South African products and the numerous trade-marks under which they are marketed overseas, harm the effective exploitation of the export markets. An intensive advertising campaign for South African products as a group, for instance, cannot under these circumstances be effective."<sup>11</sup> Meanwhile, the South African pineapple has to compete with pineapples and canned fruits from other countries which are extensively advertised. Australia, for instance, has only two exporters of canned pineapple, 90 per cent of which goes under one label. In addition, the Australian industry was receiving substantial assistance from the government to promote the overseas selling of pineapples. This was done in the form of a 7½ per cent promotional allowance to the buyer, who then decides to what use he is going to put it. The results were apparently most successful. Reliable sources indicate that the sale of Australian canned pineapple increased eleven times during the first six months of 1959 compared with a similar period during the previous year. South African sales, on the other hand, were down by 130,000 cases.

With the exception of a small canner who produces mainly for the local market, all the canners questioned were unanimous in saying that the South African canned product could never be sold under one label. Numerous reasons were put forward, but it centred mainly around quality variations between the products of the various canners and the established prestige of certain labels in the export market. In March 1960 it was reported that the buyers of canned fruit in London went mainly for 'top brands', especially those which are being advertised.<sup>12</sup> South African canners apparently also did well, but emphasis has been on buyer's labels - "a fact which must be taken as a sign that some buyers are heading the boycott threat and are getting round it by means of the 'Empire Produce' style on the label".<sup>13</sup> With limited shelf-space in every grocery shop, the buyer will limit his stocks of canned fruit to those brands which are likely to have been impressed on the minds of consumers by means of the various advertising media. "Television 'spots', large newspaper advertisements and hoardings all over Britain make it impossible not to know about the Australian cans. A South African in Britain has to search a little bit to see signs of advertising the fruit from his own country."<sup>14</sup>

#### Fresh pineapples exported

The pattern of demand for South African pineapples exported as fresh fruit is similar to that of canned pineapples in that it stems mainly from the United Kingdom.

Since ...../

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11. Select Committee Report, Op. cit. p.7.
  12. Food Industries of South Africa, March 1960, p.22. Odhams Press, Cape Town.
  13. Ibid.
  14. Eastern Province Herald, September 22, 1959.

Since 1948 there has been a tremendous increase in the export of fresh pineapples from the Union. It is shown in Table 95 that the first major increase occurred between 1949 and 1950, followed by another in the following year. Exports continued to increase up to 1953, but then suddenly decreased by about 40 per cent. Since then little fluctuation has been shown, although there is a noticeable downward drift. The increase in exports after 1948 was likely to have been prompted by a considerable increase in the per unit value of fresh pineapples for export. Between 1948 and 1951 the value per hundred pounds of fresh pineapples exported had doubled. For the following six years values continued at a high level and showed relatively little fluctuation; it never varied by more than £0.3 per hundred pounds of fresh fruit exported. In 1957, however, there was a sudden decline of £0.7 from the values for the previous year. The decrease continued through 1958 and 1959, and during the latter year, values were £1.1 lower than during 1956 - the lowest since 1948.

Table 95

QUANTITY AND VALUE OF FRESH PINEAPPLES EXPORTED FROM THE UNION OF SOUTH AFRICA, 1948 - 1959

<u>Year</u>	<u>Quantity</u> lbs. 000	<u>Value</u> £ 000	<u>Value per 100 lbs.</u> £
1948	156	3	1.8
1949	119	3	2.7
1950	2,581	89	3.5
1951	9,117	325	3.6
1952	9,755	334	3.4
1953	10,810	385	3.6
1954	6,224	224	3.6
1955	6,673	244	3.7
1956	5,391	184	3.4
1957	5,294	143	2.7
1958	7,831	188	2.4
1959*	7,064	159	2.3
<u>Total</u>	<u>71,013</u>	<u>2,283</u>	<u>3.2</u>

\* Preliminary

Source: Department of Customs and Excise, Pretoria

Information is not available on the proportions of fresh pineapples from South Africa which went to the United Kingdom before the war, but during the war exports ceased altogether for six consecutive years. As this period coincides with a time when no fresh pineapples were imported into the United Kingdom, it leaves the impression that, even before the war, South Africa was highly dependent on the British market for the sale of fresh pineapples. After the war, it was not until 1950 that South Africa began to export significant quantities, and in that year Britain took 91 per cent of the total pack - Table 96. During 1948, exports were mainly to other African countries such as Rhodesia, and to North America. In 1949 Africa still took the largest proportion of fresh exports, but the remainder now went to the Continent of Europe rather than America. In 1951 the percentage sent to the United Kingdom had increased to 98 per cent of the total, and has since remained above 90 per cent with the exception of 1956, when it fell to 87.6 per cent. Since 1950, when the rest of Africa went into second place as a sales area for fresh pineapples from the Union, it has

retained ...../

retained its relative position, but purchases were insignificant compared with the quantities bought by Great Britain.

Table 96

EXPORT OF FRESH PINEAPPLES FROM THE UNION OF SOUTH AFRICA FOR THE PERIOD 1948 TO 1959

Year	Destination					Total
	United Kingdom	Continent of Africa	Continent of Europe	North America	Other Countries	
	thousand pounds					
1948	0	49	0	31	1	81
1949	0	34	21	4	0	59
1950	2,282	182	0	0	44	2,508
1951	8,793	126	0	0	69	8,988
1952	9,480	107	0	0	72	9,659
1953	10,443	161	0	0	76	10,680
1954	5,736	253	0	0	77	6,066
1955	6,296	261	38	2	77	6,674
1956	4,724	265	313	0	89	5,391
1957	4,787	390	12	0	105	5,294
1958	7,280	488	3	0	60	7,831
1959*	6,482	512	5	0	63	7,062
Total	66,303	2,828	392	37	733	70,293
	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent
1948	0	60.5	0	38.3	1.2	100.0
1949	0	57.6	35.6	6.8	0	100.0
1950	91.0	7.3	0	0	1.7	100.0
1951	97.8	1.4	0	0	0.8	100.0
1952	98.1	1.1	0	0	0.8	100.0
1953	97.8	1.5	0	0	0.7	100.0
1954	94.5	4.2	0	0	1.3	100.0
1955	94.5	3.9	0.6	0	1.2	100.0
1956	87.6	4.9	5.8	0	1.7	100.0
1957	90.4	7.4	0.2	0	2.0	100.0
1958	93.0	6.2	0	0	0.8	100.0
1959*	91.8	7.3	0.1	0	0.8	100.0
Average	94.3	4.0	0.6	0.6	1.0	100.0

\* Preliminary

Source: Calculated from information supplied by the Department of Customs and Excise, Pretoria.

Unlike the position regarding canned pineapples, South Africa has been supplying a major proportion of the total intake of fresh pineapples by the United Kingdom market, especially since the war. From information contained in Table 97 it will be noticed that South Africa seldom supplied more than 30 per cent of the total quantities of fresh pineapples imported into the United Kingdom before the Second World War. Large quantities were then supplied mainly by the Azores. During the war, the United Kingdom imported no pineapples whatsoever. In 1946 imports again started on a small scale, but increased tremendously in the following year due to a large consignment received from the United States. In 1948 there were again no imports, but small supplies arrived in 1949 and thereafter increased to a level considerably higher than before the war. Of the total imports, South Africa supplied 19 per cent in 1947 and 47 per cent during 1950. In

1951, however, South Africa's share of the market suddenly increased to more than 80 per cent of the total. It remained above 80 per cent for the following three years, but then decreased by more than 12 per cent between 1955 and 1957. In 1958 it was again slightly above 80 per cent.

Table 97

UNITED KINGDOM IMPORTS OF FRESH PINEAPPLES FROM SOUTH AFRICA  
AS A PERCENTAGE OF TOTAL PINEAPPLE IMPORTS, 1928-1958

Year	Tonnage from South Africa	Total tonnage imported	Imports from South Africa as per cent of total
	(thousand tons)		
1928	0.3	2.3	14.1
1929	0.5	2.8	18.5
1930	0.3	2.9	9.4
1931	0.2	3.3	6.4
1932	0.4	3.4	11.6
1933	0.6	2.9	22.0
1934	0.8	2.7	30.2
1935	0.8	2.9	26.5
1936	0.9	2.3	38.1
1937	0.4	2.0	17.6
1938	0.6	2.9	20.7
1939			
1940	0.5	0.8	62.5
1941	-	-	-
1942	-	-	-
1943	-	-	-
1944	-	-	-
1945	-	-	-
1946	-	0.3	-
1947	1.0	5.3	18.9
1948	-	-	-
1949	-	0.2	-
1950	1.0	2.1	47.6
1951	4.0	4.7	85.1
1952	4.4	5.1	86.3
1953	5.0	5.6	89.3
1954	2.9	3.4	85.3
1955	3.0	3.7	81.1
1956	2.4	3.3	72.7
1957	2.2	3.2	68.7
1958	4.1	5.1	80.3

Source: Commonwealth Economic Committee, Fruit, Op. cit.

The increasing importance of South Africa as a supplier of fresh pineapples to the United Kingdom is clearly illustrated in Figure 12 on the following page. The area between the base line and the graph depicts the quantities supplied by South Africa and how far it falls short of the total intake which equals 100.

