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The apple industry in Western Australia - Some developments over the last twenty years

H. R. Powell

Fig. 1.—Apple orchards at Bridgetown. In the Bridgetown Road Board district there are 243,295 apple trees (1958 figures, Government Statistician). A recent widespread outbreak of codling moth in this district has been successfully eradicated

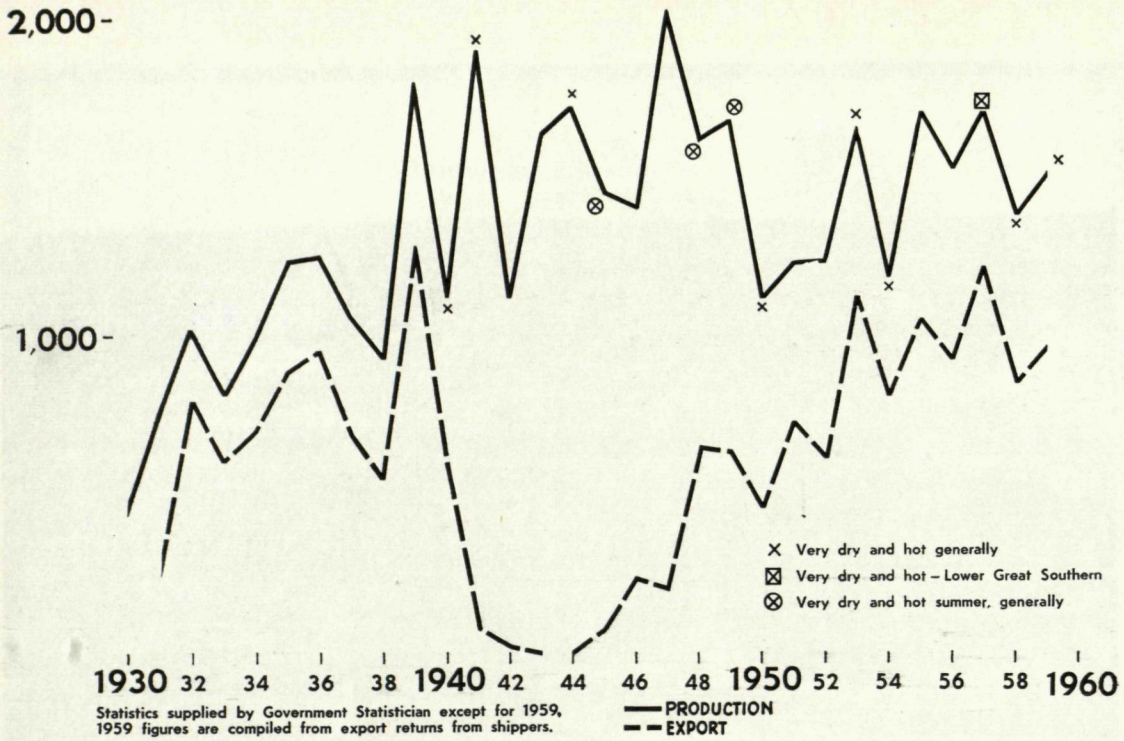
THE APPLE INDUSTRY
In Western Australia
Some Developments over the Last Twenty Years

By H. R. POWELL, B.Sc. (Agric.), Superintendent of Horticulture

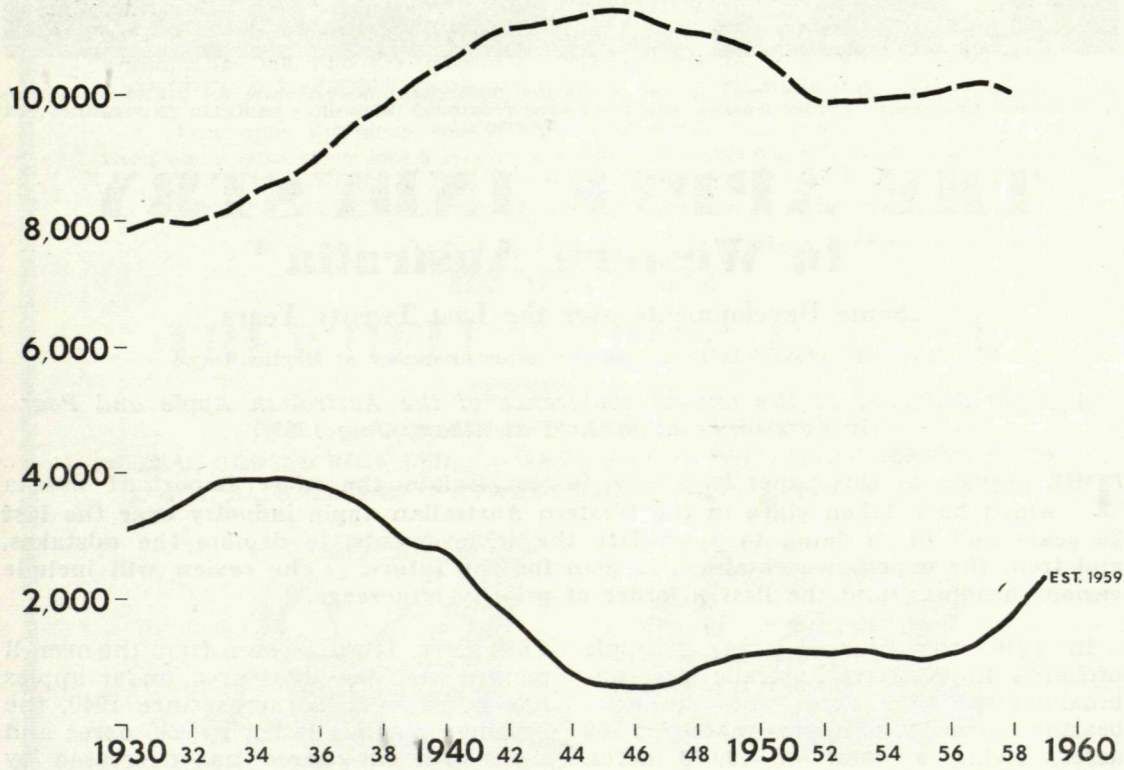
(A paper delivered at the annual conference of the Australian Apple and Pear Growers' Association, held at Albany July 1959.)

