

RURAL INDUSTRY

LAND SETTLEMENT AND IRRIGATION

Beginnings

The first permanent settlement of the then Port Phillip District of the Colony of New South Wales occurred in 1834 when the Henty brothers squatted on Crown land at Portland. They were followed by Batman and Fawcner who in the following year similarly squatted on the present site of Melbourne. Although squatting was illegal, by 1836 settlement had extended some 130 kilometres inland.

Efforts were made to legalise the squatters and in 1836 regulations were made to enable them to acquire for £10 as much land as they wished. This resulted in some very large holdings. At one time four pastoralists held approximately 3 million hectares of the District. By 1840 most of the southern and western parts had been occupied. Also, owing to the favourable reports of Major Mitchell, who led an expedition through the area, pastoralists were bringing their flocks south of the Murray River, resulting in extensive settlement in northern areas from New South Wales.

Various Acts of Parliament were proclaimed to give the squatters security of tenure and also to break up the large holdings and make land available to more people. By the use of "dummy settlers" vast areas of land still remained in the hands of a few.

The early settlers were all pastoralists. Crops that were grown were for their own consumption and for food for the horses. With the large increase in population that came with the gold rush and in the aftermath of the Irish potato famines, land-use had to be diverted from grazing to agriculture. Large holdings had to be broken up to make land available to the small farmer.

In all, some ninety Acts of Parliament were proclaimed dealing with land settlement. To enable closer settlement to take place the Government re-purchased land from the original holders and then offered it for sale to small farmers to use for cropping instead of grazing. Full details of these Acts of Parliament can be found in the *Victorian Year Book* 1973.

Rural districts

Mallee District

This district is situated in the far north-west of Victoria and has a total area of 4.4 million hectares. 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 occupied is 3.1 million hectares.

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. Wheat is the principal crop grown, in addition to oats for grain, hay, and grazing, and barley. Yields from cereal crops vary widely according to seasonal conditions. The following table shows the areas sown and average yields per hectare for the season 1972-73 :

MALLEE DISTRICT—CEREAL CROPS, SEASON 1972-73

Crop	Area	Average yield per hectare
	hectares	tonnes
Wheat	486,337	0.76
Oats—grain	47,980	0.24
hay	7,943	0.30
grazing	10,828	..
Barley	115,455	0.47

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.

At 31 March 1973 the district carried 1.2 million sheep and lambs. The total wool clip was 7.4 million kilograms.

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

Wimmera District

The Wimmera occupies the central western part of Victoria and has an area of 3 million hectares, of which 2.5 million hectares are occupied. Average annual rainfall in the north is about 406 mm per year, increasing in the south to 508 mm. 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 podsols, 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. In recent years the development of suitable strains of medics and clovers has resulted in the inclusion of a pasture phase in crop rotations.

The table below shows the areas of the cereal crops sown and average yields for the season 1972-73 :

WIMMERA DISTRICT—CEREAL CROPS, SEASON 1972-73

Crop	Area	Average yield per hectare
	hectares	tonnes
Wheat	359,629	1.60
Oats—grain	90,956	0.98
hay	14,772	2.97
grazing	3,438	..
Barley	78,891	0.87

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. About 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. At 31 March 1973 the district carried 4.3 million sheep and produced 23.7 million kilograms 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 Murray River in the north. The total area of the district is 2.6 million hectares, of which 2.3 million hectares 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 356 mm in the north-west increasing to 635 mm over the foothills of the ranges, which are on the eastern boundary of the district. The district includes the major irrigation areas of Victoria, and, because of this, several different farming activities are carried out.

Wheat growing is an important industry, and, because of climatic and soil differences, yields vary widely across the area. As in the other wheat producing districts, oat crops are an important feature in rotations and for grazing. In the 1972-73 season the following areas of cereal crops were sown:

NORTHERN DISTRICT—CEREAL CROPS, SEASON 1972-73

Crop	Area	Average yield per hectare
	hectares	tonnes
Wheat	189,702	1.15
Oats—grain	55,163	0.78
hay	34,103	2.80
grazing	6,600	..
Barley	45,404	0.87

In 1972-73 the district carried about 3 million sheep, largely on wheat farms, mainly for 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. In addition, the irrigation areas fatten sheep and lambs from non-irrigated parts of Victoria and New South Wales. The milk produced is mostly used for butter, cheese, and other manufactured products, with relatively small quantities for city wholemilk supply. In 1972-73 there were over 514,000 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. Tomatoes are also produced on a large scale.

North Central District

This district includes much of the Central Highlands area. The average annual rainfall is generally over 700 mm, but on the northern slopes it is as low as 550 mm. 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 1.2 million hectares, of which 0.8 million hectares are used for farming production.

Cereal cropping is unimportant; potatoes in the volcanic hills east of Ballarat and pome fruits 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. In 1972-73 the district carried about 2 million sheep and about 250,000 beef cattle.

North Eastern District

This district has a total area of 2.9 million hectares, but includes substantial areas of Crown lands, much of which is very steep and heavily timbered. The area occupied is 1.5 million hectares. Average annual rainfall varies from 500 mm in the north-western corner of the district to in excess of 1,500 mm over the mountains. Almost all of the area used for rural production has a 500 mm to 760 mm 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 speciality crop production, and in 1972-73, 3,900 hectares of tobacco and 453 hectares of hops were grown in these areas. In 1972-73 the district carried 100,000 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 common on the unimproved pastures along the Murray valley and in the Omeo area. The district carries about 1.2 million sheep.

The North Eastern District is an important beef cattle breeding and fattening area, and in 1972-73 over 500,000 head were carried. The cattle make good use of the rough pastures of the foothill country, and the productive pastures of the flats provide suitable fattening areas.

Western District

Most of the district is in the 630 mm to 760 mm average annual rainfall belt, but an area north and east of the Otways is influenced by a rain shadow effect so that the average annual rainfall is about 600 mm. In the Otway Ranges the average annual rainfall is as high as 1,800 mm. The soils of the district vary considerably in type and fertility. Basaltic soils cover the great bulk of the plains area. In the north the soils are similar to those of the southern Wimmera. The total area of the district is 3.5 million hectares of which 2.8 million hectares are occupied. There are substantial areas of forest reserve in the Otways in the south-eastern part of the district.

