

PART 6

PRIMARY PRODUCTION

Land Settlement and Irrigation

Land Utilization

Introduction

The climatic conditions of Victoria (for details see pages 44 to 64) and especially the incidence of rain have resulted in the development of a wide range of farming practices, but at the same time have been largely responsible for restricting the number of enterprises on individual farms. Farming is generally carried out on a single enterprise basis, a major exception being the association of cereal growing and sheep grazing in the main wheat areas. Other exceptions occur on a less extensive scale with other forms of production.

Most farms in the State are owner-operated and, with the exception of the larger holdings, the routine work on the farm is carried out by the farmer and his family, but at times of peak labour requirement, such as during shearing or harvest, additional labour is employed.

Considerable areas in the State are retained as forest reserves and for water catchments (see page 284).

The pattern of land use is more or less clearly defined in each of the statistical districts (see map on page 307). Thus the Mallee and the northern part of the Wimmera District are used almost exclusively for cereal production and sheep raising. The more intensive carrying of livestock in these districts has been made possible by a channel system of domestic and stock water supply originating in the mountainous area of the Grampians to the south. The agriculture of the Northern District is based largely on irrigation and ranges from dairying to fruit production. The non-irrigated parts of the district are used for cereal and sheep production. In the Western, Central, North-Central, North-Eastern, and Gippsland Districts, the rainfall is heavier and more reliable; consequently, there is more diversity in land utilization. In these districts, sheep grazing and dairying are the most important industries. Cultivation is generally limited. Some wheat is grown in the North-Eastern and Western Districts and there is some production of potatoes, vegetables, and other intensive cultivation crops on the more fertile soils in the higher rainfall parts.

Mallee District

This district is situated in the far north-west of the State and has a total area of 10·8 mill. acres. However, there are extensive areas in the north and west which, because of water shortage and the liability to severe soil erosion, have not been settled, and the total area used for agricultural production is 7·6 mill. acres.

The soils of the district being light in texture are easily and cheaply cultivated and the main farming enterprise is cereal cropping, associated with wool, and prime lamb production. The principal crop grown is wheat and the area sown to this crop averages about 1·3 mill. acres. In addition, some 300,000 acres of oats, including 15,000 acres for hay and 50,000 acres for grazing, and 65,000 acres of barley are usually grown. Yields from cereal crops vary widely, according to seasonal conditions. The average district yield per acre for wheat in recent years has been close to 20 bushels.

In the past, lack of suitable pasture species was a major problem in pasture development, and the grazing was provided largely by native pastures, green cereal crops and crop stubbles. The discovery and introduction into crop rotations of suitable medics has resulted in marked benefit to both crop production and grazing. The use of medics is now widespread in the district and has greatly improved the conditions for production of early prime lambs mainly for the Melbourne market. Dry land lucerne has also contributed to the vastly improved grazing afforded by the pastures.

The district now carries about 1·8 mill. sheep and produces about 17·6 mill. lb. of wool in addition to the early lambs.

Irrigation areas located close to the River Murray, which marks the northern boundary of the State, produce most of the State's dried vine and citrus fruits.

Wimmera District

The Wimmera occupies the central western part of the State and has an area of 7·4 mill. acres, of which 6 mill. acres are used for agricultural purposes. Rainfall in the north is about 14 in. per year, increasing to 25 in. in the south. The Grampians in the south of the district have a higher rainfall. This area is unsuited to agricultural production and is retained by the Crown as a watershed area and forest reserve.

There are wide variations in soil type, but the district includes substantial areas of fertile self-mulching clay loams, which are among the most productive wheat-growing soils in Australia. South and east of the Grampians the soils are podzols and in the south-west there is a large area of light-textured grey soils.

Wheat farming in association with fine-wool growing or prime lamb production is the main farm enterprise over the north and central Wimmera. Both climate and soils are suited to cereal cropping and yields obtained are high. The area sown to wheat averages about 900,000 acres, the average yield being close to 27 bushels per acre. Other major crops are oats (292,000 acres, including 24,000 acres for

hay and 18,000 acres for grazing), and barley (30,000 acres). In recent years the development of suitable strains of medics and clovers has resulted in the inclusion of a pasture phase in crop rotations.

In addition to mixed sheep and wheat farming, there are extensive areas, particularly in the south and west of the district where rainfall is higher and pasture establishment easier, which are used solely for grazing. Almost three-quarters of the sheep carried in the area are Merinos, and, although a number of early fat lambs come from the wheat-growing areas, emphasis here is more generally on fine-wool production and breeding. The district carries over 4 mill. sheep and produces more than 46 mill. lb. of wool. As is the case in the Mallee, dairying and beef cattle production are only of minor importance.

Northern District

This is an area of plains country extending from the Central Highlands in the south to the River Murray in the north. The total area of the district is 6.3 mill. acres, of which 5.5 mill. acres are occupied for agricultural purposes. The soils vary from typical light Mallee soils in the north-west to fertile red-brown earths in the east. Average annual rainfall is 14 in. in the north-west and increases to 25 in. over the foothills of the ranges, which are on the eastern boundary of the district. The district includes the major irrigation areas of the State, and because of this several different farming enterprises are carried out.

Wheat growing is an important industry. The area sown averages about 560,000 acres, and, because of climatic and soil differences, yields vary widely across the area, the district average being 23 bushels per acre. As in the other major wheat-producing districts, oat crops are an important feature in rotations and for grazing. In the Northern District over 230,000 acres of oats are sown each year, including 30,000 acres for hay and 16,000 acres for grazing.

The district carries about 4 mill. sheep, largely on wheat farms, and emphasis is on prime lamb production rather than fine-wool growing. Extensive irrigation has made it possible to establish highly productive perennial pastures which are used mainly for dairy production, but, in addition, the irrigation areas fatten sheep and lambs from the non-irrigated areas in Victoria and New South Wales. The milk produced is mostly used for butter, cheese, and other manufactured products, but small quantities are used for city whole milk supply. There are over 380,000 dairy cattle in the district.

Apart from dairying, irrigation has permitted the establishment of an important fruit-growing industry. This area supplies fresh fruit to Victorian and interstate markets and also provides fruit, mainly apricots, pears, and peaches, for the important canneries operating in the district.

North-Central District

This district includes much of the Central Highlands area and the rainfall is generally over 30 in., but on the northern slopes it is as low as 22 in. There is wide variation in topography and soils and

much of the area is used for grazing sheep and beef cattle. However, the district is relatively small, containing only 2.9 mill. acres, of which 2.1 mill. acres are occupied and used for farming production.

Cereal cropping is unimportant, but potatoes in the area north-east of Ballarat and fruit in the Harcourt area are the most important crops grown. Although dairy farms are scattered throughout the district, it is marginal for this form of production and emphasis is on sheep production associated with beef production. The district carries over 2 mill. sheep and about 80,000 beef cattle.

North-Eastern District

The district has a total area of 7.2 mill. acres, but includes substantial areas of Crown lands, much of which is very steep and heavily timbered. The area occupied is 3.7 mill. acres. Annual average rainfall varies from 20 in. in the north-western corner of the district to well over 60 in. over the mountains. Almost all of the area used for rural production has a 20 to 30 inch rainfall.

Although cereal cropping is not general, there is an interesting development of ley farming based on subterranean clover pastures. However, areas concerned and production are small in relation to the State totals. The fertile river valleys are suited to specialty crop production, and some 9,000 acres of tobacco and small quantities of hops are grown in these areas. The district carries about 150,000 dairy cattle, mainly along the river valleys.

Prime lamb growing and crossbred wool production are the main sheep enterprises in the north-western and western parts of the district, but fine-wool growing is more common on the unimproved pastures along the Murray Valley and in the Omeo area. The district carries about 2 mill. sheep.

The North-Eastern District is an important beef cattle breeding and fattening area, and over 240,000 head are carried. The cattle make good use of the rough pastures of the foothill country and the productive pastures of the flats make suitable fattening areas.

Western District

Most of the district falls in the 25–30 inch rainfall belt, but an area north and east of the Otways is influenced by a rain shadow effect and the average annual rainfall is 20 to 25 in. In the Otway Ranges the average annual rainfall is as high as 70 in. The soils of the district vary considerably in type and fertility. The great bulk of the plains area consists of basaltic soils. In the north the soils are similar to those of the southern Wimmera. The total area of the district is 8.8 mill. acres, of which 6.6 mill. acres are occupied. There are substantial areas of forest reserve in the Otways, which are in the south-eastern part of the district.

The only cereal crop of importance grown is oats which are used as a fodder crop, cut for hay, or harvested for grain which is also used very largely to feed stock. The more fertile soils produce both potatoes and onions, and about 60 per cent. of the State's onion acreage is located in the district. However, emphasis is placed on animal production, and climatically the district is well suited to the development of improved pastures. It is the major wool producing

area of the State, carrying over 9·8 mill. sheep. Almost half the total sheep population is Merino, and the fine wool breeds—Merino, Polwarth, and Corriedale—make up nearly three-quarters of the total sheep population. There are relatively few crossbreds, and prime lamb production does not have the same importance as in other districts. The Western District is an important beef cattle breeding and fattening area and carries close to 380,000 head. Many of the State's leading stud herds are located in the district, and in addition, many sheep properties carry beef cattle.

Dairying is an important industry and there is widespread distribution of dairy cattle. However, the main concentrations are in the following areas :—Colac, Camperdown, Koroit, Allansford, and the Casterton—Coleraine region. A proportion of production is used as whole milk for town supply, but a considerable proportion of the State's processed milk products and butter are produced in the district, which carries about 428,000 dairy cattle.

Central District

Rainfall varies from 20 in. in the rain shadow area, north of Geelong, to more than 50 in. over the ranges north and east of Melbourne. Topographically there is variation from plains country on the western side of Port Phillip Bay to the steep hill country north and east of Melbourne. There is also a wide variation in soil type and fertility. The total area of the district is 4·1 mill. acres and 2·7 mill. acres are occupied—the remainder being reserved as forest and watershed areas.

The climate is suited to the production of malting barley and about 40,000 acres are grown—mainly on the plains to the west. Potatoes are grown in the Romsey—Ballarat area and market gardening is important near Melbourne, Geelong, and Bacchus Marsh.

The district carries about 2·4 mill. sheep and production is almost evenly divided between fine-wool growing and fat lamb production.

Beef cattle are grazed in conjunction with sheep over most of the area, but in the east they are run with dairy cows to produce vealers.

The major dairying area is in the east, and this forms part of the most important dairying area of the State. The area is an important supplier of whole milk for city supply and for butter and cheese manufacture. There are just under 300,000 dairy cattle in the district. Pig production is also important.

Gippsland District

The total area of this district is 8·7 mill. acres, but the northern and eastern parts are mountainous and are reserved by the Crown. The area occupied is 3·6 mill. acres and the bulk of settlement is south of a line between Dandenong and Bairnsdale. Rainfall varies from just under 25 in. in the rain shadow area near Maffra and Sale to 60 in. and above in the highlands. Average annual rainfall over the most part of the settled areas is 30 to 40 in., and climatically the district is well suited to the development of highly productive perennial pastures. The soils range from poor sands to relatively fertile loams. The highly fertile alluvial soils of the river valleys are important sources of production.

With the exception of forage crops, cropping is not important in the area, although certain specialty crops, such as maize, beans, and potatoes, contribute substantially to the State's total production.

Gippsland is the most important dairying district of the State and dairying is by far the most important rural industry in the district. The highly productive pastures of the 30 to 40 inch rainfall areas are the basis of the industry. The district supplies the greater part of the whole milk requirements for the Melbourne market, and in addition, plays an important part in the production of butter, cheese, and other processed dairy products. In addition, the dairy herds contribute to veal and beef production. The district carries nearly 520,000 dairy cattle. Pig raising is associated with dairy farming, and there are 70,000 pigs carried in the area.

In western and southern Gippsland, sheep production is small and consists largely of fat lamb producing flocks run in conjunction with dairy cattle. However, in the 22-30 inch rainfall area near Sale, prime lamb production on improved pastures is a major enterprise. In the foothills, fine-woolled sheep and beef cattle are carried.

Alienation of Land

The total area of the State is approximately 56,245,760 acres. On 31st December, 1964, this comprised:—

	Acres
Lands alienated in fee-simple	31,789,514
Lands in process of alienation	2,359,365
Crown lands	22,096,881
Total	56,245,760
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Crown lands comprise:—	Acres
Reserved Forest	5,603,829
State Forest and timber reserves (under Land Act)	150,974
Water reserves	315,416
Reserves in the Mallee	410,000
Other reserves	658,894
Roads	1,707,444
Water frontages, beds of rivers, lakes, &c., unsold land in cities, towns, and boroughs ..	3,845,223
Land in occupation under—	
Perpetual leases	165,576
Leases of former agricultural college lands ..	28,235
Other leases and licences	1,645
Temporary grazing licences and leases ..	*5,873,326
Unoccupied	3,336,319
Total	22,096,881

* In addition, 77,730 acres of land listed under Reserves are held under grazing licences.

In the following table are shown the area of Crown lands sold absolutely and conditionally, and the area of lands alienated in fee-simple during the five years 1960 to 1964. A portion of the area conditionally sold reverts to the Crown each year in consequence of the non-fulfilment of conditions by the selectors. The lands alienated each year include areas selected in previous years.

VICTORIA—ALIENATION OF CROWN LANDS

Year Ended 31st December—	Area of Crown Lands Sold			Crown Lands Alienated in Fee-simple	
	Absolutely, at Auction, &c.	Conditionally to Selectors	Total	Area	Purchase Money
			acres		\$
1960.. ..	3,740	38,532	42,272	129,939	562,346
1961.. ..	16,315	42,070	58,385	99,805	552,056
1962.. ..	3,584	11,299	14,883	103,337	616,674
1963.. ..	3,308	19,425	22,733	103,766	326,934
1964.. ..	3,896	23,055	26,951	76,587	406,554

Transfer of Land Act and Assurance Fund, 1961
Government Assistance to the Farming Industry, 1964

Soil Conservation Authority

Functions

The Authority is responsible for the mitigation and prevention of soil erosion ; the promotion of soil conservation ; the determination of land use to achieve these objectives ; and the provision of an advisory service to landholders for the efficient development and use of water resources available to them.

To perform these functions, it conducts ecological and land use surveys, and carries out soil conservation work, experiments and demonstrations of soil conservation, and reclamation of eroded lands.

The Authority co-ordinates the policies and activities of Government departments and public authorities for the alienation and use of Crown lands, and the Act provides wide powers for soil conservation works. Grants and loans to assist in the carrying out of approved specific projects may be made to any Government department, public authority, or private individual on such terms as the Authority may decide.

Land Utilization Advisory Council

The Chairman of the Authority is also Chairman of the Land Utilization Advisory Council, which operates under the same Act. The Council consists of the Director of Agriculture, Secretary for Lands, Chairman of the Forests Commission, and the Chairman of

the State Rivers and Water Supply Commission. The Secretary of the Authority is also Secretary of the Land Utilization Advisory Council.

The Council's functions are to make recommendations to the Authority on the constitution and definition of catchment areas and to advise the Minister and the Authority concerning policy of all land use in any catchment area. After consultation with the Land Utilization Advisory Council, the Authority determines the most suitable use in the public interest of all lands in catchment areas, and which lands should be permanently used for forests, pastures, agriculture, and other purposes.

Farm Water Resources

Because soil conservation is closely allied with water conservation on farmlands, the Soil Conservation Authority, since its inception in 1950, has always provided a considerable advisory service on farm dams to landholders. In 1965, the Soil Conservation (Water Resources) Act gave the Authority the responsibility of promoting efficiency in the use and development by landholders of all water resources available to them. This was a considerable and desirable extension of the Authority's role in relation to water conservation.

Surveys, investigations, designs, and estimates of costs for soil and water conservation works and for distribution of water are made by the Authority by agreement with, and at the expense of, the landholders involved. Where necessary it may hire equipment to landholders for these purposes and charge fees for services provided. The Authority may also recommend that loans be granted to landholders for approved works, the Rural Finance and Settlement Commission being the responsible organization for handling loan arrangements.

Soil Conservation Authority, 1961-1966

Land Utilization Advisory Council, 1962

Destruction of Vermin and Noxious Weeds, 1963

Soil, Land Use, and Ecological Surveys, 1966

Rural Finance Facilities

Introduction

Australia's national policy for permanent land settlement has been based on the family unit farm. Financially this has seldom been easy because even in the early days settlers found it difficult to earn enough to maintain themselves whilst they were clearing and developing their blocks. The conditions of purchase were made very easy but considerable aggregation of holdings took place because settlers failed. Later, some of these large estates were re-purchased, subdivided, and the smaller farms made available to settlers under closer settlement schemes.

After the two world wars these schemes were expanded to enable ex-servicemen to acquire farms under generous terms of settlement. In addition, money was advanced to returned servicemen to enable them to buy their own "Single Unit" farms. Soldier settlers were also granted loans for the purchase of stock, plant, and equipment.

The State set up a Rural Finance Corporation with wide powers for assisting rural industry. This was later merged with the Soldier Settlement Commission into a Rural Finance and Settlement Commission.

The Commonwealth Bank has had a Rural Credits Department for many years. Its main function is to provide seasonal assistance in the marketing of products. Thus it cushions the effect of large interim payments at harvest time and provides credit for goods awaiting shipment or in transit. It also assists in financing research. The Commonwealth Development Bank is interested in making loans available for the improvement of approved properties.

The trading banks have many farmer clients who require finance mostly on a relatively short-term seasonal basis. Numerous pastoral finance companies act as agents for farmers and frequently provide credit for the purchase of properties or for their improvement or for the purchase of livestock. The State Savings Bank also makes limited financial advances to farmers.

Rural Finance and Settlement Commission

General

The Rural Finance and Settlement Commission was established by legislation passed in 1961, which began to merge the former Soldier Settlement Commission and the Rural Finance Corporation. The new Commission carried out the functions of the previous authorities temporarily in two separate branches, viz., those of Settlement and Finance, respectively, until further legislation passed in 1963 completed the merger by removing this division and co-ordinating the functions previously performed by the two separate authorities.

Rural Finance Act

The Rural Finance Corporation was established in April, 1950. Its functions, which have since been taken over by the Commission, include the making of advances through loans at low rates of interest to existing or proposed country industries, both primary and secondary. The Commission is also empowered to advance moneys to, or for the benefit of, any farmer for carrying into effect a composition or scheme of arrangement between him and his creditors.

Revenue, expenditure, &c., for each of the five years, 1960-61 to 1964-65 are given in the following table :—

**VICTORIA—RURAL FINANCE ACT : REVENUE,
EXPENDITURE, ETC.
(\$'000)**

Particulars	1960-61	1961-62	1962-63	1963-64	1964-65
REVENUE					
Interest	874	950	1,040	1,145	1,237
Other	24	40	50	20	21
Total Revenue	898	990	1,090	1,165	1,258
EXPENDITURE					
Administration	116	120	110	134	143
Interest	556	598	730	797	947
Sinking Fund	40	44	46	50	53
Other	32	24	24	108	63
Total Expenditure ..	744	786	910	1,089	1,206
Net Surplus	154	204	180	76	52
Loans and Advances Outstanding at 30th June	18,730	19,718	20,340	21,168	22,388
Loan Indebtedness to State Government at 30th June	16,646	17,812	19,032	20,208	21,050

General Settlement

Prior to the end of the Second World War, the Commonwealth Government and various State Governments made arrangements for the settlement of discharged soldiers on the land as part of a general scheme of rehabilitation of ex-members of the Services. In 1945, the Victorian Government completed an Agreement with the Commonwealth Government. The State Parliament ratified the Agreement and also passed legislation constituting the former Soldier Settlement Commission. Soldier Settlement in all States has now reached the stage where, apart from forfeited holdings, no further allocations of blocks are visualized.

Under the Victorian legislation, soldier settlement was carried out under two separate schemes. First, there was the general settlement scheme where the Commission acquired freehold land or Crown land for subdivision and development into holdings for application by ex-servicemen. Such holdings were allocated on a competitive basis, having regard to the merits of all the applicants. The number of ex-servicemen settled under this scheme totalled 3,287. Second, there was the Single Unit Farm Scheme, where ex-servicemen were granted loans up to a maximum of \$18,000 to assist them in the purchase of existing farms of their own choosing. Under this scheme 2,878 ex-servicemen were granted loans amounting to \$23,917,338.

The Soldier Settlement Act enabled the Commission to make advances to general settlers and Single Unit Farm settlers to assist them in the purchase of stock, plant, equipment, and shares in co-operatives. For this purpose \$12,539,392 has been advanced to settlers and at 30th June, 1965, \$12,224,960 has been repaid,

\$30,674 has been written off, leaving an outstanding balance of \$283,758. In addition to its functions under the Soldier Settlement Act, the Commission, on behalf of the Commonwealth Government, administered that portion of the *Commonwealth Re-Establishment and Employment Act 1945*, which related to agricultural loans and allowances.

With soldier settlement in its final stages, the following tables set out the particulars of rural rehabilitation of ex-servicemen in Victoria as at 30th June, 1965 :—

VICTORIA—LAND ACQUIRED AND COST OF DEVELOPMENT, 1945 to 1965

Particulars	Total Expenditure to 30th June, 1965		Balance Outstanding at 30th June, 1965
	acres	\$'000	
Freehold Land	1,193,171 } 51,536 } ..	39,433 } 53,840 }	443
Crown Land			
Development and Improvement of Holdings			
	Total Realizations to 30th June, 1965		
	acres	\$'000	
Sales of Land Not Required for Soldier Settlement	64,571	3,156*	469*

* Sale price of land not required for settlement ; balance outstanding represents instalments not yet due where terms were given to purchasers, who are not necessarily ex-servicemen.

VICTORIA—ADVANCES TO EX-SERVICEMEN, 1945 TO 1965

Act	Total Advances to 30th June, 1965		Advances Outstanding at 30th June, 1965	
	No.	\$'000	No.	\$'000
Soldier Settlement Act—				
Advances for Settlers' Lease Liability*	3,028	57,316	2,421	43,519
Advances to Assist in Acquiring and Developing Single Unit Farms	2,878	23,917	1,440	10,339
Advances for Improvements, Stock, Implements, &c. ..	†	12,289	275	284
Advances for Shares in Co-operatives	327	250	..	..
Commonwealth Re-establishment and Employment Act—				
Advances to Assist Rehabilitation in Farming Industry	2,970	3,594	259	88

* The total number of settlers allocated holdings is 3,287 which includes 239 holdings re-allocated and 17 holdings disposed of. Three settlers have yet to receive their lease liabilities.

† Not available.

Other Land Settlement

The *Land Settlement Act 1959* extended the functions of the then Soldier Settlement Commission in that, under such Act, the Commission was given authority to administer a new land settlement scheme to cater for those men wishing to become farm owners—many of whom were too young to have been ex-servicemen and thus eligible

for soldier settlement. The scheme generally is based on the same principles as the scheme for soldier settlement—the main differences being the interest rates payable and the basis of determining the capital liability of the settler for the farm. There is no provision in the Act for advances to buy single unit farms. The Commission is given authority to purchase privately owned land or set apart suitable Crown land for development and subdivision.

Any male British subject over the age of 21 years is eligible to apply for land made available, but the actual allocation is made on a competitive basis, having regard to a number of factors laid down in the Act, including the applicant's experience in farming and prospects of success. A feature of the legislation is that the farms are either brought to, or within sight of, production before allocation. Further details about the general principles of this legislation will be found on pages 494 to 496 of the Victorian Year Book 1963.

Up to 30th June, 1965, the land being developed for allocation under this scheme has been on three developmental projects. These are at Heytesbury near Cobden, Yanakie on Wilson's Promontory, and the East Goulburn Project near Shepparton.

The Yanakie and East Goulburn schemes have now been completed and all farms allocated to settlers.

The demand for all holdings allotted to date has been exceedingly keen and the 348 farms allocated (276 dairying and 72 soft fruit) attracted nearly 10,000 applications.

At 30th June, 1965, the position of other land settlement in Victoria under the *Land Settlement Act* 1959 was as follows:—

VICTORIA—OTHER LAND SETTLEMENT, 1959 TO 1965

Particulars	Total Expenditure to 30th June, 1965		Balance Outstanding at 30th June, 1965	
	acres	\$'000	\$'000	
Land Acquired—				
Freehold Land Purchased ..	17,894	1,304	14,379	
Crown Land	106,681			
Development and Improvement of Holdings .. .. .	..				16,483
	Total Realizations to 30th June, 1965			
	acres	\$'000		
Sales of Land Not Required for Settlement	2,013	117*	20*	
	Total Advances to 30th June, 1965		Advances Outstanding at 30th June, 1965	
	No.	\$'000	No.	\$'000
Advances to Settlers under the Land Settlement Act ..	†	631	278	407
Liability of Settlers Granted Purchase Leases	81	2,392	81	2,347

* Sale price of land not required for settlement; balance outstanding represents instalments not yet due where terms were given to purchasers.

† Not available.

*Other Rural Finance Facilities**State Savings Bank of Victoria*

State Savings Bank loans for rural purposes fall into two categories :—

(1) Credit Foncier Department loans are long-term advances to enable borrowers to purchase or improve farms. The maximum loan available from this source is \$7,000 carrying interest at 5 per cent. per annum and repayable over 10 years (subject to renewal). The maximum loan must not exceed three quarters of the value of the property. Particulars of advances, repayments, &c., for the year ended 30th June, 1965, may be found on page 680.

(2) Savings Bank Department loans are advances of larger amounts—the maximum loan is \$20,000—and are available on the security of first mortgage over freehold property. These are short-term loans extending over a period of 3 years, but are subject to renewal. Interest charged is either 5½ or 6½ per cent. per annum depending on whether the property is occupied by the borrower or whether the loan exceeds \$10,000. The maximum loan must not exceed two thirds of the value of the property.