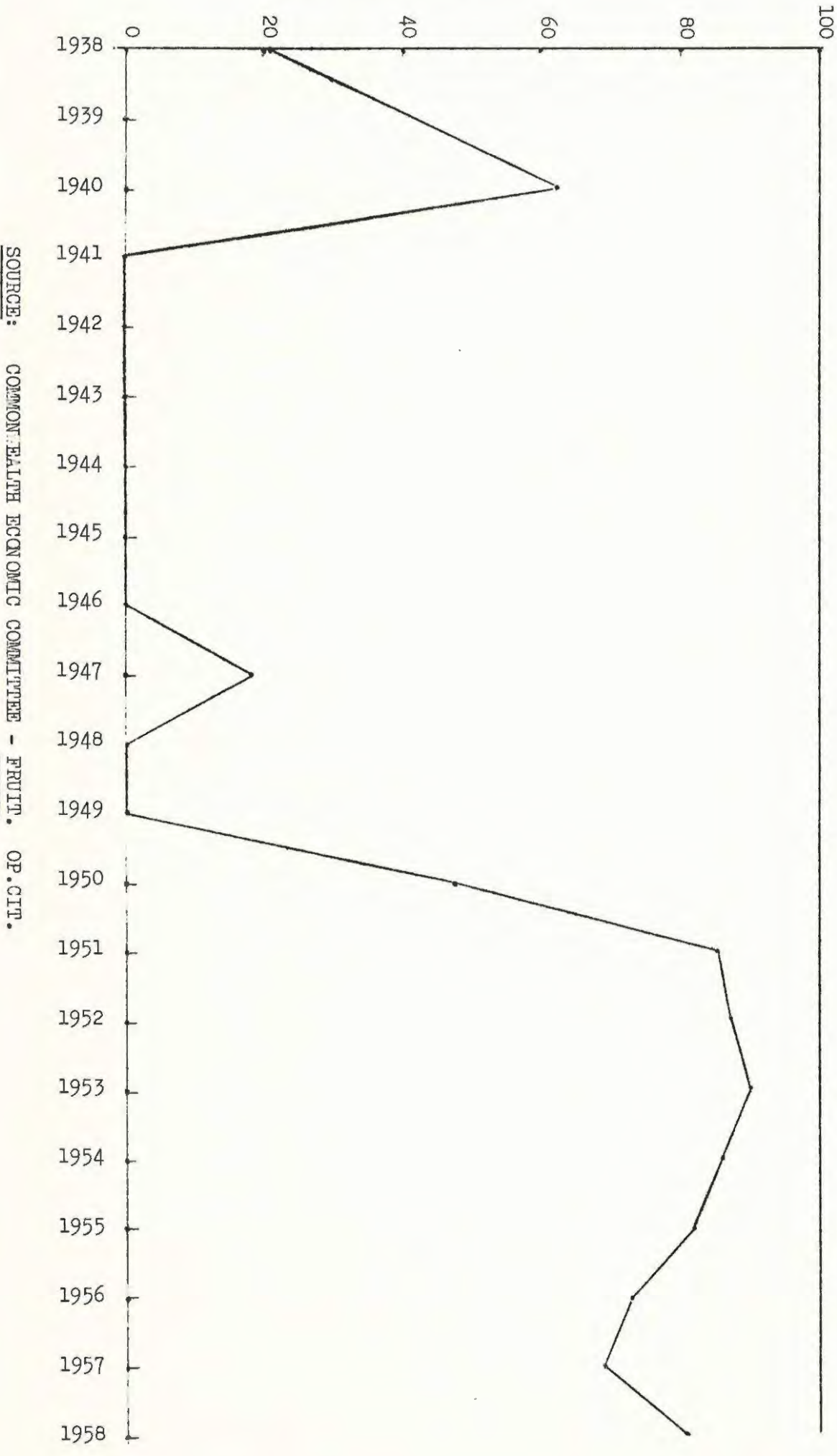
Outside the United Kingdom, South West Africa and the Rhodesias constitute the most important markets for fresh pineapple exports from South Africa. Large quantities were, however, exported to West Germany during 1956.<sup>15</sup> Table 98 contains a list of countries that have been importing large

quantities ...../

15. Full details of the quantities of fresh pineapple exports over the last ten years are recorded in Appendix IV together with the country of destination.

PERCENTAGE.

Figure 12 - PERCENTAGE OF UNITED KINGDOM FRESH PINEAPPLE IMPORTS DERIVED FROM THE UNION OF SOUTH AFRICA



SOURCE: COMMONWEALTH ECONOMIC COMMITTEE - FRUIT. OP. CIT.

1958  
 Argentine C  
 3.0  
 3.0  
 2.6  
 2.9  
 3.4  
 2.9  
 2.9  
 2.1  
 3.1  
 n.a.  
 4.9  
 3.2  
 4.2  
 2.0  
 4.0  
 2.0  
 6.3  
 4.7  
 13.1  
 23.3  
 27.7  
 9.5  
 S.W.L.

given increase in real income for the poorer section of the population will therefore lead to a more significant change in the pattern of consumption as compared with the rest of the population.

The aggregate supply for food is equally inelastic in the short-run. This is due primarily to three reasons:<sup>2</sup>

- a) the amount of land, labour and money on the average farm is more or less fixed in the short-run,
- b) factors of production, i.e., land labour and capital, used for the production of food and fibre, cannot easily be shifted from their present uses,
- c) farming is not merely a business, but is also a way of life, and the farmers are often reluctant to respond to the changes of the price mechanism; especially when it amounts to moving out of farming as opposed to adjusting production to another commodity.

To meet the ever-increasing demand for food as a result of population and real income increases, farmers must rely on the adoption of new and improved farming techniques and on increasing the area under production. The latter method used to be dominant during the days of the Great Trek, but to-day South African farmers must rely more and more on improved technology for larger production.

The cause of agricultural price fluctuations would appear to be a result of the ceaseless race between the aggregate supply of, and the aggregate demand for, farm products; a race between population growth and real income changes on the one hand, and the development of new land and technology on the other. This is not a movement around a given point, but a dynamic movement of supply and demand around a constantly changing equilibrium level. The movement is caused, not by supply or demand alone, but by both, each reinforced by different and unrelated factors. The myth in agricultural economics is the belief that these forces can be controlled and that prices will at some time be stable. In reality, farm prices will always fluctuate, but something can be done to lessen the burden caused by the often extreme nature of these fluctuations.

To-day it has become the responsibility of society to protect those of its members who suffer as a result of economic maladjustment, whether it be deep depression or violent inflation. Any such help given to curb the fluctuations of agricultural prices, provided it is agreed that the market should not be allowed "to play itself out freely", must not lose sight of the main function of price "... to ration available supplies of goods between would-be buyers, and to allocate the various factors of production to those goods which are most demanded".<sup>3</sup> The loss resulting from a less than optimum combination of resources in agriculture cannot easily be determined and probably has little significance for the individual farmer. It is felt mainly by society

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2. Cochrane, Op. cit. p.44.

3. Cohen, R. - The Economics of Agriculture, p.165. Cambridge University Press, 1955.

as a whole in so far as it will lack the benefit of additional wanted farm products. The most desirable form of interference will therefore be the one that allows a certain amount of flexibility so that prices may continue to function in the allocation of resources and justice be done to both the consumer and producer.

The demand for any one variety of food is usually more elastic than the demand for all food. The limited capacity of the individual will not allow him to consume larger quantities of all varieties of food indefinitely, but he will be able to substitute more of one variety for less of another. For a while a person can stop eating all other varieties of food and live on pineapples alone. For many people in most countries, however, pineapples are a luxury and, even should they desire to do so, they will not be able to make them part of their regular diet. If circumstances should then arise whereby restrictions have to be placed on the overall consumption of food, pineapples are likely to be one of the first varieties to be affected. On the other hand, when these restrictions are again lifted, the consumption of pineapples is likely to increase proportionately more than some other varieties of food, e.g. bread, which may in fact decrease.

This is exactly what happened before and after the Second World War. There was the curious coincidence of a simultaneous decrease in supply and demand. Western European countries discontinued the importation of pineapples at much the same time that the war in the Far East destroyed large plantations in Malaya and Formosa. After the war when restrictions were lifted, particularly in Great Britain, supplies were generally limited and prices increased.

Any measure devised for the control of the pineapple industry in South Africa is inevitably faced with the additional burden of trying to regulate the forces of supply and demand in a market falling outside the jurisdiction of the legislation under which it was instituted. As such, its task of reducing pineapple price fluctuations is infinitely more difficult.

#### The controversy over control

Widespread opposition has been voiced to control in South African agriculture both before and since the passing of the Marketing Act in 1937. In a report published in 1934, the Commission of Inquiry into Co-operation and Agricultural Credit found itself unable to support the principle of selling agricultural produce through one channel by means of boards of control. "The Commission is of the opinion that the competitive marketing system, although in its application in South Africa not free from undesirable features, has proved itself capable of fulfilling the functions of marketing efficiently and the Commission feels that assisted and strengthened by co-operative marketing organisations of producers, the system holds promise of even greater efficiency in future."<sup>4</sup> Where large proportions of the final product were involved in international trade, the Commission felt that

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4. Report of the Commission of Inquiry into Co-operation and Agricultural Credit, Op. cit. p.24.

a local board of control would not be effective in controlling either supply or price on the foreign market: "... it is clearly impossible to control world production. On the supply side it is world production and not the production of individual countries which determines price. Countries that have attempted to control price through controlling supply, have invariably been the losers."<sup>5</sup>

Apart from more detailed scrutiny of specific marketing schemes, other criticism of control generally echoed the "Laissezfaire" theme of the Commission's report.<sup>6</sup> Control schemes for various agricultural products, especially if not well co-ordinated, can greatly hinder the use and adjustment of resources into more productive avenues.

In spite of the report of the Commission on Co-operation and Agricultural Credit in 1934 and other criticisms of control, the Union's Marketing Act was passed in 1937, being an adaptation from similar legislation passed earlier in the nineteen thirties in Britain, Canada and Holland. "In the Union, as in these and other countries, the legislation was the outcome of a long-felt desire by farmers that they be given an improved bargaining power in the sale of their produce. When numerous primary producers have to sell to the limited number of primary buyers, or in competition to individual consumers, their position is as weak as that of employees contracting individually with large employers. The development has consequently been towards the closed shop and collective bargaining in the industrial field and towards the grant of statutory powers for organised marketing in agriculture."<sup>7</sup>

The passing of the Marketing Act did not end the controversy about control. In 1943 a Distribution Costs Commission was appointed to investigate, amongst other things, "... the desirability or otherwise of maintaining or extending the existing control of private enterprise, with special reference to the question of prices and the maintenance of reasonable standards of service to the public, more particularly in relation to the post-war period, and to make such recommendations in regard to matters aforesaid as it may deem fit".<sup>8</sup> In reporting on the feasibility of control schemes for agriculture, the Commission stated that the mere fact of controversy between 'control' or 'private enterprise'

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5. Report of the Commission of Inquiry into Co-operation and Agricultural Credit, Op. cit. p.15.
  6. Richards, C.S. - "Subsidies, Quotas, Tariffs and the Excess Cost of Agriculture in South Africa." The South African Journal of Economics, September 1935, Vol.3, No.3.  
  
Leslie, R. et. al. - "Economists' Protest" - South African Journal of Economics, March 1938.  
  
Tinley, J.M. - "Control of Agriculture in South Africa." South African Journal of Economics, September 1940.
  7. Report of the National Marketing Council on the Marketing Boards, 1938/46, p.1, U.G.27, 1947, Cape Times Limited, Cape Town, 1947.
  8. Distribution Costs Commission, Op. cit. p.1.

renders any dogmatic assertions dangerous and unreasonable. They therefore took it as their aim to refrain from adopting the doctrines of any particular school.

In making their final recommendation on the Marketing Act, the Commission said:<sup>9</sup>

- "i) that the Marketing Act as a piece of enabling legislation should be retained;
- ii) that all schemes promulgated under the Act should have for their object not only the promotion of healthy and stable agricultural enterprise, but in carrying out this policy the fullest consideration should be given to the nutritional needs of the people;
- iii) that in general the attainment of this last objective necessitates and justifies a greater degree of state regulation and control over the marketing and distribution of food, than is called for when dealing with commodities less basically necessary to the people."