The only cereal crop of importance grown is oats, which is used as a fodder crop, cut for hay, or harvested for grain which is used largely to feed stock. The more fertile soils produce both potatoes and onions, and about 60 per cent of Victoria's onion area is located on volcanic tuff soils near Colac and Warrnambool. However, emphasis is placed on animal production as climatically the district is well suited to the development of improved pastures. It is the major wool producing area of the State, and at 31 March 1973 there were 9.5 million sheep in the district. The Western District is also an important beef cattle breeding and fattening area, and in 1972-73 carried 940,000 head. Many of Victoria's leading stud herds are located in the district; many sheep properties also carry beef cattle.

Dairying is an important industry here, and there is widespread distribution of dairy cattle. The main concentrations are in the following areas: Colac, Camperdown, Koroit, Allansford, and the Casterton-Coleraine region. A proportion of production is used as wholemilk for town supply, but a considerable proportion of Victoria's total processed milk products and butter is produced in the district, which in 1972-73 carried 479,000 dairy cattle.

Central District

Average annual rainfall varies from 600 mm within the rain shadow area north of Geelong to more than 900 mm 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 1.6 million hectares of which 1.0 million hectares are occupied, the remainder being reserved as forest and watershed areas.

The climate is suited to the production of malting barley, and in 1972-73 21,400 hectares were grown—mainly on the plains to the west. Potatoes are grown in the Romsey-Ballarat area, on the Bellarine Peninsula, and on the Koo-Wee-Rup swamp.

Market gardening is important in the area extending from the south-eastern suburbs of Melbourne to the northern shores of Western Port, and also on the irrigation settlements near Werribee and Bacchus Marsh.

The district is Victoria's major producer of apples; dessert types of pears and peaches and other stone fruits are also important. Orchards are located in the eastern metropolitan area, on the Mornington Peninsula, and near Bacchus Marsh and Pakenham. Ninety per cent of the State's strawberry crop is grown in the Dandenong Ranges some 40 kilometres east of Melbourne.

In 1972-73 the district carried 1.7 million sheep, production being 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. At 31 March 1973 the district carried 483,000 head of beef cattle.

The major dairying area is in the east, and this forms part of the most important dairying area of the State. The area is a major supplier of wholemilk for city supply and for butter and cheese manufacture. In 1972-73 there were 251,000 dairy cattle in the district. Pig production is also important.

Gippsland District

The total area of this district is 3.5 million hectares, but the northern and eastern parts are mountainous and are reserved by the Crown. The area occupied is 1.8 million hectares, the bulk of settlement being south of a line between Dandenong and Bairnsdale. Average annual rainfall varies from just under 550 mm within the rain shadow near Maffra and Sale to 1,500 mm and above in the highlands. An intensive irrigation scheme has developed around Maffra with highly productive dairying. Average rainfall over most of the settled areas in the west is sufficient for the development of fertile 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 speciality crops, such as maize, beans, and potatoes, contribute substantially to Victoria's total production.

Gippsland is the main dairying district of the State, and dairying is by far the most important rural industry in the district. The highly productive pastures of the 760 mm to 1,000 mm average annual rainfall areas are the basis of the industry. The district supplies the greater part of the wholemilk requirements for the Melbourne market, and plays a major role in Victoria's production of butter, cheese, and other processed dairy products. In addition, the dairy herds contribute to veal and beef production. In 1972-73 the district carried about 542,000 dairy cattle and 556,000 beef cattle. Pig raising is often associated with dairy farming, and there were 50,000 pigs carried in the area at 31 March 1973.

In western and southern Gippsland, sheep production is small and consists largely of fat lamb producing flocks run in conjunction with dairy cattle. In parts of the district east of Rosedale, fine-woolled sheep and beef cattle are valuable enterprises.

Alienation of land

The following tables give particulars of the utilisation of the 22,761,851 hectares of Victoria's area at 30 June 1973 :

VICTORIA—ALIENATION OF LAND AT 30 JUNE 1973

Particulars	Area
	hectares
Lands alienated in fee-simple	13,547,291
Lands in process of alienation	133,391
Crown lands	9,081,169
Total	22,761,851

VICTORIA—CROWN LANDS AT 30 JUNE 1973

Particulars	Area
	hectares
Land in occupation under—	
Perpetual leases	16,070
Grazing leases and licences	2,277,467
Other leases and licences	11,507
Reservations—	
Reserved forest	2,289,371
Forest and timber reserves (under Land Act)	59,664
Water catchment and drainage purposes	85,827
National Parks (under National Parks Act)	205,276
Wildlife reserves (administered by Fisheries and Wildlife Department)	54,793
Water frontages, beds of streams, and lakes (not included above)	342,525
Other reserves	118,654
Unoccupied and unreserved but including areas set aside for roads	3,620,015
Total	9,081,169

Crown lands alienated in fee-simple during the years ended 30 June 1970, 1971, 1972, and 1973 were 36,868, 34,830, 24,323, and 39,195 hectares, respectively.

Government assistance to the farming industry, 1964*Improvement purchase leases*

Crown land can be made available for application under improvement purchase lease conditions, and applications received are dealt with by a local land board.

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 of Crown Lands and Survey.
5. That the lessee will reside in person on or within forty kilometres of the leasehold during the first six years.

The purchase money is payable in twenty 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 except where the lease contains a soil erosion prevention condition. The period is then twelve years or such further period as is provided in the lease.

Land utilisation

The climatic conditions of Victoria (for details see pages 66–86), especially the varying 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 range of activities on individual farms.

Most farms in Victoria 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 Victoria are retained as forest reserves and for water catchments (see page 392).

The pattern of land-use is more or less clearly defined in each of the statistical districts (see map on page 421). 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 areas 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 utilisation. 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.

Soil Conservation Authority

Information about the activities of the Soil Conservation Authority can be found on pages 42-6 of this *Year Book*.

Land Conservation Council

Information about the activities of the Land Conservation Council can be found on pages 40-1 of this *Year Book*.

Rural finance

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 while 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 each world war 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.

Rural Finance and Settlement Commission

The Rural Finance and Settlement Commission was established by legislation in late 1961 to merge the former Soldier Settlement Commission and the Rural Finance Corporation. In the first instance, the new Commission carried out the functions of the former organisations in two separate

branches until further legislation was passed in 1963 which completed the merger and co-ordinated the functions of the two branches in providing finance for country industry and land settlement development.

Rural Finance Act

The Rural Finance Act, which is administered by the Commission, embraces two distinct functions.