Reserve Bank of Australia—Rural Credits Department

The Rural Credits Department was established in 1925 as a department of the Commonwealth Bank of Australia, now known as the Reserve Bank of Australia. Its function is to provide finance to statutory marketing boards and similar authorities and to co-operative associations of primary producers. Advances are used by borrowers principally for making payments to growers for their primary produce pending its sale and to finance marketing expenses which in some cases include processing and packing of the commodity.

Finance for the marketing of wheat, and to a lesser extent, dairy products and barley has comprised the major portion of accommodation provided, but the Department's operations have also covered such commodities as tobacco, canning fruits, dried fruits, meat, eggs, and fertilizers.

The interest rates for advances during the year ended 30th June, 1965, were 4½ per cent. per annum, if against the security of a Commonwealth or State Government guarantee, and 4½ per cent. per annum against other securities.

Grants have also been made by the Rural Credits Development Fund for research and extension work to assist the development of primary industries. The Fund is financed by one half of the annual net profits of the Rural Credits Department.

Commonwealth Development Bank

A brief outline of the functions of the Commonwealth Development Bank, together with particulars of rural advances outstanding at 30th June, 1965, may be found on pages 675–676. Rural loans are made for a variety of purposes, e.g., clearing, fencing, pasture improvement, farm water conservation, erection of essential farm buildings, and the

stocking of properties. Other aspects of assistance granted include aid to successful applicants in government sponsored rural development schemes and land ballots. Special attention is also given to providing finance to applicants opening up new areas. Particulars of rural advances approved in Victoria during the year ended 30th June, 1965, are given in the following table :—

**VICTORIA—COMMONWEALTH DEVELOPMENT BANK OF
AUSTRALIA : RURAL ADVANCES APPROVED,
YEAR ENDED 30TH JUNE, 1965
(\$'000)**

Type of Rural Activity	Rural Advances Approved
Sheep	798
Dairying	1,267
Cattle	69
Wheat	137
Fruit Growing	241
Poultry	145
Other	83
Total	2,739

The average loan approved for rural purposes during the year was \$9,577.

Advances by Major Trading Banks

The extent of rural lending in Victoria by the Commonwealth Trading and other major trading banks is illustrated by the following table which shows bank advances to borrowers outstanding at the end of June for the five years 1961 to 1965 :—

**VICTORIA—COMMONWEALTH TRADING BANK AND
PRIVATE TRADING BANKS : BUSINESS ADVANCES
OUTSTANDING TO RURAL INDUSTRY BORROWERS
(\$m)**

Industry of Borrower	Amount Outstanding at the End of June—				
	1961	1962	1963	1964	1965
Sheep Grazing	38.4	39.5	39.8	39.8	45.6
Wheat Growing	4.6	6.3	7.8	8.4	12.2
Dairying and Pig Raising	24.6	27.4	29.7	31.8	31.2
Other Rural	15.9	17.2	19.4	20.2	21.2
Total	83.6	90.3	96.7	100.2	110.2

Advances to rural industry borrowers represented 17·2 per cent. of trading banks' business advances outstanding at the end of June, 1965, and 14·1 per cent. of all advances outstanding. The maximum rate of interest on bank overdrafts at 30th June, 1965, was 7½ per cent. per annum but the average rate on rural loans would probably be below this level.

Advances of Pastoral Finance Companies

The following table shows total rural advances outstanding to pastoral finance companies at the end of June for the five years 1961 to 1965 :—

VICTORIA—RURAL ADVANCES* OF PASTORAL FINANCE COMPANIES

(\$m)

At End of June—							Advances Outstanding
1961	..	..	..	..	..	..	39.9
1962	..	..	..	..	..	..	32.9
1963	..	..	..	..	..	..	35.6
1964	..	..	..	..	..	..	39.0
1965	..	..	..	..	..	..	43.9

* Held by branches located in Victoria which is not necessarily the State of residence of the borrower.

Improvement Purchase Leases

Crown land can be made available for application under improvement purchase lease conditions. All applications received are dealt with by a Local Land Board and no person is eligible to obtain a lease if the unimproved value of the area applied for together with the unimproved value of the land already owned by the applicant exceeds \$15,000.

The essential conditions of an improvement purchase lease are as follows :—

- (1) That the lessee will make such land improvements within the first six years as are specified. Land improvements means the clearing, draining or grading of land, the preparation of land for the sowing of crops and pasture, and soil improvement and maintenance.
- (2) That the lessee will commence to carry out the land improvements within one year and will complete one quarter within three years.

- (3) That the lessee will not sell, assign, or part with possession of the leasehold during the first six years.
- (4) That the lessee will not mortgage his interest in the leasehold during the first six years without first obtaining the consent of the Department.
- (5) That the lessee will establish his permanent home on the land before the end of the sixth year. If the land is not considered to be capable of being developed into a living area, then the lessee may reside on other land within 20 miles owned by him.

The purchase money is payable in 20 annual instalments and on satisfactory compliance with the conditions of the lease and on payment of the balance of purchase money and fees, a Crown grant will be issued at any time after the first six years.

Since the inception of improvement purchase leases in 1956 and up to 31st December, 1965, 685 allotments comprising 246,577 acres of Crown land have been proclaimed available for settlement.

Water Supply and Land Settlement

History

For practical purposes, the history of water supply in Victoria—outside the Metropolitan Area—can be taken up in the early 1880's when the miners who had left the goldfields to settle on the northern plains began to assess after a few exceptionally favourable years the true nature of the arid lands which they were pioneering. It was their agitation which led to the *Irrigation Act* 1886 providing for elected local trusts to construct water supply works with Government loan funds.

Between 1886 and 1900, about 90 Trusts were set up under this Act, but for a variety of reasons they all proved a failure. By 1900, the need for a State-wide attack on the water supply problem was apparent and in 1905 the Water Act was passed. This revolutionary Victorian Act, which has since provided the basis for practically all of the rest of Australia's water supply development, had three main features :—

- (1) It abolished all but one of the Trusts (Mildura) and wrote off their debts ;
- (2) it set up the State Rivers and Water Supply Commission to develop and control water supply and conservation throughout the State, with the exception of the Melbourne Metropolitan Area ; and

- (3) it completed the nationalization of water resources commenced in the 1886 Act and vested in the Crown the right to the use and control of the water in the State's rivers, streams, &c., thus avoiding the litigation which has clouded the history of water supply in the U.S.A.

Control of Surface Waters and Other Functions

One of the State Rivers and Water Supply Commission's main functions is to exercise the Crown's rights to the control and use of rural surface waters, and to act on any infringement of these rights. The Crown's interest is to see that limited resources are distributed fairly and productively between users. This is done by licences and permits for private diversions from streams, and by the apportionment of resources to authorities constituted under the Water Act.

The Commission also investigates water resources and plans works. It operates 200 gauging stations on streams and publishes the information obtained. Records of river flows extend back to the 1860's. Investigation and planning require surveys, and there are 28 surveyors working from nine centres. Other Commission investigatory services are its Testing Laboratory and Irrigation Research Section at Head Office, and its Hydraulic Research Station at Werribee.

Irrigation

Most irrigation is carried out in districts directly controlled by the Commission, although there is an increasingly large proportion of "private diverters", irrigators who are authorized to take water from streams, lakes, &c., but who do not come within the boundaries of an irrigation district. (See page 298.)

A feature of the districts is the system of "water rights". Under this system a certain quantity of water is assigned to each district and allotted to the lands commanded and suitable for irrigation. The irrigators pay a fixed sum for this water each year, whether they use it or not, and also pay a general rate. The irrigators get this water right in all except the very driest years and they can also buy water in excess of the water right in most seasons. The water right system assures irrigators of a definite quantity of water each year, and the Commission can rely on fairly constant revenue to meet the cost of district operation. Water usage varies according to seasonal conditions and the water right system provides a constant minimum income.

A feature of Victorian irrigation policy has been the development of closer settlement by intensive irrigation, that is, by allocating relatively large quantities of water per holding instead of limiting the allocation of water to a portion of each holding. This has meant that

Victorian irrigation is predominantly devoted to dairying, fruit, and vegetables, rather than to sheep raising. The advantage of intensive irrigation is that much higher returns are available from a given quantity of water and, consequently, a much greater rural population is supported.

Major storages devoted principally to irrigation are shown in the following table :—

VICTORIA—MAJOR IRRIGATION STORAGES

River	Name	Capacity	Principal System or District Served
		acre ft.	
Goulburn ..	Lake Eildon ..	2,750,000	Goulburn-Loddon
	Goulburn Reservoir ..	20,700	„ „
	Waranga Reservoir ..	333,400	„ „
Campaspe ..	Lake Eppalock ..	252,860	„ „
Loddon ..	Cairn-Curran Reservoir	120,600	„ „
	Tullaroop Reservoir ..	60,000	Maryborough town supply ; private diverters ; and Goul- burn-Loddon System
Murray ..	Lake Hume ..	1,250,000*	Murray
	River Murray Weirs ..	111,420*	„
Macalister ..	Lake Glenmaggie ..	154,300	Macalister
Werribee ..	Pykes Creek Reservoir	19,400	Bacchus Marsh District
	Melton Reservoir ..	15,500	Werribee District
		5,299,410†	

* Victoria's half share under the River Murray Agreement, subject to certain obligations to South Australia.

† In addition to the storages named, the total includes a system of natural lakes in the Kerang-Swan Hill Area. These lakes are part of the Torrumbarry System and have a total capacity of 141,910 acre ft. The Coliban River storages are used for both irrigation and town supply around Bendigo and Castlemaine. A limited irrigation area is also supplied from the Wimmera-Mallee System.

The following table compiled by the Commission shows the total areas of the various irrigation systems and the areas under irrigated culture during 1964-65 :—

VICTORIA—AREA OF SYSTEMS AND LANDS IRRIGATED, AND WATER DELIVERED, 1964-65

System or District	Total Area within Constituted District	Area Irrigated								Water Deliveries
		Pastures		Lucerne and Sorghum	Vineyards	Orchards	Market Gardens	Others	Total	
		Native	Sown							
Goulburn-Loddon System	1,351,460	25,673	436,494	27,514	371	23,542	3,253	15,351	532,198	acre ft. 757,222
River Murray System—										
Torrumbarry System* ..	365,199	17,844	224,151	7,882	5,372	1,721	862	6,207	264,039	262,167
Murray Valley Area ..	301,818	1,406	98,885	7,705	115	6,405	373	554	115,443	212,538
Pumped Supply Districts †	80,763	310	336	980	38,386	3,303	107	900	44,322	139,598
Total River Murray	747,780	19,560	323,372	16,567	43,873	11,429	1,342	7,661	423,804	614,303
Macalister District ..	130,582	3,171	57,610	622	..	..	105	66	61,574	96,764
Werribee-Bacchus Marsh	16,342	13	5,582	832	..	618	4,278	45	11,368	16,788
Other Northern Systems ..	‡	686	12,041	1,248	..	3,410	478	145	18,008	27,565
Other Southern Systems ..	‡	..	..	..	.	..	1,055	292	1,347	..
Private Diversions ..	‡	2,107	92,762	9,653	3,534	5,744	16,373	10,583	140,756	346,531
Grand Totals ..	§2,246,164	51,210	927,861	56,436	47,778	44,743	26,884	34,143	1,189,055	1,859,173

* Includes 35,118 acres irrigated by private diversion.

† Including First Mildura Irrigation Trust (16,062 acres irrigated), supervised by the Commission.

‡ Not available.

§ Incomplete.

Private Irrigation

Private irrigation by diversion of water from rivers, lakes, &c., has increased in recent years. From 1942-43 to 1964-65, the area watered privately increased from 23,462 acres to 140,756 acres, the latter being 11·8 per cent. of the total area irrigated. The number of private diversions authorized during 1964-65 was 7,828 and the water delivered was used mainly to produce annual and perennial pastures and fodder, as well as potatoes, tobacco, hops, citrus, and cotton. About half the area privately watered is supplied from streams regulated by storages, the other half being from streams wholly dependent on rainfall. Many private storage dams are being built, frequently at substantial cost, on individual properties to insure against low flows in the streams normally used.

River Improvement

The disposal and control of surplus water is as great a problem as water supply. There are 25 river improvement and drainage trusts under the River Improvement Act operating under the supervision of the Commission. At Carrum, Koo-Wee-Rup, and other areas the Commission administers drainage and flood protection districts. There is one catchment authority under the basic control of the Commission for an extensive semi-rural area adjacent to Melbourne.

Rivers and Streams Fund

This fund, unique to Victoria, was created in 1930 to assist in removing stream obstructions, and repairing river bank erosion, and for other river works. It is formed from river frontage rentals and fees for private diversions. Under the River Improvement Act, it is allocated by the Commission through local Government authorities, generally on the basis of \$2 to each local \$1. In 1964-65, the revenue was \$119,104. Since 1930, grants totalling \$1,517,820 have been made and with local contributions, \$2,260,000 has been expended on river improvement.

Town Supplies

The Commission operates major works for town water supplies outside the Metropolitan Area—the Coliban System supplying Bendigo, Castlemaine, and other towns in that area; the Mornington Peninsula System supplying Dandenong and bayside towns from Chelsea to Portsea and Crib Point; and the Otway System supplying water from the Otway Ranges to Camperdown, Cobden, Terang, and Warrnambool. The total towns supplied by the Commission are 139 and their total population is 200,000. (Other town supplies and Sewerage—see page 227.)

Finance

Acting as a government authority, the Commission constructs its works with funds provided for the purpose by Parliament—amounting to date to about \$275m. A further \$75m of Government loan moneys has been provided for expenditure by local authorities under the supervision of the Commission. In recent years the rate of

expenditure on construction of State works has been about \$12.5m annually, and the Commission also supervises the expenditure of about \$5m annually by local authorities.

The Commission administers, supplies water to, and collects revenue from, nearly 120 separate districts, each of which is run financially as a separate undertaking. Revenue from its ten irrigation districts exceeds \$4m ; from its 95 urban districts exceeds \$2m ; from its eleven rural waterworks districts about \$1m, and from its three flood protection districts about \$100,000—the total annual revenue, including other minor sources, being about \$8m.

Administration

The Commission is served by a decentralized organization, designed to carry out diverse functions all ultimately related to water. Central administrative, engineering, and clerical functions are carried out by a staff of 500 in the Head Office at Armadale. At the many country centres throughout the State, there are 1,000 other officers and some 2,000 casual employees. Together they are engaged in planning, building, maintaining, and operating waterworks vital to the prosperity of rural Victoria.

Irrigation, 1962

Wimmera-Mallee Region Water Supply and Flood Protection, River Improvement, and Drainage, 1963

Underground Water, 1964

Water Supply in Victoria, 1964

Goulburn-Murray Irrigation District, 1965

Spray Irrigation in Agriculture and Dairying, 1965

Private Irrigation Development, 1966

Water Research Foundation, 1966

Agricultural Education, Research, and Extension

Tertiary Agricultural Education

Agricultural Colleges

The legislation of 1884 which provided for the establishment of agricultural colleges set up a Council of Agricultural Education for their administration. Its revenue was derived from the rentals of endowment lands, sales of farm produce, and students' fees, and it continued to administer the Colleges until 1944 when, with the passing of a new Agricultural Colleges' Act, control passed to the Department of Agriculture in which a new Division of Agricultural Education was established. This move has provided adequate finance for maintenance and capital expenditure, the latter including a complete rehabilitation programme for both Colleges (i.e., Dookie and Longerenong) in the period from 1959 to 1963.

The main purpose of the Colleges is to train agricultural technologists in the basic technical and scientific principles underlying all aspects of agriculture. Lectures on all topics are complementary with demonstrations, tours, laboratory work and practical farm work, the latter being given on large farm areas attached to each College—6,048 acres at Dookie and 2,386 acres at Longerenong. Although the emphasis is placed on training technologists to assist in agricultural research and extension, intending farmers will gain a sound technical and scientific background to enable them to make best use of modern agricultural and economic developments in operating their own properties.

In 1966, a completely revised syllabus was introduced at Dookie and Longerenong and after successful completion of the three-year course, students gain a Diploma of Agricultural Science. The minimum entrance standard is a pass in five subjects including English and Chemistry at the Leaving or Leaving Technical examination. Short intensive courses for farmers, farmers' sons and others engaged in rural pursuits are provided at Dookie Agricultural College.

The Agricultural Education Division is responsible for administering the College of Horticulture at Burnley Gardens where, since 1958, a three-year course for the Diploma of Horticulture has been conducted. This course has been up-graded since the beginning of 1957 to the Diploma of Horticultural Science with the same pre-requisite entrance requirements as for the Agricultural Colleges. Part-time evening classes in horticultural subjects and science subjects applicable to horticulture are also conducted at Burnley. The Agricultural Education Division also administers the Government grant to Senior Young Farmers.

University of Melbourne School of Agriculture

The Faculty of Agriculture was set up in its present form by the *Agricultural Education Act 1920*, which provided for permanent staff, for a building, and for the employment of graduates as scientific officers in the State Public Service. (There had been less permanent arrangements for teaching agriculture in the University earlier in the century.) The first full-time Professor took up his appointment in 1926.

The primary purpose of the four-year University course has been to give all students a common, basic training in applied biology. The first year is devoted to pure science subjects. This is followed by three years in which the scientific principles upon which agriculture is based are presented and in which students learn of their application to the practice of agriculture. The subjects of the later years include more advanced chemistry and biochemistry, plant physiology and pathology, soils, microbiology, genetics, animal physiology and husbandry, agronomy, economics, and land utilization. The students in Agricultural Science also attend courses in engineering subjects, while a full-time degree in Agricultural Engineering is conducted elsewhere in the University.

The second year of the course is spent in residence at the University's field station at Mount Derrimut (near Deer Park). This is a property of 800 acres on which the students are shown the regular farm operations and live through a farming year, while spending their mornings on regular lecture classes and coming to Melbourne University for one day a week.

Since the establishment of the Faculty of Agriculture, 824 graduates have entered the profession. A quota of 70 is now placed on the numbers in the first year of the course, and the number of graduates is between 40 and 50 per annum. There are now twelve students for higher degrees (M.Agr.Sc. and Ph.D.) working either at the University or at Mount Derrimut. Substantial buildings have been established at Mount Derrimut from various industrial research funds for beef cattle, poultry, sheep and wool, and wheat.

Further Reference, 1966

Research and Extension

Victorian Department of Agriculture

The high standard of Victoria's agriculture, which produces more than one-quarter of Australia's primary produce (measured in terms of value) from less than one-thirtieth of the nation's area, is due in no small measure to the programme of research and advisory services undertaken by the Victorian Department of Agriculture.

The Department of Agriculture, which has expanded greatly in recent years, has concentrated on strengthening its existing research stations with new and up-to-date facilities, establishing new research centres, promoting new research projects, and intensifying advisory services.

At research centres strategically located in Victoria's rural areas, highly trained scientists are seeking the answers to a wide range of problems which face the primary producer trying to improve the efficiency of his farm. These scientists have already made many notable discoveries which have benefited Victorian agriculture.

To speed these research results to the farming community, the Department of Agriculture has appointed trained advisory officers throughout rural Victoria.

These advisory officers use every method of communication to channel technical facts to farmers. Much of their time is taken up with on-the-farm advice, but they also speak at field days and hold discussion group meetings. Their work is also backed by the Department of Agriculture's intensified production of publications, films, and radio and television services.

Farm Management in Victoria*Introduction*

In the normal operation of a farm, the farmer must make daily decisions on the priorities to be given to different tasks. He must decide on the time of year at which any given operation is to be carried out and to make the necessary arrangements so that materials and labour are available when required. In addition, he is concerned with making management decisions on technical agricultural matters such as the types of fertilizer to be used, the most suitable species of pasture plants to be sown, whether or not crops should be sprayed, and if so, with what insecticide. Skill and competence in these fields of operation and technical management are essential for success in farming.

At present, however, when change in the technology of agriculture is more rapid than at any previous time and where, in many industries, the gap between prices paid for goods and services and prices received for farm products is narrowing, it is also essential for the farmer to pay increasing attention to the managerial decisions which affect the profitability of the farm as a whole.

Profitability

Important decisions in this area of management are concerned with such things as the type and combination of enterprises, size of farm, stocking rate, levels of use of fertilizer, the use of credit, or the size and type of machinery to buy. Although all of these decisions have technical and operational implications, they must be made with a view to using the available resources in such a way that over the long term, the operation of the farm will result in a satisfactory level of profit to the farm business. This is one of the aims of farm management.

The need for study of management on farms has been emphasized by the results of various economic surveys undertaken for different reasons throughout Australia. These results all show a wide variation of financial results between farms. In some cases the variation may be partly explained because of environmental differences but even when studies relate to climatically homogeneous areas marked variations still exist. For example, in one such area, the Woorayl Shire in Gippsland, the Victorian Department of Agriculture found from a study of dairy farms undertaken several years ago, that net farm income over all farms averaged \$3,900 and the return on capital averaged 6 per cent., but that the range was from \$10,000 net farm income and 19 per cent. on capital down to \$628 net farm income and no return on capital. Analysis of the results showed that by far the greater part of the variability could be explained by differences in stocking rates and in the amounts of concentrates (grain, bran, &c.), fed to the cows.

Such results indicate that there is scope for improved farm income and productivity on a large number of farms. It is because of the realization of the importance of maximum use of resources and of

the role which a study of farm management may be expected to play that agricultural economics sections have been established in the Departments of Agriculture in all States.

Management Investigations

The Agricultural Economics Branch was established in the Victorian Department in 1954. The general function of this Branch is to provide the information and techniques necessary to permit farmers or their advisers to make management decisions that will result in increased farm prosperity. This function is regarded as being complementary to the well established technical advisory services which have contributed substantially to the improvement of agricultural production in the past.

The requirements for the successful development of farm management advisory work are, firstly, that suitable methods of farm management investigation should be available and, secondly, that farmers should keep adequate records which, with associated techniques of business analysis, form a satisfactory basis for forward planning of management.

The basic information for management investigation is usually obtained from sample surveys or from groups of farmers keeping special records for the purpose. In either case the sample must be carefully designed. The broad aim of the investigations is to define the management practices which are associated with financial success in the particular type of farming or environment under study.

Information Analysis

The information collected is analyzed using one or another of the available mathematical techniques or may be used to draw up budgets showing the estimated results from the different management possibilities. The survey analysis usually indicates the management practices responsible for differences in financial success between farms and in many cases provides farmers with an assessment of the likely financial result arising from a change in these practices. For example, the analysis of the Gippsland survey referred to previously showed that stocking rate and concentrate feeding were the major factors involved in differences in farm income. From this analysis it was also possible to estimate that on the average farm in this area, the addition of one cow to the milking herd would be expected to yield an increase of \$88 in net farm income. Similar studies have been conducted on dairy farms in the Heywood and Yarra Valley areas. Other studies are in progress on wheat farms in the Mallee and on grazing properties in the Western District.

Another type of analysis of survey information uses management standards obtained from the comparative analysis of farm management advisory work in some oversea countries. This has been used by the Victorian Department studies of the poultry, pig, and dried vine fruits industries. The standard values usually represent the average of results found in the course of surveys and these are calculated for such quantities as costs per acre, stocking rate, yield per animal or per acre, and returns per unit of cost. In application to farm situations, the farmer compares the performance of his farm

with these standards and where the farm is below standard, a change in management is indicated. The analysis suggests the direction of change and provides information on the likely outcome assuming that the farmer will be able to reach the level of the standard value.

Whichever method of analysis is adopted, these investigations are designed to provide farmers with economic information in the same sense that experiments carried out on research stations aim to provide physical information relating to such things, for example, as better yielding cereal varieties or pasture species.

Planning Budgets and Records

However, in most cases where management change is suggested there are financial implications and financial planning as well as planning of physical resources are involved. This planning requires the preparation of detailed forward budgets and so far as is possible, figures used in the preparation of these budgets should be based on the actual experience of the individual farmer concerned. Because of this and because use of the results of management investigation largely depend on records kept by farmers, the design of appropriate record systems for both the financial and physical operation of the farm has been given considerable attention.

If full use is to be made of these records, farmers must also have available a meaningful system of business analysis. The record system must be adequate for statutory taxation requirements, but probably its main purpose should be its suitability for analysis as a basis for making profitable management decisions. One such system designed to cover different types of farming has been adopted by the Victorian Department of Agriculture. It was made available to farmers during 1965 and is now widely used. This system recognizes that there are certain cost elements in the farm business which, although they have to be met, remain in many situations at a more or less constant level even though a substantial change in management may take place.

In consequence, these fixed costs which are generally the costs of ownership of land or equipment may be disregarded when considering many management changes. The remaining costs are operational costs and these vary more or less directly with the level of operations and are capable of being allocated to the enterprise concerned. The use of this enterprise costing system of farm business analysis enables the farmer to determine which of a number of enterprises may be more profitably expanded on multi-enterprise farms and if intensification is economically worthwhile on single enterprise farms. It also, of course, offers the means of estimating the likely change in profit resulting from change.

Advisory Services

Farmers are becoming increasingly aware of the practical implication of the results of farm management investigations and of the application of farm business analysis techniques. As a result these activities have expanded, not only in increased services from State Departments of Agriculture, including the in-service training of extension officers, but also in more private advisers over recent years.

The development of these private management advisory services has varied from State to State. In some States the emphasis has been on the formation of farm management clubs and in this form of organization a group of farmers employ an adviser full-time, each member of the group paying a proportion of the expense involved. In Victoria, however, the private advisers generally operate as consultants and each farmer is an individual client making payment in accordance with the time spent by the consultant. This system is analogous to the secondary industry consultant services.

In Departmental and private advisory service in farm management, the basic techniques used are similar and the widespread response of farmers to improved management indicates that these services will expand in the future.

Farming

Introduction

Collection of Statistics

Since the year 1904, police officers have been required to collect agricultural, pastoral, and dairying statistics from land holders in Victoria. Prior to 1904, the statistics were collected by the municipal authorities who were required by statute to furnish information on such forms and in such manner as was required by the Governor in Council.