The Marketing Act, according to the Commission, should, however, not be regarded as the producers' Magna Charta. "It seems to us that if the control board system is to make a real contribution to the national welfare in the future it should be regarded and organised as an instrument to serve the ends of the consumer as faithfully as that of the producer."<sup>10</sup> This noble aim of the Commission set for control boards is not actually realised, for "... when we strip all the gimmicks and trappings from marketing programs and get down to what they are really supposed to do, we find that their basic job is to make more money for the farmer. The consumer is given nodding recognition in passing, but it is the farmer's profit which is the main thing to be improved by the program. Whether this is right or wrong is another question, but is something which should be borne in mind. In fact, the title of the Agricultural Enabling Act might be rephrased to read; an Act to enable farmers to make more money."<sup>11</sup>

A control board under the Marketing Act would have no control over the disposal of the processed pineapple in the overseas market, unless the board acquired its own canneries. In evidence before the Select Committee on the Export of Canned Fruits and Vegetables it was suggested that, for a control board to be effective, it must have powers to control the marketing and handling of fruit from the moment it leaves the farm until it is purchased by the consumer, whether as fresh or processed fruit. "We would like to furnish further information to you in regard to our suggestion that the Marketing Act be amended so as to make provision for a control board to exercise control over the marketing of canned

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- 9. Distribution Costs Commission, Op. cit. p.33.
  - 10. Ibid. p.32.
  - 11. Hoos, Sidney - The Marketing Program; the basic problem. Address at the symposium on marketing, sponsored by the Committee for the Improvement of the Marketing of Washington Agricultural Products, at the University of Washington, Seattle, Washington, March 22, 1957.

products overseas, because we are convinced that such a control board, if correctly constituted, will be of greater value for both canner and producer, than a board constituted on the lines of that of Australia."<sup>12</sup> Other witnesses expressed their doubts regarding the ability of a control board to handle and solve the problems of marketing the South African canned pack overseas. "We can produce the fruit and put it into a can, but we cannot tell the consumer what he is going to pay for it and when he is going to eat it."<sup>13</sup> In other words, when a particular variety of fruit is sold on a foreign market against the competition of that same variety of fruit from other countries (or, overseas and locally, against competition from other varieties of fruit), it is unlikely that the channelised selling of that fruit will eliminate price fluctuations. There is the possibility, however, that it might enable the South African product to compete more effectively. As long as these fluctuations continue in the price of the processed article on the overseas market, they will be relayed to the farmer through the marketing system and, because of the marketing margin, be more severely felt by him.

With the conflicting views expressed in evidence before it, the Select Committee was reluctant to recommend any change in the legislation at present governing the overseas marketing of South African canned fruit and vegetables. The Committee felt that the recommendation to establish a control board for the canning industry under the Marketing Act of 1937, fell outside the scope of its terms of reference. However, the Committee thought it desirable "... that it be reconstituted as a commission of enquiry during the recess to investigate all aspects of the canning of fruits and vegetables in the Union, as well as the system of marketing and distribution of fruit and vegetables, either canned or intended for canning, and make recommendations regarding the measures to be taken to assure the orderly marketing of South African canned fruit and vegetables on markets outside the Union, and not only overseas."<sup>14</sup>

#### A pineapple control board

Although no results of such an inquiry are yet available, pineapple farmers, through a sub-committee of the South African Agricultural Union, have thought it desirable to request that a control board for pineapples under the Marketing Act be instituted. Such a board would have complete control over the marketing of the fresh product, both locally and overseas, including the sale of fresh fruit to the canners, but not the sale of the processed product on the external or local market, except in so far as it may have been processed under the auspices of the board itself.

It is important to emphasise that a control board, in itself, is only a device or tool which does not automatically provide solutions to marketing problems. "As

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12. Report of the Select Committee on the Export of Canned Fruit and Vegetables, Op. cit. Evidence by Mr. G.H. Whitehead, p.100.

13. Ibid. Evidence by Mr. E.M. Gant, p.110.

14. Ibid. p.vii.

with other tools, the effectiveness and results of such a marketing program depends on the skill and judgement of the operators and the nature of the problems involved."<sup>15</sup> Broadly speaking, control boards under the Marketing Act can make use of a number of provisions contained in the Act for the achievement of their objectives. The main elements of these provisions are usually connected with the control of volume, price, quality, size, grade, packing; advertising and sales promotion; research and the prohibition of unfair trade practices. In the next few pages an attempt will be made to evaluate each one of these provisions as a possible way of diminishing price fluctuations and increasing the returns of the pineapple producer.

a) Volume Control:

"In general, the smaller the proportion of a commodity covered by an order, the less effective the program will be in raising prices."<sup>16</sup> It has been shown that, apart from South Africa producing only a small percentage of the world's total supply of pineapples, this supply cannot be absorbed locally. South Africa, therefore, has to compete directly with other producers of pineapples in a highly competitive market. The feasibility of controlling the volume of local production in order to restrict the quantities on the open market for pineapples, is thus doubtful. Where the local market consumes the bulk of both the fresh and the canned product, it would be more feasible to increase prices through the restriction of quantity.

It must be remembered, however, that the competition for pineapples from one source of supply in any given market is not necessarily only the pineapples from another source coming to the same market. Pineapples have already been called an impulse product and, as such, face competition from all other fruits in the rush for a larger share in the consumer's food expenditure. On the assumption, then, that a large proportion of the local crop is consumed on the local market as either fresh or canned fruit, any limitation of the volume that leads to an increase in price should only be undertaken after the most careful consideration. The slightest increase in the price for pineapples paid to the producer, which is also reflected in the price which the consumer has to pay, immediately increases the competition of pineapples with all other fruits, which is likely to result in a decrease in purchases which will more than offset the benefit to be derived from an increase in price. In other words, the demand curve for pineapples is likely to be extremely elastic in most markets so that any increase in price is likely to lead to a substantial decrease in the quantity the consumer will be prepared to buy at a particular price.

The success of volume control or restriction will, on the other hand, also depend on whether the decrease in price which aroused the need for volume control was due to a decrease in demand and whether this decrease was temporary or permanent, or whether it was due to oversupply. "Restriction is

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15. Hoos, Sidney - Agricultural Marketing Orders and Agreements; Their Objectives, Operations and Results. A statement prepared at the request of the North Carolina Bankers Association.

16. Ibid. p. 2

economically unsound as a means of meeting a permanent decline in the demand for the product of a particular industry during times of general prosperity, and is more than likely to intensify the difficulties of the inevitable readjustment of resources; but in times of general depression it may be justifiable until general recovery is under way, since in the depths of a depression the readjustment of resources will probably present the maximum of difficulty. Restriction is economically sound, as a means of meeting a temporary decline in the demand for the product of a particular industry, both during times of general prosperity and of general depression, provided that no substantial proportion of the productive capacity is in an advanced stage of obsolescence, this proviso being of special importance if there is any tendency towards excess capacity before the demand declines. Restriction can at no time be a cure for troubles arising from excess capacity, unless the productive technique of the industry in the widest sense of the term is virtually stationary - a condition which is nowadays most unlikely to be fulfilled."<sup>17</sup>

Viewed in its true perspective, it does not seem as if the control of the volume of pineapple production in South Africa is likely to benefit the producer at any time in the near future. It is more likely that foreign exchange may be lost to the country as a result of volume control in a highly competitive market. Reflecting on the factors which influence the degree of financial success in farming, it will be remembered that price, in spite of being at a low level at the time of the survey, appeared to be less important at this stage than some other factors such as size and the environment in which production is taking place. The decrease in price which occurred over the last few years will tend to eliminate the more 'marginal' producers. The result of this will be that those remaining are likely to be 'intra-marginal' producers who can continue production at a low price and still show a handsome profit. This will strengthen the competitive position of the pineapple canning industry on the overseas market; an industry with a product which makes it vital to keep its share of the market rather than to risk losing it by increasing price through artificial means. Because of its dependence on the overseas market, South Africa cannot afford to keep pineapple farmers in production in areas, or under conditions, which are not suited for the production of the product.

b) Quality Control:

The importance of quality control in a highly competitive market cannot be overemphasised and it is equally important that each grade, whether it be determined on the basis of size or maturity, should reflect real differences in consumers' preferences. This applies equally to fresh and canned fruit.

Canners in the Eastern Cape were on the whole agreed that the processing of pineapples is adversely affected by irregularities of quality from season to season. The various grades of fruit should be clearly defined by a board of control and payment should be made according to the grade of the fruit at the time of delivery. In some circles there is the feeling that a rigid standard for fruit is undesirable and should be adjusted from season to season depending on

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17. Rowe, J.W.F. - Markets and Men, p.216, Cambridge University Press, 1936.

climatic conditions. "The climatic conditions in New Zealand and Australia are very similar to those in South Africa. It is therefore often the case that drought conditions occur in all three of these countries in the Southern Hemisphere during the same season. The products of all three countries are then not of the highest quality, but it is possible to sell them, as consumers are prepared to buy such products in the absence of any better product. For that reason it is impossible to lay down a rigid standard and say that, if any product does not conform to that standard, it shall not be exported. We maintain that the standards laid down should be based on market conditions overseas and on the quality of the products of other countries with whom we have to compete."<sup>18</sup>

The wisdom of such an approach to the grading of pineapples for canning is doubted. The strongest competition for South African pineapples does not come from countries in the Southern Hemisphere, nor does it come from pineapples only, as has been pointed out earlier. It is neither feasible to argue that "... Economic circumstances, however, would simply compel such a person to switch from producing unpopular products which cannot be sold, to producing products which it is indeed possible to sell."<sup>19</sup> The pineapple industry of South Africa cannot afford the consequences of variation in the quality of its products marketed under a label saying 'made in South Africa'. Competition is far too keen on the overseas market for that to happen. The quality of products sold under a buyer's label, especially a buyer's label with great prestige value, cannot simply be varied radically from one season to the other because the quality of the raw material has changed during that particular season. Only when South Africa absorbs the bulk of its own produce, which is wishful thinking at present, will such a system of grading be at all acceptable, and then not without undesirable consequences on the market for this 'impulse product'. In the long-run the pineapple-producing industry is likely to benefit more by assuring that any local grade compares favourably with a similar grade elsewhere and that the quality of that grade does not vary to any marked extent from one season to the next. This can lead to a loss of confidence by the consumer in the reliability of quality standards for South African fruit.

c) Price Control:

Frequent reference has already been made to the extent of price variation between different consignments of pineapples of the same quality during any given season, whether it be intended for canning, fresh export, or local fresh consumption. For obvious reasons, it is unlikely that a board of control will be able to lay down prices for the sale of fresh fruit either locally or overseas. By organising a pool and information service, however, it would be possible to obtain a more equal distribution of pineapples between the markets in the Union and overseas and so obtain a more equitable price for the producers selling fresh fruit.