First, under part III of the Act, the Commission may grant loans to any person or body establishing or carrying on any country industry, primary or secondary. These loans are, subject to the Act, made on such terms as are determined by the Commission. However, interest on the loans is required to be at a rate as low as practicable having regard to the rate at which the Commission borrows money and the costs of administration. Loans are made to primary industry for farm purchase, farm development, refinance, payment of probate, and seasonal advances. Loans to secondary industry have resulted in the establishment of a number of successful country industries over the years. The Victorian Development Corporation was established towards the end of the 1972-73 financial year and the Commission is working in close co-operation with the new body regarding loans to establish new country industries and for expanding and improving existing facilities. It is anticipated that the Corporation will now be the major channel through which Victorian Government loan assistance is made available to country secondary industry. The Commission, however, will still have a role to play in selected cases and industries.

The other function administered by the Commission under the Rural Finance Act is to act as agent for the Treasurer of Victoria in administering money provided from the Public Account for any special purpose, subject to such directions as the Treasurer may give or impose. Under these agency provisions, the Commission administers relief lending to members of the rural community in times of adversity, such as bushfire, drought, flood, etc. The agency provisions are also the means whereby special loans outside the scope of the Commission's ordinary lending are made available to particular industries. Three major Australian-State Government schemes—the Rural Reconstruction Scheme, the Marginal Dairy Farms Reconstruction Scheme, and the Fruitgrowing Reconstruction Scheme—have also been administered in Victoria by the Commission under an agency direction from the Treasurer pursuant to section 35 of the Rural Finance Act.

VICTORIA—LOANS UNDER THE RURAL FINANCE ACT
(\$'000)

Particulars	1968-69	1969-70	1970-71	1971-72	1972-73
Primary industry—					
Ordinary lending	2,666	4,830	4,529	2,519	2,347
Agency lending	3,394	823	74	240	1,229
Secondary industry—					
Ordinary lending	32	807	441	868	1,301
Agency lending	54	..	4,000	230	1,415
Loans outstanding at 30 June—					
Ordinary lending	27,330	29,099	30,875	30,924	29,223
Agency lending	6,412	6,203	9,376	8,773	9,824

Soldier settlement and land settlement

The Commission administers the Soldier Settlement Act and the *Land Settlement Act* 1959. Allocation of soldier settlement ceased some years ago. In total, 6,171 ex-servicemen were assisted, either to obtain farms of their own choosing or allocated a farm under the various general settlement projects. At 30 June 1973, 3,286 of these farmers had completely repaid their liabilities to the Commission. Under the Land Settlement Act the Commission has developed several projects, and 573 farms have been allocated to settlers under purchase leases.

The Victorian Government decided in June 1970 to refrain until further notice from making further land available for dairying. Pending a decision for future use, the Commission has used the 15,600 hectares at Heytesbury, 1,400 hectares at Rochester, and 2,800 hectares at its Palpara Project to graze its own beef cattle.

Rural reconstruction scheme

Following the economic problems experienced by the farming community in 1969 and 1970, with greatly depressed prices and rising costs, a scheme for rural reconstruction was introduced in 1971, after conferences between the Australian and all State Governments.

Initially, the Australian Government agreed to provide \$100m to the States (of which Victoria's share was \$22.07m) for the purposes of the scheme, to be expended over four financial years. This expenditure was later agreed to be concentrated into two financial years to 30 June 1973, and it was also later agreed to continue the scheme for a further three financial years beyond that date. Additional funds allocated to Victoria to 30 June 1974 totalled \$11.2m. In addition, Victoria had available an amount of \$4.5m from funds received as repayments of the farmers debts adjustment scheme of the 1930s.

The scheme provides for three main forms of assistance :

Debt reconstruction. The purpose of this was to assist a farmer who, although having sound prospects of long-term commercial viability, had used all his cash and credit resources and could not meet his financial commitments.

Farm build-up. The object of this was to supplement the normal processes under which uneconomic properties were amalgamated with adjoining holdings or were subdivided and the subdivided portions added to adjoining holdings. It also aimed at assisting the farmer of sound financial position, but whose property was too small to be economic, to purchase additional land to build up his property to at least an economic size.

Retraining and rehabilitation. This aimed at providing assistance, where necessary, for those who were obliged to leave the industry, in retraining for some other occupation. Loans up to \$3,000 could also be made available to alleviate personal hardship.

Initially, expenditure under the scheme was concentrated on debt reconstruction, with only a small interest being shown in farm build-up. As confidence in the rural sector increased, however, particularly because of the higher prices being obtained for products, including wool, the emphasis shifted from debt reconstruction to farm build-up. Loans made for debt reconstruction purposes carry an interest rate of 4 per cent, and loans for the purpose of farm build-up carry an interest rate of 6.25 per cent.

To 30 June 1973, 2,747 applications were received for debt reconstruction loans, of which 774 were approved, while 885 applications were received for farm build-up loans, of which 396 were approved. Expenditure to 30 June 1973 totalled \$18,418,481 for debt reconstruction and \$8,168,020 for farm build-up.

Marginal dairy farms reconstruction scheme

This scheme was introduced in 1970 so that dairy farmers whose farms had insufficient potential to become viable economic units could voluntarily dispose of their land and improvements at market value to the State. The State, after allowing for redundant improvements on the basis of the most practical and economic land-use, could then sell the land and remaining improvements with the object of building up other rural properties to economic levels or for specific purposes other than farming, such as forestry. Victorian dairy farmers have shown little interest in this scheme, and to 30 June 1973 the total commitment by the Commission amounted to only \$375,864.

Fruitgrowing reconstruction scheme

During 1971 and 1972, growers in the canning fruit and export apple and pear industries continued to experience financial difficulties brought about by restriction of market outlets. The industry, generally, was experiencing high levels of stocks. Against this background, proposals were put forward by the industry for the curtailment of production by means of a tree removal scheme. The Australian Government, after consultation with the States, offered to finance a scheme within the context of the rural reconstruction measures, with the emphasis on relief being given to the individual grower. Legislation was passed in 1972 to establish the scheme. A total of \$4.3m was made available to the States under the scheme to pay compensation to growers for the removal of trees. Half the amount available was to be applied to canning peach and pear trees, and the other half to fresh apples and pears. State authorities were to administer the scheme so that the average rate of assistance did not exceed \$350 per acre for canning peaches and canning pears and \$200 per acre (later amended to \$250 per acre) for fresh apples and fresh pears. Compensation in respect of trees was to be assessed after having taken due regard to age, yield, and condition of the trees, and market access availability.

Eligibility for admission to the scheme was divided into two categories :

- (a) clear fell for the grower in severe financial difficulties who intended to clear fell his orchard, leave the industry, and convert his land to other use ; and
- (b) partial fell for the grower who did not have adequate resources to withstand the short-term effect on his economic viability of removing surplus trees without assistance.