The rural statistics contained in this chapter are in the main compiled from annual returns of agricultural, pastoral, and dairying production collected from some 70,000 rural holdings in Victoria at 31st March each year. Schedules are distributed to farmers by 323 local police officers who act as collectors of statistics. Statistics from these schedules are compiled for each county and municipality.

Every holding of 1 acre and upwards used for the production of agricultural products or for the raising of livestock and the production of livestock products is visited, and full particulars are obtained of the area occupied, the rural population, the number of persons employed, the area and yield of each kind of crop cultivated, artificial fertilizer usage, numbers of certain items of farm machinery, the number and description of livestock, and the quantity of wool clipped.

Data relating to area sown, production, yield per acre, and number of holdings growing crops are for the season ended 31st March, thus including crops which are sown and harvested, or harvested, during the twelve months ended 31st March.

In cases where harvesting of certain crops has not been completed by the 31st March (potatoes, fruit, vines, &c.), supplementary collections are made later in the year.

Livestock numbers, farm machinery on rural holdings, and the number of persons working are reported at 31st March, whilst wage and salary payments relate to the twelve months ended 31st March.

Summary of Australian Statistics

The following table, which summarizes the principal farming activities in Australia during the 1964-65 season, shows the position of farming in Victoria relative to other States :—

**AUSTRALIA—PRINCIPAL ITEMS OF FARM ACTIVITY,
1964-65**

Particulars	N.S.W.	Vic.	Qld.	S.A.	W.A.	Tas.	N.T. and A.C.T.	Australia
Rural Holdings—								
Number	77,098	69,737	43,565	28,754	22,856	10,979	514	253,503
Area ('000 acres)	172,147	37,844	377,010	156,954	268,553	6,420	171,840	1,190,770
Principal Crops—								
Wheat—								
Area ('000 acres)	5,760	3,236	1,026	2,727	5,151	17	2	17,919
Production ('000 bush.)	151,483	78,166	22,830	52,817	63,071	364	58	368,789
Oats—								
Area ('000 acres)	850	966	55	444	1,152	28	1	3,497
Production ('000 bush.)	22,885	22,446	1,171	8,977	14,011	520	32	70,042
Barley—								
Area ('000 acres)	239	187	225	1,095	303	15	..	2,064
Production ('000 bush.)	6,707	4,334	7,111	26,932	3,701	529	..	49,315
Hay—All Types—								
Area ('000 acres)	599	1,306	74	314	305	180	5	2,784
Production ('000 tons)	1,040	2,506	162	487	390	364	8	4,958
Tobacco—								
Area (acres)	2,546	9,720	14,042	..	..	..	..	26,308
Production (dried leaf '000 lb.)	2,356	12,080	10,675	..	..	..	..	25,111
Onions—								
Area (acres)	803	3,825	3,422	1,146	428	83	*	9,707†
Production (tons)	6,378	22,963	22,853	11,061	5,981	465	*	69,701†
Potatoes—								
Area (acres)	20,530	32,931	14,005	5,247	5,797	9,393	16	87,919
Production (tons)	75,769	183,665	82,389	48,400	60,739	57,062	105	508,129
Other Vegetables—Area (acres)	41,094	45,861	42,361	9,204	7,872	21,565	259	168,216
Fruit—Area (acres)	97,221	75,509	45,918	43,012	26,425	22,375	186	310,646
Vineyards—Area (acres)	20,464	47,996	3,299	58,557	8,310	..	..	138,926
Grapes for Table (tons)	8,251	9,495	3,825	1,167	2,256	..	..	24,994
Wine Made ('000 gall.)	6,403	3,458	24	28,112	7,74	..	..	38,771
Currants (tons)	671	4,477	..	4,937	2,364	..	..	12,449
Sultanas and Raisins (tons)	12,615	66,153	..	15,831	75	..	..	94,674
Livestock Numbers, 31st March, 1965—								
Sheep ('000)	72,396	30,437	24,016	17,289	22,392	3,793	297	170,620
Cattle ('000)	4,619	3,316	7,393	697	1,258	451	1,043	18,777
Pigs ('000)	449	378	406	196	137	92	2	1,661
Livestock Slaughtered for Human Consumption—								
Sheep ('000)	6,086	7,111	2,497	1,581	1,269	425	63	19,032
Lambs ('000)	5,652	5,432	437	1,519	787	562	52	14,441
Cattle ('000)	1,526	1,234	1,506	185	299	123	55	4,928
Calves ('000)	632	645	453	90	28	51	2	1,901
Pigs ('000)	674	599	623	241	182	135	7	2,461
Wool Production ('000 lb.)	706,061	361,530	251,426	215,736	207,035	39,671	2,564	1,784,023
Whole Milk Production—								
All Purposes ('000 gall.)	291,931	745,896	230,289	102,330	61,883	87,343	1,192	1,520,864
Principal Items of Machinery on Rural Holdings—								
Tractors (No.)	78,482	74,524	64,440	34,164	32,028	11,379	485	295,502
Shearing Machines (Stands)	70,747	41,112	19,359	28,844	21,517	4,493	321	186,393
Milking Machines (Units)	42,209	101,994	44,074	19,135	10,055	13,806	116	231,389
Gross Value of Production —								
Agriculture (\$'000)	395,283	298,751	270,639	178,132	139,426	40,875	616	1,323,722
Pastoral (\$'000)	535,114	373,501	270,939	135,916	125,837	33,233	8,509	1,483,049
Dairying (\$'000)	153,155	194,988	71,194	37,533	22,581	25,234	571	505,256

* Not available for publication.

† Incomplete.

Figure 11. Counties and Statistical Districts of Victoria



Land Occupied in Different Districts, 1964-65

For the season 1964-65, the number of occupiers of rural holdings was 69,737, the area devoted to agriculture 7,503,902 acres, and the total area occupied 37,844,335 acres.

It should be noted that statistics in this part of the Year Book have been compiled for Statistical Districts, which are groups of counties, namely, land areas with immutable boundaries. A map defining the boundary of each Statistical District appears on the previous page.

VICTORIA—LAND IN OCCUPATION IN EACH DISTRICT, SEASON 1964-65 (Areas of 1 acre and upwards)

Statistical District	Total Area of Districts (Acres)	Number of Holdings	Acres Occupied				Total
			For Agricultural Purposes*	For Pasture		Unproductive	
				Sown Grasses, Clover, or Lucerne†	Natural Grasses		
	'000			'000			
Central ..	4,065	14,538	294	1,496	663	203	2,655
North-Central ..	2,930	4,420	109	822	1,007	140	2,077
Western ..	8,775	12,715	404	4,458	1,359	409	6,631
Wimmera ..	7,395	6,081	2,080	2,006	1,568	397	6,050
Mallee ..	10,784	6,119	3,020	1,209	2,739	582	7,551
Northern ..	6,337	11,829	1,366	2,006	2,049	124	5,545
North-Eastern ..	7,220	5,006	139	1,279	1,802	479	3,699
Gippsland ..	8,739	9,029	91	1,554	1,281	710	3,636
Total ..	56,246	69,737	7,504	14,830	12,468	3,043	37,844
PERCENTAGE OF ABOVE TO AREA OCCUPIED							
Central ..	..	..	11.08	56.32	24.97	7.63	100.00
North-Central ..	..	..	5.23	39.56	48.47	6.74	100.00
Western ..	..	..	6.10	67.23	20.50	6.17	100.00
Wimmera ..	..	..	34.38	33.15	25.91	6.56	100.00
Mallee ..	..	..	40.00	16.01	36.28	7.71	100.00
Northern ..	..	..	24.64	36.18	36.95	2.23	100.00
North-Eastern ..	..	..	3.77	34.58	48.71	12.94	100.00
Gippsland ..	..	..	2.49	42.74	35.24	19.53	100.00
Total ..	..	..	19.83	39.19	32.94	8.04	100.00
PERCENTAGE IN EACH DISTRICT OF TOTAL IN STATE							
Central ..	7.23	20.85	3.92	10.09	5.32	6.66	7.02
North-Central ..	5.21	6.34	1.45	5.54	8.08	4.60	5.49
Western ..	15.60	18.23	5.39	30.06	10.90	13.44	17.52
Wimmera ..	13.14	8.72	27.71	13.53	12.57	13.05	15.99
Mallee ..	19.17	8.77	40.25	8.15	21.97	19.14	19.95
Northern ..	11.27	16.96	18.21	13.53	16.43	4.06	14.65
North-Eastern ..	12.84	7.18	1.86	8.62	14.45	15.73	9.77
Gippsland ..	15.54	12.95	1.21	10.48	10.28	23.32	9.61
Total ..	100.00	100.00	100.00	100.00	100.00	100.00	100.00

* Excludes area of clover and grasses cut for hay and seed.

† Includes oats and barley sown for grazing and lucerne fed off.

Classification of Rural Holdings by Size and Type of Activity

Tabulations classifying rural holdings by principal characteristics have, in the past, been undertaken at irregular intervals. Since the Second World War they have been prepared for each of the years

1947-48, 1949-50, 1955-56, and 1959-60. The first detailed classification of holdings by principal type of activity was carried out in conjunction with the size classification of rural holdings 1959-60. The following tables show some of the information, in summary form, from the 1959-60 classification of rural holdings by size and type of activity :—

VICTORIA—HOLDINGS CLASSIFIED ACCORDING TO SIZE OF HOLDING : NUMBER AND TOTAL AREA OF HOLDINGS AND AREA USED FOR VARIOUS PURPOSES, 1959-60

Size of Holding	Number of Holdings	Total Area of Holdings	Area Used For—				
			Fruit	Crops (Excluding Fruit)	Fallow	Sown Grasses and Clovers	Balance of Holding
acres			acres				
1- 99 ..	21,803	841,772	86,184	124,963	11,042	290,300	329,283
100- 199 ..	12,374	1,750,203	10,890	256,687	25,417	824,264	632,945
200- 299 ..	6,499	1,569,717	4,053	185,773	30,833	661,140	687,918
300- 399 ..	5,263	1,780,143	3,445	217,143	55,612	638,202	865,741
400- 499 ..	3,423	1,523,243	1,374	181,096	63,511	519,584	757,678
500- 999 ..	11,287	7,931,505	3,744	1,165,916	571,239	2,249,580	3,941,026
1,000-1,399 ..	3,737	4,409,447	869	727,701	405,757	1,038,161	2,236,959
1,400-1,999 ..	2,477	4,081,603	2,184	606,537	346,348	966,320	2,160,214
2,000-2,999 ..	1,515	3,635,339	1,771	517,383	314,369	811,277	1,990,539
3,000-4,999 ..	888	3,292,668	169	393,508	242,314	656,082	2,000,595
5,000 and over ..	512	6,920,890	1,438	199,910	113,824	752,141	5,853,577
Total ..	69,778	37,736,530	116,121	4,576,617	2,180,266	9,407,051	21,456,475

VICTORIA—NUMBER OF HOLDINGS GROWING WHEAT, AND NUMBER OF HOLDINGS ON WHICH LIVESTOCK WERE DEPASTURED, CLASSIFIED ACCORDING TO SIZE OF HOLDING, 1959-60

Size of Holding	Holdings With—				
	Wheat	Sheep	Dairy Cattle	Beef Cattle	Pigs
acres	No.				
1- 99 ..	191	2,865	11,071	2,271	2,510
100- 199 ..	302	4,027	9,842	2,362	2,670
200- 299 ..	442	3,490	4,782	2,006	1,323
300- 399 ..	819	3,709	3,537	2,051	987
400- 499 ..	743	2,747	2,267	1,533	523
500- 999 ..	4,380	10,144	7,436	5,382	1,412
1,000-1,399 ..	1,914	3,521	2,464	1,830	439
1,400-1,999 ..	1,302	2,383	1,574	1,243	254
2,000-2,999 ..	845	1,477	1,662	780	291
3,000-4,999 ..	501	858		457	
5,000 and over ..	196	470	321	343	60
Total ..	11,635	35,691	44,956	20,258	10,469

VICTORIA—HOLDINGS CLASSIFIED ACCORDING TO TYPE OF ACTIVITY : NUMBER AND TOTAL AREA OF HOLDINGS AND AREA USED FOR VARIOUS PURPOSES, 1959-60

Type of Activity	Number of Holdings	Total Area of Holdings	Area Used for—				
			Fruit	Crops (Excluding Fruit)	Fallow	Sown Grasses and Clovers	Balance of Holding
			acres				
Sheep—Cereal Grain ..	6,092	8,334,036	857	1,959,402	1,127,595	1,039,230	4,206,952
Sheep ..	16,622	16,546,417	996	735,512	223,135	5,383,597	10,203,177
Cereal Grain ..	2,370	2,496,198	74	966,888	598,859	82,153	848,224
Beef Cattle ..	1,887	2,462,716	174	46,235	9,862	359,760	2,046,685
Dairying ..	20,097	4,190,352	2,324	509,283	52,149	1,904,901	1,721,695
Vineyards ..	2,159	77,960	45,176	1,493	1,410	2,593	27,288
Fruit (Other than Vine) ..	2,109	154,894	53,719	4,688	1,990	18,887	75,610
Vegetables—							
Potatoes ..	1,030	156,331	130	49,977	4,866	44,673	56,685
Other and Mixed ..	1,688	145,125	3,632	43,662	5,249	33,121	59,461
Poultry ..	1,333	97,854	943	10,116	5,651	16,009	65,135
Pigs ..	246	28,040	109	1,925	1,434	5,703	18,869
Tobacco ..	212	29,626	81	7,281	71	6,421	15,772
Other ..	486	51,187	448	14,230	2,655	9,969	23,885
Multi-Purpose ..	2,139	1,271,362	2,267	191,875	71,117	304,046	702,057
Total Classified Holdings	58,470	36,042,098	110,930	4,542,567	2,106,043	9,211,063	20,071,495
Unclassified Holdings—							
Sub-Commercial ..	6,821	656,874	1,069	19,664	31,040	89,804	515,297
Unused, Special, &c. ..	4,487	1,037,558	4,122	14,386	43,183	106,184	869,683
Total All Holdings	69,778	37,736,530	116,121	4,576,617	2,180,266	9,407,051	21,456,475

Artificial Fertilizers

Fertilizers have played a major role in the development of Australian agriculture in recent years. Superphosphate, which was first used in Australia early this century, lifted production in wheat areas dramatically and later allowed the establishment of clover pastures. More recently, research has shown that increased yields of pastures can be achieved by the use of elements such as molybdenum, potassium, copper, and zinc.

The main elements which can be added to soils by the use of fertilizers are phosphorus, potassium, and nitrogen. There are also various trace elements.

Most of Australia, including Victoria, is deficient in phosphorus. Irrespective of how the soil was formed, the story is much the same—a natural supply of 200 parts per million in the surface soil with less in the sub-soil. Notable exceptions include the Darling Downs area of Queensland and small areas of volcanic soil in the Victorian Western District. The addition of one cwt. of superphosphate, which contains 11 lb. of elemental phosphorus, is equivalent to the amount of phosphorus removed from the area by the sale of 27 prime lambs or 75 bushels of wheat.

Soil reserves of potassium are adequate in the drier wheat areas. However, in the wetter areas where leaching has taken place, deficiencies occur. This particularly applies to sandy soils. Clovers are generally the first plants to show visible symptoms of potassium deficiency and this often shows first in the outer paddocks of dairy farms or in paddocks continually cut for hay.

Very little nitrogen fertilizer is applied to crops other than high value crops such as fruit and vegetables. The less intensive agricultural pursuits rely on the fixation of atmospheric nitrogen by the nitrogen fixing bacteria associated with leguminous plants.

The significance of trace elements has become more apparent in recent years following the development of more refined experimental techniques. Some of the more important of these elements include molybdenum and copper.

Experiments have shown that substantial increases in clover growth can be obtained by spreading two ounces of molybdenum an acre in superphosphate, particularly in the high land of the Dividing Range. Recent work has shown that this application may have to be repeated after five to seven years.

Copper deficiencies are common in Victoria on the sandy podsolic soils, particularly in the coastal areas.

In 1964-65 artificial fertilizers were used on 3,201,668 acres of wheat; 1,184,482 acres of other cereal crops; 75,892 acres of vegetables; 88,623 acres of orchards; 152,769 acres of other crops; and 11,495,908 acres of pastures. Superphosphate is the main fertilizer used on both crops and pastures and in 1964-65 amounted to 200,842 tons or 81.1 per cent. of the total artificial fertilizer used on all crops and 695,876 tons or 94 per cent. of that used on pastures.

A summary of the area fertilized, quantity used, and number of holdings on which artificial fertilizers were used is shown below for each of the years 1960-61 to 1964-65 :—

VICTORIA—ARTIFICIAL FERTILIZERS

Year	Crops			Pastures		
	No. of Holdings	Area Fertilized	Quantity Used	No. of Holdings	Area Fertilized	Quantity Used
		'000 acres	'000 tons		'000 acres	'000 tons
1960-61 ..	31,774	4,129	199	40,561	9,408	546
1961-62 ..	32,965	4,193	211	40,166	9,661	567
1962-63 ..	32,028	4,530	227	40,144	9,940	596
1963-64 ..	31,224	4,478	225	39,531	10,525	656
1964-65 ..	31,181	4,703	248	40,291	11,496	741

Aerial Agriculture

The aerial agriculture industry in Victoria has grown rapidly and aircraft are now extensively used for topdressing and sometimes for seeding, crop spraying with weedicides and insecticides, and the control of rabbits by the dropping of poisoned carrot baits. A more recent phase of aerial development is the dropping of young fish into Victorian lakes and streams. A full description of aerial agriculture will be found on page 494 of the Victorian Year Book, 1966.

Since 1956-57, statistical information has been collected by the Department of Civil Aviation and details for each of the years 1960-61 to 1964-65, are shown in the following table :—

VICTORIA—AERIAL AGRICULTURE

Particulars	Unit	Year Ended 31st March—				
		1961	1962	1963	1964	1965
Total Area Treated						
* † ..	acres	806,592	972,269	923,776	1,512,819	1,896,461
Topdressed ..	acres	580,169	676,219	659,975	1,165,183	1,429,159
Seeded ..	acres	196,297	231,098	206,711	281,331	386,102
Sprayed or Dusted						
Materials Used—						
Superphosphate ..	cwt.	749,020	877,200	888,060	1,427,640	1,844,260
Seed ..	lb.	1,624	5,135	2,128	39,190	162,140
Aircraft Utilization						
(Flying Time) ..	hours	9,598	8,545	8,238	11,190	14,649

* Areas treated with more than one type of material in one operation are counted once only.

† Includes 29,981 acres baited for rabbit destruction in 1961, 64,952 acres in 1962, 57,090 acres in 1963, 66,305 acres in 1964, and 81,200 acres in 1965.

Farm Machinery

The numbers of the principal items of farm machinery on rural holdings at 31st March during each of the five years from 1961 to 1965 are given in the table below :—

VICTORIA—FARM MACHINERY ON RURAL HOLDINGS

Particulars	Number at 31st March—				
	1961	1962	1963	1964	1965
Milking Machines—Units ..	92,315	95,661	97,372	98,321	101,994
Shearing Machines—Stands ..	37,926	38,758	39,162	39,433	41,112
Tractors—Wheeled Type ..	62,730	65,487	66,479	68,954	71,950
—Crawler Type ..	1,807	1,931	1,936	2,451	2,574
Rotary Hoes ..	9,284	9,777	9,899	10,205	11,757
Fertilizer Distributors and Broad-					
casters ..	29,035	29,349	29,188	28,757	29,212
Grain Drills—Combine ..	18,749	19,016	28,957	28,785	19,442
—Other ..	9,501	9,709			
Maize Planters ..	*	*	*	*	756
Headers, Strippers and Harvesters	13,888	14,065	14,646	14,131	14,177
Pick-up Balers ..	8,968	9,282	10,107	10,789	11,405
Stationary Hay Presses ..	2,584	2,213	*	*	*

* Not collected.

NOTE.—Details of items which have not been collected since 1955 are published in the Victorian Year Book 1954-58, page 88.

Mechanization of Farming, 1962

Progress of Cultivation

The first Statistical Register of Victoria published in 1854 shows that in 1836 there were 50 acres of land under cultivation in the Colony of Victoria. By 1840 this figure had increased to 3,210 acres. This progress continued until 1852 when 57,471 acres were under cultivation. With the discovery of gold in Victoria, agricultural progress received a temporary setback, the area of land cultivated declining to 34,816 acres in 1854. However, with the influx of population came a demand for agricultural products and, by the end of 1860, the area of land under cultivation amounted to 407,740 acres.

The following table shows the annual average area under cultivation in each decennium from 1856 to 1965 and the actual area for each of the five seasons 1961 to 1965 :—

VICTORIA—ACREAGE CULTIVATED ANNUALLY

Period or Year (Ended March)	Annual Average Area in Each Decennium, 1856-1965, and Actual Area Each Year 1961-1965, under—		
	Crop*	Fallow	Total Cultivation*
		acres	
1856-65	325,676	12,146	337,822
1866-75	624,377	57,274	681,651
1876-85	1,306,920	137,536	1,444,456
1886-95	2,109,326	364,282	2,473,608
1896-1905	3,022,914	524,197	3,547,111
1906-15	3,756,211	1,276,148	5,032,359
1916-25	4,594,244	1,852,145	6,446,389
1926-35	5,233,894	2,501,357	7,735,251
1936-45	4,435,645	2,142,953	6,578,598
1946-55	4,635,982	2,311,401	6,947,383
1956-65	4,222,393	2,191,000	6,413,393
1961	4,504,732	2,217,789	6,722,521
1962	4,532,686	2,286,771	6,819,457
1963	5,036,686	2,521,355	7,558,041
1964	4,899,557	2,524,863	7,424,420
1965	5,019,479	2,484,423	7,503,902

* Until 1960 the area of crop included pasture cut for hay and seed. For the decennium 1956-65 and 1961 onwards, area of pasture cut for hay and seed is included under pasture.

Crops and Growers

The following table shows the area under, the yield from, and the gross value of each of the principal crops in Victoria for the season 1964-65 :—

VICTORIA—AREA, YIELD, AND GROSS VALUE OF CROPS, 1964-65

Crop	Area	Yield	Gross Value*
	acres		\$'000
Cereals for Grain—			
Barley—			
2 row	177,242	4,140,490 bushels	4,682
6 row	9,695	193,982 bushels	146
Maize	2,353	114,182 bushels	213
Oats	966,280	22,445,992 bushels	16,237
Rye	13,581	109,162 bushels	139
Wheat	3,236,039	78,165,690 bushels	109,396
Hay—			
Barley and Rye	5,650	10,023 tons	143
Lucerne	80,391	177,789 tons	2,446
Meadow	1,034,003	1,986,367 tons	35,587
Oaten	163,101	290,314 tons	5,202
Wheaten	23,221	41,458 tons	685
Green Fodder	86,292	.. .. .	1,576
Grey and Other Field Peas	6,607	162,911 bushels	365
Grass and Clover Seed	55,602	445,669 bushels	2,459
Industrial Crops—			
Broom Millet	228	{ 975 cwt. fibre	20
		{ 394 cwt. seed	1
Linseed	9,953	106,824 bushels	394
Hops	633	9,252 cwt.	944
Mustard	821	4,985 cwt.	62
Tobacco	9,720	107,855 cwt.	11,678
Vegetables—			
Onions	3,825	22,963 tons	1,440
Potatoes	32,931	183,665 tons	24,820
Other	45,861	223,262 tons	22,336
Stock Fodder—			
Pumpkins and Root Crops	13,748	.. .. .	651
Vineyards—			
Grapes—			
Table	2,625	9,495 tons	1,559
Wine	4,577	20,179 tons	793
Drying	37,001	292,060 tons .. ..	.. ..
		59,594 tons of sultanas	17,781
		6,559 tons of raisins	1,909
		4,476 tons of currants	1,417
Vines, Unproductive	3,793	.. .. .	.. ..
Orchards—			
Productive	56,254	.. .. .	28,433
Unproductive	19,255	.. .. .	.. ..
All Other Crops	7,802	.. .. .	5,235
Total Crops	6,109,084	.. .. .	298,751

* The gross value is based on the wholesale price realized in the principal markets. The places where primary products are absorbed locally or where they become raw materials for a secondary industry, are presumed to be the principal markets.

The following table shows the numbers of growers of certain primary products, in each statistical district of the State, for the season 1964-65.

The information has no relation to the number of rural holdings in the State, as numbers of occupiers are engaged in the cultivation of more than one of the crops enumerated.

**VICTORIA—GROWERS OF CERTAIN CROPS, SEASON
1964-65**

Crops Grown	Statistical District								Total
	Central	North-Central	Western	Wimmera	Mallee	Northern	North-Eastern	Gippsland	
Grain Crops—									
Wheat ..	614	436	778	3,845	2,759	3,824	508	57	12,821
Oats ..	552	566	2,006	3,015	1,470	2,740	765	41	11,155
Barley ..	552	83	244	455	609	711	81	66	2,801
Maize ..	8	..	2	..	..	..	3	11	24
Green Fodder—									
Maize ..	389	21	152	1	2	9	28	650	1,252
All Other ..	961	359	1,148	31	53	329	338	931	4,150
Other—									
Potatoes ..	1,458	425	481	7	10	16	110	462	2,969
Onions ..	271	..	246	3	18	8	..	18	564
Other									
Vegetables	1,346	28	336	37	369	479	29	155	2,779
Orchards ..	1,716	155	54	99	1,276	1,030	112	44	4,486
Vineyards ..	3	2	..	8	2,410	154	24	..	2,601
Grass and Clover Seed	45	85	232	49	44	164	229	11	859
Tobacco ..	..	..	..	..	..	36	316	..	352*

* Excluding share-farmers.