The board can fulfil a valuable function by assuring a fixed price to be paid by canners for the various grades of

fruit ...../

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18. Report of the Select Committee on the Export of Canned Fruits and Vegetables, June 1957. Evidence by Dr. P.G. le Clus, p.90, Cape Times Limited, Cape Town.

19. Ibid. p.91.

fruit every season. Such a price would be determined through the negotiation of the members of the board representing the canning industry and those representing producers. Although bargaining power is likely to be in the hands of the canners, especially during times of over-supply or a slackening in the demand for the processed product, it will have the decided advantage of forcing all canners to pay the same price for the various grades of fruit that they purchase. Even though the raw material constitutes only 25 per cent of the cost of the processed product, the advantage certain canners had during the recent past of buying pineapples at bargain prices gave them a further advantage in the pricing of their product in a highly competitive market. The decrease which resulted in the price of the entire canned pack had almost disastrous consequences for the industry as a whole. The negotiation of a fixed price will not eliminate the possibility of price competition between canners in the consumers' market, nor will it stabilise the price paid to the primary producers from season to season. What it will do, however, is to assure that the same price is paid to every farmer for a given grade of pineapples and limit competition between canners to efficiency in processing rather than to the payment of prices exploiting the farmer. This will lead to the reallocation of resources in farming over a period of time to the point where the industry will eventually be restricted to those areas most suited to the production of pineapples. This, together with relatively cheap and plentiful labour supplies and a comparatively high yield for pineapples in the more intra-marginal production areas, should enable the pineapple industry of South Africa to compete favourably with other producing areas in the foreseeable future.

Most recent information about the formation of a pineapple control board indicates that the regulation of price between producer and processor will be the main aim of the board. "A representative conference of pineapple growers, which met in Pretoria under the aegis of the South African Agricultural Union's Pineapple Committee, has unanimously agreed upon a control scheme under the Marketing Act, it was announced to-day. The scheme will, in the first place, be limited to pineapples intended for processing but, if desired by growers, it could be extended to include local and export fresh fruit ... To keep operating costs as low as possible, it was decided that only a small control board should be set up, having as its primary function the negotiation of prices between growers and processors."<sup>20</sup>

d) Research:

"Most research projects under provisions of a marketing program are of a relatively short-term basis. When the money is provided by direct assessment upon the industry, there is a natural desire for prompt results. Most fundamental research takes a long period of time and yields recorded results slowly. Consequently, short-term research in current operating problems is more suited for a marketing program project; however, either type of research is permissible under authority granted."<sup>21</sup>

Research ...../

20. Eastern Province Herald, Port Elizabeth, August 19, 1960.

21. California Department of Agriculture, California Agricultural Marketing Programs. Bulletin No.1, Vol. XLV, 1956.

Research most needed by the local pineapple industry is likely to be of a long-term nature. It is not certain which areas are most suited to pineapple production, especially within given regions, but it is as much in the interest of the farmer as it is of a control board that pineapples should only be produced in those areas most suited to them. "In order to get a better understanding of our pineapple growing conditions, it is of utmost importance that a thorough study be made of the temperature variations in all our pineapple producing provinces, and also the sunshine and rainfall conditions because of the possible link between these factors and the incidence of translucency."<sup>22</sup>

It is important further that more should be done about the by-products to be derived from the waste material at local canning factories, and here it is possible to derive a lot of benefit from experience in Hawaii. A major problem is at present presented by the disposal of cannery 'waste' at East London and Port Elizabeth. "... during the peak season in East London over 100 tons of waste is dumped to-day which costs the canner about 6s. per ton to dispose of. It is estimated that in the Union to-day some 30,000 tons of waste in total, is dumped during the peak season of about five months."<sup>23</sup> Canning factories in the Eastern Cape report a recovery from the pineapple of about 32 per cent without juice and 50 per cent with juice and the rest is classified as waste. In Hawaiian canneries, this 'waste' is turned into alcohol, vinegar, sugar, bromelain and cattle feed. "In the pineapple cannery of the Hawaiian Pineapple Company something like 8,000 tons of sugar is obtained from the waste juices, which is then again used in the syrup for the canning of pineapples."<sup>24</sup>

Further research is necessary on the ways and means of marketing and shipping pineapples, a recent example of which are the experiments made with the dehydrofreezing of pineapples at the Western Province Fruit Research Station at Stellenbosch.<sup>25</sup> Good progress is also reported on the development of a decorticating machine to extract fibre from pineapple leaves.

Whilst most of these research projects are long-term, it is essential that a board of control for the industry should encourage and finance such research to the maximum possible. Care should be taken to avoid any duplication of effort and to restrict research mainly to established institutions in order to keep costs at a minimum.

e) Advertising and Promotion:

The cost of 28 marketing programs to producers and handlers in California during 1958 was almost \$7,000,000.

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22. Van Lelyveld, Report of Official Visit to Principle Pineapple Producing Countries of the World, Op. cit. p.170.

23. Ibid, p. 178

24. Ibid. p.168.

25. Van der Merwe, H.B. - "The dehydrofreezing of Pineapples". Food Industries of South Africa, January, 1960.

Of this total, \$4,635,300, or 67 per cent of the total, was allocated to advertising and sales promotion.<sup>26</sup>

The advantages to be derived from advertising are, theoretically speaking, uncertain. "A serious question is involved in the economic analysis of advertising and promotion; that is, the lack of an anchor to which to tie the analysis. The theoretical developments sketched earlier, as well as most treatments of advertising, generally assume, explicitly or at times implicitly, that increased sales occur along with increased selling costs. Yet, the basis of such an assumption is questionable. Samuelson has shown that even under monopoly there is no unique effect on equilibrium output or price when selling cost is introduced. After his proof, he writes, 'Thus, the direction of change of output depends upon the direction of shift of the marginal revenue schedule (upward and downward) as advertising changes. Now there is nothing in the formula of the problem which requires that this shift be of any particular direction. Hence, short of quantitative empirical investigations of sales responses to advertising no presumption is possible ... It is not possible, therefore, to state whether output will be larger or smaller under positive advertising expenditures as compared to no advertising expenditure. It may be pointed out that the effect of advertising upon price is also incapable of unambiguous inference....' When other forms of market structure are introduced, the issue is even more pertinent... From the view of economic principles involved, there is the added question as to whether there is something unique about advertising and promoting farm products compared with nonfarm or industrial products. Most farm products are generally recognised as being relatively inelastic in demand with respect to price, as having a relatively low elasticity of demand with respect to income, and relatively high cross elasticities of demand with respect to prices of a wide range of products. Associated with these demand characteristics is the fact that, in our society with its mores and institutions, 'the human stomach is highly inelastic' as evidenced by the stable per capita disappearance of food in terms of poundage. These aspects lead to the view that population and its age distribution are the variables which primarily determine the level of aggregate food consumption and that increased per capita consumption of particular foods is highly sensitive to the substitution principle."<sup>27</sup>

It would seem therefore, that whilst a board may feel it is desirable to advertise, it can never be certain about the effectiveness of such advertising. It is clear that it will compete for space in a limited market and, as such, must persuade the consumer to substitute pineapples from South Africa for pineapples from other countries, or, pineapples from South Africa for other fruit (and other food), even from South Africa. This is assuming, of course, that South Africa will continue to market the bulk of its pineapple product on the overseas market, particularly in the United Kingdom. Under existing conditions it is unlikely that the local market for pineapples can be expanded to any significant extent through

advertising...../

26. Hoos, Sidney - The Marketing Program - The Basic Problem, Op. cit. p.9.

27. Hoos, Sidney - The Advertising and Promotion of Farm Products; Some Theoretical Issues. University of California, Berkeley. Giannini Foundation Paper No.174.

advertising. In the long-run, however, the income elasticity of demand for certain varieties of food in under-developed countries, such as South Africa, is likely to be greater than was suggested in a previous quotation. As the consumption pattern of an increasing population is then changed through economic development, an even greater proportion of the domestic production of all food stuffs, at present marketed overseas, will be consumed locally. The advertising of pineapples in order to keep pace with the advertising of other fruits in their competition with pineapples for a given share of the consumers' food budget, will only then assume major proportions on the domestic front.

To be most effective in advertising the South African pineapple abroad, it will be necessary that such plans be financed by means of uniform industry-wide assessments which must then be used to advertise one label. If more than one label has to be advertised, the campaign immediately becomes either more costly or less effective. A campaign in Western Europe to 'eat more pineapples' will be less effective than a campaign to eat more of a particular brand of pineapple from South Africa, because of the greater elasticity in the demand of one brand as compared with the total product, e.g., it is unlikely that advertising gasoline will induce people with motor-cars to travel more, but the advertising of any one brand might induce them to use that brand rather than any other. Similarly, South African pineapples should be advertised as a brand in competition with pineapples from other countries.

The chances of launching a co-ordinated program of advertising for a South African pineapple is becoming increasingly limited. Apart from the fact that canners are reluctant to sacrifice the prestige of their individual brands, the increasing tendency to sell under buyer's labels is a further restriction. Canners no doubt fear the threat of a boycott, and some try their utmost to avoid the present use of a label saying 'Produce of the Union of South Africa'. A further complication is the tendency of a more diversified market to develop, for the more concentrated the market is, the less complicated and costly it is to carry on a programme of advertising and promotion.

Chapter XIII

SUMMARY AND CONCLUSIONS

It was the objective of this study to investigate certain aspects of farm management and marketing on commercial pineapple farms in the Eastern Cape region of the Union of South Africa. Attention was also given to the historical development of the industry in the region of study and the position that South Africa holds as an international producer of pineapples.

The major source of information was a survey of pineapple farms conducted during October and November of 1959, which covered the period from July 1958 to June 1959. Altogether 69 questionnaires were completed of farms located in a narrow strip along the coast about 30 miles wide and 250 miles long. Of the 69 farms, 25 were located in the district of East London, 21 in Bathurst, 16 in Albany, 3 in Peddie, and two each in Komgha and Alexandria. Farmers were of the opinion that the year under consideration was above average from a climatic point of view. They had had good rains and in most cases sunburn damage to pineapples was less than usual. Climatic information from weather stations in the area, however, indicated considerable variation between the mean minimum and the mean maximum temperatures in the region of study, which is generally speaking, disadvantageous for successful pineapple farming. Although the evidence was not conclusive, indications were that temperature fluctuations were generally less violent in the north-easterly parts of the region as compared with the south-west.

Historical information was obtained primarily from the Cory library at Rhodes University, although several private sources proved valuable. South Africa's position in the international market for pineapples was primarily determined with the aid of data contained in publications of the Commonwealth Economic Committee and the South African Department of Customs and Excise.