To 30 June 1973, 149 applications had been received, of which 6 were later withdrawn and 53 rejected. At that date, 26 applications were pending and offers had been made in 64 cases, of which 44 had accepted, involving compensation totalling \$253,000. The scheme was extended for a further year to 30 June 1974.

Other rural finance facilities

State Savings Bank of Victoria

State Savings Bank loans for rural purposes are available on the security of first mortgage over freehold property. Loans are repayable over periods

varying between fourteen and a half and twenty-one years. Interest is charged at the rate ruling from time to time—in 1973 ranging from 6.75 to 7.75 per cent per annum depending on the amount of the loan and whether the property is worked by the applicant. The maximum loan must not exceed two thirds of the value of the property.

Particulars for the year ended 30 June 1973 may be found in the Private Finance chapter.

Reserve Bank of Australia—Rural Credits Department

The Rural Credits Department was established in 1925 as a department of the Commonwealth Bank of Australia, and is now part of 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, has comprised the major portion of credit provided, but the Department's operations have also covered such commodities as barley, cotton, canning fruits, dried fruits, meat, eggs, and superphosphate.

Interest rates since 20 September 1973 have been 7 per cent per annum if against the security of an Australian or State Government guarantee; and 7.25 per cent per annum against other securities. The interest rates were previously (from 8 August 1969) 5 per cent and 5.25 per cent, respectively.

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.

Farm Development Loan Fund

The Farm Development Loan Fund was established in 1966 to provide loans to primary producers, at preferential rates and conditions, for drought relief and farm development purposes. Loans are made by the trading banks from their Farm Development Loan Fund Accounts with the Reserve Bank, and are designed to supplement other loans available from the banking system.

Commonwealth Development Bank

A brief outline of the functions of the Commonwealth Development Bank, together with particulars of rural loans outstanding at 30 June 1973, may be found in the Private Finance chapter. 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 basic 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.

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 1969 to 1973:

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

Industry of borrower	1969	1970	1971	1972	1973
Sheep grazing	82.2	81.0	78.9	67.3	53.5
Wheat growing	26.5	28.4	27.2	25.6	26.4
Dairying and pig raising	54.2	48.7	45.5	44.9	57.0
Other rural	44.7	50.9	51.8	59.4	73.9
Total	207.6	209.1	203.3	197.2	210.7

Advances to rural industry borrowers represented 14.8 per cent of trading banks' business advances outstanding at the end of June 1973, and 11.2 per cent of all advances outstanding. The maximum rate of interest on bank overdrafts at 30 June 1973 was 7.75 per cent per annum for amounts under \$50,000 but the average rate on rural loans would probably be below this level. Actual rates for amounts \$50,000 and over are now a matter for negotiation between banks and their customers.

Advances of pastoral finance companies

The following table shows total rural advances outstanding to pastoral finance companies at 30 June for the five years 1969 to 1973:

VICTORIA—RURAL ADVANCES (a)
OF PASTORAL FINANCE COMPANIES
(\$m)

At 30 June—	Advances outstanding
1969	65.9
1970	66.1
1971	57.2
1972	57.2
1973	68.0

(a) Held by branches located in Victoria, which is not necessarily the State of residence of the borrower.

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 1880s 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 ninety 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 approach to the water supply problem was apparent and in 1905 the Water Act was passed. This innovatory 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 nationalisation 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, etc., thus avoiding the litigation which has clouded the history of water supply elsewhere.

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 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 438 gauging stations on streams and publishes the information obtained. Records of river flows date back to the 1860s. Investigation and planning require surveys, and there are thirty-five surveyors working from ten centres. Other Commission investigatory services are its Testing Laboratory and Water Research Section at Head Office and its Hydraulic Research Station at Werribee.

New ten year plan

The State Rivers and Water Supply Commission's second ten year plan, a full programme of works for the period 1973-1983, received Victorian Government approval (subject to funding) during the year under review. The new programme reflects a changing emphasis in the Commission's work towards greater involvement with urban water supply, sewerage, environmental protection, and water quality.

Two basic principles were adopted by the Commission in formulating the programme:

1. the environmental impact of new projects would be taken into account with emphasis on multi-objective planning. The Commission would take into consideration both the effects its works would have on the environment and the contribution they would make to the environment and to the quality of life of those people whom they serve.
2. each project should be economically sound and viable. There are a number of intangible benefits which accompany water conservation projects and one of the Commission's tasks will be to evaluate these in money terms.

Major provisions of the 1973-1983 programme include :

- (a) construction of new water supply trunk mains, reticulated services, and water treatment plants at an estimated cost of \$112m (including \$46m for locally administered waterworks trusts).
- (b) sewerage of all towns with populations over 200 by the end of 1982 at an estimated cost of \$37m.
- (c) expenditure of \$15m by river improvement, flood protection, and drainage trusts to preserve flood waterways, protect valuable marginal land, and safeguard the natural environment of streams in their catchment area.
- (d) \$7.5m expenditure on rural waterworks districts, including the Millewa pipeline scheme (scheduled for completion in 1975) and commencement of the pipelining of the extensive Mallee domestic and stock channel system.

- (e) construction or enlargement of ten major storages at a total cost of \$47m (including Victoria's share of the cost of the Dartmouth Dam project).
- (f) expenditure of \$58m on irrigation and drainage works within existing irrigation districts.
- (g) expenditure of \$30m to reduce water losses and control seepage in irrigation distribution systems.
- (h) provision of adequate drainage systems, including groundwater control in irrigation districts, at an estimated cost of \$15m.
- (i) expenditure of \$13m on salinity control works to arrest the deterioration of highly productive irrigated lands and protect the Murray River from saline inflows from Victorian irrigation areas.
- (j) expenditure of \$5.5m as Victoria's share of capital works undertaken by the River Murray Commission (additional to the Dartmouth Dam project).
- (k) expansion of Water Commission facilities and resources at an estimated cost of \$12m.

The ten year programme as proposed is consistent with the Victorian Government's aim of encouraging decentralisation. The programme provides for safeguarding and improving the service to rural based enterprises reliant on the State's irrigation systems and for adequate and high quality urban water services and proper sewerage systems in country areas throughout Victoria.

Additional recreational facilities for the people of Victoria will be provided as a by-product of further storage construction and provision has been made in the programme for the development of these assets.