THE purpose of this paper is, briefly, to recapitulate the more important events which have taken place in the Western Australian apple industry over the last 20 years and in so doing to appreciate the achievements, to deplore the mistakes, and from the experience obtained, to plan for the future. The review will include various headings, and the first in order of priority is acreage.

In 1940, the bearing area of apple orchards in Western Australia was approximately 10,359 acres and the non-bearing area was approximately 2,739 acres, giving a total of 13,098 acres. At the present time, 1957-58, the total area is 11,618 acres, the bearing area 9,929 acres and the non-bearing area 1,689 acres. It will be seen from the overall picture that the total area under apples has fallen by 1,480 acres since 1940, the bearing area has fallen by 430 acres and the non-bearing area has decreased by 1,050 acres. Since the year 1955 there has been an appreciable annual increase in plantings and this trend is expected to



PRODUCTION AND EXPORT. The figures at the left denote units of 1,000 bushels



APPLE ACREAGE. Graph showing acreage of trees in bearing (broken line) and non-bearing trees (black line) from 1930 to the present time

Fig. 2.—Granny Smith apple trees in flower on the orchard of Mr. W. Gregory, Bridgetown. This State is fortunate in being free from such serious apple pests and diseases as codling moth and apple scab, which require costly spraying treatments to ensure good quality fruit

continue. In 1958 sufficient apple trees were sold to plant 1,000 acres. Looking back, the total maximum bearing area of 11,247 acres occurred during 1946 and this time was also the lowest for non-bearing trees, namely 547 acres.

The reductions in planting were no doubt caused by the uncertainties of the future as far as export markets were concerned, the difficulties caused through the war, shortages of nursery trees and incidentally, the boom prices for wool.

This State had in the past relied almost entirely on Victorian nurserymen for the supply of fruit trees and this source of supply was closed in 1948 owing to restrictions on imports. It is very pleasing to point out that local nurserymen, after many setbacks, are now meeting the demand for trees.

PRODUCTION

Peak production occurred during the years 1941 to 1947 in the acquisition period; although these yields included tree measurement figures for some varieties, the high production did coincide with the maximum bearing acreage which occurred during the same period. The highest productions occurred in 1947, with 2,021,494 bushels, and in 1941 with 1,906,000 bushels.

During the twelve-year period since 1947, production has exceeded 1,500,000 bushels on seven occasions, the highest being 1,704,635 bushels in 1955. In the five off-years, production ranged between 1,117,000 and 1,359,458 bushels.

Although considerable numbers of bearing trees are old it is confidently expected that most will continue in production for a number of years to come. By the time they do go out, sufficient new plantings should be in production to maintain present yields. Any very favourable growing season would still boost production to over 2,000,000 bushels.

An important factor which it is difficult to assess at this stage is the effect of the new root-stocks. The earliest of these orchards are now in their tenth or eleventh

year and some are averaging ten bushels to the tree. It is quite likely that with the new stocks and with irrigation, significant increases in production can be expected in the years to come.

EXPORT

Over the 20 years under review, apple exports have definitely increased. The period 1941 to 1951 was affected by conditions arising from the war, lack of shipping space, etc., and exports were generally limited. From 1951 onwards, exports ranged from 604,197 bushels in 1952 to 1,290,160 bushels in 1957. The greatest quantity exported in the State's history occurred in the year 1939, when 1,301,295 cases were shipped. This was not a year of heavy production but the increase in quantities was brought about by exceptionally heavy rains during the summer months.

The principal varieties which are exported are Granny Smiths, Cleopatras, Jonathans, Yates, Dunns, Dougherty and Red Delicious. These are the main varieties grown in the State and they serve both the local and export markets. Red varieties are becoming more and more popular on the growing local market and it can be expected that export quantities will tend to be reduced in the years to come.

Cleopatras, Yates and Dougherty are being planted in only relatively small quantities and at the present time practically all the production is coming from old trees. There is a growing interest in Golden Delicious but it is difficult to say what the export trend will be. The variety is increasing in popularity on the local market and it will probably be some considerable time before greatly increased quantities will be available for export.

Almost all the fruit from this State is packed in redwood dump boxes made of karri or jarrah. Although standard boxes have been used there does not appear to be any trend towards their general use.

The quality of Granny Smith apples on overseas markets is of a high standard but unfortunately some complaints of bruising and overmaturity have been received regarding shipments sent late in the season.

CHANGE IN VARIETIES

In 1940, the four main varieties exported were, in bushels, Granny Smiths 213,396; Cleopatras 174,535; Dunns 56,076; Jonathans 55,933. The year previous, owing to unusually heavy summer rains, the quantities were much greater, namely, Granny Smiths 329,460; Cleopatras 303,452; Dunns 216,274 and Jonathans 191,590 bushels respectively.