It would appear that pineapples were planted in South Africa long before they were first introduced into the Eastern Cape. The industry took root in this area quite by chance. Fresh pineapples were imported from Natal for local consumption, until a Bathurst farmer had success with the planting of a few tops in his garden at home. Whether through selection or the importation of better planting material from areas other than Natal, pineapples grown in the Bathurst area were generally regarded as superior to any that were formerly imported from Natal. The limited extent of the local market, the lack of adequate transport facilities to the overseas market, and the perishability of fresh pineapples all hindered the expansion of the local industry beyond certain limits. During the harvesting season, there was generally a glut on the market which led to a disastrous slump in prices, while off-season prices were high. It is doubtful whether the Eastern Cape pineapple belt had produced more than 50 tons by the turn of the century. It was only after the opening of the first canning factory in Port Elizabeth during 1919 that the prospects of the local industry began to improve.

The large-scale production of pineapples was first undertaken by the Schlesinger Organisation on the Langholm Estates. It is estimated that, during their peak, these estates produced more than 3,000 tons annually. Conditions,

however, ...../

however, were not as favourable for the production of pineapples at Langholm as was originally anticipated and these plantations eventually had to make way for cattle grazing.

After the Second World War pineapple farming in South Africa in general and the Eastern Cape in particular, for the first time assumed major proportions. Pineapples were now being planted in parts of Bathurst and Albany where they were formerly never thought of as a commercial crop. The industry also expanded into the East London district, and here growth and yields were found to be particularly encouraging. Speculation in land became rife during the decade after the war, as the price of pineapples steadily increased and reached levels formerly unheard of.

Despite development in East London and Bathurst, most of the canning of pineapples was still being undertaken in Port Elizabeth. Cannerys had to pay more than £2 per ton to have the fruit transported by rail between East London and Port Elizabeth (more than 300 miles). With production levels steadily increasing during the early 1950's, the burden of transportation costs became increasingly heavy and it was unavoidable that Port Elizabeth factories should open branches in East London. Consequently, during 1957 and 1958 respectively, two new canning factories were opened in East London. One of the large companies has since decided to close down operations in Port Elizabeth altogether and expects eventually to draw all its pineapples exclusively from East London and vicinity. Contract holders with the company in Bathurst and Albany have been informed that, depending on general overseas marketing conditions, their contracts with the company might not be renewed on the date of expiry.

After reaching a peak during the 1953/54 season, prices paid by the canning industry began to decline. Those farmers who had incurred heavy debts in the acquisition of their properties during peak price periods, were now beginning to find it increasingly difficult to meet interest and principal payments. Producers in more marginal areas found that the risk attached to low and uncertain yields were no longer adequately rewarded. After the decline in price levels to a new low at the time of the survey, only the more conservative newcomers in intra-marginal areas, and old established family farms, found that they could still remain in production at a profitable level.

The post-war boom in pineapple prices was primarily the result of a considerable reduction in the production of pineapples in the far East, which formerly supplied a major proportion of all pineapples imported into the United Kingdom. During the war, food rationing in Britain eliminated the consumption of pineapples, both fresh and canned. After the war, when these restrictions were lifted, major pre-war suppliers were without pineapples and a low gold and dollar reserve made it impossible to obtain any surplus which might be available in Hawaii. The two remaining Commonwealth producers of significance, Australia and South Africa, then found themselves in the enviable position of selling as much as they could at increasing price levels. With a steadily rising price level, and optimistic rumours that the future of the industry was secure and promised to be brighter than ever, South African production increased sevenfold in the ten years after the war.

The rapid expansion of production in Australia and South Africa, and the equally rapid recovery of plantations in

the Far East made it inevitable that the point of satiety would sooner or later be reached in a limited British market. This happened shortly before the 1953/54 season. The reduction in prices, however, could not deter the arrival of ever-increasing quantities from South Africa, Australia and Malaya. The time lag of approximately two years it takes for pineapples to come into production after planting, and the relatively long economic life of both varieties has caused the steady upward trend in the production of pineapples to continue into the present season even though prices started to decline during the 1953/54 season.

Since 1950, the United Kingdom market has been taking increasing quantities of the South African canned pineapple export and almost all the time, more than 90 per cent of the fresh export. Between 1954 and 1957 Great Britain took more than 90 per cent of canned pineapple exports, while the remaining percentage went to a multiplicity of countries in Africa, Western Europe and elsewhere. In the last two years for which information is available, however, there has been a steady decline in the proportions shipped to Great Britain, and a larger percentage has gone to Western Europe, particularly Germany. As opposed to canned export, where South Africa is only supplying about one-third of the total imports into Great Britain, she has been supplying more than 80 per cent of fresh imports by Britain almost every year since 1952.

Information for 1958 shows that South Africa ranked seventh with Cuba in the total production of pineapples and fourth in the known production of canned pineapple. On this basis, it is supplying 5.4 per cent of the world total of all pineapples and 6.6 per cent of the known production of canned pineapple.

The 69 sample farms visited during the survey averaged just over 1,000 acres in extent each and had an average capital investment of £16,855. Only about 8 per cent of the land area on each farm was planted to pineapples and more than 80 per cent was classified as grazing or waste land. Farmers, at the time of the survey, thought that they could still increase the area planted to pineapples considerably, but the fact that these lands have not been put to pineapples during periods of exceptionally high prices in the recent past leaves the impression that opportunity costs, or other considerations, do not make it a feasible proposition, on the average farm visited during the survey, to plant much more land to pineapples.

Land values in the decade since the war have fluctuated violently in the pineapple belt. It was difficult to determine exactly when land prices reached a peak, but it is clear that at the time of the survey, land values had declined considerably in the very recent past and had reached a new low. As a result of these fluctuations, farmers were generally unable to make a true assessment of the market value of their properties with any degree of certainty. The general impression was gained that they erred on the high side.

The debt burden of the farmers were generally heavy. Only 20 farms, constituting 29 per cent of the sample total, had no debts at all. More than half of the group without debts consisted of farms in Group A that derived less than 50 per cent of their cash income from pineapples. The largest debts and most unfavourable debt ratios were found in the case of those farms that derived more than 90 per cent of

cash ...../

cash income from pineapples (Group C). No less than 27 per cent of the latter group had a debt ratio of more than 60 per cent.

White labour on the sample farms seldom consisted of more than the labour of the operator, with, in some cases, help from his family. Hired white labour constituted less than 1 per cent of the total labour supply, while total white labour constituted 5 per cent. Without making any adjustment for possible degrees of variation in productivity between white and non-white labour, the latter group constituted the remaining 95 per cent of the labour supply. The permanent male worker and the seasonal labourers account for the bulk of non-white labour. Permanent females (not domestic) and youths accounted for a remaining 7 per cent. On the whole, Group C farms, or those deriving more than 90 per cent of their cash income from pineapples, employed a larger labour force than the remainder of the sample farms. This was, of course, mainly due to the employment of a larger number of non-whites. This group averaged nearly five man-equivalent more per farm than either Group B or Group A, both of which derived progressively smaller proportions of cash income from pineapples.

The average farmer was a man of approximately 45 years of age, seldom with education higher than matriculation. Seven of the farmers were younger than 30 and eleven were older than 60. Twenty per cent of them had never been to school after standard six while 15 per cent had been either to college or university after matriculation. As may well be expected from the large number of farms which were acquired after 1950, an equally large percentage of farmers started pineapple production in recent years without any previous experience of either pineapple production or farming of any kind.

Most of the farmers relied on 'other farmers' for the acquisition of knowledge about pineapple farming, although a number had been in direct contact with the research station or technical officers. Fifteen per cent, however, denied having obtained any worthwhile information from sources other than their own experience.

The farm houses were generally spacious and equipped with a variety of modern facilities, although in a number of cases signs of dilapidation were obvious. All the farmers had radios, but only 65 per cent had electricity in the house. Nearly 90 per cent had the use of telephones. Most of the farmers still partook actively in some form of sport, while many had cottages at the beach which they used during weekends. Only six operators were unmarried.

Two varieties of pineapples were grown, namely, the Smooth Cayenne and the Queen of Pines. Most of the farmers grew a combination of both varieties, but Cayennes accounted for 80 per cent of the total tonnage sold. More than 90 per cent of all the pineapples sold went to canning factories, 8 per cent was consumed as fresh fruit locally and the remainder went as fresh export. The sale of Queens, however, was more or less equally distributed between canning factories and local fresh consumption, with about 3 per cent going as fresh export. The importance of the canning industry to the pineapple farmer therefore, stems mainly from the predominance of Cayennes in the pineapple structure of the farms and their virtually exclusive sale as fruit for canning.

For the planting of Queens, almost exclusive use was made of the parent stump, while mainly slips and tops were used for the planting of Cayennes. Most of the plantations were laid out on the contour, but a large number of farmers also planted diagonally across or directly down the slope with regular contour furrows to stop the run-off. Only two plantations were laid out on flat land. Both varieties were planted in double rows, with alternate spaces of two and four feet between the rows and one foot between the plants in each row, but a great many farmers still preferred the planting of Queens in single rows. In three cases use was made of triple rows for the planting of Cayennes.

The yield varied considerably from district to district. Both Queen and Cayenne yields in East London were almost double those in Albany. Although a larger percentage of pineries in East London are likely to be on virgin soil, the longer growing season and less violent temperature fluctuations in the area seem to favour the pineapple more than conditions further to the south-west. Direct correlation was found between the number of plants and yield per acre for both varieties, although it would appear that plantations were generally narrower spaced in East London. A direct correlation between the percentage of income which was derived from pineapples and yield per acre can also be explained, at least partially, by a higher incidence of Group C farms in the East London district.

The age structure of the plantations on the sample farms shows a faster decline in the rate of planting in those areas located to the south-west of the Great Fish river. Proportionately, the rate of replanting Queens is declining much faster than that for Cayennes. Farmers' indications of their intended rates of replanting during the 1959/60 season, however, showed a slight recovery for both varieties in the north-east, while the south-west continued to decline. It is known that in some cases farmers in the south-western districts of the region destroyed young plantations not in bearing yet, when they were told of a further decline in prices during the 1959/60 season. The more favourable yield, the less violent fluctuations in temperature, the longer growing season, the closer proximity of plantations to canning factories and the higher rate of replanting indicate that the centre of pineapple cultivation and canning may be shifting from Port Elizabeth and areas to the south-west of the Great Fish river to East London and north-east of the Great Fish river. It is thus expected that the importance of Bathurst and Albany as pineapple growing districts will decline in the coming decade. It can further be expected that the deliveries of pineapples for canning, especially of the Queen variety, will start to decline fairly rapidly after the 1959/60 season. The extent and duration of the decline will depend entirely on the farmers' anticipation of the future trend of prices. Barring unforeseen developments on the overseas market, it can be expected that prices paid by the canning companies will show a recovery during the 1960/61 season.