Groundwater Act

The Groundwater Act, which was passed in the 1969 autumn session of Parliament and proclaimed in September 1970, enables the Mines Department and the Commission to establish the administrative procedures necessary for the investigation, conservation, and utilisation of the groundwater resources of Victoria.

The Act gives the Mines Department authority to investigate the State's groundwater resources so that Victoria's total water resources and their proper use can be considered by the Government in the future.

Staff have been appointed to administer the Act. The Groundwater Appeal Board has been appointed and will serve to protect the rights of the individual in the equitable distribution and use of groundwater resources.

Since the proclamation of the Act, 3,175 applications for licences to extract groundwater for purposes other than domestic and stock use have been lodged with the Commission and over 5,850 bores from which water is extracted only for domestic and stock use have been registered.

A Groundwater Conservation Area has been declared in the Koo-Wee-Rup-Dalmore District. Over 200 bores are operated in the district for the irrigation of a total area of about 4,000 hectares of pastures and miscellaneous cash crops and the volume of groundwater extracted annually exceeds the natural rate of replenishment of the aquifer. The groundwater level is falling steadily, leading to a deterioration in water quality in areas adjacent to the coast. Investigations are in progress to determine the safe volume which may be extracted annually.

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 authorised to take water from streams, lakes, etc., but who do not come within the boundaries of an irrigation district. (See private irrigation on page 402.)

Characteristic of the districts is the "water rights" system. 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

VICTORIA—MAJOR IRRIGATION STORAGES

River	Irrigation storage	Capacity	Principal system or district served
		megalitres	
Goulburn	Lake Eildon	3,390,000	Goulburn-Loddon Systems
	Waranga Reservoir	411,200	" " "
	Green's Lake	32,750	" " "
	Goulburn Reservoir	25,500	" " "
Campaspe—Coliban	Lake Eppalock	311,900	Campaspe Irrigation District and Coliban System
	(a) { Upper Coliban Reservoir	31,700	
	Lauriston Reservoir	19,620	
Loddon	Malmsbury Reservoir	17,760	Loddon District
	Cairn-Curran Reservoir	148,800	
	Tullaroop Reservoir	73,690	
Broken	Lake Mokoan	364,800	Maryborough town supply; Goulburn-Loddon System
	Lake Nillahcootie	39,790	Broken River valley private diverters
Ovens	Lake Buffalo	24,050	Wangaratta town supply; private diverters, Ovens valley
	Lake William Hovell	12,330	
Macalister	Lake Glenmaggie	190,300	Macalister District
Werribee	Pykes Creek Reservoir	23,920	Bacchus Marsh District
	Melton Reservoir	17,150	Werribee District
	Lake Merrimu	19,140	Bacchus Marsh District
Murray	(b) { Lake Hume	1,529,500	Goulburn—Murray Murray valley
		Lake Mulwala		58,600
	Torrumbarry	17,800	Torrumbarry System
	Euston	19,300	Robinvale
	Mildura	18,300	Sunraysia
	Wentworth	23,510	Sunraysia
	Kow Swamp	50,400	Loddon District
	Kerang North-West Lakes	69,940	Loddon District
	Dartmouth (b) under construction	1,850,000	Goulburn—Murray

(a) Multi-purpose storages—Bendigo town supply and irrigation supply.

(b) Victoria's half share under the River Murray Agreement subject to certain obligations to South Australia.

to a portion of each holding. This has meant that Victorian irrigation is predominantly devoted to dairying and horticulture, 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. In 1973-74, the total area under development in irrigation districts was 647,706 hectares and the total water right allocated to these lands was 1,842,176 megalitres.

VICTORIA—AREA IRRIGATED
(hectares)

Source of supply	1969-70	1970-71	1971-72	1972-73	1973-74
Goulburn-Loddon system	259,955	274,499	275,525	276,172	234,074
Murray River system	183,600	195,460	193,063	193,963	183,488
Other northern systems	7,437	7,445	7,346	7,360	7,316
Southern systems	29,724	30,907	34,137	33,789	34,998
Private diversions	81,403	82,383	85,872	87,710	85,176
Total	562,119	590,694	595,943	598,994	545,052

Private irrigation

Private irrigation by diversion of water from rivers, lakes, etc., has increased in recent years. From 1942-43 to 1972-73 the area watered privately increased from 9,454 hectares to 93,028 hectares, the latter being 12.5 per cent of the total area irrigated. The number of private diversions authorised during 1972-73 was 11,412 and the water delivered was used mainly to produce annual and perennial pastures and fodder, as well as potatoes, tobacco, hops, vegetables, vines, fruit, and cereals. 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, to insure against low flows in the streams normally used.

Irrigation farms and produce

The total value of all farm produce derived from irrigation in Victoria was in excess of \$235m in 1972-73. Over one third of this value was attributable to milk, while the other main forms of produce in order of value were meat, vine fruits, vegetables, canning fruits, fresh and jam fruits, tobacco, potatoes, and wool.

Irrigation contributes towards a very wide range of produce and some of the items of lesser importance which are sold off some irrigation farms are hay, cereal grains, poultry and eggs, oilseeds (particularly sunflowers), pasture seeds, sorghum, goat's milk, broom millet, and cut flowers.

Pastures, lucerne, and fodder crops occupy about 84 per cent of the irrigated land in Victoria. Orchards and vineyards each account for a further 3.5 per cent, while vegetables, potatoes, and cereals each use about 1.5 per cent of the State's land under irrigation.

Town supplies

The Commission operates major works for town water supplies outside the Melbourne metropolitan area—the Coliban System supplying Bendigo, Castlemaine, and other towns in that area; the Mornington Peninsula System supplying towns extending from Longwarry to a portion of Dande-

nong, the bayside towns from Seaford to Portsea, the Western Port towns from Hastings to Flinders, and the township of Wonthaggi; the Bellarine Peninsula System supplying water to the towns extending from Portarlington to Anglesea; and the Otway System supplying water from the Otway Ranges to Camperdown, Cobden, Terang, and Warrnambool. The total towns supplied by the Commission are 150 and their total population is 312,610. (For other town supplies and sewerage, see pages 154-5.)

Wimmera-Mallee Domestic and Stock Supply System

The Wimmera-Mallee Domestic and Stock Supply System is one of the largest of its kind in the world. It extends from the Grampians in western Victoria to Ouyen and Manangatang in the north, Underbool in the west, and Korong Vale in the east. The system supplies water to about 20,500 farm storages and 60 towns and villages in 28,489 square kilometres of agricultural land, through 9,656 kilometres of Commission and 6,437 kilometres of farm earthen channels.