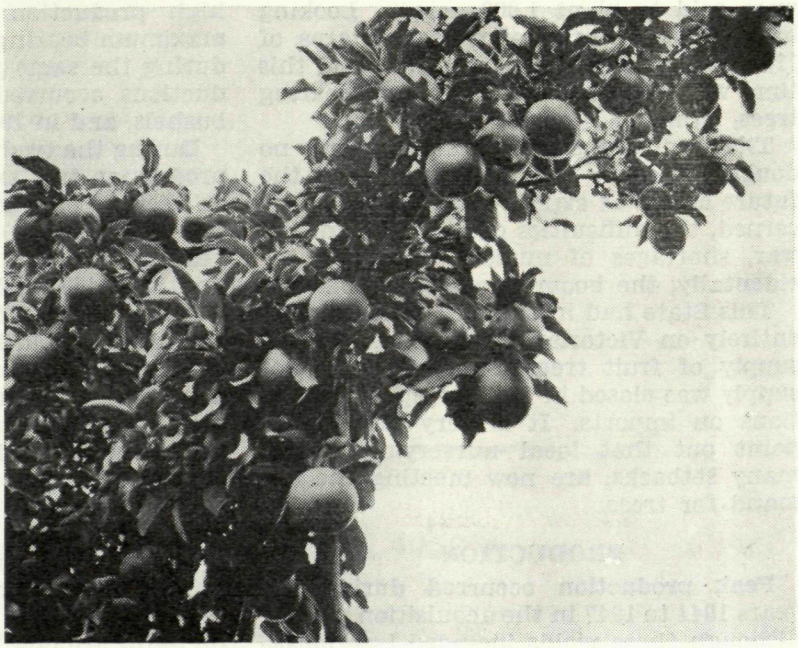


Fig. 3.—A limb of Granny Smith apples. This variety is widely planted in this State and production in a good year is in the region of one million bushels. Large quantities, up to 700,000 bushels, are exported and bring premium prices in the United Kingdom

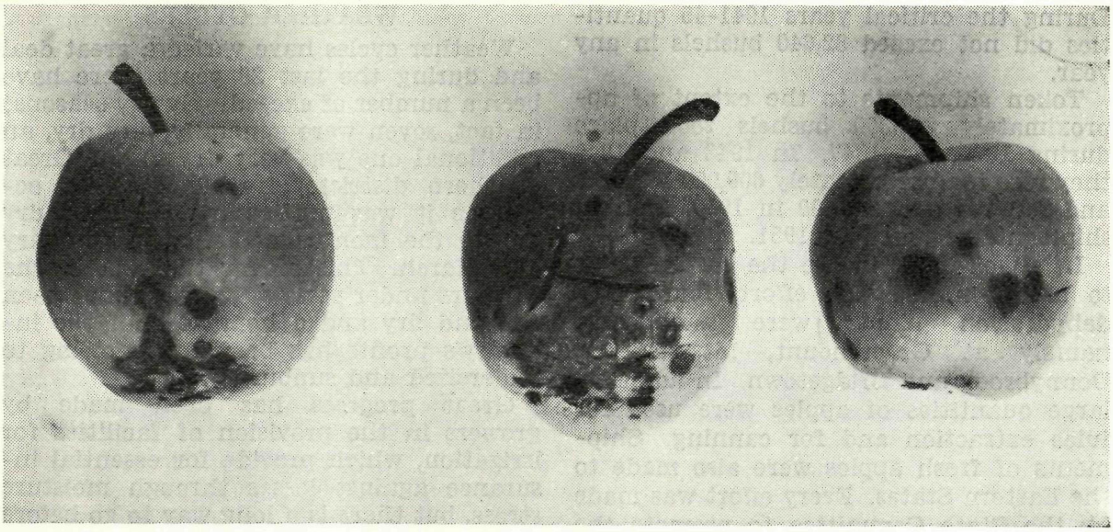


Fig. 4.—A serious disease, apple scab. The specimens were taken from diseased trees at Manjimup prior to the commencement of a successful eradication campaign

Since 1951 when full-scale shipments were resumed, Granny Smith exports have greatly increased and the quantities of the other varieties have not changed very much. In 1957, over 700,000 Granny Smiths were exported, and in 1959 the quantity was 614,470. Since 1951, the only year in which exports were less than 400,000 bushels was in 1952 when 340,196 bushels were shipped.

There has been little change in the exports of Cleopatras, which were 174,535 bushels in 1940 and 163,414 bushels in 1959. The peak export of this variety in the period was 268,000 bushels in 1957.

With regard to Dunns, in no year have exports reached the relatively large figures recorded in 1939 when over 216,000 bushels were shipped. The position today appears to be that in the "on-year," total quantities are in the region of 80,000 to 90,000 bushels and in the "off-year" 20,000 to 25,000 bushels.

The position is much the same with Jonathans and in no year since have exports reached the 1939 level. Excepting the year 1953 when 99,566 bushels were exported, the normal range for this variety is between 26,000 and 81,000 bushels.

The importance of the Granny Smith apple to the Western Australian industry cannot be overlooked. Although total production figures are not available, the quantity grown must approximate in an "on-year" to a million bushels. The variety is well suited to the somewhat severe growing conditions often experienced during the summer months and it can benefit from rain during late March and April to a greater extent than other varieties.

THE ACQUISITION SCHEME

The Acquisition Scheme commenced in 1940 and terminated in 1951. This scheme was the salvation of the industry here as it was no doubt in Tasmania. A great deal of credit must be given to those responsible, and to the State Committee who managed local activities during the long difficult years when shortages of labour and materials, etc., were an everyday occurrence.

The executive members of the State Committee were G. Parke, (Chairman); R. M. Carter (Superintendent), and H. Soothill, later Deputy Chairman of the Apple and Pear Marketing Board.

During the early years of the Acquisition Scheme, growers were paid on quantities of apples determined by tree measurements. Many growers, with young orchards, found the temptation to leave fruit on the untipped leaders until the trees had been measured too great to withstand. Unfortunately the result was disastrous as many young trees broke down under the weight of fruit and never fully recovered. During the acquisition period with the exception of 1940, exports were greatly restricted.