A summary of the area under cultivation in each statistical district of the State for the season 1964-65 is given in the following table :—

**VICTORIA—AREA UNDER CULTIVATION, SEASON 1964-65
(Acres)**

Crop	Statistical District								Total
	Central	North-Central	Western	Wimmera	Mallee	Northern	North-Eastern	Gippsland	
Grain Crops—									
Wheat ..	43,714	28,898	69,229	929,410	1,427,690	678,307	54,819	3,972	3,236,039
Oats ..	25,734	24,721	157,335	290,651	218,376	216,362	31,527	1,574	966,280
Barley ..	43,204	1,878	7,951	28,768	64,838	35,221	2,700	2,377	186,937
Maize ..	39	..	2	..	..	8	373	1,931	2,353
Field Peas ..	3,223	256	1,548	750	535	133	50	112	6,607
All Hay ..	176,258	70,446	381,817	117,888	37,016	272,218	84,729	165,994	1,306,366
Green Fodder ..	23,708	7,978	32,807	618	1,862	6,642	5,633	20,792	100,040
Grass and Clover for Seed ..	2,742	5,469	17,835	3,498	4,670	9,792	11,326	270	55,602
Tobacco ..	..	..	..	..	620	9,100	..	..	9,720
Potatoes ..	17,466	5,343	4,701	16	119	54	583	4,649	32,931
Onions ..	1,374	..	2,248	4	36	8	2	153	3,825
All Other									
Vegetables ..	22,220	150	12,716	120	3,109	4,297	155	3,094	45,861
Vines ..	6	65	..	824	44,879	844	1,378	..	47,996
Orchards ..	24,866	2,509	569	3,757	8,274	33,310	1,698	526	75,509
All Other Crops	3,603	163	11,036	684	13,209	2,170	1,063	1,090	33,018
Total Area under Crop ..	388,157	147,876	699,794	1,376,988	1,824,613	1,259,986	205,136	206,534	6,109,084
Land in Fallow ..	55,471	16,392	54,233	782,430	1,215,003	314,909	13,345	32,640	2,484,423
Total Area under Cultivation ..	443,628	164,268	754,027	2,159,418	3,039,616	1,574,895	218,481	239,174	8,593,507

The following table shows the yields, in statistical districts, of the principal crops for the season 1964-65 :—

VICTORIA—YIELDS OF PRINCIPAL CROPS, SEASON 1964-65

Crop	Statistical District								Total
	Central	North-Central	Western	Wimmera	Mallee	Northern	North-Eastern	Gipps-land	
Grain Crops—									
Wheat bush.	1,138,239	713,303	1,187,793	29,048,842	30,121,673	14,636,076	1,219,771	99,993	78,165,690
Oats "	727,927	676,673	4,043,246	6,770,403	3,968,394	5,398,857	834,095	26,397	22,445,992
Barley "	1,419,406	43,873	165,795	603,980	1,164,474	811,126	57,590	68,228	4,334,472
Maize "	627	..	35	..	..	290	11,616	101,614	114,182
Field Peas "	88,297	7,561	25,978	19,703	14,759	3,159	1,231	2,223	162,911
All Hay tons	359,868	138,153	751,690	183,093	53,056	502,082	168,861	349,148	2,505,951
Grass and Clover for Seed cwt.	6,945	9,592	36,405	4,224	7,944	18,043	15,308	189	98,650
Tobacco "	..	..	..	..	..	5,870	101,985	..	107,855
Potatoes tons	96,808	23,955	28,383	58	831	203	2,288	31,139	183,665
Onions "	7,707	..	14,039	16	245	22	6	928	22,963
Wine Made gall.	*	*	*	*	*	*	*	*	3,457,798
Dried Vine Fruits—									
Raisins tons	..	..	..	..	6,557	2	..	..	6,559
Sultanas "	..	..	..	..	59,594	..	..	..	59,594
Curraots,,	..	..	..	..	4,477	..	..	..	4,477

* Details for individual districts are confidential.

Principal Crops

General

The cereals wheat, oats, and barley are the principal crops grown in Victoria and these, together with hay, represent about 90 per cent. of the total area sown, although there is some variation from year to year. The growing of potatoes, grapes, and apples is also important.

In the following section some detailed descriptive and statistical information is given for all main crops grown in the State including those mentioned above.

Wheat

The acreage sown to wheat in recent years has been approximately 3 mill. acres. This is about half the total area under crop in the State. Virtually all the wheat crop is used for grain production, only about 1 per cent. being cut for hay. The average annual production for the five years ended 1964-65 was about 69 mill. bush., of which about 65 per cent. was exported. Grain yields during the past five years averaged about 23 bush. (60 lb. per bush.) per acre, but yields as high as 60 bush. per acre are harvested on individual farms in most seasons. The highest officially recorded yield is 78·8 bush. per acre for 50 acres grown near Murtoa in 1960.

The main wheat belt lies in the northern part of the State, in the Mallee, Wimmera, and Northern Districts, where about 94 per cent. of the crop is grown. The average annual rainfall in these Districts varies from 10 inches in the extreme north-west of the State to about 20-23 inches at the eastern and southern margins of the main wheat belt. About three-quarters of the wheat crop is sown on bare fallowed land.

Superphosphate is applied at seeding to virtually all crops. Zinc sulphate is added in the Wimmera District, applications normally being made to each third or fourth wheat crop. Small amounts of nitrogenous fertilizers have been used in particular circumstances, especially in view of the more favourable wheat/nitrogen fertilizer price relationships now existing. Diseases are not normally a major problem, but occasionally some heavy losses occur due to stem rust and foot rots. Ball smut is effectively controlled by pickling, which is done at the same time as the wheat is graded. Weeds are controlled by fallow cultivation or by crop spraying. The crop is harvested from mid-November in the early districts to January under late conditions.

Wheat is grown in rotation with fallow, other crops, and pastures. The use of subterranean clover and medic leys has greatly improved soil fertility, with resultant benefit to wheat yields and quality. (See Victorian Year Book 1963, pages 517 to 519.) Sheep grazed on these, and on native pastures, contribute materially to the State's wool and prime lamb production, especially to the production of early prime lambs.

Wheat is grown on three major soil types :—(1) Mallee soils referred to as solonized brown soils ; (2) self-mulching grey soils of heavy texture and high fertility in the southern Wimmera ; and (3) red-brown earths of varying texture in the northern Wimmera and the Northern District.

Most wheat varieties grown in Victoria are of the soft white class. The environment generally does not favour the production of wheat of the harder types, but increased areas of a semi-hard variety are being sown in the eastern Mallee where wheat of the highest protein content in Victoria is produced. Substantial improvement in wheat quality has been achieved by plant breeding during the past 30 years, and several of the soft wheats available reach the medium to strong class. The adoption of clover and medic ley rotation systems has led to a substantial improvement in the protein content, and thus the quality, of Victorian wheat.

Virtually the whole of the wheat crop is handled, stored, and transported in bulk. The crop is marketed through the Australian Wheat Board in one grade known as f.a.q. (fair average quality).

Grain Elevators Board

In 1934, an Act was passed to provide for the handling of wheat in bulk in Victoria. The Act gave the Government power to constitute a Board of three members to implement the provisions of the Act. On submissions made by the Board to, and approved by, the Government, 218 country receiving elevators and a shipping terminal have been constructed, the necessary finance being obtained from loans totalling \$23,500,000. Repayment of the principal and interest are guaranteed by the Victorian Government. In 1963, the Act was amended to provide for the handling of barley in bulk by the Grain Elevators Board.

The Grain Elevators Board first received and shipped Victorian wheat in bulk for the 1939-40 season.

The Board's Geelong Terminal is operated by push-button remote control with operational indicator lights appearing on a diagram panel of the whole terminal. Wheat can be received from rail trucks at the rate of 1,200 tons per hour and can be shipped from the terminal at the rate of 1,600 tons per hour, either direct from the terminal storage bins or by a combination of storage bins and rail receivals.

The Grain Elevators Board has under its control storage for 102·6 mill. bushels of wheat. A record was established during the 1964–65 season when 79,492,687 bushels were delivered. In addition, during the 1964–65 season, 1,355,691 bushels of bulk barley were delivered to the Board. During the 1965–66 season, 59,900,000 bushels of bulk wheat and 1,333,700 bushels of bulk barley were delivered.

The following statement shows the revenue and expenditure of the Grain Elevators Board in Victoria :—

**VICTORIA—GRAIN ELEVATORS BOARD : REVENUE,
EXPENDITURE, ETC.
(\$'000)**

Particulars	Year Ended 31st October—				
	1961	1962	1963	1964	1965
REVENUE					
Operating and Maintenance Expenses	1,408	1,388	1,484	1,726	1,763
Capital Facilities Allowance	740	752	930	1,258	1,946
Interest on Investments	206	308	340	326	358
Other .. .. .	..	2	..	13	..
Total Revenue	2,354	2,450	2,754	3,324	4,067
EXPENDITURE					
Operating and Maintenance Expenses	924	862	890	1,023	1,362
Administration Expenses	256	270	270	336	400
Depreciation and Renewals	228	256	324	392	421
Interest on Loans	414	534	682	826	1,058
Sinking Fund Charges	84	100	128	158	212
Appropriations to Reserves	328	412	446	637	293
Other	12	12	..	..	3
Total Expenditure	2,246	2,446	2,740	3,372	3,749
Net Surplus	108	4	14	—48	318
Fixed Assets (At 31st October)	9,326	11,256	14,524	19,157	23,880
Loan Indebtedness (At 31st October)—					
State Government	1,848	1,826	1,804	1,780	1,755
Public	7,790	9,334	12,192	15,099	20,424

Australian Wheat Board

The Australian Wheat Board is the sole constituted authority for the marketing of wheat within Australia and for the marketing of wheat and flour for export from Australia during the period of the present Wheat Industry Stabilization Plan. The Board consists of a Chairman and four other Commonwealth Government appointees and ten members who are representatives of wheat growers in the five main wheat growing States, each State being represented by two members.

The current five year Wheat Industry Stabilization Plan commenced with the 1963-64 crop and provides for a guaranteed price to wheat growers on up to 150 million bushels of exports from each season's wheat. The guaranteed price of wheat of a particular season is an amount equal to the cost of production of wheat of that season as determined in accordance with the Commonwealth Wheat Industry Stabilization Act and for seasons 1963-64 and 1964-65, it was fixed at \$1.44 and \$1.45 per bushel respectively. For the third year (1965-66) of the Stabilization Plan the cost of production and thus the guaranteed price was determined at \$1.51 per bushel. The prices referred to are on a bulk wheat basis f.o.r. ports.

Total deliveries by wheat growers to the Victorian Branch of the Australian Wheat Board during season 1964-65 were 80,682,027 bushels including 4,647,000 bushels of southern New South Wales wheat delivered to railway stations operated by Victorian Railways in New South Wales, and 2,022,000 bushels of southern New South Wales wheat delivered to Victorian stations.

After an autumn break in early April, sowing proceeded normally on an area of 3·236 mill. acres. Winter rainfall was consistent and above average but this period was also notable for gale force winds. Spring rainfall was more than adequate in all districts, and there was concern that excessive moisture would harm crops. Root diseases appeared in a number of crops and caused some losses, but a cool early summer assisted crops generally to finish well, particularly the Wimmera which produced a record yield.

The State yield per acre was 24·15 bushels and the f.a.q. was fixed at 64 lb. per bushel.

Wheat Standard

The fair average quality (f.a.q.) standard is fixed each season by a State Committee and is the basis for sales of each crop.

Samples of wheat from various districts are obtained each year and mixed to obtain a representative sample of the whole crop. The f.a.q. weight is then determined by use of the Schopper 1-litre scale chondrometer.

Farmers Growing Wheat for Grain, Area Sown, Production, Gross Value, and F.A.Q.

In the following table the number of holdings growing 20 acres or more of wheat for grain, the area, production, average yield, gross value of production of wheat, and the f.a.q. standard determined in Victoria

for each of the seasons 1960-61 to 1964-65 are shown :—

VICTORIA—WHEAT STATISTICS

Season	Holdings Growing Wheat (20 Acres and over)	Area	Production	Yield per Acre	Gross Value	Weight of Bushel of Wheat, f.a.q.
	No.	'000 acres	'000 bush.	bush.	\$'000	lb.
1960-61 ..	10,625	2,672	67,587	25·30†	96,487	64½
1961-62 ..	11,648	2,849	56,878	19·97	85,394	64
1962-63 ..	12,166	3,125	67,899	21·73	98,910	65½
1963-64 ..	11,370	3,109	76,302	24·54	108,498	65½
1964-65 ..	11,981	3,237	78,166*	24·15	109,396	64

* Record production.

† Record yield per acre.

Wheat Breeding

The objective of wheat breeding in Victoria is to produce new varieties which will give higher yields of better quality grain than existing varieties. Included in the yield objective is the reduction of losses due to drought and various diseases which include stem rust (the most important), leaf rust, septoria, loose smut and eye spot lodging. The breeding work is a function of the Victorian Department of Agriculture, which undertakes plant breeding, field testing, and quality evaluation. The wheat breeding activities of the Department are centred on the State Research Farm at Werribee where the hybridization is carried out, the early generations raised, and the primary quality and disease testing done. This station is supplemented by regional selection centres in the main wheat growing districts. Field testing is undertaken in all districts at departmental research stations and colleges and on farmers' properties. The number of centres for varietal testing in Victoria is nearly 40. Disease testing is carried out at research stations in appropriate areas and at the Plant Research Laboratories at Burnley. Quality evaluations, including test baking, are undertaken at the Department's Cereal Laboratories in Melbourne.

The wheat breeding work of the Department has been very successful. During the past 50 years, 40 new varieties of wheat have been released for cultivation by farmers. The most widely grown of these have been Free Gallipoli (1923), Ghurka (1924), Rancee 4H (1930), Magnet (1939), Quadrat (1941), Insignia and Pinnacle (1946), Sherpa (1953), and Olympic (1956). Ninety-five per cent. of the wheat acreage in Victoria is sown to varieties bred by the Department. Since 1930, the baking quality of Victorian wheat has improved markedly.

The varieties released for sowing since 1946 are : 1946—Insignia, 1946—Pinnacle, 1947—Diadem, 1953—Sherpa, 1956—Olympic, 1957—Beacon, 1960—Stockade, and 1963—Emblem.

The following table shows the areas under the principal varieties of wheat, including wheat for hay, for the seasons 1962-63, 1963-64, and 1964-65. Varieties are tabulated in order of popularity for the last mentioned season.

VICTORIA—PRINCIPAL VARIETIES OF WHEAT SOWN

Variety (In Order of Popularity), Season 1964-65	1962-63		1963-64		1964-65	
	Acres Sown	Percentage of Total Area Sown	Acres Sown	Percentage of Total Area Sown	Acres Sown	Percentage of Total Area Sown
Insignia ..	1,516,564	47·96	1,635,619	52·13	1,691,276	51·89
Pinnacle ..	764,009	24·16	681,159	21·71	610,348	18·73
Olympic ..	503,082	15·91	463,827	14·79	583,900	17·92
Heron ..	32,677	1·03	53,432	1·70	89,721	2·75
Insignia 49 ..	80,529	2·54	86,813	2·77	73,344	2·25
Sherpa ..	101,022	3·20	68,814	2·19	62,561	1·92
Emblem ..	..	..	1,261	0·04	28,686	0·88
Quadrat ..	58,727	1·86	43,722	1·39	28,483	0·87
Stockade ..	18,106	0·58	29,218	0·93	26,347	0·81
Beacon ..	25,879	0·82	23,091	0·74	22,888	0·70
Falcon ..	1,514	0·05	5,453	0·17	12,410	0·38
All Other Varieties ..	59,820	1·89	44,908	1·44	29,296	0·90
Total ..	3,161,929	100·00	3,137,317	100·00	3,259,260	100·00

Wheat Growing in Conjunction with Livestock Grazed

A table showing the number of holdings in Victoria growing wheat for grain together with sheep, dairy cattle, beef cattle, and pigs as at 31st March, 1960, appears on page 309.

Oats

Oats are the second most widely grown crop in Victoria, and in recent years the area of this cereal has averaged about 1·2 mill. acres. Nearly 72 per cent. of this is harvested for grain, some of it after winter grazing. Although oaten hay was important in the past, only about 15 per cent. of the acreage is now harvested for this purpose, the remainder (13 per cent.) of the area being used solely for grazing.

As the land on which oats are grown is normally not fallowed or does not receive as good seedbed preparation as that intended for wheat, oat production shows greater fluctuations than does wheat production. This seasonal variability is particularly marked in the northern parts of the State. The average annual grain production is about 20 mill. bush. (40 lb. per bushel), ranging in the last ten years from 9·5 mill. bush. in 1957-58 to 27 mill. bush. in 1962-63.

Over half the oat grain produced in Victoria is held on farms or is used within Victoria for stock feed. Large quantities are retained for feeding during periods of seasonal shortage or in drought conditions. About a quarter of the crop goes to mills, but only a relatively small proportion is used to manufacture foods for human consumption. The proportion of oats purchased in the milling grades is approximately 10 per cent. of the oats marketed. Milling grades usually command a premium of 2 cents to 10 cents per bushel above feed oats. The other

uses of the grain by the mills are for the manufacture of stock foods and for the manufacture of unkilned rolled oats, mainly for export. The remaining quarter of the crop is exported as grain. More than 95 per cent. of the oats exported are sold as "Victorian Feed" grade. Oat grain is sold in an open market through merchants or through the voluntary oat pool, and prices fluctuate widely according to seasonal conditions and supplies available.

With the decline in the number of horses throughout the State, there has been a corresponding decline in the area of oats used for hay production, particularly in the main cereal growing districts. However, during the past ten years, the area cut for hay has fluctuated around 200,000 acres. The hay may be cut either for farm use or for sale (mainly to chaff mills near Melbourne, Ballarat, and Maryborough).

Most of the area fed-off completely is grazed by sheep in the winter, but in dairying districts oats are sometimes sown for autumn and winter grazing to supplement pasture growth. About 30 per cent. of the oats completely grazed are in the Mallee District.

The main oat grain producing areas are in the Mallee, Wimmera, Northern, and Western Districts. The popularity of varieties has undergone marked changes in recent years. After having held supremacy for more than 40 years, Algerian was superseded as the leading variety by Orient in 1962, while Avon now holds this position. The area sown to the five leading varieties—Avon, Orient, Algerian, Ballidu, and Kent—is over 90 per cent. of the total oat acreage in the State.

The area harvested (season 1964–65) for hay was 163,101 acres, and for grain 966,280 acres, which produced 290,314 tons of hay, and 22,445,992 bushels of grain, respectively. The area of oats sown for grazing purposes amounted to 188,724 acres. The following table shows the area, yield, and gross value of oats for grain for each of the five seasons 1960–61 to 1964–65 :—

VICTORIA—OATS FOR GRAIN

Season			Area	Production	Yield per Acre	Gross Value
			'000 acres	'000 bushels	bushels	\$'000
1960–61	..	..	835	20,666	24·75	12,958
1961–62	..	..	774	16,312	21·06	11,464
1962–63	..	..	932	27,042*	29·01	18,412
1963–64	..	..	910	19,885	21·85	13,849
1964–65	..	..	966	22,446	23·23	16,237

* Record production.

Barley

The maximum barley production was in 1958-59, when about 362,000 acres (2- and 6-row) were sown, with a production of approximately 8.6 mill. bush. (50 lb. per bushel), but, since then, area and production have declined. About 95 per cent. of the barley grown in Victoria is of 2-row or malting type. The remainder is sown with 6-row varieties, which are used primarily for feed.

Although some barley is grown in all districts, the main production is centred in two distinct areas where high quality grain is produced. The largest production is in the south-western Mallee and the adjacent area of the north-western Wimmera. While wheat is the main cereal throughout the cereal growing districts, the barley crop occupies second position in the areas noted above, whereas, in most other portions of northern Victoria, oats occupy this position.

In this northern barley growing area, the best quality barley is grown on the sandier soil types. The crop is sown either on ley land cultivated in the autumn just prior to sowing or on wheaten stubble land. The variety Prior is almost exclusively sown in this area, and superphosphate is the standard fertilizer applied. Average district yields are about 19 bushels per acre.

The other important area is in southern Victoria between Geelong, Werribee, and Bacchus Marsh. Here, barley is the main crop, and the normal practice is to sow it with superphosphate on fallowed land. The main variety has been Research, but Resibee and Anabee, released by the Department of Agriculture in 1962 and 1963, respectively, are now being grown to an increasing extent. While Research produced very good malting quality grain in this area, the new varieties have quality characteristics slightly superior to those of the older variety. Yields are considerably higher than those obtained in the north, the average yield being about 32 bushels per acre. This region is close to the main barley shipping terminals, and growers' freight costs are thus considerably lower than in the northern areas.

In 1963, a bulk handling scheme for barley was introduced at Beulah in the southern Mallee, and the scheme has been extended to ten additional receival points in the Mallee and Wimmera, one in the Northern District and two in the Central District. Barley is marketed through the Australian Barley Board, which operates in Victoria and South Australia and provides an orderly marketing system for barley grown in those States. All the barley is classified on sample before delivery. Classification is, firstly, on varietal type—Chevalier (Prior and similar varieties) and Research (Research, Resibee, Anabee)—and, secondly, on quality—Malting (Nos. 1 and 2), Milling (No. 3), and Feed (Nos. 4 and 5). There are price differentials between each grade.

Practically all the barley of malting quality is malted in Australia for local use or export as malt—principally to Eastern destinations. Most of the milling and feed grades are exported, chiefly to Europe and Eastern Asia.

The following table shows the area, yield, and gross value of barley for each of the five seasons 1960-61 to 1964-65 :—

VICTORIA—BARLEY PRODUCTION

Season	Area		Production		Yield per Acre			Gross Value
	Malting (2 row)	Other (6 row)	Malting (2 row)	Other (6 row)	Malting (2 row)	Other (6 row)	Total	
	'000 acres		'000 bushels		bushels			'000
1960-61 ..	293	16	7,392	327	25·19	20·66	24·95	6,632
1961-62 ..	212	13	4,415	239	20·79	18·26	20·64	5,056
1962-63 ..	180	14	5,129	340	28·45	24·22	28·14	5,310
1963-64 ..	180	10	3,833	192	21·32	18·67	21·17	3,802
1964-65 ..	177	10	4,140	194	23·36	20·01	22·65	4,828

Maize

Maize is grown in Victoria both for grain and for green fodder and cultivated mainly in Gippsland. The area, yield, and gross value of maize for each of the five seasons 1960-61 to 1964-65 are given in the following table :—

VICTORIA—MAIZE PRODUCTION

Season	For Green Fodder	For Grain							Yield per Acre	Gross Value
		Area			Production					
		Hybrid	Other	Total	Hybrid	Other	Total			
		acres			bushels				'000	
1960-61 ..	11,681	2,742	243	2,985	162,682	8,422	171,104	57·32	274	
1961-62 ..	15,440	2,999	310	3,309	181,745	10,029	191,774	57·96	248	
1962-63 ..	15,970	3,138	496	3,634	197,376	18,788	216,164	59·48	286	
1963-64 ..	11,741	3,108	291	3,399	194,585	8,820	203,405	59·84	273	
1964-65 ..	5,793	2,148	205	2,353	107,911	6,271	114,182	48·53	213	

Rye

Cereal rye is of minor importance in Victoria and is not grown primarily as a cash crop. European migrants to Australia have created a small demand for this cereal for human consumption, thus helping to stabilize the market for rye grain.

The chief purpose for which rye is grown is the stabilization of loose sand or sandhills in the Mallee District. There is some interest in it for winter grazing in cold districts during the winter months.

The following table shows the area, yield, and gross value of rye for each of the five seasons 1960-61 to 1964-65 :—

VICTORIA—RYE PRODUCTION

Season	Area	Production	Yield per Acre	Gross Value
	acres	bushels		\$'000
1960-61	22,895	187,659	8.20	235
1961-62	17,849	136,725	7.66	185
1962-63	17,551	114,639	6.53	171
1963-64	15,275	95,200	6.23	155
1964-65	13,581	109,162	8.04	139

Hay

The pattern of hay production in Victoria changed considerably in the post-war period. More complete mechanization and the virtual disappearance of the working horse removed the previous emphasis from cereal hay. The harvesting of large areas of cereal crops, particularly oats, grown specifically for the production of hay for the maintenance of horse teams, is no longer necessary and so there has been a marked decline in the amount of cereal hay produced.

On the other hand, there were spectacular increases in the production of other forms of fodder. The annual production of meadow hay increased from about 400,000 tons to over 2 mill. tons during this period. There was also a substantial increase in the amount of lucerne hay conserved. Silage made mainly from pasture growth increased from about 25,000 tons annually to over 300,000 tons in the post-war period, yet it still supplies something under 10 per cent. of the dry nutrients in Victoria's fodder reserves.

This increase in fodder conservation has resulted in more efficient utilization of the extra herbage grown as the result of pasture improvement in all districts. Large numbers of livestock are now being maintained with greater safety following the conservation of portion of the surplus spring growth for feeding out during periods of seasonal shortage or in drought.

As pastures have been improved and livestock production intensified, the provision of supplementary fodder has become an important factor in the Victorian grazing industry. The conservation of meadow hay fits in well with farm management routine and is a convenient method of ensuring continuity of fodder supplies.

Particulars of areas harvested and production of the several kinds of hay appear in the following table :—

VICTORIA—HAY PRODUCTION, 1964–65

Kind	Area	Production	Yield per Acre
	acres	tons	tons
Wheaten	23,221	41,458	1·79
Oaten	163,101	290,314	1·78
Lucerne	80,391	177,789	2·21
Barley, Rye, &c.	5,650	10,023	1·77
Meadow	1,034,003	1,986,367	1·92
Total	1,306,366	2,505,951	1·92

The following table shows, in respect of each statistical district of the State, the quantity of ensilage made during the 1964–65 season, and the stocks of ensilage and hay held on rural holdings at the 31st March, 1965 :—

VICTORIA—ENSILAGE MADE AND FARM STOCKS OF
ENSILAGE AND HAY
(Tons)

Statistical District	Ensilage Made, 1964–65	Stocks at 31st March, 1965	
		Ensilage	Hay
Central	68,936	57,707	311,395
North-Central	5,832	6,872	116,282
Western	28,685	23,708	608,513
Wimmera	3,178	7,274	218,329
Mallee	2,241	12,629	66,174
Northern	14,145	16,318	510,675
North-Eastern	31,100	23,638	222,349
Gippsland	96,880	58,158	348,582
Total	250,997	206,304	2,402,299

Potatoes

Victoria is the largest producer of potatoes in Australia, contributing a little more than one-third of the total annual requirement. Potatoes are generally used as a fresh vegetable, but there is increasing interest in processed forms. Generally regarded as a summer crop, potato planting goes on in one district or another for ten months of the year, while harvest extends over the whole year.