The ten major storages in the region are interconnected and serve a complex system of over 9,656 kilometres of distributory channels. Six main channel routes take water by gravitation from any of the storages to anywhere in the Wimmera-Mallee System. To reach the furthest limits of the system, it is necessary for the water to travel about 563 kilometres of channel in one section alone. Unlike irrigation channels elsewhere in the State, which are run in the hot, drier months, water from the Grampians storages is released during the cooler and wetter months in late autumn, winter, and early spring, to minimise seepage and evaporation. During the summer months, maintenance work such as channel cleaning of weeds and sand drift is carried out.

When the water is released, it is run first to the northern-most limits of the system. It is then systematically worked back until the end of the watering season when farm storages nearest to the headworks are filled so as to leave empty channels behind. All farm dams and town storages are filled only once a year.

Water is supplied to 52 towns from the system's storages. The Commission controls and operates the water supply for 38 of these towns. Trusts or local government bodies are in charge of water supply to the remainder.

Millewa scheme

Land in the Millewa, which has some of the best soil in the Mallee, was first released for closer settlement in 1923. However, despite the pioneering spirit of the early settlers, their attempts at making a living were unsuccessful. The small size of the holding, low prices for farm produce, and the inexperience of the settlers combined to make farming in this dry region an uneconomic proposition.

In 1948 the North-West Mallee Settlement Act amalgamated the small holdings to form larger properties from which a living could be made. Consequently, farming has generally produced good results with the exception of severe drought years.

VICTORIA—LANDS UNDER IRRIGATED CULTURE: EXTENT OF IRRIGATION AND AREAS WATERED, 1973-74

Name of irrigation district area, etc.	Area irrigated, incl. lands adjoining a district															
	Total area of holdings in irrigation districts	Area classified as irrigable within constituted districts	Water rights apporportioned including extra water right	Cereals		Lucerne grown for pasture and hay		Sorghum and other annual fodder crops		Pastures		Vineyards		Market gardens	Fallow and miscellaneous	Total
				hectares	hectares	hectares	hectares	hectares	hectares	hectares	hectares	hectares	hectares			
Goulburn-Campaspe																
Loddon System—																
Shepparton	90,581.8	64,964.6	190,224	14.0	751.0	648.0	43.0	12,528.0	17,484.0	132.0	4,834.0	325.0	289.0	37,048.0		
Rodney	109,303.0	88,940.2	254,195	168.2	1,567.8	332.2	975.5	19,198.0	28,805.2	61.3	3,698.4	832.6	514.9	56,155.1		
Tongala-Stanhope	30,948.0	7,281.2	104,660	108.0	120.0	25.0	4.0	6,538.0	6,453.0	..	256.0	56.0	44.0	23,580.0		
Deakin	63,613.5	7,866.2	147,658	112.0	295.0	107.0	390.0	6,289.0	5,852.0	..	72.0	128.0	44.0	13,222.0		
Rochester	73,522.5	57,031.9	147,968	349.0	494.0	677.0	93.0	13,468.0	20,702.0	..	50.0	148.0	320.0	36,212.0		
Dingee	4,192.3	3,131.9	39,045	..	543.0	7.0	8.0	1,042.0	3,202.0	..	..	..	5.0	2,264.0
Cailwil	23,970.3	20,379.3	39,045	..	543.0	200.0	32.0	4,869.0	3,870.0	..	..	..	246.0	9,760.0
Tragowel plains	88,682.3	70,119.0	121,026	6.0	369.0	863.0	2,918.0	23,060.0	6,829.0	..	..	..	1,101.0	37,146.0
Boort	43,403.5	30,118.4	50,898	127.0	1,279.0	894.0	29.0	8,193.0	2,506.0	..	..	34.0	1,661.0	14,723.0
Campaspe	8,695.3	4,923.4	14,741	..	434.0	33.0	15.0	700.0	1,366.0	..	..	249.0	16.0	2,739.0
East Loddon	..	..	..	..	24.0	..	..	75.0	14.0	..	..	..	..	129.0
West Loddon	..	..	..	..	170.0	40.0	..	493.0	63.0	..	..	..	263.0	1,029.0
Total	543,522.9	386,128.3	975,083	882.2	6,053.8	3,822.2	4,507.5	98,453.0	105,061.2	193.3	8,850.4	1,764.6	4,481.9	234,070.1		
Murray River System																
Torrumbarry																
weir—																
Cohuna	45,815.0	29,017.4	120,236	204.0	804.0	381.0	1,872.0	14,473.0	26,843.0	..	6.0	5.0	219.0	44,807.0		
Koondrook	37,843.8	28,185.7	71,197	164.0	319.0	373.0	2,324.0	15,355.0	4,631.0	2.0	186.0	3.0	543.0	23,900.0		
Swan Hill	15,603.2	9,910.4	55,759	53.0	507.0	17.0	71.0	1,493.0	6,414.0	1,189.0	439.0	220.0	23.0	10,426.0		
Third Lake	7,915.4	3,728.3	11,812	10.0	94.0	..	..	1,669.0	155.0	..	..	..	..	2,028.0
Mystic Park	8,399.1	4,335.2	11,535	..	105.0	11.0	114.0	1,521.0	221.0	23.0	..	..	..	2,004.0
Tresco	1,857.3	773.9	5,015	..	55.0	1.0	..	11.0	13.0	595.0	2.0	1.0	..	809.0		
Fish Point	7,431.4	5,314.5	9,857	12.0	16.0	87.0	482.0	1,223.0	265.0	..	..	45.0	41.0	2,128.0
Kerang	37,175.1	29,724.1	68,816	35.0	132.0	64.0	212.0	11,668.0	4,495.0	..	..	..	2.0	17,417.0
Kerang North-West	..	..	..	81.0	196.0	83.0	50.0	574.0	32.0	45.0	79.0	5.0	18.0	1,163.0
Total	162,040.3	110,989.5	354,227	559.0	2,228.0	1,017.0	5,125.0	48,093.0	43,069.0	1,854.0	801.0	281.0	1,655.0	104,682.0		