There was considerable variation in the financial success of the sample farms. Gross receipts for the farms averaged about £3,800, of which 66 per cent was derived from the sale of pineapples. This was more than £1,100 less than for Group C, the group which derived more than 90 per cent of cash income from pineapples. Other income was mainly derived from a variety of cash crops and the livestock enterprise. Especially on farms in Albany and also some in the Bathurst district, the latter sources of income tended to be the most important. Altogether, there were 24 farms that derived less

than ...../

than 50 per cent of their cash income from pineapples, 30 that derived between 50 and 90 per cent, and 15 between 90 and 100. In only a few cases were there farmers with substantial sources of income other than from farming.

Labour was by far the most important item of expense on all the farms, but especially for the farms which derived more than 90 per cent of their income from pineapples, where it constituted almost 60 per cent of cash expenses. The farms that derived less than 50 per cent of their income from pineapples actually had a higher proportion of cash expenses on mechanical power than on labour. Cash receipts per man-equivalent constituted only half of the remuneration for labour on all the farms, which does not include the value of such intangible items as the use of a hut, water, wood, or produce grown in their own gardens. It was estimated that the average non-white family received about £7. 4. 0 per month, and in addition it has produce grown in home gardens, the benefit from the sale or slaughter of its own stock, and the earnings by members of the family employed as domestic servants.

After allowing for all farm expenses, including any decrease in the farm inventory and the labour value of any member of the family who worked on the farm without receiving any pay, and calculating the interest on average capital investment for the year at 5 per cent, a Labour Income of £209 was left to the farmer. This was the reward he received for his own labour on the farm as well as remuneration for his enterprise. Group C farmers who derived 95 per cent of their income from pineapples, were more successful in this respect than the other farmers. They earned a Labour Income of £1,096 as compared to £84 for Group A and a negative amount of £136 for Group B. That is, the group which derived between 50 and 90 per cent of cash income from pineapples were less successful than either of the groups which derived less than 50 per cent or more than 90 per cent of their cash income from pineapples.

The explanation must not be sought merely in terms of the percentage of income which was derived from pineapples, but also in factors such as the size of the business, prices, yields, selection and combination of enterprises, labour efficiency, markets, farm layout and building arrangements, all of which are important in determining the degree of success of a farm under given conditions of climate and management. It was not possible to determine the influence of each and every one of these factors, but in a number of cases it was possible to express a numerical relationship between certain factors and the financial success of the farm, which was measured in labour income. Those factors related to labour income were: price, size (measured in various ways), yields, labour efficiency and the selection and combination of enterprises. It is difficult to isolate any one as being more important than the other, for in most cases there is a close-knit relationship between all these factors. Indications were, however, that many of the farms would have had a better chance of greater financial success if the units were larger. Varying measures were used to measure the scale of business, and all showed a positive relationship; as the size of the business increased, it became financially more successful. Other measures, which appeared to be particularly important were the degree of efficiency achieved in the use of labour and the yield per acre.

The level of prices received on those farms which specialised in pineapples to the exclusion of virtually every

other .....

other enterprise, did not appear to have much effect on the financial success of the unit. This must be explained in terms of the influence of the other factors mentioned earlier. This phenomenon tends to explain why some farmers continue to plant pineapples at the same time as another farmer destroys plants not yet in bearing, for the effect of a lower price must invariably be felt first by the more marginal producer. The indications are indisputable that pineapples were planted during the recent boom in areas where the enterprise can only be profitable under abnormally high price conditions. Any 'normal' price will not be high enough for these farmers to make the pineapple enterprise a successful proposition.

An attempt to calculate the cost of production for pineapples was considerably aided by farms in Group C where virtually all costs on the farm were directly connected with the pineapple enterprise. The reliability of these calculations, however, is dependent on the reliability of the information supplied by the farmer, his estimates of the value of the land under pineapples and the proportion of overhead costs to be charged to the pineapple enterprise. Allowance also had to be made for the rate of replanting on each farm. Where replanting was at a rate higher than is required to keep production at a given level, costs had to be decreased proportionately, and where it was below the required rate, it had to be increased proportionately. The weighted (number of plants) cost of production per ton sold for the 15 farms included in the analysis came to £6.7 and the straight average to £10.3. This is an average cost figure for Queens and Cayennes, where Queens constituted 11 per cent of the tonnage sold and 16 per cent of the plants on the sample farms in Group C. Because of the almost equal cost of establishing and maintaining Queen and Cayenne plantations and the lower yield per acre for Queens, it must be expected that the cost of production will increase as the percentage that Queens constitute of the total tonnage sold increases, all else being equal.

Indications were that the cost of production tended to decline as the size of the operation, in terms of the tonnage sold, increased. As the tonnage sold per farm increased, the cost per ton sold became progressively smaller, and as the tonnage sold decreased, the cost per ton sold became progressively higher.

The fluctuating level of pineapple prices over the last decade has caused deep concern to pineapple farmers in the region of study, and consequently, much has been done recently to obtain a control board for the industry. Superficial investigation of the factors which cause the prices of agricultural products to fluctuate, more particularly that of pineapples, leads to the conclusion that prices can never be stable if it (price) is to continue to function in the rationing of limited supplies between consumers and as a guide in the allocation of resources. Recent fluctuations in the price of pineapples are completely outside the jurisdiction of any control board. However, the differential prices paid by various canning companies for the same quality fruit during any one season, can be regulated by a control board. Especially during times of surplus production the control board is likely to be at the shortest end in bargaining for higher prices while the danger also exists that bargaining will take place primarily between the board and those canners who can least afford to pay a higher price. Where the latter group forms an important part of the canning industry, the

board ...../

board will be successful in curbing an unequal decline in price, but it may be a hinderance to an average increase in price unless the ceiling is left completely flexible.

The advantages, e.g. advertising and research, to be derived from a control board will be limited during the initial stages. The widespread nature of the market for South African pineapples, both fresh and canned, the multiplicity of labels under which the canned product is sold, and the costly nature of research, mean that advertising and research will receive little attention from an industry in which money is at present scarce.

The future of the pineapple industry in South Africa does not depend on price alone, but also on the extent to which the industry adjusts itself to those areas, whether inside or outside the Eastern Cape, where conditions are most suited to the production of pineapples. It is difficult to suggest alternatives without conclusive evidence, but indications are that many farmers in Albany and parts of Bathurst may well discontinue the production of pineapples and revert to livestock. It is possible that a large pineapple enterprise may improve the monetary returns from the enterprise in these areas, but it is likely that for various reasons mentioned earlier, East London holds an absolute advantage over the remainder of the area in the production of pineapples.

A large proportion of the farmers along the Eastern Cape coastal belt have been undecided in the past as to which enterprise is best suited to their particular environment. In many cases the uncertainty has been due not to the unsuitability of a particular enterprise to that area, but because the units on which the enterprise was undertaken were too small to make it an economical proposition. Rather than continue the struggle on an undersized unit (assuming that there is little room for increasing the scale of the operation through intensification), the farmer must try to expand through a proportionate increase in working and fixed capital, e.g. livestock and land. Failing that, it might be in his interest to sell the farm later as part of another unit, rather than encourage the return of his children to the same undersized unit. Any discrepancy in the earnings of human resources between agriculture and other industries can only be decreased through the movement of human resources out of the industry where earnings are low into the industry where earnings are high. This usually takes place in the form of a movement of people from country to town, which is an economic fact, and unavoidable in any developing country, particularly when that country is not primarily suited to agriculture.

Although the livestock enterprise in larger units has been mentioned as an alternative to pineapples in certain areas, there is little conclusive evidence to support such a statement. Only through more research into the profit margins of other enterprises, such as sheep and cattle, and greater knowledge of the climatic conditions which affect the growing of pineapples in the Eastern Cape, can specific recommendations be made. Further research along these lines is highly desirable in the Eastern Cape coastal belt. The rate at which farmers ventured into the production of pineapples when prices began to show a slight increase is the best indication that they were not satisfied with the return they received from their previous farming speciality. To say that part, if not most, of their trouble lies in the size of

their .....

their operation, is probably correct, but it cannot be said with certainty that the size of the operation should be increased through the acquisition of more land, or what type of farming should be practised on the larger units.

In conclusion, it is considered that more attention should be paid to the development of by-products for the industry in South Africa. That this has not been done in the past is due either to the farmer absorbing most, if not all, of the fluctuations in price paid by the consumer for the canned product, or because there are cheaper sources of alcohol, sugar, bromelain, vinegar and bran than can be made from pineapple 'waste'. Whatever the cause, the time will come when all sources of food and drink in South Africa will have to be developed to the full, for increasing demands are being, and will be, made by both shifters of demand, namely, a population increase and a rising level of real income for more than three-quarters of the country's population. The future market for the products of the South African pineapple industry lies not elsewhere, but inside the borders of this country.

Appendix 1

R h o d e s U n i v e r s i t y

INSTITUTE OF SOCIAL AND ECONOMIC RESEARCH

Pineapple Processing Industry Questionnaire 1959

CONFIDENTIAL

Name of Company: \_\_\_\_\_ Date: \_\_\_\_\_

Address: \_\_\_\_\_ No. of employees: \_\_\_\_\_

PRODUCTION

(1) How many tons of pineapples has your company processed during the last production year? \_\_\_\_\_

(2) In what form were they canned? a. Rings: \_\_\_\_\_  
b. Chunks: \_\_\_\_\_ c. Juice: \_\_\_\_\_  
d. Fruit Salad: \_\_\_\_\_ e. Other: \_\_\_\_\_

(3) What is your percentage recovery from pineapples  
a. With juice: \_\_\_\_\_ b. Without Juice: \_\_\_\_\_

(4) How many tons of pineapples has your company purchased annually since 1946?

Year	Queen		Cayenne		Total Tonnage
	Quantity	Price	Quantity	Price	
1946					
1947					
1948					
1949					
1950					
1951					
1952					
1953					
1954					
1955					
1956					
1957					
1958					
1959					

MARKETING

- (5) What percentage of your canned product do you sell in South Africa? (Give Pineapple figures only, if available).  
\_\_\_\_\_  
\_\_\_\_\_
- (6) To which countries do you export? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- (7) What is the nett difference in the price received by your company for pineapple products marketed domestically and overseas? \_\_\_\_\_  
\_\_\_\_\_
- (8) What is your company doing at present to expand the export market for its product? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- (9) What is your company doing at present to expand the South African market for its product? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- (10) In view of the uncertain nature of the overseas market, are you of the opinion that the local market offers much potential? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- (11) Do you have any information on the purchases of your company's products by the Coloured and Native groups in South Africa? \_\_\_\_\_  
\_\_\_\_\_
- (12) What arrangements has your company at present for the overseas marketing of its product? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- (13)...../

(13) Are you of the opinion that there should be legislation to assure the orderly marketing of canned fruits and vegetables? \_\_\_\_\_

(14) Do you find it tolerable to operate under the minimum price rigidities of the present Act? (Which can only be really successful if executed in co-operation with Australia and Malaya.) \_\_\_\_\_

STANDARDISATION

(15) Would the South African canned product enjoy a better market overseas if quality standards were more rigid? \_\_\_\_\_

(16) Would it be possible to market all South African canned products under one label and through one marketing channel if strict quality standards were enforced? \_\_\_\_\_

(17) Is it desirable that quality control should be transferred from the Department of Agriculture to the Bureau of Standards? \_\_\_\_\_

GENERAL

(18) Are you of the opinion that special legislation is required for the pineapple industry? \_\_\_\_\_

(19) What are your pineapple buying plans for the future? \_\_\_\_\_

(20) In the marketing of processed pineapples, do you find it advantageous and economical to combine canned pineapples with other canned fruit or products?