Early crops are grown in favoured localities where the risk of frost is not great, such as in the Bellarine Peninsula and the market garden areas south-east of Melbourne. These are lifted from October (or sooner) to December. Mid-season crops come on the market in January, February, and March from districts such as Koroit, Gembrook, Koo-Wee-Rup, and parts of Gippsland. The late or main crop is produced in the Central Highlands (Ballarat to Trentham), Kinglake, Otways, and the Gippsland hill country. Its harvest commences in April and runs on until October.

Spray irrigation is now common in most districts and has proved useful in tiding crops over the short but critical dry periods that occur in mid-summer in the State's higher rainfall areas. Potato growing has become increasingly mechanized and production has therefore tended to pass into the hands of specialist growers having larger individual areas.

The following table shows the area, yield, and value of potatoes for each of the five seasons 1960-61 to 1964-65 :—

VICTORIA—POTATO PRODUCTION

Season			Area	Production*	Yield per Acre	Gross Value
			acres	tons		\$'000
1960-61	..	..	38,672	180,819	4.68	18,686
1961-62	..	..	36,469	196,032	5.38	13,048
1962-63	..	..	43,024	254,473	5.91	6,612
1963-64	..	..	39,626	200,384	5.06	15,586
1964-65	..	..	32,931	183,665	5.58	24,820

* Includes amounts held on farms for seed, stock feed, &c., as follows :—23,910 tons in 1960-61 ; 25,506 tons in 1961-62 ; 32,688 tons in 1962-63 ; 22,897 tons in 1963-64 ; and 23,795 tons in 1964-65.

Onions

The principal onion growing areas are in the Central and Western Districts. In the season 1964-65, these areas were responsible for 94 per cent. of the total onion production of the State. The following table shows the area, yield, and gross value for each of the five seasons 1960-61 to 1964-65 :—

VICTORIA—ONION PRODUCTION

Season		Area	Production	Yield per Acre	Gross Value
		acres	tons		\$'000
1960-61	.. ..	3,532	16,286	4.61	1,500
1961-62	.. ..	4,456	23,784	5.34	1,588
1962-63	.. ..	4,634	26,175	5.65	1,390
1963-64	.. ..	3,756	17,946	4.78	1,138
1964-65	.. ..	3,825	22,963	6.00	1,440

Linseed

Linseed is the major oil producing crop grown in Victoria. Its commercial production, which began in 1947, has increased to over 25,000 acres in suitable years, with an output in excess of 300,000 bushels. In wet seasons, however, such as 1963, weather and soil conditions seriously cut the intended acreage. In 1965, acreage was restricted following a production surplus in New South Wales and Queensland in 1964.

Linseed has proved to be well adapted to broad acre production over a wide area of mixed farming and pastoral country in the 20 to 30 inch rainfall zone in the western part of Victoria. Initially, the industry was developed on imported varieties, and, in the period up to 1955, yields were low because these varieties were not fully suited to Victorian conditions and because of their susceptibility to disease.

Greater stability has been given to the industry with the release by the Victorian Department of Agriculture of disease resistant and better adapted varieties. Other factors influencing the expansion of the industry have been the improved technical knowledge available to growers, price stability, and the decline of flax growing.

Victorian linseed contains 38 to 40 per cent. of oil of satisfactory quality. Linseed oil is one of the main components of paints, varnishes, and linoleum, and also has many other industrial uses. The meal or press cake which remains after the oil has been extracted is a valuable stock food.

The following table shows the area, yield, and value of linseed for each of the five seasons 1960-61 to 1964-65 :—

VICTORIA—LINSEED PRODUCTION

Season		Area	Production	Yield per Acre	Gross Value
		acres	bushels		\$'000
1960-61	.. ..	6,179	39,356	6.37	142
1961-62	.. ..	17,711	243,700	13.76	853
1962-63	.. ..	25,232	327,216	12.97	1,145
1963-64	.. ..	16,240	190,322	11.72	666
1964-65	.. ..	9,953	106,824	10.73	394

Tobacco

Flue-cured Virginia tobacco is the only type produced in Australia and is mainly absorbed in the manufacture of cigarettes. The use of domestic leaf is encouraged by a statutory mixing percentage applied in conjunction with concessional rates of import duty. The statutory percentage is currently set at 50 per cent. and at the present high level of usage, it is important that only leaf of desirable smoking quality is produced. Such leaf can be grown with some certainty only in areas having sandy friable soils and, during the summer months, appreciable rainfall, moderate temperatures, and high atmospheric humidity.

The Victorian crop usually accounts for rather more than one-third of the total Australian tobacco production. Suitable growing conditions are found in the north-eastern river valleys, and the industry is concentrated at present along the Ovens and King Rivers and their tributaries, with small outlying areas in the northern part of the State. Recent trends disclose a concentration of production in the higher parts of these valleys, with some contraction at certain climatically less favoured downstream centres and in the inundated area above the Buffalo River dam. The Mount Beauty district in the upper Kiewa Valley has latterly become established as a reliable centre for the production of good quality leaf.

Tobacco growing in Australia has traditionally been regarded as a rather speculative proposition due to wide fluctuations in production and market conditions, and it is only in the past decade that any degree of stability has become apparent due to a consistent upward trend in average yield which has resulted in the Victorian figure approaching a level comparable to that achieved by the world's major tobacco producing countries.

The fungus disease, blue mould, has often brought about drastic reduction of yield and has been the prime cause of most short Victorian crops in the past. At present growers are able to control this disease by implementing newly developed fungicidal spray programmes, and this is perhaps the main factor in current yield improvement.

The establishment of a Tobacco Leaf Marketing Board has lent further stability to the industry through its policy of orderly crop disposal.

Victorian tobacco producers are assisted in their efforts to increase yield and improve leaf quality by the Department of Agriculture, which conducts research in agronomy, plant pathology, and plant breeding at the Tobacco Research Station at Myrtleford and its sub-station at Gunbower, and also provides an intensive farm to farm advisory service for growers.

The following table shows the area, yield, and gross value of tobacco in each of the five seasons 1960-61 to 1964-65 :—

VICTORIA—TOBACCO PRODUCTION

Season			Area	Production	Yield per Acre	Gross Value
			acres	cwt. (dry)		\$'000
1960-61	..	..	9,932	86,854	8·74	8,450
1961-62	..	..	9,286	58,168	6·26	7,278
1962-63	..	..	9,844	84,351	8·57	10,210
1963-64	..	..	10,519	129,096	12·27	14,060
1964-65	..	..	9,720	107,855	11·10	11,678

Further Reference, 1963

Fruit Industries

Victoria is a major producer of a wide variety of fruit and nearly 120,000 acres are used for orchards or vineyards. The three most important districts are the area within 50 miles of Melbourne (apples, dessert tree fruits, and berries), the Goulburn Valley (canning fruit), and the Mallee region (dried vine fruit and citrus).

Most of the fruit growing districts south of the Dividing Range receive an annual rainfall of between 25 and 35 inches. This rainfall is fairly evenly spread, but in many areas additional irrigation is essential during January-March. This water is supplied from natural catchments, rivers, or town supplies. The north-eastern section of the State has a rainfall of from 20 to 40 inches, but the average rainfall in the Goulburn Valley is 19 inches and in the Mallee only 10 inches. In these districts elaborate irrigation schemes of the Lower Murray Valley and of the Goulburn and Campaspe Rivers make possible the large scale development of the fruit industry. The distribution of water is effected mainly by gravity except for small areas of citrus under spray irrigation.

Because of the high capital expenditure invested in orchard land and equipment and with the keen competition for local and oversea markets, most Victorian growers realize that they have to produce increased quantities of better quality fruit without increasing costs. To achieve this, labour expenses are cut by high capacity spraying units for pest control and by bulk handling of the crop. Many orchardists

use fruit thinning sprays to make hand thinning less time consuming. The increasing use of weedicides in orchards and vineyards has reduced the need for cultivations. Lighter pruning of apples is showing promising results in southern Victoria and this trend could also become an important factor in reducing labour costs.

Statistics on fruit growing are collected from all persons who grow fruit for sale (for all purposes). Particulars of fruit production (excluding vines) for the five seasons 1960-61 to 1964-65 are given in the following table :—

VICTORIA—FRUIT GROWING

Particulars	1960-61	1961-62	1962-63	1963-64	1964-65
Number of Growers	4,783	4,700	4,807	4,769	4,486
Area acres	71,415	72,712	75,855	76,796	75,509
Gross Value of Fruit Produced (\$'000)	25,358	25,356	23,546	26,396	28,433
Kind of Fruit—					
Apples bushels	3,134,917	3,045,808	4,059,045	3,298,851	4,394,197
Pears "	3,704,278	4,605,808	3,848,614	4,771,604	4,025,455
Quinces "	20,563	32,564	22,017	29,909	19,915
Apricots "	206,521	631,810	535,235	352,557	293,497
Cherries "	90,297	137,494	116,920	109,783	117,721
Nectarines "	14,981	16,940	20,713	21,717	28,910
Peaches "	955,224	1,686,496	1,811,799	1,827,910	2,362,620
Plums "	106,833	184,723	141,953	137,431	144,069
Prunes "	23,853	24,383	24,346	19,332	28,360
Lemons "	199,535	150,738	212,693	105,115	148,237
Oranges—					
Navels "	343,659	399,168	531,249	479,580	541,371
Valencias "	314,730	543,832	586,991	605,916	662,585
Other Oranges "	31,024	42,167	45,495	48,879	40,337
Mandarins "	27,095	27,824	41,297	36,410	46,668
Grapefruit "	69,844	80,902	97,217	88,596	83,650
Figs "	2,273	2,349	2,264	2,462	1,362
Passion-fruit "	2,680	2,288	3,601	5,762	3,844
Olives "	23,425	13,178	14,845	36,367	11,004
Gooseberries cwt.	703	775	865	606	722
Loganberries "	2,144	1,787	1,684	1,451	1,193
Raspberries "	2,616	2,936	2,848	3,018	2,827
Strawberries "	6,531	10,712	15,172	16,817	20,112
Youngberries "	4,172	4,649	4,891	3,607	4,221
Other Berries "	625	679	964	978	657
Almonds lb.	74,900	141,819	64,599	69,366	45,750
Filberts "	7,244	15,510	6,608	14,750	11,420
Walnuts "	148,357	135,254	146,020	150,982	99,270

The production of the principal kinds of dried tree-fruits for each of the last five seasons is shown in the following table. Particulars in respect of dried vine-fruits appear on pages 334 to 337.

VICTORIA—DRIED TREE-FRUITS
(lb.)

Year Ended 31st March—	Apricots	Peaches	Pears	Prunes	Others	Total
1961	33,820	4,510	2,290	368,731	626	409,977
1962	17,844	..	3,925	397,841	620	420,230
1963	31,421	2,278	4,652	590,323	1,988	630,662
1964	19,810	5,390	6,714	481,648	309	513,871
1965	27,170	28,125	16,665	380,803	..	452,763

Information on the number of trees of each variety is collected triennially; the latest figures available are for the season 1964–65. The extent of cultivation of each important class of fruit and nuts on holdings of 1 acre and upwards during the seasons 1961–62 and 1964–65 is shown in the following table :—

VICTORIA—FRUIT TREES, PLANTS, ETC., IN ORCHARDS
AND GARDENS

Fruit and Nuts	Number of Trees, Plants, &c.					
	1961-62			1964-65		
	Bearing	Not Bearing	Total	Bearing	Not Bearing	Total
Apples	1,531,839	664,194	2,196,033	1,622,392	642,444	2,264,836
Pears	1,189,246	548,139	1,737,385	1,269,225	491,594	1,760,819
Quinces	13,099	481	13,580	8,269	716	8,985
Plums	137,450	48,047	185,497	125,662	41,901	167,563
Prunes	26,990	8,575	35,565	21,652	6,086	27,738
Cherries	117,078	65,327	182,405	121,270	94,184	215,454
Peaches	842,117	634,192	1,476,309	1,176,184	291,910	1,468,094
Apricots	317,157	68,495	385,652	298,434	37,010	335,444
Nectarines	13,252	12,219	25,471	21,937	14,593	36,530
Oranges—						
Navels	175,563	60,572	236,135	180,459	82,914	263,373
Valencias	208,758	89,498	298,256	226,765	123,886	350,651
Other Oranges	18,904	2,874	21,778	13,751	6,453	20,204
Mandarins	13,049	23,144	36,193	29,611	28,032	57,643
Grapefruit	21,898	4,663	26,561	20,988	5,640	26,628
Lemons and Limes	80,162	27,326	107,488	71,284	26,531	97,815
Figs	3,402	1,294	4,696	1,830	842	2,672
Raspberries	223,000	32,250	255,250	221,500	30,000	251,500
Loganberries	49,890	1,395	51,285	72,146	1,590	73,736
Strawberries	6,877,500	686,250	7,563,750	8,302,500	495,000	8,797,500
Gooseberries	40,500	9,000	49,500	28,500	5,100	33,600
Youngberries	79,489	9,532	89,021	64,883	3,536	68,419
Other Berries	19,737	2,127	21,864	10,106	..	10,106
Olives	73,931	53,660	127,591	86,032	51,830	137,862
Passion-fruit	9,011	3,657	12,668	8,484	4,282	12,766
Almonds	23,568	3,247	26,815	15,307	1,264	16,571
Walnuts	6,134	1,054	7,188	5,895	1,623	7,518
Filberts	5,592	120	5,712	4,876	282	5,158

The distribution of the fruit industry over the State is set out in the following table, where the number of trees of each kind in each statistical district is given for the season 1964-65 :—

**VICTORIA—NUMBER OF FRUIT TREES, PLANTS, ETC.,
SEASON 1964-65**

Particulars	Statistical District								Total
	Central	North-Central	Western	Wimmera	Mallee	North-eastern	North-Eastern	Gippsland	
Growers .. No.	1,716	155	54	99	1,276	1,030	112	44	4,486
Area .. acres	24,866	2,509	569	3,757	8,274	33,310	1,698	526	75,509
Apples .. trees	1,595,254	167,799	52,327	17,026	18,673	272,736	104,246	36,775	2,264,836
Pears .. "	199,594	64,896	795	6,754	3,722	1,482,229	523	2,306	1,760,819
Peaches .. "	274,021	2,625	107	19,308	26,420	1,140,933	1,347	3,333	1,468,094
Apricots .. "	30,485	556	556	10,675	57,619	234,845	344	364	335,444
Plums .. "	73,096	4,871	556	2,449	30,081	56,071	178	261	167,563
Prunes .. "	413	..	831	10,504	8,569	7,394	19	8	27,738
Cherries .. "	185,807	4,377	..	1,117	372	15,072	7,489	1,220	215,454
Quinces .. "	5,540	126	..	341	90	2,835	35	18	8,985
Nectarines .. "	17,571	261	18	168	10,674	7,050	375	413	36,530
Figs .. "	830	4	5	45	272	1,496	13	7	2,672
Olives .. "	542	35	..	107,800	26,658	1,005	1,822	..	137,862
Oranges .. "	223	..	..	183	494,651	137,167	2,004	..	634,228
Mandarins .. "	3	..	..	11	53,987	3,570	72	..	57,643
Grapefruit .. "	257	..	..	2	20,186	6,002	181	..	26,628
Lemons and Limes .. "	60,151	45	..	307	18,807	17,883	572	50	97,815
Passion-fruit .. vines	2,144	..	..	..	66	2,473	3,303	4,780	12,766
Strawberries .. plants	8,677,500	41,250	..	3,750	48,750	26,250	..	..	8,797,500
Raspberries .. bushes	248,000	1,000	..	..	..	500	..	2,000	251,500
Loganberries .. "	73,338	..	..	..	..	199	199	..	73,736
Gooseberries .. "	30,600	3,000	..	..	..	..	..	..	33,600
Youngberries .. "	67,957	..	..	..	..	154	308	..	68,419
Other Berries .. "	9,780	..	..	..	..	..	326	..	10,106
Almonds .. trees	310	92	..	1,544	7,047	2,364	5,214	..	16,571
Walnuts .. "	280	3	..	6	421	370	5,195	1,243	7,518
Filberts .. "	189	..	..	..	100	..	4,869	..	5,158

Cool Storage

The fruit industry has been well aware of the importance of refrigeration since the end of the last century. Before the First World War several co-operative and privately owned cool stores had been built, beside the first Government Cool Stores, at Flinders Street, Melbourne. The Government also built and operated five further stores situated in the fruit growing districts close to Melbourne. These have been gradually handed over to growers' co-operatives.

The extension of electric power to rural areas throughout the State has resulted in the construction of numerous small private cool stores. More efficient refrigeration techniques and insulating materials have also helped to spread the idea of cool storage. Since the Second World War there has been a rapid increase of cool store capacity in

Victoria, mainly because of the very rapid development of small cool stores built in individual orchards as illustrated by the following table :—

VICTORIA—FRUIT GROWERS' COOL STORES, 1948 TO 1963

Year						Number	Capacity
1948	..	..	..	..	..	72	'000 bushels 600
1958	..	..	..	..	..	218	1,500
1961	..	..	..	..	..	311	1,800
1963	..	..	..	..	..	357	2,600

Including co-operative and proprietary stores, the total for 1963 is 432 stores with a capacity of 5·8 mill. bushels.

Many of the small orchard cool stores are used to pre-cool highly perishable soft fruits (apricots, peaches, plums and berries) and tomatoes before they are forwarded to Melbourne or interstate markets. These fruits ripen in the summer and at high summer temperatures often become over-ripe and worthless in the interval between picking and marketing, unless pre-cooled at the orchard within a few hours of picking.

Most of the orchard cool stores situated within 50 miles of Melbourne are used together with the larger co-operative and proprietary stores to achieve a more gradual marketing of Victoria's apple and pear crop. This supply of good quality fruit from store at regular intervals for a period of 6–9 months calls for considerable skill and knowledge. The fruit picked is still alive and it continues its living processes for a certain time, influenced by the variety, its ripeness at the time of harvesting ("picking maturity"), interval between harvesting and beginning of cool storage, temperature and humidity of cool chambers, and other factors. Cool storage behaviour of the fruit and the type of storage provided are also of great importance with the fruit exported to oversea markets.

To assist the industry with cool storage research, Experimental Cool Chambers were set up at the Government Cool Stores, Victoria Dock in 1923. In 1956, these were transferred to the Scoresby Horticultural Research Station, where large and better experimental chambers were constructed for this purpose.

Vine Fruits

Most vine fruits grown in Victoria are marketed as dried fruits (currants, sultanas, and raisins). Smaller quantities are sold as fresh fruit or are used for wine production. Some 40,000 acres of vines are grown in the irrigated districts of the River Murray at Mildura, Robinvale and Swan Hill. The climate at Mildura and Robinvale provides the high temperatures and clear sunny conditions during the growing season and drying period which are essential for the production of first quality dried fruit. The Swan Hill district with slightly lower temperatures and higher rainfall is less suitable than Robinvale and Mildura.

After dipping and sun drying by the grower, the dried fruit is processed and packed in packing houses. The production of dried fruits in Victoria for season 1964-65 amounted to 59,594 tons of sultanas, 4,477 tons of currants, and 6,559 tons of raisins. Approximately 70 per cent. of this produce was exported to the United Kingdom, Canada, and New Zealand.

During recent years the growing of grapes for table use has expanded rapidly and with some growers has become a specialized industry. The main varieties are Waltham Cross, Purple Cornichon, Ohanez, Sultanas, and Muscats. Melbourne and Sydney are the main market outlets, but Indonesia, Colombo, and Singapore may grow in importance as export markets.

Grapes are grown specifically for wine production at Rutherglen, Great Western, and Nagambie. While the wine growing area around Rutherglen is gradually declining, increasing quantities of grapes for winemaking are produced in the River Murray Irrigation districts. In 1964-65, 3.5 mill. gall. of wine were produced.

Grapes for Wine, 1964

Dried Fruits Industry

Location

The dried fruits industry is mainly based in Mildura in the north-west of Victoria, the district commonly known as Sunraysia. It consists of the irrigation settlements of Mildura, Irymple, Red Cliffs, Merbein, and Robinvale on the Victorian side of the River Murray and Curlwaa, Coomealla and Euston on the New South Wales side. The climate is hot and dry with an average yearly rainfall of about 10 inches. Mallee scrub is the chief natural vegetation.

History

The first settlements were made at Mildura and Irymple in 1887 following earlier negotiations between George Chaffey and the Victorian Government. The First Mildura Irrigation Trust, formed in 1895, is a locally elected authority, and is responsible for the machinery, channels, and irrigation works. In 1908, the State Rivers and Water Supply Commission of Victoria allocated 5,000 acres for lucerne growing and dairying in Merbein, but due to prevailing high prices for dried vine fruits during the First World War, settlers transferred their interest to dried vine fruits production. Between 1917 and 1921, further settlement by way of soldier settlement was made in Merbein West and Birdwoodton and later in the Red Cliffs district, where 700 blocks averaging 16 acres each were allocated. Robinvale was settled in 1946 with the allocation of 246 blocks, approximately 25 acres each to soldier settlers. Not all this land was used for dried vine fruits production. Another area known as the Mid-Murray area consisting of Nyah, Woorinen, and Tresco in Victoria with neighbouring plantings at Koraleigh and Goodnight in New South Wales accounts for a packing house production of approximately 4,500 tons annually.

Description of Industry

The dried fruits grower faces many risks. Frosts, hail, and damage from disease caused by adverse weather conditions during the growing season, and adverse weather conditions following harvesting can cause heavy reduction in the amount of crop available for packing. Auxiliary drying equipment can help to reduce such losses.

A State Board, The Victorian Dried Fruits Board, is responsible for maintaining the quality and gradings of dried fruits generally. Similar Boards exist in other producing States. The Commonwealth Department of Primary Industry controls the quality of dried fruits for export and co-operates with the Board by inspecting all fruits, both local and export.

The Australian Dried Fruits Control Board consisting of growers' representatives, members with commercial experience in marketing of dried vine fruits, and the Government representatives controls the sale and distribution of dried vine fruits exports, recommends the licensing of exports, and contributes to dried vine fruits publicity activities overseas. Publicity and promotion within Australia are handled by the Australian Dried Fruits Association, an association of growers.

Harvesting occurs between February and April, and is largely carried out by casual labour. Once picked, the grapes are dried by spreading the fruit evenly on wire netting shelves in drying racks where it gradually dries out in the warm air. Then the fruit is transferred to packing houses where it is stemmed, weighed, classed for quality, and inspected for local consumption or export.

Pruning commences in June, reaches peak activity in July, and then declines sharply to a minimum in September. Summer pruning to cut back excessive growth and to allow the passage of tractor machinery down rows occurs in November; cultivation and irrigation are carried out in the summer months prior to harvest.

As Australia is the third largest producer of dried vine fruits in the world, the economics of the dried vine fruits industry are largely dependent on export markets. The Commonwealth Government has introduced a stabilization scheme designed to assist the economic control of the industry based on the average cost of production each year.

Australian dried fruits production and processing techniques are assisted by research. Scientists in Australia have found that by microscopic examination of the tiny vine buds nine to ten months prior to harvest, they can forecast the quantity and quality (subject to weather vagaries) of the crop and recommend the best cultivation practices. The technique for seeding raisins has largely been perfected in Australia and seeded raisins are processed in a locally developed machine which squeezes out the small seeds from the fruit.

The Commonwealth Scientific and Industrial Research Organization conducts a research station at Merbein whilst the Victorian Government in 1965 established an insectary costing approximately \$50,000 at Mildura. The Government has also acquired some 140 acres at Irymple for other field research projects.

As labour is the largest single cost factor in the industry, mechanization is continually advancing and has resulted in electric cranes on dips, mechanical rack shakers, fork loading of dried vine fruits, and tractor use on blocks and mechanical hoist, air sorting, carton packaging, and labelling in packing houses.

Particulars of vine production for the five seasons, 1960-61 to 1964-65, are given in the following table :—

VICTORIA—VINE-FRUIT PRODUCTION

Season	Number of Growers	Area		Production				
		Bearing	Not Bearing	Grapes Gathered	Wine Made	Dried Fruits		
						Raisins	Sultanas	Currants
		acres		'000 cwt.	'000 gall.	cwt.		
1960-61 ..	2,524	42,688	1,961	5,017	3,021	105,552	914,492	111,660
1961-62 ..	2,526	42,540	2,565	5,902	3,605	122,730	1,174,494	54,290
1962-63 ..	2,547	42,734	2,928	4,271	2,433	94,777	786,410	50,728
1963-64 ..	2,583	43,485	3,016	6,274	3,705	122,352	1,200,415	78,676
1964-65 ..	2,601	44,203	3,793	6,435	3,458	131,179	1,191,888	89,535

Vegetables

The climate of Victoria is such that practically every kind of vegetable can be grown in some part of the State during the favourable season in each area. Consequently, there is a plentiful supply of fresh vegetables on the market for the whole year in normal years. These vegetables (excluding potatoes and onions) worth about \$18m each year to Victoria are harvested from about 40,000 acres.

Over half the area under vegetables is situated close to Melbourne. Other vegetable producing centres south of the Dividing Range are in the Western District (the centre of processed pea production) and in Gippsland (the centre of the stringless bean growing industry for processing and also for seed bean production). These areas are fairly free of frosts and have a well distributed rainfall ranging from 20 to 35 inches. Vegetables are grown on a wide variety of soils (sand, sandy loam, clay loam, peat, and volcanic). Many market gardeners use irrigation from town water supplies, storage catchments, streams, and dams to supplement summer rains.