During the critical years 1941-45 quantities did not exceed 82,640 bushels in any year.

Token shipments to the extent of approximately 200,000 bushels took place during 1946 and 1947. In 1948 and 1949 they rose to approximately 600,000 bushels, and fell back to 450,000 in 1950. Normal shipments resumed in 1951.

In an effort to utilise the surplus fruit to assist in the war effort, four apple dehydration plants were established, namely at Greenmount, Mt. Barker, Donnybrook and Bridgetown. In addition, large quantities of apples were used for juice extraction and for canning. Shipments of fresh apples were also made to the Eastern States. Every effort was made by the State Committee to promote the sale of fruit. Mobile units regularly visited suburbs in the metropolitan area and sold fruit at cheap prices. Country sales were encouraged but unfortunately bagged fruit suffered severely from bruising.

Before the war most growers were versed in the proper methods of sound orchard husbandry. When an interest in fruit-growing was recreated after the war, many new growers found themselves ignorant of such basic requirements as proper care in the handling and the presentation of their fruit. They also were hampered by an almost complete absence of skilled labour for pruning, grafting, packing, etc.

WEATHER CYCLES

Weather cycles have varied a great deal and during the last 20 years there have been a number of exceedingly dry seasons; in fact, seven were generally very dry, an additional one was very dry in the Great Southern districts; further, on four occasions it was particularly hot and dry during the months of January, February and March. This means that out of the 20 years under review, 12 years have been hot and dry and a heavy toll of the industry's profits has been taken owing to undersized and sunburnt fruit.

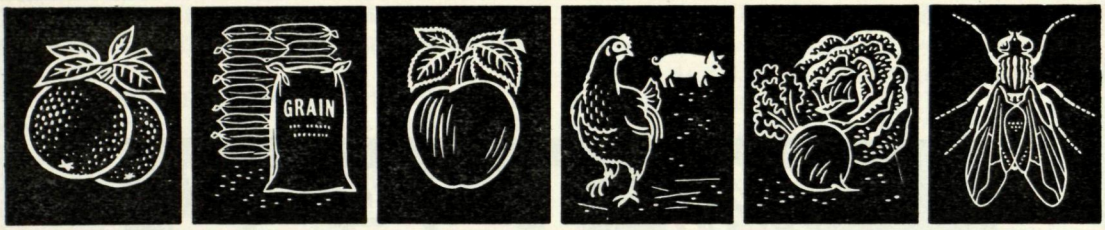
Great progress has been made by growers in the provision of facilities for irrigation, which provide for essential insurance against losses through moisture stress, but there is a long way to go before the majority of growers will cease to be entirely dependent on natural growing conditions. It can be pointed out that in some years, owing to low winter rainfalls particularly in the Great Southern areas, dams and creeks were only partially filled and only limited quantities of water were available for irrigation.

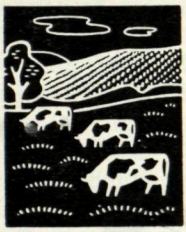
DISEASE ERADICATION

The period has been notable from the pest and disease point of view in that there have been six large-scale outbreaks of codling moth, apple scab and oriental peach moth.

A new importation was the apple leaf hopper or jassid. It was first noticed at

Fig. 5.—An incident during the apple scab eradication campaign at Manjimup where flame-throwers were used to destroy possibly diseased fallen leaves caused by premature leaf-fall





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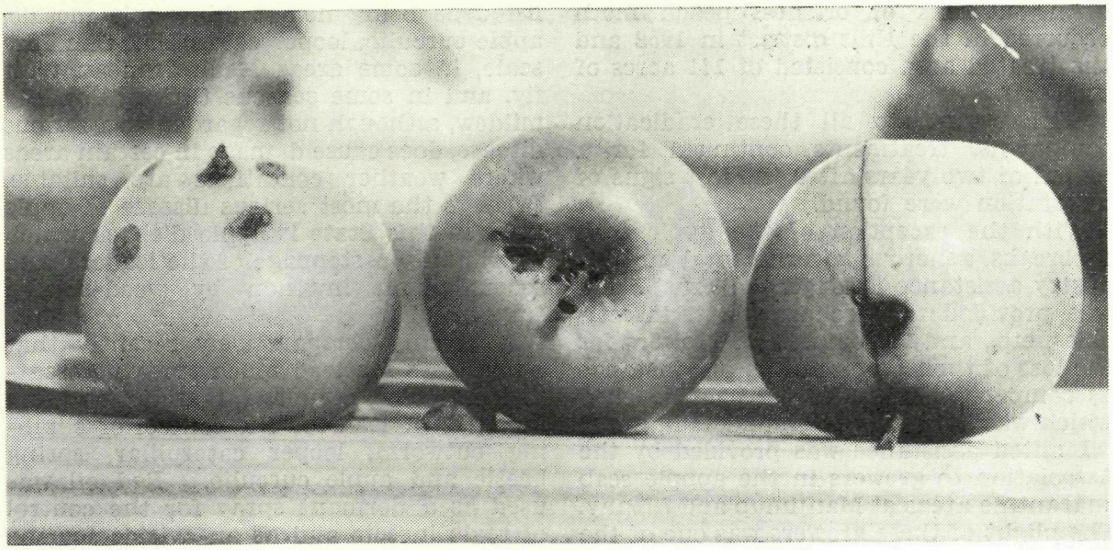

Fig. 6.—Apples damaged by codling moth—a serious pest of apples, pears and quinces. A number of outbreaks have occurred in the State and all have been successfully eradicated

Bridgetown in 1941 but unfortunately to such an extent that eradication was considered to be impossible. Tremendous damage was caused by this pest, particularly during the acquisition period when a number of adverse growing conditions were experienced. In recent years it has been adequately controlled by summer sprayings used against bryobia mite and red spider.