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(21) Do you find that the processing of pineapples is adversely affected by irregularities of quality and quantity from one season to the next? \_\_\_\_\_

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R h o d e s   U n i v e r s i t y  
INSTITUTE OF SOCIAL AND ECONOMIC RESEARCH  
FARM MANAGEMENT AND COST STUDY - 1959

Farm No. \_\_\_\_\_

Enumerator: \_\_\_\_\_

Date: \_\_\_\_\_

Record of the Farm Business: \_\_\_\_\_ year ended \_\_\_\_\_ 1959

Address: \_\_\_\_\_

Station: \_\_\_\_\_ Distance: \_\_\_\_\_

Nearest town: \_\_\_\_\_ Distance: \_\_\_\_\_ District: \_\_\_\_\_

Do you have a contract? \_\_\_\_\_ Name of Canner: \_\_\_\_\_

What are the terms of your contract? \_\_\_\_\_

Table 1

OWNERSHIP AND ACQUISITION

Item	Area Acres/Morgen	Method of Acquisition			
		Method	Year	Area Acres/Morgen	Price paid
Owned					
Cash rented					
Share rented					
Leased					
Total operated:					

Table 2

FARM ORGANISATION

Item	Morgen/ Acres	Value per-unit	Total land value
1. <u>Cultivated</u> <u>land:</u>			
a) Irrigated			
b) Pineries			
c) Orchards			
d) Pastures			
e) Native Land			
f) Other dry lands			
2. Plantations			
3. Other land			
4. Farmstead, roads, etc.			
TOTAL AREA			

What planting materials do you use?

- a) Slips \_\_\_\_\_%
- b) Suckers \_\_\_\_\_%
- c) Tops \_\_\_\_\_%
- d) Crowns \_\_\_\_\_%

How many morgen/Acres on your farm, in addition to your present plantations, can still be put under pineapples?

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Do you plant your pineapples:

- a) Across the slope? \_\_\_\_\_
- b) Down the slope? \_\_\_\_\_
- c) Diagonally? \_\_\_\_\_

How many tons of fertiliser do you apply to your pineapple lands per acre/morgen? \_\_\_\_\_

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What type of fertilisation do you use?

- 1) \_\_\_\_\_
- 2) \_\_\_\_\_
- 3) \_\_\_\_\_

What are your main sources of information on pineapple growing?

- 1) \_\_\_\_\_
- 2) \_\_\_\_\_
- 3) \_\_\_\_\_

Do you avail yourself of the services of an Extension Officer or any other technical adviser? \_\_\_\_\_

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COST OF MECHANICAL POWER

Make				Purchases	Sales
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Table 3

PINEAPPLE PLANTING STRUCTURE

C A Y E N N E				
Age	Total No. of plants	No. of plants per acre/morgen	Plant distance	Area acre/morgen
Plantations abandoned 1958-59				
To be planted 1959-60				
Planted 1958-9 (6-9 months old)				
Planted 1957-8 (18-27 m.) <u>1st Season</u>				
2nd Season				
3rd Season				
4th Season				
5th Season				
Total Cayenne		xx	xx	

Q U E E N S				
Age	Total No. of Plants	No. of plants per acre/morgen	plant distance	area acre/morgen
Plantations abandoned this year				
To be planted 1959-60				
Planted 1958-59 (6-9 months)				
Planted 1957-8 (18-27 m.) <u>1st Season</u>				
2nd Season				
3rd Season				
4th Season				
5th Season				
Total Queen		x	x	
TOTAL ALL PINEAPPLES				

Would you regard the past year as climatically

- a) Above the average? \_\_\_\_\_
- b) Average? \_\_\_\_\_
- c) Below average? \_\_\_\_\_

What form of rotation do you use for your pineapple lands?

\_\_\_\_\_

Table 6

VALUE OF FIXED IMPROVEMENTS

Type of improvement	Value beginning of year	New build-ings	Value end of year	Repairs	Share to pine-apples
<u>CROPS</u>					
Grain & hay sheds					
Wagon sheds					
Packing sheds					
Equipment sheds					
Other 1)					
2)					
<u>LIVESTOCK</u>					
1) Cow shed					
2) Calve pens					
3) Dairy					
4) Wash room					
5) Fodder sheds					
6) Stables					
7) Kraals					
8) Pigsties					
9) Fowl-runs					
10) Silo					
<u>GENERAL</u>					
1) Foreman's house					
2) Native housing					
3) Garage					
4) Fencing					
5) Dipping tank					
6) Windmills & bore-holes					
7) Pumps & piping					
8) Reservoirs					
9) Dams					
10) Other					
TOTAL					XX

Value of Homestead £ \_\_\_\_\_

Table 7.

IMPLEMENT CAPITAL AND COST

	no.	Value be- ginning of year	New Equip- -ment bought	Equip- -ment sold	Value end of year	Re- pairs	Share to pines
Trailers							
Wagons							
Carts							
Ox ploughs							
<u>Tractor ploughs:</u>							
Mouldboard							
Disc							
One way							
Subsoiler							
Cultivator							
Offset							
Scuffles							
<u>Harrows:</u>							
Zig-zag							
Springtooth							
Disc							
Fertiliser spreader							
Roller							
Mower							
Power mower							
Hay rake							
Hay press							
Dam dredger							
Hammer mill							
Silage cutter							
Milking machine							
Separator							
Other Dairy equipment							
Planter							
Other							
TOTAL	XX						

Table 8

LIVESTOCK REGISTER

	Beginning of year		Purchased		Sold		Slaughtered		Dead and Lost		End of year
	No.	Val.	No.	Val.	No.	Val.	No.	Val.	No.	No.	Val.
Bulls											
Cows											
Heifers over 2 yrs.											
Heifers 1-2 yrs.											
Calves											
Tollies											
Oxen 2-3yrs.											
Oxen over 3 yrs.											
Trek oxen											
Horses & mules											
Donkeys											
Sheep											
Lambs											
Rams											
Goats											
Pigs											
Fowls											
TOTAL											

LABOURERS' LIVESTOCK

	Cattle		Sheep and goats	Horses, mules and Donkeys
	Large	Small		
Foreman				
Natives				
TOTAL				

ANIMAL UNITS:

- 1) Owner \_\_\_\_\_
- 2) Foreman \_\_\_\_\_
- 3) Natives \_\_\_\_\_

Table 9

LIVESTOCK PRODUCTS SOLD

Item	Sale		Farm Use	
	Quantity	Value	Quantity	Value
Milk				
Butter				
Cream				
Wool				
Skins & hides				
Eggs				
Other				
TOTAL	xx		xx	

Table 10

FARM PRIVILEGES

Item	Household			Labour		
	Quantity	Price per unit	Value	Quantity	Price per unit	Value
Whole milk						
Skimmed milk						
Butter						
Cream						
Meat						
Vegetables						
Mealies						
Eggs						
Pineapples						
Other						
TOTAL	xx	xx		xx	xx	

Table 11

MISCELLANEOUS FARM RECEIPTS

Item	Quantity	Value
Machine work		
Trucking		
Stock pastured		
Rent of farm land and buildings		
Lumber and wood sold		
Labour off the farm		
Agric. conservation programme		
Planting material sold		
Other		
TOTAL	XX	

Table 12

FEED AND SUPPLY INVENTORY

Item	Beginning		End	
	Quantity	Value	Quantity	Value
Fertiliser				
Silage				
Seed				
Packing material				
Feed				
TOTAL	XX		XX	

Table 13

LABOUR STRUCTURE AND COST

Item	Hired White labour	Sea-sonal	Permanent Native Labour		Picca-nins	Family labour	Total
			Male	Female			
Number							
Days worked per yr. (280)							
	£	£	£	£	£	£	£
Cash wages paid							
Rations bought							
Farm rations							
Clothing, tobacco, etc.							
Other							
TOTAL							
SHARE TO PINES							

(Base family labour on what it would cost to hire work done.)

Total man equivalent (Total days worked ÷ 280) \_\_\_\_\_

Percentage of man equivalent to pines \_\_\_\_\_ % = \_\_\_\_\_ man equivalent.

Tons of pineapples sold \_\_\_\_\_ ÷ man equivalent to pines = \_\_\_\_\_ ton per man.

Table 14

INVENTORY VALUES

Item	Total	
	Beginning	End
Land T.1 & 2		
Fixed improvements T.6		
Power equipment T.5		
Other equipment T.7		
Livestock T.8		
Feed & Supplies T. 12		
TOTAL	£	£
AVERAGE	£	

Table 15

FARM EXPENSES

	Quantity	Value £	% against pineapple
<u>Crops:</u>			
Seed bought a)			
b)			
c)			
Weed & insect killers			
Disinfectants for seed			
<u>Fertilisers</u> <u>Kind</u>			
a) _____ : _____			
b) _____ : _____			
c) _____ : _____			
Bags & twine			
Hired road transport			
Hired railway transport			
Baling costs			
Pineapple commission			
Bulldozing or other machinery hired			
Planting material			
Packing material			
Paper			
<u>Livestock:</u>			
Veterinarian			
Medicine, disinfectants, dip			
Purchased feeds			
<u>General:</u>			
Stationery			
Telephone			
Association subscriptions			
Wheel taxes			
Smithy coal and welding gas			
Rates and taxes			
Other costs			
TOTAL			xx

Table 16

DEBTS

Particulars	Mortgagee	Amount £	Rate of interest %
First bond			
Second bond			
Co-ops.			
Government			
Hire purchase			
Bank			
Other 1)			
2)			
TOTAL	XX		XX

Table 17

NON-FARM INCOME

Received for	Amount
TOTAL	

(Include interest on investments, and non-farm activities of owner - not that of his labourers.)