North of the Dividing Range the summer is longer and hotter, but winter frosts are more frequent. Many areas along the Murray are ideal for growing early spring crops. In many instances intercropping in orchards and vineyards is practised. Efficient transport enables the shipping of the products to both the Melbourne and the Sydney markets. In the Goulburn Valley and around Bendigo tomato

production for processing is concentrated. The greatest part of the Victorian crop, which is almost half of the total Australian production, comes from this area.

Returns from market gardening can fluctuate greatly according to weather and market conditions, and production methods have to be highly efficient. Besides using the dwindling supplies of animal manure, a large amount of artificial fertilizer is used (6–12 cwt. per acre). There is an increasing tendency towards mechanization (spraying units for pest and weed control, vining units for harvesting of peas and beans). While most crops reach the consumers as fresh vegetables, a considerable amount is processed.

Details of the area, production, and gross value of vegetables are given in the table below for all the more important types, including potatoes and onions which are shown in greater detail under separate heading on pages 327–328 :—

VICTORIA—VEGETABLES FOR HUMAN CONSUMPTION,
1964–65

Type	Area Sown	Production	Gross Value
	acres	tons	\$'000
Potatoes	32,931	183,665	24,820
Onions	3,825	22,963	1,440
Carrots	1,803	25,072	2,347
Parsnips	602	6,995	966
Beetroot	311	3,153	326
Tomatoes	4,828	69,664	7,052
French Beans	2,582	4,015	889
Green Peas—			
Sold in Pod	7,654	8,844	1,721
Canning	14,957	22,104*	1,033
Cabbages	1,923	24,429	988
Cauliflowers	2,720	34,613	2,007
Brussels Sprouts	711	2,551	576
Lettuce	2,100	7,446	1,254
Pumpkins	2,155	9,761	1,073
Other Vegetables	3,515	16,782	2,103
Total	82,617	442,057	48,596

* Pod equivalent.

Minor Crops

There are other crops cultivated in Victoria in addition to those enumerated on pages 314 to 316. The most important of these are nursery products, cut flowers, Japanese millet, sunflowers, agricultural seeds, vegetable seeds, and safflower.

Pastoral and Dairying*Progress of Stock Breeding*

The first great development in Victoria, or as it was then known, the district of Port Phillip, was the pastoral interest. Millions of acres of lightly timbered land lay at the feet of the newcomers, and the quickest way to wealth was evidently by the division of the land into runs and the depasturing of sheep and cattle. Settlers and stock, at first from Tasmania and eventually from New South Wales, came from the very first year of settlement.

According to early statistical records, there were 26,000 sheep, 100 cattle, and 57 horses in the Colony on the 25th May, 1836. On 1st January, 1841, as a result of five years of livestock importation and breeding, there were 782,283 sheep, 50,837 cattle, and 2,372 horses. By 1st January, 1851, the livestock population had increased to 6,032,783 sheep, 378,806 cattle, 21,219 horses, and 9,260 pigs.

The following table shows the number of livestock in Victoria at decennial intervals since 1861 to 1961 and the number of livestock on rural holdings for each of the five years 1961 to 1965. As from 1957 no allowance has been made for the small number of livestock not on rural holdings.

VICTORIA—LIVESTOCK
(‘000)

Year	Horses (Including Foals)	Cattle*		Sheep	Pigs
		Dairy	Beef		
1861 at 31st March ..	77		722	5,781	61
1871 " " ..	167		721	10,762	131
1881 " " ..	276		1,286	10,360	242
1891 " " ..	436		1,783	12,693	282
1901 " " ..	392		1,602	10,842	350
1911 at 1st March ..	472		1,548	12,883	333
1921 " " ..	488		1,575	12,171	175
1931 " " ..	380		1,430	16,478	281
1941 " " ..	318		1,922	20,412	398
1951 at 31st March ..	186	1,489	727	20,012	237
1961 " " ..	64	1,717	1,147	26,620	319
1962 " " ..	62	1,824	1,332	27,533	325
1963 " " ..	58	1,858	1,367	27,472	298
1964 " " ..	56		3,301	28,413	322
1965 " " ..	56		3,316	30,437	378

* Separate figures for beef and dairy cattle are not available for years prior to 1943 or for 1964 onwards.

A table showing the sizes of holdings and the numbers of holdings depasturing stock at March 1960, appears on page 309. Dot maps showing the distribution of livestock on rural holdings in Victoria at 31st March, 1962, appear on pages 577 to 580 of the Victorian Year Book 1964.

Following an investigation into the adequacy of the wording and layout of the cattle sections of the Agricultural, Dairying, and Pastoral Statistics form, changes were introduced to the 1963-64 form.

Prior to 1964, farmers were asked to classify their herds as either "beef cattle" or "dairy cattle". As these two terms tended to confuse breed and purpose, farmers were asked in the new design to classify their cattle, with the exception of bulls, according to the two main purposes of (i) milk production and (ii) meat production, irrespective of breed, and to report separately the number of cows and heifers kept for their own domestic milk supply; bulls were to be reported according to their breed and age, i.e., dairy or beef and over or under one year of age. Consequently, detailed statistics of cattle for 1965, set out in the following table, are not comparable with those for years prior to 1964.

VICTORIA—DISTRIBUTION OF LIVESTOCK, MARCH, 1965
(’000)

Particulars	Statistical District								Total
	Central	North-Central	Western	Wimmera	Mallee	North-eastern	North-Eastern	Gippsland	
Horses	13	4	12	3	2	8	6	7	56
Cattle—									
Bulls for Service—									
Bulls, 1 Year and over—									
Dairy Breeds ..	6	1	9	1	1	8	3	11	41
Beef Breeds ..	5	2	10	1	1	4	5	5	32
Bull Calves—Under 1 Year—									
Dairy Breeds	2	*	3	1	*	3	1	4	13
Beef Breeds ..	2	1	3	1	*	1	1	1	11
Cows and Heifers for Milk and Cream—									
Cows in Milk ..	140	13	162	8	11	219	41	279	873
Cows Dry ..	46	8	109	6	3	31	48	62	314
Heifers—1 Year and over ..	51	7	73	4	4	72	26	85	322
Heifer Calves—Under 1 Year ..	44	6	64	4	5	76	25	85	309
House Cows and Heifers	4	2	6	4	3	5	3	2	29
Other Cattle and Calves for Meat Production—									
Cows and Heifers ..	103	38	204	19	13	63	115	119	675
Calves—Under 1 Year ..	64	25	110	14	11	55	71	83	433
Other ..	36	15	56	6	4	37	52	58	264
Total Cattle ..	505	118	808	70	57	574	390	794	3,316
Pigs	64	11	39	17	20	114	39	74	378
Sheep	2,781	2,444	10,691	4,605	1,894	4,253	1,986	1,784	30,437

* More than nil but less than half the final digit shown.

Changing Patterns in Animal Husbandry, 1963

Fodder Conservation

The intensification of fodder conservation has been a natural development in farm management following pasture improvement and increased capacity for the carrying of livestock.

Even the best pastures do not provide a full ration for grazing animals throughout the year and, in addition, droughts and other circumstances, such as floods or fires, have serious effects on the amount of grazing available. In most cases, these periods of feed shortage must be met by fodder conservation and hand feeding. Fodder conservation is, therefore, a highly important farm activity without which stable livestock production at high levels could not be maintained.

In Victoria meadow hay is the main fodder conserved, being cheaply and readily available from surplus spring pasture growth in most seasons. Victoria produces some 60 per cent. of Australia's meadow hay, although having only about 30 per cent. of Australia's sown grasses and clovers. Cereal hay (mainly oaten) is also made in large quantities, especially in drier districts and in drier years, i.e., in circumstances where good pasture production may be irregular, or low due to poor spring rains.

Considerable quantities of lucerne hay are conserved, especially in irrigated areas, although the excellent quality of much of the clover and grass hay made from improved pastures has lessened interest in this fodder. Oat grain, which is easily stored, transported, and rationed is an important livestock fodder favoured for sheep in both cereal growing and grazing districts. Silage occupies a relatively minor position in the fodder conservation of the State, although important to dairy farmers meeting whole milk supply contracts in dry farming areas. Silage is also used successfully for feeding beef cattle, and has special value as a drought reserve.

Most hay in Victoria is made with the mower, side-delivery rake, and pick-up baler. About one in eight farms has a baler. After mowing, the crop dries for a time in the swath, and is then raked for further drying in the windrow before it is baled. Some farmers are using systems of loose hay handling and self-feeding based on simple low cost equipment, especially in northern areas or where short-term storage of hay is involved for early feeding needs.

Sometimes baled hay intended for summer or early autumn feeding is left in the paddock for self-feeding by the stock. Provided the hay is well made and, preferably, stored in stooks, there is little wastage in such temporary storage, especially if feeding is controlled. Long-term storage requires adequate protection, such as is given by a well constructed shed.

There is much interest at present in new machines and techniques aimed at faster drying of hay. This is a most significant development, since it makes possible further increases in hay production and also

the production of better quality hay. The types of machines used include tedders, which loosen and aerate the hay lying in swath or windrow; conditioners, which crush or crimp fresh hay between rollers and enable internal moisture to move faster through the fractured cuticle of the plants; and rotary slashers and flail mowers, in which cutting by high-speed impact replaces conventional mowing and the drying rate may increase as a result of the bruising and cuticle damage that the crop experiences.

Silage

Most silage is made in open stacks using a mower and buckrake. This is simple, but wastage is high. The flail-type forage harvester is popular because of simple cutting action and relative cheapness. It consists of swinging blades which rotate at high speed on a horizontal shaft. The crop is thrown or blown into an accompanying trailer or truck for transport for storage. Flail-cutting has opened the way to more effective silage making because the process may be better controlled. Improved storage and feeding techniques are leading to more effective use of silage than is possible with high wastage—open stack methods.

Further References, 1963, 1964, 1966

Dairying Industry

Though faced with the long-term prospect of expanding local markets, both for liquid milk and for dairy products, as the population of Australia increases, the dairying industry at present experiences varying fortunes according to the demand in oversea markets and the supply from other countries. In Victoria, however, the demand for good dairying land remains keen.

There is some tendency to sustain competitive land prices by increasing the output of milk or butterfat to the point at which the farm business gives a satisfactory return. Until the middle of the 1930's, 30-cow hand-milked herds were common, and three persons were usually needed to milk a herd of this size. In the next decade the introduction of milking machines made it possible for two persons to milk 30 to 40 cows. In the late 1940's, dairy farmers in large numbers gave up hand-stripping after machines, and one man could then comfortably milk 40 to 45 cows. Doubling up of machine units also made the task easier. In the past few years the introduction of the herringbone-type milking shed has made it possible for one man to milk up to 60 cows and for two men to milk 80 or more.

More recently there has been a trend towards smaller herringbone sheds with "doubled-up" machines to increase further the number of cows milked per operator. Pasture improvement has been the basis of the increased carrying capacity of many farms. In some places potash fertilizers and trace elements have played their part; in others, the use of more superphosphate and better management and grazing of the pastures have sufficed. With this increase of production has come a greater need to produce and conserve feed to be used at times when pasture production is slack. This is especially true on farms which supply market milk, as these must fulfil a contract every day of the year. Silage making on dairy farms has increased eightfold in recent years, and is still being taken up by more farmers. More crops are grown to fill the summer and winter feed gaps, and some have resorted to water harvesting and spray irrigation to provide green pasture in summer. Light tractors with hydraulic three-point linkage have brought with them the tendency to rely on machinery in preference to employing labour.

Advisory services given by the Department of Agriculture through dairy supervisors, the bi-monthly "Dairyfarming Digest", and other media, have made dairy farmers more conscious of their need to give thought to every side of farm management. More cows are under test than ever before in Victoria. Many artificial breeding groups have been formed, and a co-operative society now conducts the bull farm on which the semen is produced. There has been increased interest in milking methods, milking machine efficiency, and in the use of new and improved dairy detergents. Farmers who are keen to advance their methods have been helped by the formation of 70 discussion groups, each comprising about seven dairy farmers. Refrigeration of milk on the farm and its collection from bulk vats by road tanker have proved practicable in some districts, and these practices are now being extended.

Local markets are changing. More country towns are being provided with supplies of pasteurized bottled milk and the Milk Board has brought many country areas under its jurisdiction. In manufacturing, there is a trend towards large versatile factories equipped to change from one type of product to another, according to market prospects. There is also a growing local market for various types of cheeses hitherto little known in this country, and cheddar cheese is now exported in blocks wrapped in plastic film. These have several advantages over the traditional cylindrical bandaged cheeses.

The research projects now being financed by the industry levy for research and promotion should benefit the dairying industry greatly in the coming years.

Victoria is the principal milk producing State and in 1964-65, the Victorian output (746 mill. gall.) represented 48 per cent. of the Australian production.

Sharefarming in the Dairying Industry

In dairying as in other farm industries numbers of farms are run on a sharefarming basis. These sharefarming enterprises are of two kinds. In the one a single unit dairy farm is operated by the share-

farmer who is in sole control of the enterprise except that he does not own the property and pays rent in the form of a proportion of the production. In the other more than one dairy unit is concerned. The owner retains control in the management of the farm or group of farms. (The difference between the two types is significant.)

The following table shows the numbers of cow-keepers and cows, the estimated total production of milk, and the gross value of dairy produce for each of the last five years :—

VICTORIA—DAIRYING

At 31st March—	Number of Cow-keepers	Number of Dairy Cows	Estimated Total Production of Milk for All Purposes (Year Ended 30th June)	Gross Value of Dairy Produce*
		'000	'000 gall.	\$'000
1961	43,690	1,197	596,706	144,008
1962	43,113	1,264	642,055	143,176
1963	41,866	1,294	670,788	157,136
1964†	28,181	1,184	694,775	172,560
1965	27,704	1,187	745,896	194,988

* Includes subsidy.

† Details of cow-keepers and dairy cows from 1964 onwards are not comparable with those for earlier years. Prior to 1964 these statistics were based on numbers of cows (in milk or dry) and springing heifers and included cows kept for the farmer's own domestic milk supply. Commencing with 1964, details of cows kept for the farmer's own domestic milk supply have been excluded. See page 340.

The quantities of butter, cheese, condensed and powdered full-cream milk, and casein produced during the last five years were as follows :—

VICTORIA—BUTTER, CHEESE, CONDENSED AND POWDERED MILK, AND CASEIN MADE

('000 lb.)

Year Ended 30th June—	Butter*	Cheese*	Condensed Milk	Powdered Full-cream Milk	Casein
1961	201,447	44,799	87,321	22,396	22,576
1962	215,328	53,633	88,178	23,745	27,362
1963	228,167	57,468	104,518	20,635	32,907
1964	232,394	56,446	132,225	22,328	34,967
1965*	247,924	60,975	146,167	25,291	36,685

* Commencing with the year ended 30th June, 1965, small quantities of butter and cheese made on farms are excluded from the above table. For the year ended 30th June, 1964, there were 895,000 lb. of butter and 49,000 lb. of cheese made on farms.

The following table shows the number of dairy herds in Victoria, grouped, according to the number of cows, for each of the five years 1961 to 1965 :—

VICTORIA—DAIRY HERDS, CONTAINING FIVE COWS OR MORE, GROUPED ACCORDING TO SIZE

At 31st March—	Number of Herds—							Total
	5 to 9 Cows	10 to 14 Cows	15 to 19 Cows	20 to 29 Cows	30 to 49 Cows	50 to 99 Cows	100 Cows and over	
1961.. ..	4,213	2,149	1,545	2,738	5,915	8,723	1,549	26,832
1962.. ..	4,092	2,064	1,454	2,712	5,667	9,271	1,838	27,098
1963.. ..	3,660	1,904	1,405	2,537	5,486	9,569	2,015	26,576
1964* ..	2,459	1,596	1,183	2,507	5,660	9,339	1,646	24,390
1965.. ..	2,281	1,462	1,025	2,202	5,342	9,462	1,759	23,533

* Details from 1964 onwards are not comparable with those for earlier years. See footnote to the first table on page 344.

Eradication of Tuberculosis, 1962

Pig Industry

Between 20,000 and 25,000 tons of pig carcasses are produced in Victoria in a year and most of these are consumed here. Only a few are exported to other countries. More than half the pig meat is used as fresh pork or for sausages and other meat products. The remainder is made into bacon and ham, some of which is canned. Victoria is usually a net importer of pig meat from other States of Australia.

Farmers sell pigs to meat works either directly or through public auction sales. There are adequate facilities for selling pigs in most districts. Pigs are sold for meat as porkers about 4 to 5 months old and yielding dressed carcasses of 60 lb. to 100 lb.; as baconers, 5 to 7 months old and with dressed carcasses of 120 lb. to 160 lb.; or as backfatters, yielding carcasses of 200 lb. to 500 lb. after having been discarded from the breeding herd.

Most of the pigs in Victoria are in small herds on dairy farms and mixed farms. The sizes of the herds are related to the quantities of separated milk and other food by-products of the farms. A food supply which is adequate in quality, quantity, and cost is the basis of economic pig production. There are few specialized pig farms in Victoria. Their main food supplies are buttermilk and whey from dairy produce factories, and food refuse from eating places and food factories. Pig farms based on the use of cereal grain feeding, though still few, are increasing.

Pig prices vary and farmers have practically no control over them. Prices are usually higher in spring, when there are fewer pigs in the market, than in autumn when there are more pigs. Seasonal fluctuation in the quantities of milk available for pig feeding is the usual cause of fluctuating supplies of pigs to markets, though increases in the number of breeding sheep following a period of favourable prices also lead to fluctuations in supply and price of pigs.

Another cause of fluctuation in production and prices of pigs, not so regular but sometimes big enough to cancel the seasonal one, is due to big increases or decreases in pig breeding. As three-quarters of the pig breeders in Victoria have an average of less than three breeding sows each, an addition of one more sow when prices are favourable results in a substantial over-all increase.

The number of pigs in Victoria at 31st March, 1965, was 378,055. About 77 per cent. of these are held in the Central, Western, Northern, and Gippsland districts. The following table shows classifications (in statistical districts) of pigs, together with the numbers of pig-keepers :—

VICTORIA—PIGS AND PIG-KEEPERS, 31st MARCH, 1965

Statistical District	Boars	Breeding Sows	All Other	Total Pigs	Pig-keepers
Central	1,188	10,201	52,948	64,337	1,267
North-Central	266	1,862	9,086	11,214	431
Western	948	6,459	31,664	39,071	1,241
Wimmera	444	2,696	13,461	16,601	943
Mallee	511	3,368	16,282	20,161	869
Northern	2,002	17,919	93,788	113,709	1,908
North-Eastern	972	6,644	31,186	38,802	1,099
Gippsland	1,597	11,843	60,720	74,160	1,703
Total	7,928	60,992	309,135	378,055	9,461*

* Of this number 1,838 had herds of under 5 pigs ; 1,119 herds of 5 and under 10 ; 1,576 herds of 10 and under 20 ; and 4,928 herds of 20 pigs and over.

The following table shows the latest statistics available of the number of dairy herds (in size groups) separated into those where pigs are held, and those where no pigs are held. The sizes of pig herds are also shown.

VICTORIA—PIG-KEEPING IN CONJUNCTION WITH DAIRYING : NUMBER OF HOLDINGS AT MARCH, 1960

Size of Dairy Cattle Herd (Numbers)	Size of Pig Herd (Numbers)								Holdings with Pigs	Holdings with No Pigs	Holdings with Dairy Cattle
	1-4	5-9	10-14	15-19	20-29	30-49	50-99	100 and over			
1-4	526	119	71	44	49	55	42	31	937	12,351	13,288
5-9	481	136	64	45	50	58	33	11	878	4,786	5,664
10-14	279	122	70	24	35	32	14	7	583	2,113	2,696
15-19	169	83	57	23	40	24	10	2	408	1,301	1,709
20-29	255	164	121	61	93	60	23	14	791	1,946	2,737
30-49	330	339	255	169	240	172	53	14	1,572	3,176	4,748
50-69	179	261	261	192	328	298	100	15	1,634	2,976	4,610
70-99	118	142	165	151	320	490	266	30	1,682	3,747	5,429
100-149	42	75	55	64	171	300	288	73	1,068	2,050	3,118
150 and over	9	7	14	14	26	78	114	66	328	629	957
Total	2,388	1,448	1,133	787	1,352	1,567	943	263	9,881	35,075	44,956

*Sheep Industry**Breeds of Sheep*

Victoria and Tasmania are the only two Australian States in which the Merino does not comprise over 50 per cent. of the sheep population. In 1965, Victoria's sheep population consisted of 46 per cent. Merinos; 15 per cent. Corriedales; 4 per cent. Polwarths; 29 per cent. Comebacks and Crossbreds; and 6 per cent. British breeds (mainly pure Dorset Horn, Romney Marsh, Border Leicester, and Southdown).

The Corriedale and the Polwarth were both developed in Victoria to meet a special need in the southern high rainfall area for a dual purpose sheep which combined the production of good style comeback or crossbred wools with good meat conformation.

The pure British breeds are mostly run in small stud flocks which produce rams for use in cross breeding for prime lamb or crossbred wool production. Some common crosses used in fine crossbred and comeback wool production are Merino by Corriedale, Merino by Polwarth, and Corriedale by Polwarth. The common crosses used to produce strong Crossbreds for wool and prime lamb production are Border Leicester by Merino, Romney Marsh by Corriedale, and Romney Marsh by Merino. The most important breeds for siring prime lambs are the Dorset Horn (and the Poll Dorset), the Southdown, and the Border Leicester.

Information on the number of sheep of each breed is collected triennially.

The following table shows the breeds of sheep in Victoria (by statistical districts) at 31st March, 1965 :—

VICTORIA—BREEDS OF SHEEP (INCLUDING RAMS),
31ST MARCH, 1965
('000)

Statistical District	Merino	Corriedale	Polwarth	Dorset Horn	Romney Marsh	Border Leicester	South-down	Merino Comeback	Crossbred	Other	Total
Central ..	718	490	210	54	44	52	22	222	953	16	2,781
North-Central ..	1,249	322	32	42	9	45	14	167	551	13	2,444
Western ..	4,761	2,449	817	62	427	49	30	935	1,108	54	10,691
Wimmera ..	3,585	410	21	28	28	42	1	112	363	15	4,605
Mallee ..	921	113	7	44	3	58	1	160	580	7	1,894
Northern ..	1,493	375	41	120	9	94	20	262	1,813	26	4,253
North-Eastern ..	642	256	82	40	32	26	6	158	727	17	1,986
Gippsland ..	779	169	14	34	41	28	13	144	549	13	1,784
Total ..	14,148	4,582	1,224	424	592	395	109	2,160	6,643	160	30,437

Information on the number of rams of each breed is collected annually. The following table shows the breeds of rams in Victoria (by statistical districts) at 31st March, 1965 :—

VICTORIA—BREEDS OF RAMS, 31ST MARCH, 1965

Statistical District	Merino	Corriedale	Polwarth	Dorset Horn	Border Leicester	South-down	Other	Total
Central	4,739	4,546	1,958	9,357	1,377	4,946	3,944	30,867
North-Central	8,305	3,069	497	5,318	2,623	2,644	1,755	24,211
Western	52,837	25,651	11,144	7,933	2,149	4,428	15,159	119,301
Wimmera	26,311	5,543	269	4,720	3,977	140	2,399	43,359
Mallee	3,840	1,332	40	8,548	7,820	82	1,442	23,104
Northern	10,211	4,108	441	24,342	11,453	2,387	3,328	56,270
North-Eastern	4,311	2,382	907	8,660	3,423	2,004	3,248	24,935
Gippsland	4,798	1,650	193	3,549	1,940	3,028	3,884	19,042
Total	115,352	48,281	15,449	72,427	34,762	19,659	35,159	341,089

The numbers of sheep in Victoria in selected years since 1861 are shown in the table on page 339. The distribution of all livestock is shown in the table on page 340.

Factors such as seasonal conditions, prices of wool, mutton, lamb, and to a lesser degree, wheat, affect the number of sheep in the State in any given year. In an adverse season flocks may be reduced by mortality due to lack of fodder or water, by the increase in the slaughtering of fat stock, or by the decrease in lambing. Decreased imports from other States are another factor. In addition to the seasonal movements of sheep from New South Wales and South Australia for agistment, there is a regular importation of sheep from those States for slaughtering purposes.

Lambing

Climatic conditions also play a large part in determining the proportion of lambs marked to ewes mated, and thus the natural increase from season to season may vary considerably. The following table shows the number of ewes mated or intended to be mated, the number actually mated, and lambs marked, in each of the five seasons 1961 to 1965 :—

VICTORIA—LAMBING

Season	Ewes Intended for Mating	Ewes Actually Mated	Lambs Marked	Proportion of Lambs Marked to Ewes Mated
		'000		%
1961	11,516	11,440	9,773	85
1962	11,409	11,008	9,217	84
1963	11,436	11,369	9,795	86
1964	11,633	11,611	9,853	85
1965	12,560	12,501	10,556	84

Sheep and Lambs in Statistical Districts

The following tables set out the number of rams, ewes, wethers, and lambs depastured in each statistical district of the State at 31st March, 1965, and the numbers of ewes mated classified according to whether the progeny is intended for wool, or for fat lamb production:—

VICTORIA—SHEEP AND LAMBS IN EACH STATISTICAL DISTRICT AT 31ST MARCH, 1965
(’000)

Particulars	Statistical District							Total	
	Central	North-Central	Western	Wimmera	Mallee	North-ern	North-Eastern		Gipps-land
Rams ..	31	24	119	43	23	56	25	19	341
Breeding Ewes*	1,227	964	4,535	1,782	1,090	2,282	1,026	838	13,745
Other Ewes ..	70	52	400	147	23	72	41	41	845
Wethers ..	953	998	3,403	1,724	280	928	561	515	9,362
Lambs ..	499	405	2,234	908	478	915	332	372	6,143
Total Sheep and Lambs ..	2,781	2,444	10,691	4,605	1,894	4,253	1,986	1,784	30,437

* Includes breeding ewes not mated (1,185,469 at 31st March, 1965).