Yarrowonga weir	121,951.5	88,611.2	246,101	561.8	1,428.1	1,401.4	1,755.4	20,584.3	18,941.4	233.8	2,396.0	242.8	1,039.1	48,584.1
Murray valley pumping—														
Nyah	1,564.5	1,070.2	9,070	202.3	667.4	106.3	7.3	1,169.3	523.6	194.4	216.4	114.8	293.4	3,495.2
Red Cliffs	5,510.5	4,618.9	43,693		199.7	18.8	52.3	223.3	5,449.9	1,355.3	635.0	46.0	46.0	7,999.4
Merbein	3,733.5	3,145.5	30,140	32.0	109.5	34.0	26.0	1,027.9	3,738.9	757.4	88.1	16.7	16.7	5,830.5
Robinvale	3,609.1	2,281.0	17,533	..	35.0	..	..	42.0	589.0	2,808.0	945.0	544.0	..	4,963.0
Total	14,417.6	11,115.6	100,436	234.3	1,011.6	159.1	85.6	2,258.3	5,074.8	9,209.7	2,604.8	1,293.8	356.1	22,288.1
First Mildura Trust	15,863.7	7,933.3	72,542	..	..	..	..	..	269.1	6,160.9	310.8	..	1,192.5	7,933.3
Murray River System	314,273.1	218,649.6	773,306	1,355.1	4,667.7	2,577.5	6,966.0	70,935.6	67,354.3	17,458.4	6,112.6	1,817.6	4,242.7	183,487.5
Other northern systems—														
Coitban	..	2,582.0	..	4.0	155.0	..	168.0	758.0	2,309.0	4.0	614.0	96.0	19.0	4,127.0
Western Wimmera	..	466.0	..	..	48.8	56.7	..	..	2,531.0	0.2	62.8	5.0	..	2,704.5
Wimmera United	..	..	..	..	63.3	11.0	..	15.3	385.6	..	5.3	4.0	..	484.5
Total	..	3,048.0	..	4.0	267.1	67.7	168.0	773.3	5,225.6	4.2	682.1	105.0	19.0	7,316.0
Southern systems—														
Bacchus Marsh	2,545.6	1,285.5	3,956	7.0	107.0	..	23.0	..	869.0	..	181.0	177.0	15.0	1,379.0
Werribee	3,872.9	3,245.6	9,902	..	115.0	..	15.0	..	1,556.0	..	57.0	1,532.0	13.0	3,293.0
Maffra-Sale	34,800.2	21,389.0	63,551	34.0	76.0	139.0	284.0	..	18,395.0	..	..	27.0	..	19,155.0
Central Gippsland	17,898.7	13,960.8	38,643	..	27.0	23.0	..	..	10,883.0	..	..	..	..	10,933.0
Mornington Peninsula	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Bellarine Peninsula	..	..	..	..	..	..	..	..	..	..	..	64.8	45.0	109.8
Total	59,217.4	39,880.9	116,052	41.0	325.0	167.0	307.0	15.0	31,903.0	..	238.0	1,898.8	93.0	34,987.8
Private diversions throughout the State	..	..	..	374.0	6,115.0	3,829.0	1,556.0	7,277.0	48,933.0	2,465.0	2,718.0	7,322.0	4,587.0	85,176.0
GRAND TOTAL 1973-74	917,013.4	647,706.8	1,864,441	2,656.3	17,428.6	10,463.4	13,504.5	177,453.9	258,477.1	20,120.9	18,601.1	12,908.0	13,423.6	545,037.4
GRAND TOTAL 1972-73	914,019.0	643,962.0	1,794,677	17,117.0	22,157.0	10,294.0	17,808.0	218,061.0	246,420.0	20,850.0	18,889.0	12,791.0	14,607.0	598,994.0

Original scheme

Since Millewa lands were opened to settlement, water has been supplied through a network of open channels to earthen dams located on farms. Water was pumped from the Murray River by the Millewa A pumping station and discharged through a 100 cusec earthen channel into Lake Cullulleraine. The Millewa main station then lifted the water about 29 metres to discharge into open earthen distributory channels. Millewa B and Millewa C sub-stations relifted water to areas which could not be supplied by gravity after the initial lift by the main station. Dams were filled once a year in winter when evaporation was at its lowest.

However, the system was inefficient. Only about 5 per cent of water pumped from the Murray River was available for use by the farmer, with evaporation and seepage accounting for much of the remainder. To maintain such an obsolete system would have required a huge capital commitment which investigations revealed would be economically unsound. Alternatively, a system of pipelines to replace the old earthen open channels was proposed.

New scheme

In the new piped reticulation scheme, water will be pumped from the Murray River to Lake Cullulleraine when necessary to replenish the lake's supply level. A new pumping station to be built at Lake Cullulleraine will then relift water to a 19,094 kl earthen storage at a high point at Bambill South. Water will then be reticulated by gravity from the earthen storage through 644 kilometres of pipeline to impervious tanks on landholders' properties. The new Millewa scheme will provide a continuous pressurised supply of water for domestic, stock, and home use to 126 holdings with a total area of 226,624 hectares.

The Millewa pipeline scheme is being carried out in five major stages at a cost of about \$3m. The Australian Government has provided a grant of \$2m under the National Water Resources Development Programme, with \$1m being provided by the Victorian Government.

Construction of the earthen storage and the installation of the majority of the main trunk lines has been carried out by contract. Commission work forces will connect farms to the installed mains. Holdings are progressively connected to the newly installed pipelines.

Stage 4 of the scheme is well advanced, with work under way to install the balance of the rising main and associated spurs. Designs for the pumping station have been completed and orders have been placed for the pumping station equipment. Tenders for the construction of the pumping station were let in 1974.

When completed in 1975 the Millewa pipeline scheme will provide a constant water supply to farms and considerably reduce operating and maintenance costs. The reduction in operating costs will occur through eliminating both the need to convey large volumes of water through extremely wasteful open earth channels, and also the high annual sand cleaning bill, since the new system will be fully piped.

Tarago-Western Port pipeline

The Mornington Peninsula Waterworks District, encompassing towns along the Princes Highway between Dandenong and Longwarry and the

Mornington Peninsula generally south and east of the Patterson River, receives its water supply from diversion points on the upper reaches of the Tarago and Bunyip Rivers. Presently the water is conveyed into the supply areas via an open raceline.

The average annual water requirement within these areas has now reached the capacity of the raceline and to meet future demands increased conveyance capacity is required. To meet this increase the State Rivers and Water Supply Commission is now constructing a steel pipeline between the Tarago Reservoir and a service reservoir near Tyabb. The location of the pipeline has been selected so that it crosses the rapidly developing industrial area of Western Port. Water demands of industry are expected to form a very large part of the overall future water requirements.