Table 18

SOCIAL AND GENERAL

- 1). Age \_\_\_\_\_
- 2). Marital Status \_\_\_\_\_
- 3). Education \_\_\_\_\_
- 4). Occupation before farming \_\_\_\_\_
- 5). Number in family \_\_\_\_\_
- 6). Education of children \_\_\_\_\_  
\_\_\_\_\_
- 7). Recreation \_\_\_\_\_
- 8). Do you have:
  - a). a radio \_\_\_\_\_
  - b). a refrigerator \_\_\_\_\_
  - c). electricity \_\_\_\_\_ (voltage) \_\_\_\_\_
  - d). running water \_\_\_\_\_
- 9). How long have you been in pineapple farming? \_\_\_\_\_

Appendix III - EXPORT OF PRESERVED PINEAPPLES FROM THE UNION OF SOUTH AFRICA BY COUNTRY OF DESTINATION, 1948 - 1959

Destination	Year												Total
	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959*	
	(Thousand pounds)												
United Kingdom	15	220	849	6,441	6,901	18,835	31,161	23,548	32,100	41,729	54,883	39,470	255,954
Gibraltar	36	x	-	13	33	29	3	11	16	25	10	47	224
Malta	14	24	1	3	-	-	-	-	-	3	-	-	45
Aden	18	32	6	13	4	12	7	5	3	x	5	34	140
British Malaya	3	1	-	32	x	1	2	x	x	-	-	-	41
Cyprus	10	-	4	-	x	-	x	x	5	11	2	5	39
Hong Kong	24	11	x	28	-	-	x	-	x	-	-	-	66
Anglo-Egyptian Sudan	60	106	23	57	8	23	10	7	-	-	-	-	292
Ascension	x	x	x	-	-	x	x	x	-	x	x	x	2
British Somaliland	2	-	-	-	-	-	-	-	-	-	-	x	2
British West Africa	12	15	7	17	12	40	28	33	-	-	-	-	166
Kenya	126	28	49	52	4	5	3	4	3	3	1	-	279
Mauritius	-	x	-	x	3	x	5	2	3	2	2	4	22
Rhodesia & Nyasaland	344	196	297	507	275	332	413	401	527	605	432	517	4,847
Seychelles	x	x	-	-	-	x	-	-	-	-	-	-	1
Nigeria	-	-	-	-	-	-	-	-	12	14	13	5	45
South West Africa	101	44	125	90	79	85	100	-	-	-	-	-	625
St. Helena	x	1	1	2	1	x	x	x	x	x	2	1	12
Tanganyika	43	7	19	30	14	8	8	12	10	6	6	6	170
Trisdan de Cuhna	-	x	-	x	x	x	x	x	x	x	x	x	5
Uganda	x	x	x	x	-	-	x	x	-	x	x	x	3
Zanzibar	-	5	-	x	x	x	x	x	1	x	1	x	9
British West Indies	4	x	3	19	18	43	49	22	33	40	27	61	320
Falkland Islands	7	9	1	8	6	x	3	1	3	-	1	3	43
Netherlands	-	-	x	52	7	1	1	9	-	2	841	1,523	2,439
Somaliland	-	-	-	-	4	34	4	1	2	5	-	6	55
Trieste	-	-	-	-	-	x	-	-	-	-	-	-	x

\* Preliminary

x - Less than 1,000 pounds

Source: Department of Customs and Excise, Pretoria.

## Appendix III (cont.)

Destination	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	Total
Norway	84	34	164	36	12	42	6	4	3	x	2	56	443
Portugal	-	-	x	-	x	x	-	x	x	3	2	8	16
Angola	x	x	x	7	3	17	21	5	3	8	14	15	94
Portuguese Possessions	-	-	-	-	-	-	-	-	x	x	3	x	5
Portuguese East Africa	2	4	2	2	2	181	4	10	8	13	17	30	275
Spain	-	-	-	-	-	x	-	-	-	-	-	136	136
Sweden	38	56	1,707	327	397	368	172	2	4	18	24	347	3,462
Switzerland	2	x	2	-	x	x	x	-	-	7	-	6	18
Arabia	5	x	9	16	11	1	-	-	-	-	-	1	44
Bahrein Islands	7	-	2	-	-	-	-	-	-	3	3	-	15
Indonesia	18	51	6	-	-	-	-	-	-	-	-	24	99
Iran	-	-	-	x	x	-	-	-	-	1	1	1	5
Iraq	3	-	-	-	-	-	9	20	-	4	-	2	37
Israel	168	-	-	-	x	x	x	-	-	-	-	-	169
Lebanon	-	2	-	-	-	-	-	-	-	x	1	-	4
Japan	-	-	-	-	-	x	-	x	-	-	-	x	1
Jordan	-	-	-	-	-	-	x	-	-	-	-	x	1
Egypt	96	66	17	53	8	2	14	8	-	-	-	-	263
Ethiopia	1	4	-	3	x	3	13	x	-	-	12	4	41
Morocco	-	7	-	-	-	-	-	-	-	-	-	-	7
Libya	-	-	-	-	-	x	-	1	-	-	-	-	2
Sudan	-	-	-	-	-	-	-	-	5	14	1	23	43
British Borneo	-	-	-	-	-	-	x	-	-	-	-	x	1
Sierra Leone	-	-	-	-	-	-	-	-	7	3	16	10	37
Gambia	-	-	-	-	-	-	-	-	1	7	5	5	18
Uruguay	-	-	32	5	-	2	2	-	-	-	-	2	42
Pacific Islands	-	-	x	-	-	-	-	-	-	x	2	2	4
Ceylon	-	-	-	-	-	-	x	-	-	-	-	-	x
British Guiana	-	-	-	-	3	-	2	1	-	7	9	5	27
Pakistan	-	-	1	-	-	-	-	-	-	-	-	-	1
Australia	-	x	-	x	-	-	-	x	6	x	-	x	7
Ghana	-	-	-	-	-	-	-	-	8	x	1	4	13

Appendix III (cont.)

Destination	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	Total
New Zealand	x	11	178	1,200	139	145	249	66	235	402	1,214	881	4,720
Canada	2,572	2,980	4,326	1,957	2	516	x	x	1	430	526	1,748	15,058
Ireland	45	721	178	1,023	594	163	25	-	-	-	-	22	2,771
Belgium	773	-	-	2	-	x	x	-	-	x	120	1,221	2,117
Austria	-	-	-	-	-	-	-	-	x	x	2	4	6
Belgian Congo	12	1	8	27	20	48	27	16	21	29	27	17	253
Bulgaria	-	1	-	-	-	-	-	-	-	-	-	-	1
Czechoslovakia	-	-	x	-	-	-	-	-	-	-	-	-	x
Denmark	32	10	49	7	32	169	116	23	29	133	135	607	1,342
Iceland	-	-	1	-	-	-	-	-	-	-	-	-	1
Finland	-	-	x	x	-	-	x	-	-	-	-	-	1
France	-	-	5	x	2	2	5	x	59	45	13	-	133
French Equatorial Africa	x	-	-	-	10	2	6	7	8	6	4	11	55
French West Africa	x	-	-	-	-	x	-	-	x	-	-	-	1
French Somaliland	-	-	-	-	-	2	-	2	-	-	-	-	4
Germany	-	-	3	419	456	239	104	x	174	326	9,742	12,511	23,975
Madagascar	-	-	-	-	5	-	-	-	-	8	3	-	15
Greece	-	x	-	x	x	x	x	-	x	-	-	-	1
Italy	-	-	71	38	23	27	3	2	x	45	339	489	1,037
Libya	-	-	6	x	-	-	-	-	-	-	-	2	8
Italian East Africa	3	9	51	32	-	-	-	-	-	-	-	-	95
Venezuela	7	-	-	x	-	-	-	-	-	-	-	-	8
Argentina	-	-	-	-	-	x	-	-	-	-	-	-	x
Brazil	-	-	-	-	x	-	-	-	-	-	-	-	x
United States	x	x	x	x	1	x	2	x	-	x	427	1,207	1,640
British Honduras	-	-	-	-	-	-	-	-	-	-	x	-	x
Ship's Stores	87	96	105	121	170	145	166	176	200	143	108	110	1,629
<b>Total</b>	<b>4,784</b>	<b>4,758</b>	<b>8,313</b>	<b>12,644</b>	<b>9,262</b>	<b>21,530</b>	<b>32,752</b>	<b>24,406</b>	<b>33,493</b>	<b>44,106</b>	<b>69,005</b>	<b>61,233</b>	<b>326,287</b>

Appendix IV - EXPORT OF FRESH PINEAPPLES FROM THE UNION OF  
SOUTH AFRICA BY COUNTRY OF DESTINATION, 1948 - 1959

Destination	Year											Total	
	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958		1959 *
	(thousand pounds)												
United Kingdom	x	x	2,282	8,793	9,480	10,443	5,735	6,296	4,724	4,787	7,280	6,483	66,304
Rhodesias	49	34	182	126	104	160	251	258	261	390	488	486	2,790
South West Africa	75	59	73	128	95	129	159	+	-	-	-	-	718
Canada	-	4	-	-	-	-	-	1	-	-	-	-	5
Ireland	1	-	-	-	-	-	-	-	-	-	-	-	1
Belgium	-	21	-	-	-	-	-	-	-	-	-	x	21
Belgian Congo	-	-	x	-	-	-	-	-	2	x	-	-	2
Denmark	-	-	-	x	-	-	-	-	-	-	-	-	x
France	-	-	x	-	-	-	x	-	x	-	-	-	x
Netherlands	-	x	-	-	x	x	x	2	3	2	x	-	7
Germany	-	-	-	-	-	-	-	29	250	11	3	5	297
Norway	-	-	-	-	-	x	-	x	-	-	-	-	x
Portugese East Africa	-	x	-	x	4	1	2	2	2	-	x	26	36
Sweden	-	-	-	-	-	-	-	6	12	-	-	-	19
Greece	-	-	-	-	-	-	-	-	17	-	-	-	17
Switzerland	-	x	-	-	-	-	x	-	31	x	-	-	32
United States	31	-	-	-	-	-	-	x	-	-	-	-	31
Austria	-	-	-	x	-	-	-	-	-	-	-	-	x
Israel	-	-	-	x	-	-	-	-	-	-	-	-	x
Nigeria	-	-	-	-	-	-	-	-	-	-	-	x	x
Czechoslovakia	-	-	-	-	-	-	-	-	-	-	-	x	x
Ship's Stores	-	-	44	69	73	76	77	77	89	104	60	63	732
<b>Total</b>	<b>156</b>	<b>119</b>	<b>2,581</b>	<b>9,117</b>	<b>9,755</b>	<b>10,810</b>	<b>6,224</b>	<b>6,673</b>	<b>5,391</b>	<b>5,294</b>	<b>7,831</b>	<b>7,064</b>	<b>71,013</b>

x. Less than 1,000 pounds

\* Preliminary

Source: Department of Customs and Excise, Pretoria.

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