VICTORIA—LAMBING, 1964 SEASON

Particulars	Statistical District							Total	
	Central	North-Central	Western	Wimmera	Mallee	North-ern	North-Eastern		Gipps-land
Ewes Mated '000 ..	1,026	810	3,575	1,474	1,024	2,095	926	681	11,611
Lambs Marked '000 ..	925	685	2,908	1,194	888	1,853	784	616	9,853
Percentage ..	90	85	81	81	87	88	85	90	85

VICTORIA—LAMBING FORECAST, 1965 SEASON
(As Advised by Farmers at 31st March, 1965)
(’000)

Breed of Rams Used	Ewes Mated or Intended to be Mated (For Lambing during 1965 Season)							Total	
	Statistical District								
	Central	North-Central	Western	Wimmera	Mallee	North-ern	North-Eastern		Gipps-land
Merino ..	160	294	1,507	922	164	342	182	199	3,769
Corriedale or Polwarth ..	226	129	1,318	199	61	153	123	85	2,294
Shortwool Breeds ..	649	327	579	212	469	1,196	495	319	4,247
Longwool Breeds ..	103	146	559	233	359	496	177	175	2,249
Total ..	1,138	895	3,963	1,567	1,053	2,187	978	779	12,560

Sheep and Wool Growing Districts

Sheep are run in all parts of Victoria, except on some of the fringe country of the southern coast, and the heavily timbered mountainous country in the Eastern Highlands.

Central. This district has a wide range of environments which influence the type of enterprise. Prime lamb production is the main sheep enterprise, with some areas suited to late lamb production. Some attractive wools are also grown.

North-Central. Wool growing is important in this district, but the wool is generally not as attractive as that produced in the Western District because of more dust and seed. Prime lamb production is also important in the western part of the district. The ewes preferred are Corriedale or similar crossbred types.

Western. This district has a high concentration of sheep. The climate is well suited to the production of the finest and most stylish wools, having a reliable annual rainfall of 20 to 30 inches, and relative freedom from dust. About half the sheep are Merinos with the remainder mainly Polwarths, Corriedales, or Comebacks. These sheep are raised almost exclusively for wool, producing one-third of Victoria's total wool clip.

Wimmera. In this district sheep are frequently raised in conjunction with wheat growing. In the southern part wool growing is the main pursuit with Merinos forming the majority; whereas in the northern part prime lamb raising is of greater importance, using mainly strong wool Merinos or crossbred ewes mated with Dorset Horn or Border Leicester rams. Dust and vegetable faults detract from the wools grown in this district.

Mallee. As in the Northern Wimmera, prime lamb raising in conjunction with wheat growing is the main sheep enterprise. Dust, sand and burr reduce the value of wool grown in this district. Sheep play an important role in the medic-ley and clover-ley systems of farming which have been introduced in recent years.

Northern. The wheat sheep enterprise again predominates in this district. Early prime lamb production is of major importance on the irrigation areas within this district. On the dry land areas, both lamb raising and the growing of coarser types of wool occur.

North-Eastern. This high rainfall area produces both attractive wool and prime lambs, the population being approximately one-third Merino, one-third crossbreds, and one-third Corriedale and Comebacks.

Gippsland. In the eastern part of this district Merinos, Comebacks and crossbred types are run mainly for wool; prime lamb production in conjunction with dairying prevails in the western areas. There is a potential for late lamb production in the higher rainfall area around Leongatha.

Wool Growing Districts, 1962*Production of Wool*

Statistics of wool production are obtained direct from growers, from fellmongeries and, for wool exported on skins, from the Department of Customs and Excise.

VICTORIA—SHEEP AND LAMBS SHORN, SEASON 1964-65

Statistical District	Shorn		Wool Clipped (Including Crutchings)		Average	
	Sheep	Lambs	Sheep's	Lambs'	Per Sheep	Per Lamb
	'000		'000 lb.		lb.	
Central ..	2,463	562	25,732	1,769	10.45	3.15
North-Central ..	2,366	491	23,292	1,413	9.84	2.88
Western ..	10,069	2,492	100,970	7,677	10.03	3.08
Wimmera ..	4,394	1,033	45,330	2,937	10.32	2.84
Mallee ..	1,531	489	16,811	1,461	10.98	2.99
Northern ..	3,917	1,083	39,380	3,241	10.05	2.99
North-Eastern ..	2,013	426	18,490	1,127	9.19	2.65
Gippsland ..	1,563	449	15,404	1,246	9.85	2.78
Total ..	28,315	7,024	285,407	20,871	10.08	2.97

VICTORIA—SHEEP SHORN AND WOOL CLIPPED

Season	Shorn		Wool Clipped (Including Crutchings)		Average	
	Sheep	Lambs	Sheep's	Lambs'	Per Sheep	Per Lamb
	'000		'000 lb.		lb.	
1960-61 ..	24,999	5,822	255,915	17,222	10.24	2.96
1961-62 ..	25,664	6,847	261,012	19,994	10.17	2.92
1962-63 ..	25,376	6,235	243,238	17,561	9.59	2.82
1963-64 ..	26,009	6,836	262,472	18,863	10.09	2.76
1964-65 ..	28,315	7,024	285,407	20,871	10.08	2.97

VICTORIA—WOOL PRODUCTION AND VALUE

Season	Clip	Stripped from and Exported on Skins, &c. (Greasy)	Total Quantity (Greasy)	Gross Value	Average Price per lb.
					'000 lb.	'000	cents
1960-61 ..	273,137	48,874	322,011	138,530	43.02
1961-62 ..	281,006	49,632	330,639	148,438	44.89
1962-63 ..	260,799	55,906	316,705	158,013	49.89
1963-64 ..	281,335	52,953	334,288	208,700	62.43
1964-65 ..	306,278	55,252	361,530	176,041	48.69

Wool Marketing System

The present system of wool marketing has been built up over more than a century by the efforts of many able and energetic leaders, notably Thomas Sutcliffe Mort who prompted the first Australian

auctions held at Sydney in 1843, and Richard Goldsbrough who started the sale of Victorian wool and produce in Melbourne in 1848. Geelong, the third Australian centre, was established in 1857.

On these foundations has been built a marketing system probably unique in world commerce, where a product is sold, in the presence of its grower, to the highest bidder amongst manufacturers and their agents from all over the world.

A sales programme, which ensures that there is a representative selection of wool to meet the varied demand at each centre of auction in Victoria, is prepared for the complete season. Thus, by controlling the amount of wool offered, an orderly marketing system is maintained.

Auction System

Under the auction system wools are displayed on the show floors of woolbrokers' stores, equipped with sawtooth roofs, giving clear, even lighting. This presentation of the wool under conditions which promote the interests of the grower, and at the same time retain the confidence of the buyer is the responsibility of the selling broker, and involves strict and thorough attention to detail.

The whole of the offering in each catalogue is valued by the brokers' experts, who keep in the closest touch with the market and its movements. When the auction begins, the auctioneer is accompanied by the wool expert who is able to protect the growers' interests. In this way, the grower exercises control up to the last moment, and may withdraw any lot if the bids do not conform to his ideas of value.

At the fall of the auctioneer's hammer, the ownership of the lot passes from the woolgrower to the woolbuyer, but the woolbroker still performs some service by storing it in his warehouse until it is required by the buyer. If the wool is to go overseas it is dumped, or compressed tightly and held by metal bands. The broker then has it delivered to the ship, or the local mill, and at that point marketing ends.

Further Reference, 1963

History of Pastoral Industry, 1963

Meat Industry

The farm lands of Victoria have proved most suitable for meat production and about 30 per cent. of Australia's red meat is produced in Victoria.

The American market has brought big changes to the beef industry, since the United States is mostly interested in lean meat. The demand created to supply this market has lifted the prices of bulls, dairy cows, and what are known to the trade as store cattle. The prices for these cattle have increased considerably and are now close to the prices per 100 lb. dressed weight (chilled carcass) of the traditionally prime cattle, used extensively in supplying the local trade.

The local market for lamb has always been good but the demand for export lambs has been irregular, largely because of overfatness. Grading is largely a matter of fatness and the leaner, meatier types used locally are the most profitable to produce in areas where the season

favours marketing from February to September. Marketing of lambs from the drier parts of the State has to be done during October, November, and December when, because of the large offerings, lamb prices are at export parity.

Boneless mutton exports to the United States have provided a large market for old sheep which at one time brought low prices for canning and small goods. There is still a proportion of old sheep allowed to die on properties but the waste has been greatly reduced in recent years and is reflected in greater mutton production.

There have been more pigs in Victoria than at present but, with faster growth and more rapid turnover, pig meat production has remained high. Most pig meats are consumed locally and a small increase in production is reflected in a big drop in prices and vice versa. Since prices improved following the almost complete cessation of exports during the Second World War, pig meat production has tended to follow three year cycles. For about eighteen months, pig prices are low and many farmers go out of production. Then there is a shortage of pig meats and prices rise, attracting new farmers into pig meat production. When these new farmers have pigs to sell, the shortage is overcome and prices fall. The successful pig farmer has a cheap supply of good food and produces steadily all the time.

The American influence upon Victoria's standards of living has had a telling impact on table poultry production. Fewer people are keeping poultry for their own domestic requirements, and consequently, more poultry meat is purchased. This has resulted in a big increase of broilers, capons, and other table fowl, including ducks and turkeys.

Broiler Industry

The raising of chickens for meat on a large scale has emerged in Victoria since the mid 1950's. Chickens are most efficient in converting poultry feeds, grains, and protein supplements, to meat. Chickens are also multiplied cheaply and rapidly through scientific breeding and modern artificial incubation methods.

It now takes approximately 2.7 lb. of poultry feed to produce 1 lb. of poultry meat, and a 3-3½ lb. chicken is grown in nine to ten weeks. There is every prospect of attaining current British and American production figures of 2-2.5 : 1 feed conversion and a 3-3½ lb. chicken in seven to eight weeks. This efficient conversion and rapid growth has been achieved by extensive breeding programmes ; the use of "high energy" poultry feeds, highly supplemented with vitamins and minerals ; growth promoters and disease control drugs ; and by the development of enclosed, factory-like broiler houses, with controlled temperature, humidity, ventilation and light, conducive to fast growth.

The organization of the broiler industry on a continuous, production-line, factory-like operation, has been a major factor in the great reduction in price to consumers. Breeders, hatcheries, contract growers, poultry processors and distributors, have all co-ordinated to ensure efficient and continuous production. Seasonal effects are no longer a consideration and prices do not fluctuate. As a result, poultry meat, once a luxury, is now cheap and a normal part of the diet.

Main production centres are located on the Mornington Peninsula and in areas south-east and east of Melbourne, near the processing works and the main centres of consumption. Most of Victoria's production is consumed locally; very little is exported and some interstate broilers are imported.

Broiler houses are fully enclosed, each house grows a "crop" of about 10,000 broilers, about four times a year. Chickens are stocked at a rate of 0·8–1 sq. ft. of floor space per bird. A one-man or one-family farm raises approximately 60,000 birds a year. Growers are usually contracted to supply large broiler organizations which hatch and supply the specially bred meat chickens and receive broilers back for processing and distribution.

Stock Slaughtered

The following table shows the number of slaughtering establishments and details of the stock slaughtered in the State during each of the five years 1960–61 to 1964–65 :—

VICTORIA—STOCK SLAUGHTERED

Particulars	Stock Slaughtered in Establishments and on Farms and Stations				
	Year Ended 30th June—				
	1961	1962	1963	1964	1965 *
	'000				
Sheep	6,374	7,389	7,444	7,306	7,136
Lambs	5,002	5,099	5,408	5,342	5,433
Bulls and Bullocks	165	263	310	292	295
Cows	267	356	463	509	577
Young Cattle	172	216	255	312	365
Calves	436	508	574	668	675
Pigs	514	588	530	533	601
	No.				
Number of Slaughter-houses	296	282	284	282	270

* Average dressed weights per carcass during 1964–65 were: Sheep 46·07 lb.; Lambs 34·67 lb.; Bulls and Bullocks 606·32 lb.; Cows 415·98 lb.; Young Cattle 281·39 lb.; Calves 48·11 lb.; Pigs 106·70 lb.

Frozen Meat Exported

The importance of the beef, mutton and lamb export trade is indicated by the export figures for the years 1960–61 to 1964–65, as shown in the table below. During 1964–65, the United States, the United Kingdom, Greece, Japan, Canada, and Italy absorbed the largest quantities of frozen meats exported from Victoria. In that year, the United States took 48 per cent. (in value) of beef and veal exports followed by the United Kingdom, 28 per cent. The United Kingdom and Greece each purchased 21 per cent. of mutton exports followed by the United States (17 per cent.) and Japan (14 per cent.), whilst the United Kingdom was most prominent as a buyer of frozen lamb (60 per cent. of Victorian exports).

FROZEN MEATS EXPORTED FROM VICTORIAN PORTS

Year Ended 30th June—	Mutton		Lamb		Beef and Veal	
	'000 lb.	\$'000	'000 lb.	\$'000	'000 lb.	\$'000
1961	50,043	9,360	34,209	6,244	41,652	11,868
1962	76,284	11,276	18,022	2,384	81,085	21,290
1963	95,057	16,502	27,674	5,114	117,314	31,822
1964	104,409	16,591	20,877	3,658	122,323	33,637
1965	107,178	18,969	30,290	6,029	147,618	41,431

Honey Industry

Victoria's hardwood forests each year provide an important contribution to the wealth of the State by virtue of timber production for various purposes. However, one little known facet of forest productivity is the annual harvest of honey and beeswax collected by bees from many species of eucalypts in all parts of the State. Today, Victoria ranks second among the States in apicultural activities. Eucalyptus species provide the bulk of the honey crop—up to 95 per cent. of the total—with the balance made up of ground flora species such as clover and Patterson's Curse.

In recent years some concern has been felt in the industry at the increasing pressure for alienation of some types of Crown land for agricultural purposes. Much of this land has in the past been reliable beekeeping country because of its natural tree and shrub flora. These lands are generally cleared after alienation and so are lost for honey production. Parts of the Mallee, Western District, and North-east are areas most affected.

There are some 1,250 apiarists in Victoria with five or more hives. These apiarists produce an average of 8 mill. lb. of honey per annum. Hive yields are relatively good and range from 90 to 150 lb. per annum. The larger commercial outfits would average 200 lb. per annum.

The industry is, of necessity, migratory, whole apiaries with attendant plant being moved by road transport from one part of the State to another following the flowering of various species of honey flora in the forests and on the farm lands. Hives, trucks, and plant have been designed and modified to suit the requirements of mobility demanded by the industry.

Pollination of agricultural crops is a further aspect of the industry which has received considerable attention. Each year in the past, thousands of colonies have been hired out to fruit and seed growers to ensure profitable sets of seed and fruit. However, in recent years the advent of the newer types of insecticides and their increasing popularity, especially with fruit growers, has caused concern amongst apiarists, many of whom are no longer prepared to lease hives of bees for

pollination because of serious bee losses following spray application of certain types of insecticides. It is anticipated that, with the increasing use of some of these chemicals, pollination of agricultural crops may become a serious problem in Victoria and elsewhere. The application of insecticides with the spreading of superphosphate on pastures, especially in irrigation areas, is also causing concern.

Marketing has always been a great problem to the industry. Violent fluctuations in the annual honey crop are always, in the absence of any organized marketing scheme, attended by similar fluctuations in prices. Considerable carry-overs occasionally aggravate this. However, late in 1962 Federal Parliament passed enabling legislation for the establishment of the Commonwealth Honey Marketing Board. The functions of the Board are to regulate export of, and export prices for, honey. The activities of the Board are financed by means of a levy on domestic consumption of honey and a publicity and research programme is being undertaken.

State interest in the industry is authorized by the *Bees Act* 1958 and extends to disease control, advisory services, and research into the problems of the industry. An Apicultural Research Unit is in operation at the Scoresby Horticultural Research Station.

Particulars relating to apiculture for the five years 1961-1965 are given in the following table :—

VICTORIA—BEE-HIVES, HONEY, AND BEESWAX

Season Ended 31st May—	Beekeepers*	Hives	Production		Gross Value	
			Honey	Beeswax	Honey	Beeswax
	No.		'000 lb.		\$'000	
1961 ..	1,184	105,685	8,390	105	1,049	52
1962 ..	1,276	103,216	10,314	135	1,182	68
1963 ..	1,280	100,787	4,818	64	582	33
1964 ..	1,247	93,424	9,460	110	1,498	57
1965 ..	1,276	99,345	9,181	105	1,377	52

* Apiarists with 20 hives and over numbered 822 in 1961, 830 in 1962, 821 in 1963, 747 in 1964, and 771 in 1965. Since 1958 the statistics have been collected from apiarists with five or more registered hives.

Primary Industries Other than Farming

Forestry

Forest Estate

Of the 56,245,760 acres in Victoria, the forest estate consists of 5,603,829 acres of reserved forest and over this area the Forests Commission has full control. Only a proportion of this reserved forest produces commercial timber, as large areas come within the category of protection forests and are of value in safeguarding the State's water catchments. In addition, the Forests Commission has partial control

over some 9 mill. acres of unoccupied Crown land which must, therefore, be included in the forest estate. These Crown lands include areas of Mallee scrub and alpine grass lands as well as good timbered country.

The Forests Commission of Victoria was established by the *Forests Act 1918* and consists of a chairman and two commissioners. Subject to the *Forests Act*, the Commission has the exclusive control and management of all matters of forest policy, the granting of leases, licences, permits and authorities, and the collection of rents, fees, royalties, and other revenue. It is the duty of the Commission to carry out plans and works for the establishment, maintenance, improvement, and renewal of natural forests and plantations of indigenous and exotic trees. It is also responsible for the prevention and suppression of fires, the training of forest officers, conduct of research work, provision of facilities for public recreation, and the protection of native flora and fauna in State forests.

Forest Timber

The following table summarizes the total output of all species for the years 1961 to 1965 :—

VICTORIA—FOREST TIMBER (’000 Cubic Feet)

Item	Year Ended 30th June—				
	1961	1962	1963	1964	1965
Logs for sawing, peeling, slicing, or pulping—					
Hardwoods	63,779	60,789	66,910	67,371	68,159
Softwoods—					
Indigenous Forest Pines ..	217	205	*	13	2
Plantation Grown Pines ..	7,822	8,139	9,615	10,853	12,398
Total Logs	71,818	69,133	76,525	78,237	80,559
Hewn and Other Timber (Not Included above) Estimated Volume—					
Firewood †	43,767	37,539	33,557	35,335	33,331
Other §	4,956	4,676	4,152	4,684	4,805

* Output was only 524 cub. ft.

† Excludes mill waste used as firewood.

§ Includes telephone and electric supply transmission poles, bridge and wharf piles and beams, fencing timbers, railway sleepers and mining timbers from Crown lands. Similar information for private lands is not available.

Although the total consumption of industrial wood in 1964–65 shows little change since the previous years, the distribution between industries has altered somewhat. Sawmillers operating in the native hardwood forests cut fewer logs but maintained their output of sawn

timber, apparently by drawing on stockpiled logs. The section of the trade relying on plantation grown exotic softwood logs further expanded its operations, but not sufficiently to balance the reduced intake of hardwoods. Veneer manufacturers also increased their consumption of plantation grown softwoods, and there was a considerable increase in the use of softwood for pulping. Both private and Crown plantations contributed to the increased supply of softwood timber.

The increase in use of "Other" timbers was almost entirely due to the greater demand for transmission poles. Shortage of timber of the more durable species caused a decline in sleeper production.

Softwood Plantations

Experimental plantings of softwoods began in Victoria in 1880, and the first commercial plantations were established in 1910. In 1925, there were 4,555 acres of State plantations and the planting programme then increased quite rapidly until by 1935 the area had increased to 38,360 acres. The main areas were at Bright, Ovens, and Stanley in the north-east, the Otways, and at Ballarat and Creswick. More recent extensions of State plantations have been in the south-west, north-east, and in the south Gippsland hills on abandoned settlement areas. The total area of State plantations at 30th December, 1965, was 65,002 acres. In 1961, an expanded planting programme commenced and the annual planting objective of 5,000 acres of softwood per year was reached in the 1964 planting season.

Pinus radiata has proved itself adaptable to all sites available, makes rapid growth, is hardy and relatively immune from insect and fungous attack, and produces a good quality utility timber. The area planted to *Pinus radiata* comprises 54,706 acres. Many of the areas originally planted with other conifers are now being converted to this species.

The older stands are principally 15 to 40 years old. Relatively small areas have been clear felled and either replanted or naturally regenerated, the bulk of the timber utilized to date being from thinnings in the form of logs for peeling and sawing, and pulpwood for paper manufacture.

Privately owned softwood plantations were estimated to comprise 82,102 acres at 30th June, 1965, and the areas are steadily increasing. Large industrial companies are planting *Pinus radiata* to provide sustained yields of softwood for sawmilling and wood-fibre industries. Private individuals plant small areas as long-term investments and many State schools maintain small endowment plantations.

The *Land (Plantation Areas) Act 1959* is designed to encourage private establishment of softwood plantations by providing that Crown lands suitable for commercial plantations and unsuitable for agriculture may, with certain safeguards, be leased for timber-growing purposes and subsequently sold to the lessee.

The output from State plantations is summarized below :—

VICTORIA—OUTPUT FROM STATE PLANTATIONS OF
SOFTWOOD LOGS AND PULPWOOD

('000 Cubic Feet)

Year Ended 30th June—						Sawlogs and Peeling Logs	Pulpwood
1961	..	..	..	..	..	2,196	1,392
1962	..	..	..	..	..	2,659	1,527
1963	..	..	..	..	..	2,949	1,540
1964	..	..	..	..	..	3,274	1,385
1965	..	..	..	..	..	4,030	2,037

During 1964–65, an amendment to the *Forests Act* 1958 was passed enabling loans of up to \$50 per acre to be advanced to land-owners for planting softwood species on land approved by the Commission as being capable of producing an economic crop. The basic intention is to encourage farmers to establish farm woodlots by providing funds interest free for the first twelve years to cover expenses.

Fire Protection

Victoria is one of the most fire hazardous areas in the world. Disastrous fire seasons have occurred periodically since 1851.

The State is divided into seven Divisions, comprising 55 forest districts. The Commission maintains a radio laboratory and a fire equipment workshop.

The Forests Commission is responsible for the prevention and suppression of fires in all State forests and National Parks and in certain alienated lands within one mile of State forest or National Park. This area of responsibility is legally designated the Fire Protected Area.

Legislation provides strict control over the lighting of fires, power to prohibit the use of fire, and to close down certain operations in the Fire Protected Area during any period of extreme fire danger.

Further Reference, 1965

Telecommunications

The radio system consists of 40 base stations, 210 mobile sets in vehicles, 380 portable radios, and a central station in Melbourne. Ten automatic repeating stations have been installed to improve radio performance in difficult areas, and three mobile emergency stations are held for use at the base of operations of major fires. Four hundred and fourteen miles of telephone lines erected by the Commission are maintained each year prior to and during the fire season.

Forest Fires

The causes of fires attended by Forests Commission personnel in the period, 1960-61 to 1964-65, were as follows :—

VICTORIA—CAUSES OF FOREST FIRES

Cause	Number of Fires				
	1960-61	1961-62	1962-63	1963-64	1964-65
Grazing Interests	2	2	7	1	—
Landowners, Householders, &c. ..	101	200	149	117	91
Deliberate Lighting	44	59	44	45	38
Sportsmen, Campers, Tourists ..	59	82	61	49	41
Licenseses and Forest Workers ..	18	34	22	12	14
Smokers	59	44	33	87	43
Lightning	187	133	53	143	153
Tractors, Cars, Trucks, Locomotives, and Stationary Engines ..	47	30	26	37	28
Children	30	39	18	37	25
Sawmills	10	7	3	18	11
Miscellaneous Known Causes ..	80	94	22	85	41
Unknown Origin	25	60	43	39	72
Total	662	784	481	670	557

VICTORIA—AREAS OF STATE FOREST BURNT
(Acres)

Year Ended 30th June—				Commercial Area	Non-Commercial Area	Total
1961	..	..	..	25,943	118,996	144,939
1962	..	..	..	59,348	108,024	167,372
1963	..	..	..	36,289	43,592	79,881
1964	..	..	..	16,620	274,820	291,440
1965	..	..	..	386,815	420,761	807,576

Laboratory Research

Tests for viability, purity and dormancy of seeds of various soft-wood and hardwood species are being carried out.

Field Research

The factors affecting regeneration of a number of eucalypts, particularly *E. regnans*, *E. delegatensis*, *E. obliqua*, *E. nitens*, and *E. camaldulensis* are being studied by extensive field trials. Thinning trials in regrowth of ash species and mixed eucalypt have been established and are being regularly measured together with the significance of damage to crop trees during thinning.

Methods of direct seeding of eucalypt species and conifers are being investigated including trial sowings of *E. delegatensis* by aircraft.

Various pathological and entomological investigations are being carried out, including major attempts to control *Sirex noctilio*, the European horntail woodwasp which is a serious potential danger to softwood plantations, and also to check a phasmatid or native stick insect which defoliates eucalypts. Forest hydrology studies are being carried out in relation to quality and quantity of water from forested water supply catchments. Investigations are also being conducted into chemical methods of controlling unwanted vegetation in softwood plantations and hardwood regeneration areas.

Further Reference, 1965

Economic Aspects of Forests

General

It is only in more recent times that Victorians have come to appreciate the economic importance of forests and their dependent industries. The early settlers found a countryside densely clothed with trees more than adequate to supply the timber needs of the gold mines, the expanding railway system, and the cities and towns of a growing colony. In many parts of the State they regarded forests as a hindrance to progress and, in clearing land for agriculture and pastoral purposes, destroyed valuable timber. Early sawmillers and paling splitters also were wasteful in their methods. Hence the early protagonists of conservation found little public appreciation of the economic value of forests, and in their efforts to secure adequate reservations of forest lands they tended to focus attention on values other than economic.