The outbreaks of apple scab, codling moth and oriental peach moth have been successfully eradicated by the efforts made by the Department and the growers concerned. The following is a brief summary of the outbreaks:—

During 1940, the disease "apple scab" was found in 25 orchards in the Manjimup district and three orchards in the Albany district. Growers suffered severely through the use of Bordeaux sprays russetting the fruit and by damage to the trees caused by moisture stress brought about by the prohibition of any cultivations until after Christmas. Although growers received payments through the Acquisition Scheme most of the fruit was classified as "good" grade and was paid for accordingly. Another severe outbreak of apple scab occurred during 1947 on young apple seedlings imported from Tasmania. A survey was quickly put into operation, and infested trees which were found on 20 commercial orchards, in two nurseries and in three backyard orchards were destroyed. It was obvious, from this experience and from other occasions when infested trees were found in nurseries, that the disease was being imported on young trees. On this account a prohibition was placed in 1948 on the importation of young apple trees; since that date no further signs of this disease have been found.

With regard to codling moth, outbreaks occurred at Collie in 1947, a large coal-mining town, at Mullalyup and Nannup in the South-West in 1951, and at Bridgetown in 1956. In Collie there were approximately 40 acres of pome fruit trees growing in backyard gardens. These trees were closely surveyed and many were bandaged, sprayed and "magpied" by departmental officers. In a number of instances buildings and fences close to infested trees had to be destroyed on account of harbouring hibernating larvae. It is pleasing to note that the compensation to the townspeople for the loss of fences and buildings was paid by the Western Australian Fruit Growers' Association through their Trust Fund.

The quarantine area at Nannup and Mullalyup amounted to 240 acres and the quarantine area at Bridgetown applied to approximately 60 square miles containing approximately 1,300 acres of orchards, producing approximately 270,000 bushels of pome fruits.

An outbreak of oriental peach moth occurred in the Hills district in 1952 and the treated area consisted of 141 acres of orchards.

With regard to all these eradication campaigns, treatments continued for a period of two years after the last signs of infestation were found.

With the exception of the apple scab outbreaks, generous governmental and industry assistance through the Trust Fund was provided to purchase plant, insecticides, etc., and to compensate growers for the loss of their crops, and in one instance as compensation for an old packing shed which was burnt to the ground at Nannup.

Limited assistance was provided by the Association to growers in the appple scab quarantine areas at Manjimup and Albany. The plight of these growers was one of the stimulations which produced the Trust Fund.

It can be expected that further outbreaks of codling moth will occur from time to time in the future and it is more than probable that given an even chance, eradication will be achieved.

DISEASES AND PESTS

Certain diseases and pests cause a great deal of trouble and they can briefly be listed as being nematodes, apple mosaic, apple curculio, looper caterpillar, San Jose scale, in some areas Mediterranean fruit fly, and in some seasons thrips. Powdery mildew, although not regarded as a serious disease, does cause damage in certain areas where weather conditions are suitable. Perhaps the most serious disease of apple trees in this State is apple dieback which is primarily a stoppage of the leaders, and secondly, an invasion by wood-rotting fungi.

It is only comparatively recently that apple trees received much spraying treatments. The standard insecticides were arsenate of lead for the control of climbing cutworm, looper caterpillar, spring beetle and apple curculio. Red oil was used as a dormant spray for the control of scale insects and as an ovicide for the control of bryobia mite. Lime-sulphur was used for the control of scale insects and in some instances for powdery mildew.

The introduction of so many new insecticides and fungicides has been somewhat bewildering to growers as it is difficult for them to counteract the arguments of a determined salesman. The materials Metasystox and Trithion have been most effective in the control of bryobia mite, red spider and apple jassid. Dieldrin has

Fig. 7.—An incident during the codling moth eradication campaign at Nannup. During this period large numbers of non-commercial trees were destroyed by Departmental officers. In the right foreground a deep pit has been dug to bury the fruit. The trees were destroyed by burning on account of harbouring hibernating grubs in loose bark, cracks, etc. A few trees were always left intact to ensure that the moths did not fly to clean orchards

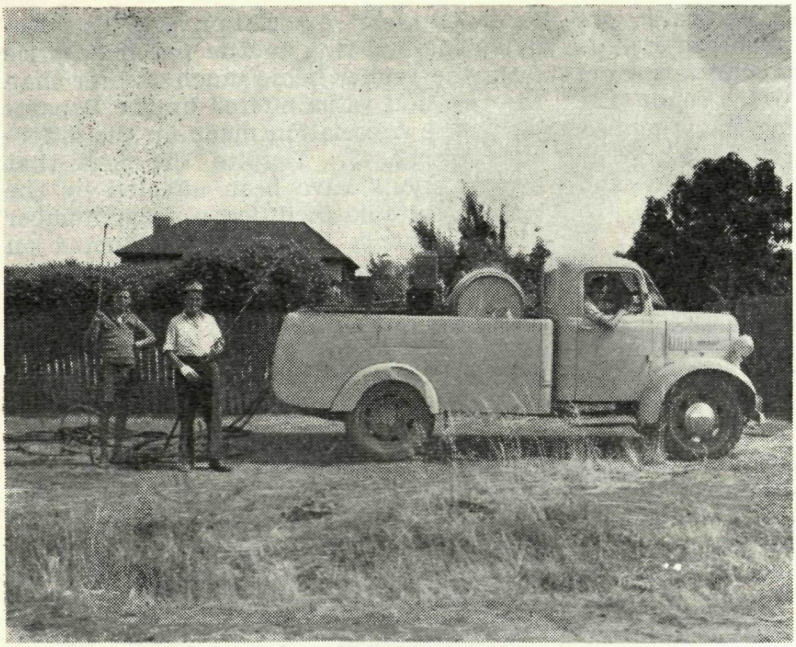

Fig. 8.—A mobile spraying plant used to spray house orchards infested with codling moth. Similar plants were used at Collie, Nannup and Bridgetown

proved to be a potent defence against the apple curculio. DDT has never been popular among growers, although it was most effective for the control of the apple leaf hopper, loopers, etc. Red oils have been supplanted by superior oils and it is not certain to what extent they are superior. Lime-sulphur is still used for winter sprayings against San Jose scale and it is only on odd occasions that this material or Karathane are used for the control of powdery mildew..