An indication of this economic value is given by the royalty received on produce from State Forest, which during 1965–66 was approximately \$5.8m. This does not represent the liquidation of an asset, but is a return which may be expected from the forest each year, without destroying the productivity of the land. Indeed as improved techniques of silviculture and forest management build up the forest asset, it will be possible to increase both the volume and the value of the crop which may be removed annually.

Employment

Precise statistics of the employment provided by forests are not available. Factory returns indicate that the wood working establishments in the State employ some 20,000 persons, of whom about one-third would be found in country mills, but this does not include the important group of workers engaged in the forests themselves in silvicultural works, in cutting and processing forest produce outside factories, and in transporting it to factories for further processing.

Forestry, particularly plantation forestry, is a relatively intensive employer of labour and has the advantage over other cropping industries in that its labour requirements can be spread fairly evenly over the whole year instead of being largely concentrated into a short harvest period.

Sawmill Logs

In terms of both volume and monetary value, sawmill logs constitute the most important item of Victorian forest produce. The timber industry converts these logs to supply vital materials to the building, furniture, packaging, and other essential industries, and as an employer of rural labour contributes to the decentralization of population. The Forests Commission, therefore, adopts a policy on log supply aimed at securing stability and maximum life for the industry. An important contribution to stability is made by using a royalty equation system which, in fixing the rate payable by licensees for the right to cut and remove logs from various forest areas, makes allowances for differences in log quality and costs of transport from the stump to principal markets for sawn timber.

The volume of sawmill logs obtained from State forests in 1965-66 was 438 mill. super ft. They returned \$3.5m in royalty, but in assessing their full economic worth several other factors must be taken into consideration. For example, they were processed to yield over 275 mill. super ft. of sawn timber, which is enough for building and fencing some 30,000 houses, although a high proportion was actually used for purposes other than home building.

Uses of Other Forest Products

If scientific methods of increasing the output of forest products are to be fully effective, these methods require an economic outlet for small and faulty timber removed in the course of tending operations. One of the best ways of using such materials is to pulp them for paper and building boards. These industries require considerable capital outlay and rely heavily on the economies of large scale operation for their financial success. Victoria has, in appropriate cases, entered into agreements and passed special legislation to assist them and they now operate near Traralgon and Bacchus Marsh in factories representing large investments.

The recently developed timber preservation industry provides another outlet for small timber. As comparatively little capital expenditure is needed, some 28 plants have been established throughout the State. They treat non-durable round timbers ranging from fence posts to transmission poles and impart to them a greatly lengthened service life. Such treated timbers reduce the annual costs of structures in which they are used and are winning wide acceptance in the community.

Total use of timber in the State is such that at present Victoria imports about one-third of her timber requirements from interstate and oversea sources, and replacement of these imports with locally grown timber presents an avenue for the further development of Victorian forests.

Fisheries and Wildlife

General

Practical management of the fish and wildlife resources of Victoria is vested in the Department of Fisheries and Wildlife, which is responsible to the Chief Secretary for the administration of the Fisheries Act and the Game Acts, and for conservation, management, and research on native and introduced fishes, birds, and mammals.

The State Freshwater Fisheries Research Station and Native Fish Hatchery are located at Snobs Creek, near Eildon. A wildlife research centre is being developed at Lara, near Geelong. Fisheries and Wildlife Officers (enforcement staff) are stationed at eighteen district centres throughout the State, and eight more district stations are proposed.

Scallop Fishery

Although the extent of the scallop beds in Port Phillip Bay was determined by the Fisheries and Wildlife Department in 1957, the fishery did not become established until September, 1963. An attempt was made to fish these scallops commercially in 1960, but lack of dredging experience caused the operation to be discontinued after a few days. However, during 1963, the increasing demand from France for frozen scallops could not be satisfied by the existing Tasmanian fishery, and as a result, some fishermen from that State commenced fishing for scallops in Port Phillip Bay. The Bay proved to be a prolific source of scallops and a flourishing commercial fishery and processing industry were rapidly established in Melbourne.

The resultant landings from the Port Phillip beds increased Australian production and this had a significant effect on world trade in frozen scallops. In 1962-63, the Australian production which originated from fisheries in Tasmania and, to a lesser extent Queensland, amounted to 6,498,000 lb. live weight. During 1963-64, when the Victorian fishery had been active for only ten months, Australian production had increased to 15,373,000 lb. live weight. Subsequently the production from Port Phillip alone during 1964-65, was in excess of 19 mill. lb. live weight, and at its peak in August, 1964, the monthly catch amounted to 2,357,000 lb. live weight.

Australia is now the third largest producer of scallops, with a production exceeded only by the U.S.A. and Canada. Other scallop producing countries in order of importance are Japan, France, the United Kingdom, and a number of Southern European countries. Over half of the Australian scallop catch is exported as frozen scallops, the remainder being mainly absorbed by the Melbourne and Sydney markets. During 1964-65, 1,669,188 lb. of scallop flesh worth \$770,264 was exported from Victoria. France was the main buyer, followed by Belgium, the United Kingdom, and lately the U.S.A.

The sudden increase in production created serious marketing difficulties and, in late 1964, this led to a drop in price to the fishermen whilst a restriction on landings was imposed by the processors. In consequence many fishermen left the industry. However, the local and oversea demand revived in January, 1965, and the industry is now relatively stable.

A programme of investigation of the Victorian scallop fishery was initiated in 1963 by the Fisheries and Wildlife Department in order to obtain the basic information necessary for the management of the fishery. Although incomplete, this study has already permitted a valuable forecast to be made of the potential productivity of the beds for the next three years. The scallop, upon which this fishery depends, is hermaphrodite and a prolific breeder. The eggs and sperm are discharged into the water where fertilization occurs. If conditions are favourable, the resulting fertilized eggs quickly develop into pelagic embryos which are carried by the water currents for a short time before settling—a process known as spatfall. Certain environmental conditions such as water temperature and currents and perhaps others probably determine the success of spatfall. If conditions are adverse, the spatfall is light or may even fail and, when this happens, the productivity of the beds is thus seriously reduced some years later when this age group should have become of fishable size.

The present fishery in Port Phillip Bay is based on spatfalls which occurred throughout the Bay in 1961 and 1962. Surveys of the beds since this time have shown that spatfalls have been light and restricted to localized areas, and on the basis of these results it has been predicted that the productivity of the beds will fall substantially by 1967. In an effort to offset the probable effects of this decline on the fishing and associated processing industries, ocean surveys are being carried out in an effort to locate alternative scallop beds.

Wildlife, 1962

Introduced Fish, 1963

Commercial Fisheries, European Carp, 1964

Freshwater Research, 1965

Marine Fisheries, 1966

State Wildlife Reserves System, 1966

Fisheries Statistics

The statistics of production shown in the following tables are in terms of recorded landed weight. Some species are landed in a headed, headed and gutted, or otherwise reduced condition; others are landed whole. In interpreting fisheries statistics, allowance should be made for the incomplete coverage. Returns are collected from licensed professional fishermen only, and as a result the published totals fall short of total fish production to the extent of the catch by amateur fishermen, the commercial catch by persons not licensed as professional fishermen, and unrecorded catch by professional fishermen.

The following table shows certain particulars about the fishing industry in Victoria for the years 1960-61 to 1964-65 :—

VICTORIA—FISHERIES : MEN AND BOATS EMPLOYED : QUANTITY AND GROSS VALUE OF TAKE

Year Ended 30th June—	Number of Men	Boats Employed		Value of Nets and Other Plant	Recorded Production*			
		Number	Value		Fish		Crayfish	
					Quantity	Value	Quantity	Value
			\$'000	\$'000	'000 lb.	\$'000	'000 lb.	\$'000
1961	1,002	714	2,414	440	12,140	3,118	2,069	966
1962	1,045	794	2,692	554	13,065	3,150	1,676	810
1963	1,004	784	2,748	634	12,611	2,938	1,531	766
1964	1,541	917	3,825	763	14,134	3,532	1,317	691
1965	1,518	897	4,174	798	13,530	2,030	1,291	903

* See footnote, table below.

The following table shows the production of the principal types of fish in Victoria for the years 1960-61 to 1964-65 :—

VICTORIA—FISH : PRODUCTION OF PRINCIPAL TYPES ('000 lb. Landed Weight)

Type of Fish	Year Ended 30th June—				
	1961	1962	1963	1964	1965
Marine Fish—					
Australian Salmon ..	1,050	636	1,023	1,649	1,223
Barracouta ..	3,608	3,308	2,588	2,034	2,891
Bream	225	329	195	218	204
Flathead	1,880	2,318	1,832	2,213	1,527
Garfish	310	479	503	476	281
Morwong	138	318	277	505	426
Mullet	710	964	978	960	919
Pilchard	192	349	308	639	485
Shark*	1,873	2,181	2,731	2,987	3,193
Snapper	132	279	303	335	414
Whiting	537	402	300	255	267
Other†	1,265	1,258	1,369	1,630	1,416
Total Marine Fish..	11,920	12,821	12,407	13,901	13,246
Freshwater Fish ..	220	244	204	233	284
Total Fish ..	12,140	13,065	12,611	14,134	13,530

* Up to and including the year ended 30th June, 1964, catch by Victorian fishermen in Tasmanian waters is included. For the year ended 30th June, 1965, production has been based on the quantity of fish landed at Victorian ports.

† Includes quantities of shark livers for oil extraction for the years ended 30th June, 1961 to 30th June, 1964.

Mining

Introduction

The most notable recent development in Victoria's mineral industry is the continued expansion of the non-metallic minerals and the decline of the metallic minerals, especially gold. The most marked progress has been made in open cut mining, especially in the extraction of brown coal and construction materials. Exploratory off-shore drilling on the Gippsland Shelf in Bass Strait has revealed the presence of considerable quantities of natural gas. This discovery, made in February, 1965, was the culmination of a search begun in the Gippsland area in 1924, when oil was found at Lakes Entrance. The natural gas field is likely to be of great economic significance if sufficient reserves are proved because it is favourably placed in relation to markets, being 16 miles off-shore and 70 miles from an existing pipeline which carries brown coal gas from Morwell to Melbourne.

Gold

Production of gold in Victoria has steadily declined and in 1965 was the lowest yet recorded. Modern large-scale prospecting techniques have stimulated interest in the search for gold, and the Government introduced legislation in 1965 to authorize holders of exploration licences to prospect Crown land and private land up to 1,000 square miles in extent. Large exploration companies are already active in the Bethanga, Stawell, Clunes, and Beechworth areas and geophysical techniques will be used to locate drilling targets.

Black Coal

Only a small proportion of the State's fuel needs is met by Victorian black coal. The bulk of the total output comes from the Wonthaggi district but, because of the faulted nature of the seams and the difficulty in obtaining labour, black coal as a fuel has been replaced by brown coal or briquettes. The replacement of steam locomotives by diesel or electric locomotives and developments on fuel oil or oil derivatives from the new oil refineries are further reducing the demand for black coal.

Brown Coal

The annual rate of brown coal extraction now attained by the State Electricity Commission at Yallourn and Morwell in the Latrobe Valley has placed Victoria amongst the world's largest brown coal producers. The annual production of brown coal in 1965 was 19 mill. tons and it is estimated that 27 mill. tons will be produced annually by 1970. This upward progression in the anticipated demand for Latrobe Valley brown coal is more than adequately provided for by the present coal reserves estimated to be between 20,000 mill. tons and 45,000 mill. tons.

The State Electricity Commission produces 95 per cent. of the total brown coal mined in Victoria but smaller quantities are produced from private open cut mines in the south-west of Victoria in the Altona, Bacchus Marsh, Deans Marsh, Anglesea, Wensleydale, and Lal Lal areas. Anglesea coal is of higher calorific value and reserves of 400 mill. tons have been proved. The establishment of a modern electric power generating plant for aluminium smelting at Anglesea will be based on the use of this coal as a source of power, but this fuel is also used by cement industries and consumers within a 25 miles radius of the mine.

Bauxite

Production of bauxite in 1965 at 2,555 tons and valued at \$11,230 showed an increase on the previous year (1,766 tons valued at \$12,086). Victorian bauxite is not used for alumina production, but is used mainly in the manufacture of various chemical products, particularly in the form of aluminium sulphates for water purification.

Gypsum

Gypsum deposits are widely distributed in the Mallee region of north-western Victoria. The deposits are generally associated with salt lakes and they occur either on the floor of the lakes where they are submerged during the wet season or in low hills surrounding the lakes and swamps. Deposits are worked in the Swan Hill, Ouyen, Mildura, and Murrayville districts principally at Nowingi West, and Cowangie. Victorian gypsum is used in the plaster and allied industries, and as a fertilizer and conditioner for soils.

Salt

Most salt produced in Victoria is won by solar evaporation on the shores of Corio Bay at Geelong and at Laverton. Seasonal natural brine lake deposits are also harvested in the area below Swan Hill and Kerang. Most of the salt produced from sea water is for domestic and industrial use, but the salt harvested from the saline lakes is used for agricultural purposes.

Diatomaceous Earth

Production of this mineral fluctuates at about 600 tons annually. It is won at Lillicur, Happy Valley, and Newham. Diatomite is used for heat and sound insulation but the most important use is in the food, beverage, and chemical industries.

Mining in Victoria, 1964

Underground Water, 1964

Mineral Production

The mineral production of the State, as recorded by the Mines Department, from lands occupied under the Mines Act (excluding stone raised in quarries and salt) for the years ended December, 1964 and 1965, is shown in the following table :—

VICTORIA—MINERAL PRODUCTION

Minerals	1964		1965	
	Quantity	Value	Quantity	Value
	fine oz.	\$'000	fine oz.	\$'000
Precious Metals—				
Gold	21,284	737*	18,143	565*
Silver	646	‡	31	
Other Minerals—	ton		ton	
Bauxite	1,766	12	2,555	11
Coal, Black	47,058	544	41,519	362
Coal, Brown	19,034,792	17,304	20,712,016	20,182
Copper Concentrate	55	4†	13	1†
Fire Clay	28,050	54	32,816	73
Gypsum	104,212	235	168,588	281
Kaolin and Other White Clays	600,467	1,148	565,655	1,119
Limestone	1,371,479	1,301	1,460,356	1,400
Other	812	62	708	50

* Includes gold subsidy, \$77,024 for 1964 and \$144,489 for 1965.

† Includes copper bounty \$42 for 1964 and \$21 for 1965.

‡ Value of silver production in Victoria in 1964 and 1965 was \$646 and \$32 respectively.

The following table shows the average annual production and value of black and brown coal for each of the five year periods from 1921 to 1960 and the production and value for each of the years 1961 to 1965 :—

VICTORIA—COAL PRODUCTION AND VALUE*

Period	Black Coal		Brown Coal	
	Production	Value	Production	Value
	tons	\$'000	tons	\$'000
1921-1925	520,705	1,184	258,094	124
1926-1930	668,177	1,786	1,515,592	386
1931-1935	472,030	888	2,445,215	512
1936-1940	324,903	568	3,608,751	712
1941-1945	286,277	818	5,010,555	1,052
1946-1950	156,290	722	6,648,430	2,404
1951-1955	143,535	1,590	8,728,116	7,186
1956-1960	100,893	1,050	12,193,625	11,302
1961	66,363	718	16,279,168	15,444
1962	56,721	632	17,137,438	15,682
1963	50,481	588	18,456,445	16,158
1964	47,058	544	19,034,792	17,304
1965	41,519	362	20,712,016	20,182

* Value of output at the mine.

Oil Exploration in Victoria from 1924 to 1963, 1965

Offshore Drilling for Petroleum in Victoria, 1966

Quarrying

Stone, Sand, and Gravel

Victoria is plentifully supplied with excellent sources of basalt suitable for building purposes in the form of dimension stone, road-making stone, railway ballast, and aggregate material. Basalts of the Newer Volcanic series cover hundreds of square miles in the southern and western parts of the State, and associated with these expansive basalt areas are a number of scoria cones which provide a potential source of road surfacing material. The range and quality of material is so great that quarries are generally located close to their markets.

In addition to crushed and broken stone, dimension stones are quarried in various parts of Victoria. Quarries at Harcourt produce light grey granite in almost any dimension and other grey granites occur at Beechworth and elsewhere in Victoria. Excellent red granite is quarried at Gabo Island but is comparatively expensive to produce. Marbles of high quality are quarried extensively at Buchan and are available in other parts of the State. Sandstone and slates are also quarried for structural purposes but the Grampians' sandstone is the stone most widely used. It is strong and durable and has been extensively quarried at Stawell.

Sands and gravels are readily available near the Metropolitan Area and other large centres of population. Scoria is used extensively in the Camperdown district. Glass making sands are obtained from the Mornington Peninsula and at Lang Lang. Reef quartz is known to occur at Allendale and industrial sands most of which are wind blown are found close to Melbourne in the Brighton-Frankston area.

Further Reference, 1966

Information in the following table has been obtained from "regular" quarries which are known to have a fixed plant and which are in permanent production, and from mines producing construction materials as by-products of their main activity :—

VICTORIA—CONSTRUCTION MATERIALS

Year Ended 31st December—	Number of Returns	Production					Local Value of Production
		Sand	River Gravel and Gravel Boulders	Dimension Stone	Crushed and Broken Stone	Other Quarry Products	
		'000 cub. yds.		tons	'000 cub. yds.		\$'000
1961	252	1,701	661	6,877	7,903	819	18,434
1962	254	2,054	425	9,181	7,622	744	17,784
1963	275	2,134	401	10,147	7,866	936	17,270
1964	223	2,442	526	10,268	8,685	932	19,886
1965	221	2,956	664	14,347	9,827	728	22,736

In addition to the production set out in the preceding table, there is a considerable quantity of material "won" by contractors operating shallow pits for or on behalf of Local Government Authorities, and by exploiting stone outcrops, mine tailings, &c. This itinerant activity was first covered by a statistical collection for 1961. However, the statistics are available only from 1962. Reported production data for the years 1962 to 1965 are :—

VICTORIA—CONSTRUCTION MATERIALS : ITINERANT ACTIVITIES

Type of Material	Year Ended 31st December—			
	1962	1963	1964	1965
	'000 cu. yds.			
Sand	225	311	240	194
Gravel and Gravel Boulders ..	1,976	2,533	2,582	1,759
Crushed and Broken Stone ..	718	1,453	1,469	2,123
Other Quarry Products	524	914	1,241	1,040
	\$'000			
Local Value	982	1,659	1,648	1,710

Value of Production

General

The value of production as estimated in the following tables is based to a large extent on returns received annually from individual producers throughout the State. As a measure of total production it is incomplete, as it does not include the building and construction industry. It also omits factories employing less than four hands (unless power-driven machinery is used) and excludes agriculturists with holdings of less than 1 acre.

A detailed account of the period covered for individual rural industries is given on page 305. Except in the case of mining and quarrying, statistics for the non-rural industries refer to the year ended 30th June. Statistics for mining and quarrying relate to the year ended 31st December of the first year shown.

Gross Value

Gross value is defined as the value placed on recorded production at the wholesale price realized in the principal market. In cases where primary products are absorbed locally, or where they become raw material for secondary industry, these points are presumed to be the principal markets. Care is taken to prevent, as far as possible, all overlapping or double counting. The primary value of dairy production, in accordance with the above definition, is the price paid at the factory for milk or cream sold by the farmer ; the value added by the process of manufacturing into butter, &c., is included in manufacturing production.

VICTORIA—GROSS VALUE OF PRIMARY PRODUCTION
(\$'000)

Industry	1960-61	1961-62	1962-63	1963-64	1964-65
Agriculture	265,836	230,224	253,468	272,807	298,751
Pastoral	278,828	287,760	318,914	382,211	373,501
Dairying*	144,008	143,176	157,136	172,560	194,988
Poultry and Bees	50,856	47,454	46,688	52,945	47,777
Trapping	6,312	6,048	5,868	6,373	5,830
Forestry	29,531	27,632	27,437	30,592	33,629
Fisheries	4,128	4,032	3,764	4,835	4,108
Mining	32,534	39,166	40,016	40,838	44,892
Total Primary Industries	812,032	785,494	853,291	963,161	1,003,475

* Includes Subsidy—1960-61, \$13,420,000 ; 1961-62, \$13,088,000 ; 1962-63, \$13,572,000 ; 1963-64, \$13,690,000 ; 1964-65, \$14,491,000.

Local Value

The gross value of production, less costs of marketing (freight, cartage, brokerage, commission, insurance, and containers), represents the gross production valued at the place of production, that is, local value, details of which are shown in the following table :—

VICTORIA—LOCAL VALUE OF PRIMARY PRODUCTION
(\$'000)

Produce	1960-61	1961-62	1962-63	1963-64	1964-65
Agriculture—					
Barley	4,728	3,978	4,720	3,438	3,808
Maize	212	178	226	216	203
Oats	9,820	8,918	14,314	11,034	12,345
Wheat	81,442	73,342	85,118	93,039	91,950
Onions	1,256	1,300	1,078	919	1,140
Potatoes	16,626	10,756	3,986	13,432	22,705
Other Vegetables	18,820	16,208	15,106	15,876	20,957
Hay and Straw	41,708	27,468	39,850	34,703	41,580
Fruit—					
Orchards	20,168	20,846	17,560	22,016	22,047
Vineyards	14,472	15,920	12,678	21,875	19,806
Other Crops	19,700	18,562	21,112	23,389	21,515
Total	228,952	197,476	215,748	239,938	258,055

VICTORIA—LOCAL VALUE OF PRIMARY PRODUCTION—*continued*

(\$'000)

Produce	1960-61	1961-62	1962-63	1963-64	1964-65
Pastoral—					
Wool	122,190	126,950	137,980	187,157	150,987
Sheep, Slaughtered ..	47,310	40,964	44,764	46,523	51,297
Cattle, Slaughtered ..	81,926	86,034	102,434	112,071	130,201
Total ..	251,426	253,948	285,178	345,751	332,484
Dairying—					
Whole Milk Used for—					
Butter	61,592	61,422	71,368	77,246	87,345
Cheese	9,484	9,802	11,210	12,851	14,537
Condensing, Concentrating, &c. ..	12,140	12,200	12,284	14,065	16,379
Human Consumption and Other Purposes ..	27,104	28,476	28,894	32,786	34,348
Subsidy Paid on Whole Milk for Butter and Cheese ..	13,420	13,088	13,572	13,690	14,642
Pigs, Slaughtered ..	14,354	11,546	13,410	15,217	20,165
Total ..	138,094	136,534	150,738	165,857	187,416
Poultry and Bees—					
Eggs	30,348	28,276	28,946	34,659	30,183
Poultry	13,790	12,370	11,794	12,009	11,196
Honey and Beeswax ..	638	830	480	1,151	867
Total ..	44,776	41,476	41,220	47,819	42,245
Trapping, &c.—					
Rabbits and Hares ..	4,620	4,570	4,332	4,444	4,599
Rabbit and Hare Skins, &c. ..	1,270	1,050	1,168	1,470	870
Total ..	5,890	5,620	5,500	5,914	5,469
Forestry—					
Sawmills	18,450	18,136	18,884	19,543	22,391
Hewn Timber	2,716	2,522	2,202	2,490	2,587
Firewood	6,525	5,444	4,943	6,682	6,949
Bark for Tanning ..	116	92	108	134	90
Other	72	66	64	72	58
Total ..	27,879	26,260	26,200	28,920	32,076

VICTORIA—LOCAL VALUE OF PRIMARY PRODUCTION—*continued*
(\$'000)

Produce	1960-61	1961-62	1962-63	1963-64	1964-65
Fisheries—					
Fish	2,694	2,714	2,528	3,049	1,702
Crayfish	840	706	670	606	797
Oysters	4	2	2	2	2
Scallops .. ..	..	..	..	481	996
Other	36	60	50	64	57
Total ..	3,574	3,482	3,250	4,202	3,552
Mining—					
Gold	942	940	946	854	737
Coal—					
Black	836	718	632	589	544
Brown	13,690	15,444	15,682	16,158	17,304
Other Metals and Minerals ..	4,014	3,630	3,990	4,308	4,772
Quarrying	13,052*	18,434	18,766	18,929	21,534
Total ..	32,534	39,166	40,016	40,838	44,892
Total Primary Industries	733,126	703,962	767,851	879,238	906,189

* Not strictly comparable with figures for subsequent years. In 1961 increased coverage involved an additional total value of \$3,210,000. See *Victorian Year Book*, 1966, pages 547 and 548.

Net Value of Production

Net value of production is computed by subtracting from local value the cost of materials used in the process of production. These materials include stock feed, seed, manures, power, petrol, kerosene, other oils, dips, sprays, and other costs. No deductions have been made for depreciation or certain maintenance costs. The net value of production is the only satisfactory measure to use when comparing or

combining the value of primary industries with those of other industries. Details for primary industries and manufacturing are shown in the table below :—

VICTORIA—NET VALUE OF PRODUCTION
(**\$'000**)

Division of Industry	1960-61	1961-62	1962-63	1963-64	1964-65
Rural—					
Agriculture ..	208,062	176,490	193,972	218,136	236,382
Pastoral	232,362	231,056	265,126	323,696	309,668
Dairying	101,894	87,044	110,134	121,385	136,097
Poultry	28,692	24,878	24,812	30,104	24,407
Bee-farming ..	638	830	480	1,151	867
Total Rural ..	571,648	520,298	594,524	694,473	707,421
Non-rural	63,660	67,464	67,372	72,686	78,149
Total Primary ..	635,309	587,762	661,897	767,159	785,569
Manufacturing ..	1,417,546	1,440,644	1,601,742	1,750,478	1,949,665
Total All Industries ..	2,052,855	2,028,406	2,263,639	2,517,637	2,735,234