Perhaps some reference should be made to fruit fly control. Two new baits consisting of Malathion and sugar, and Malathion and hydrolised yeast have recently been gazetted. When used experimentally, significantly better results were obtained, when compared to sodium fluosilicate.

Towards the end of the period there has been the introduction of the new soil fumigants, DD; Ethylene dibromide and Nemagon. These materials should prove to be of considerable value in controlling nematodes and in this direction the use of Nemagon around living trees appears extremely promising.

CROP LOSSES

As mentioned previously, severe crop losses have occurred during the period under review due to hot and dry weather conditions.

Unfortunately other crop losses have occurred from time to time due to hail, frost and thrips.

The Mt. Barker district has been probably the most unlucky district in this regard. Early in 1951, a severe hailstorm reduced export quantities by approximately 100,000 bushels and later in the same year thrips more or less ruined crop prospects for the following year. In addition, since 1951, severe dry weather has reduced yields in almost all the on years.

Other districts have been more fortunate as crop losses due to hail were restricted to relatively small areas. The greatest loss was through frost damage in 1944.

STOCKS

Up until 1948, the main stock in this State was Northern Spy. Since 1948, when imports were prohibited from outside the State, the two stocks now being mainly used are root grafts and seedlings, with more trees on root grafts than on seedlings.. Many of the orchards on these stocks are in their tenth or eleventh year and are showing great promise with regard to tree growth particularly when irrigated. Bearing however, has been delayed but it does

appear that these stocks generally, are superior to Spy. They have the disadvantage however, that the trees being larger are more susceptible to dry growing conditions.

One nurseryman is selling small quantities of trees this season on M.793. The stock does well in New Zealand and Queensland.

INVESTIGATIONS

Considerable investigations have been made into the problems affecting apple trees, principally the disease known as apple dieback. Although significant advancements in knowledge have been obtained, the fundamental causes have not yet been ascertained. Investigations are now in progress on the secondary phases of the problem, namely, the control of wood-rotting fungi. In the near future it is intended to initiate full-scale trials on the primary cause mainly directed into soil management, control of nematodes and apple curculio. The acquisition of the Stoneville Research Station in 1955 has now made it possible for the commencement of more comprehensive and detailed investigations and during 1961 a rootstock trial will be planted. All the most promising rootstocks have been obtained and they will be used with suitable scion varieties. The purchase of the research station highlights the co-operation which exists between the Western Australian Fruit Growers' Association and this Department. Owing to the purchase price from the vendor being much greater than the taxation value offered by the Department, the Association made up the difference of £2,843. Despite the fact that investigations have been affected by the lack of suitable facilities, a great number of experiments have been conducted on growers' properties on such matters as the control of insect pests and nematodes, fertilisers, stop drop sprays, soil mulches, chemical thinning etc., etc. In this particular sphere considerable progress has been made since 1940 and it is confidently expected that with the research station in operation significant results of value to industry will be achieved in the years to come.

It is also pertinent to point out that storage experiments with Granny Smith apples have been highly successful in controlling superficial scald by the dual temperature method and by delayed harvesting.

Important advances have also been made in the use of polythene liners for the successful storage of Yates apples, and Bartlett and Packham pears.

COLD STORAGE

During recent years many small cold stores have been established on grower's properties, particularly in the Hills and Donnybrook districts.

Fig. 9.—Bulk-handling of apples on the orchard of Mr. R. Grist, Donnybrook. This grower and Mr. R. Crouch of Kendenup pioneered this method of harvesting in this State

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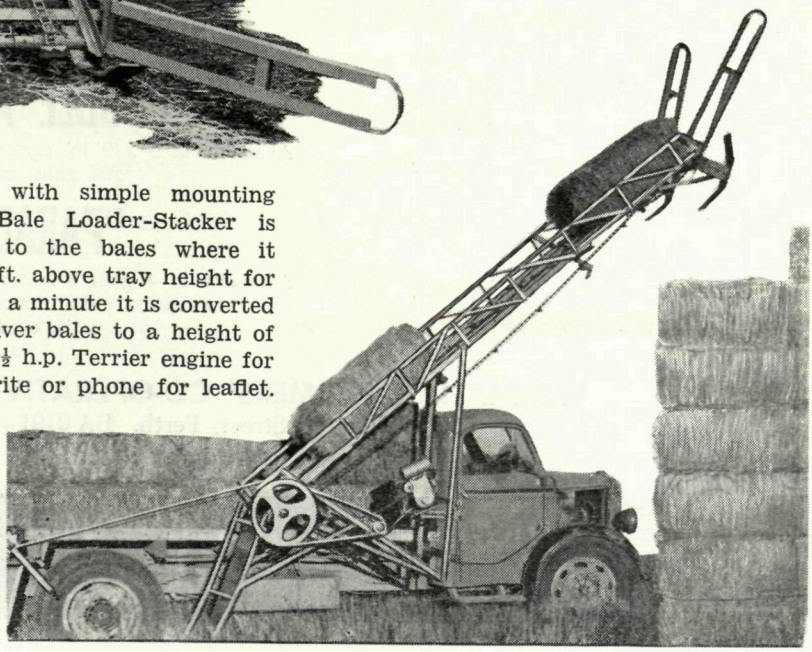

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Fig. 10.—Propagation of apple trees on various rootstocks in the nursery, Stoneville Research Station. The first experimental planting of apples will be made during 1960

BULK HANDLING

Bulk harvesting commenced three years ago when two growers adopted the practice with considerable ingenuity to meet their own particular requirements. They were Mr. R. Grist of Donnybrook and Mr. R. Crouch of Kendenup.

During 1958, two central packing sheds at Donnybrook erected by Westralian Farmers Co-op. Ltd., and Tropical Traders & Patersons Ltd., made considerable progress in commercial experiments and during 1959, the practice was adopted on a much more general scale by both growers and central packing sheds.

Although bulk containers or bins holding approximately 25 bushels of unwrapped fruit of mixed sizes, $2\frac{1}{4}$ in. to $2\frac{3}{4}$ in., were used in Tasmania for export purposes to the United Kingdom on a small scale during 1958 and more generally during 1959, the new method of packaging for export was slow to commence in this State. Only one export firm, the Mount Barker Co-op., participated to the extent of shipping six bins towards the close of the last export season.

LEGISLATION

The most important legislation affecting the apple industry are the Plant Diseases Act, the Fruit Growing Industry Trust Fund Act, the Agricultural Products Act and the Fruit Cases Act. Under the Plant Diseases Act power exists to cope with the outbreaks of disease which occur from time to time, and provision is made for the inspection and treatment of imported plant material. A very significant section of the Act deals with annual orchard registration fees and these apply to both commercial and non-commercial orchards. Backyard growers are required to register and the minimum fee is 2s.; should they have more than 24 trees the registration fee is 5s. The registration fee for commercial orchards of one acre and greater is 5s. per acre or part thereof. The money collected from orchard registration fees is placed into a special Trust Fund and is used entirely for the payment of salaries and expenses of fruit fly inspectors, printing, etc. This Fund is considerably augmented by advances from Government sources to subsidise Compulsory Fruit Fly Baiting Schemes, etc. Provision for the establishment of these schemes is also made under the Act; there are three in operation at the present time. Significant advances in fruit fly control will commence this year by a joint arrangement with the Western Australian Fruit Growers' Association and the Department. The Association has decided to make available monies from the Trust Fund and have voluntarily agreed to increase the commercial registration fees from 2s. to 5s. The extra money, which will be subsidised on a £1-for-£1 basis by the Department, will be used for publicity purposes, research, and the appointment of additional staff.

The Fruit Growing Industry Trust Fund Act was passed in 1942 and the Fund has now reached a high figure. It has been used in the past to cover the expenses of the Association and very significant contributions have been made from it to recoup losses to growers involved in disease and pest eradication. The establishment of this fund is a major advance and has made possible the eradication of the disease outbreaks without severe financial loss to the growers involved.

Grading regulations are provided for apples under the Agricultural Products Act, and fruit cases are specified under the Fruit Cases Act.

PERSONS

The fruit growing industry has been fortunate in having over the years capable representatives who have held their own in the many Government and Industry conferences which have taken place. First and foremost is the President, M. J. McNeil Martin, M.B.E., who has occupied this position over the last 25 years. He has been ably assisted by others who have made great contributions to the well being of the industry.

The Fruit Branch of the Department has changed a great deal since the beginning of 1940 when the late Mr. G. W. Wickens retired. Officers who have been with the Department and who are now performing important duties elsewhere include Mr. R. C. Owen, M.L.A., who is Chairman of the Central Citrus Council of this State; Mr. T. C. Miller, who is now Chief Horticulturist with the Department of Agriculture, South Australia; Mr. W. J. Bettenay, who is Supervisor, Fresh Fruit Exports with the Department of Primary Industry, Melbourne, and Mr. S. de Beaux, who is Fruit Officer in London with the Department of Primary Industry. Although the Department has lost the services of these ex-officers, it has been fortunate in obtaining replacements who are now doing sterling work for the industry.

Throughout the period a number of overseas visits have been made to obtain experience in marketing, extension and research in other countries.

The Superintendent of Horticulture visited Singapore in 1947 and acted as Australian Fruit Officer in London during 1949. Mr. H. J. Price of the Illawarra Orchard Co., Karragullen, visited Canada and the United States of America during 1954. This year Mr. F. Melville, a senior officer of the Horticultural Division, has acted as Assistant Fruit Officer in London and is now in America for several months.

CONCLUSION

The Apple Industry in this State, which was showing signs of slowing down in 1940, was still further handicapped by the conditions arising from the war. At the end of hostilities, trees, materials and labour were in short supply. The high price for wool and other primary products caused

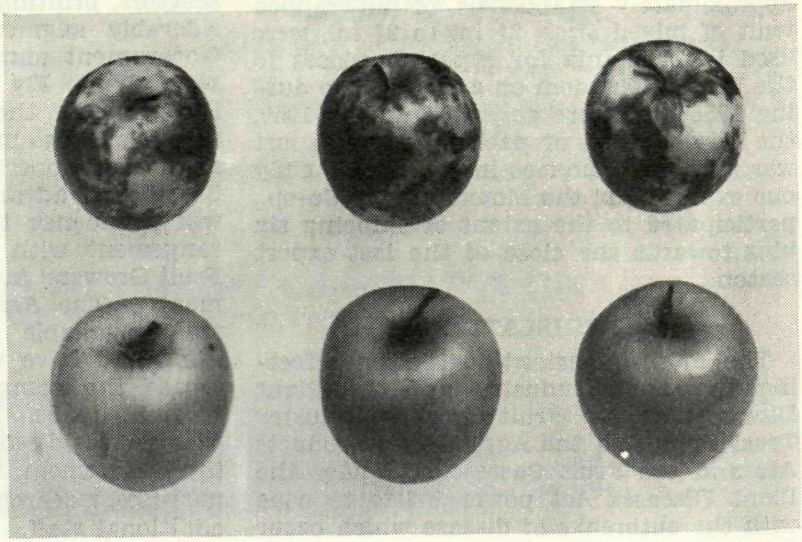

Fig. 11.—Results of a storage experiment with Granny Smith apples; top row is affected with superficial scald and the bottom row is free; much storage research has been done and recommendations are now available to reduce the incidence of this serious disorder

Fig. 12.—Some of those who attended the 1942 Annual Conference of the Western Australian Fruit Growers' Association (Inc.). Most of these men played an important part within the industry and some are still doing so. Unfortunately the ranks have been thinned by time

Front row: T. Skinner; the late T. G. Sounness; J. McNeil Martin—President (recently honoured by the Queen for his services to the industry); J. Cross; E. S. Hester

2nd row: L. Hill; R. M. Carter; the late F. Kamman; H. R. Powell, Superintendent of Horticulture; R. Wallace; W. Cansdale; the late A. Chately; the late Mr. Samson, M.L.A.

3rd row: H. Lake; T. C. Miller—now Chief Horticulturist, Department of Agriculture, Adelaide; the late B. Hickling; the late A. Machin; the late O. A. K. Sounness; C. R. Moore

4th row: G. Parke; F. Hawter; the late J. McAlinden; H. Clothier; ————

5th row: S. Bennett, Horticultural Instructor; the late T. Ilbery; the late T. Howatson; the late J. Brindle, ————, M. W. Wright; W. Gibb; H. J. Price; ————; ————; the late W. Boon.

a lack of interest in apple growing and many orchards, particularly in marginal areas and in the Lower Great Southern, were allowed to deteriorate. This trend is now changing with the fall in price of wool and more interest is being shown in orchards. The most significant changes have taken place in the Hills, Donnybrook and Manjimup districts.

The attached table shows areas of apple orchards in some key Road Board districts in 1940 and in 1958: With regard to diseases and pests, the industry has been fortunate in safeguarding its position against the establishment of codling moth, oriental peach moth and apple scab. On the other hand, an important pest, the apple leaf hopper has been introduced.

A solution to the problem of apple dieback has not yet been obtained but fortunately there are indications that a solution is in sight.

Of the other pests and diseases, effective control measures are available except for the virus disease, apple mosaic. Efforts are being directed to the establishment of virus-free material which it is hoped will be made available to nurserymen for future plantings.

The establishment of the research station at Stoneville is a major advancement and will do much to clarify many of fruit growers' problems.

Important advances have been made in controlling superficial scald of Granny Smith apples and with the use of plastic liners for the storage of certain varieties of apples and pears. There have also been significant advances in cold storage facilities, and many small cold stores have been established on growers' properties.

Again, there have been spectacular changes in harvesting by the adoption of bulk handling methods, resulting in less

bruising and lower costs. Central packing sheds have in most instances made the necessary adjustments to handle the bulk containers. The use of bulk bins for export has also commenced and this method can easily revolutionise existing shipping practices during the next few years.

Certain legislation has been mentioned as being of particular importance to the industry and the advantages which have been obtained in the past should apply to the future.

The organisation of the industry is on sound lines and there is an organisation known as the Advisory Council to discuss mutual problems. This Council consists of representatives of growers, shippers, and the Department of Agriculture.

There have been important changes in the mechanisation of orchards. The era has seen the disappearance of the horse and its replacement by tractor. More efficient spraying plants have been obtained and growers are thus better equipped, than they were in 1940.

From the growing point of view it is clear that at the present time a large proportion of the apple trees are old and are incapable of producing a crop in excess of 1,700,000 bushels, except under favourable weather conditions. However, with the increased facilities for irrigation and post-war plantings of more vigorous stocks, production can be expected to increase in the future.

Generally, it can be said that progress over the last 20 years, measured by production, has not been spectacular, but important achievements have been realised in the eradication of pest and disease outbreaks and it can safely be said that progress in the future, if there are no world calamities, will be steady and certain.

NUMBERS OF APPLE TREES IN SOME KEY ROAD BOARDS IN 1940-1958

	DARLING RANGE			PRESTON			BRIDGETOWN			WARREN			PLANTAGENET		
	Bearing	Non-bearing	Total	Bearing	Non-bearing	Total	Bearing	Non-bearing	Total	Bearing	Non-bearing	Total	Bearing	Non-bearing	Total
1940	11,142	9,501	20,643	99,322	33,638	132,960	197,481	50,774	248,255	83,984	36,343	120,327	244,500	42,554	287,054
1958	25,119	16,304	41,423	119,563	38,765	158,328	209,829	24,466	234,295	125,428	34,089	159,517	207,368	6,899	214,267

NEW FLAX VARIETY RELEASED

A new flax variety named "Forrest," which is resistant to all known strains of flax rust, has been released to flax growers for cultivation in the Boyup Brook area.

The new variety was developed by selection from an introduced variety known only as D.83, and is an excellent flax type with fine, medium tall straw and a good seed-head. It is a sparsely-tillering variety with medium to good straw strength.

During the last five years experimental bundles of straw have been processed and the fibre quality assessed by the Blackwood Flax Co-op. Co Ltd. In 1958 an acre was grown on Mr. J. Hands' property, and enough seed was obtained to sow 10 to 12 acres on the same farm this year.

"Forrest" is equal to present standard varieties such as "Wada" and "Boyup" in respect to yield of straw, fibre yield and fibre quality. It is superior in rust-resistance and therefore should prove a valuable new early-maturing variety for growing in the Boyup Brook area.