The urban development now occurring in the Berwick-Narre Warren area will require most of the water being conveyed by the existing raceline. The Tarago-Western Port pipeline will be best used by cross-connecting it into the existing supply system to provide alternative water resources when the existing race is closed for maintenance and by directly supplying the southern parts of the Mornington Peninsula. Excess quantities will be stored in Devilbend Reservoir and used when required during periods of peak demand.

Consideration is also being given to augmenting the water supply of some towns and rural areas en route which are not already supplied from this system. The pipeline will consist of 92.5 kilometres of 1,050 millimetre cement mortar lined mild steel pipes, and will be installed at an estimated cost of \$13m.

The route of the pipeline from the Tarago Reservoir will follow the Tarago River valley to a point near Rokeby and then proceed west to a crossing with the Bunyip River just south of the Princes Highway. It will continue further west past the townships of Bunyip and Garfield and then generally south-west along the Koo-Wee-Rup drainage district's northern boundary drain and Rhythdale Road to the Toomuc Creek-Deep Creek outfall drain near Cardinia. It will continue south along the drain to the Cardinia Creek confluence and then in a south-westerly direction, past Tooradin and Cannons Creek, and parallel to the Tyabb-Tooradin Road on to the service reservoir at Tyabb.

The pipeline has been designed to carry 67 megalitres per day under gravity supply conditions, and 115 megalitres per day under boosted conditions. Provision has also been made in the pipe track for a second pipeline of similar capacity to allow for further development of the existing headworks resources.

Finance

Acting as a government authority, the Commission constructs its works with funds provided for the purpose by Parliament, amounting by 30 June 1973 to \$356m including contributions by Victoria towards works carried out for the River Murray Commission. A further \$104m 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 \$13m

annually, and the Commission also supervises the expenditure of about \$4.8m annually by local authorities.

The Commission administers, supplies water to, and collects revenue from nearly 110 separate districts, each of which is run financially as a separate undertaking. Revenue from its ten irrigation districts exceeds \$7m; from its urban districts about \$3m; from its thirteen rural and waterworks districts about \$1.7m; and from its three flood protection districts about \$100,000; the total annual revenue, including other sources, is about \$13m.

Administration

The Commission is served by a decentralised organisation designed to carry out diverse functions all ultimately related to water. Central administrative, engineering, and clerical functions are carried out by a staff of 585 in the head office at Armadale, near Melbourne. At the many country centres throughout Victoria there are 1,116 other officers and 1,339 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, 1963; 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; River improvement, 1967; Rivers and streams fund, 1967; Dandenong Valley Authority, 1968; Water conservation, 1969; Water supply to Western Port, 1971; Lake William Hovell dam, 1972; River Murray Agreement and the River Murray Commission, 1972; Ten year plan, 1974; Millewa pipeline project, 1974; Snowy Mountains Hydro-Electric Scheme, 1974

DEPARTMENT OF AGRICULTURE

Functions

The functions of the Department of Agriculture may be described briefly as providing regulatory, research, diagnostic, and extension services in the fields of animal health, animal industry, agriculture, dairying, and horticulture; discharging the statutory responsibilities imposed by the legislation administered directly by the Department; and administering Victoria's agricultural and horticultural colleges.

The current administrative and functional pattern may be said to have originated from the appointment of Dr S. S. Cameron as Director of Agriculture in 1911. The Department comprises Central Administration and eight divisions: Agricultural Chemistry, Agricultural Education, Agriculture, Animal Health, Animal Industry, Dairying, Extension Services, and Horticulture, as well as the two major servicing branches, Economics and the Victorian Plant Research Institute (Biology). Under the divisional and branch structure, the Department operates a number of agricultural research establishments, veterinary diagnostic laboratories, and offices throughout the State, in addition to the colleges.

Regulatory activities

The Minister of Agriculture administers more than forty Acts of Parliament, a number of which establish statutory authorities that are independent bodies such as the Australian Barley Board, the Grain Elevators Board, the Milk Board, the Poultry Farmer Licensing Committee, the Poultry Farmer Licensing Review Committee, the Tobacco Quota Committee, the Tobacco

Quota Appeals Tribunal, the Veterinary Board of Victoria, the Victorian Abattoir and Meat Inspection Authority, the Victorian Dried Fruits Board, the Western Metropolitan Market Trust, the Wheat Quota Committee, the Wheat Quota Review Committee, and the marketing boards for chicory, citrus fruit, egg and egg pulp, onions, and tobacco leaf. In addition, legislation provides for a number of advisory statutory authorities such as the Agricultural Colleges Advisory Committee, the Consumers' Committee (Marketing of Primary Products Act), the Dairy Produce Board, the Filled Milk Advisory Committee, the Fruit and Vegetable Marketing Advisory Committee, the Imitation Milk Advisory Committee, the Milk Pasteurization Committee, the Stock Medicines Board, and the Victorian Dairy Products Board.

The Department is responsible for the administration of legislation within the Department including the registration and inspection of dairy farms and dairies and factories producing butter, cheese, and other dairy produce, to ensure proper standards of hygiene and equipment; the registration of manufacturers of margarine and the limitation of the quantity of table margarine which may be made by each manufacturer; the registration and control of farm produce merchants and commission agents; the inspection, packing, and grading of fruit and vegetables; the inspection of orchards and insistence on proper methods for preventing and controlling plant diseases and insect pests, including measures to be taken against outbreaks of fruit fly; the registration of agricultural limes, fertilisers, pesticides, stock foods, stock medicines, and sheep branding fluids; the licensing of abattoirs, pet food manufacturers, and meat transport vehicles; the inspection of meat; the prevention, control, and eradication of stock diseases including the control over the feeding of food refuse to stock and the licensing of premises where chickens are hatched for sale; the assessment and payment of compensation to owners of cattle, swine, and bees condemned because of infection with prescribed diseases; the inspection and registration of stallions; the elimination of bulls not of a reasonable standard in respect of type, conformation, and breeding; the control and regulation of the artificial breeding of stock; the control and processing of poultry intended for sale; the inspection and testing of seeds for sale to ensure compliance with prescribed standards of purity and germination; the conduct of seed certification schemes; the control of the spraying of agricultural chemicals from aircraft; the control of rain-making operations; the inspection of accommodation provided for shearers to ensure that it conforms to prescribed standards; and the control of agricultural colleges.

In addition the Department, on behalf of the Australian Government, undertakes the inspection of fruit and grain for export and the inspection and quarantining of imported animals and plants to prevent the introduction of diseases.

Since 1971, apart from a number of amendments to established legislation, the Bees Act, the Fertilizers Act, and the Seeds Act have been reviewed and updated as new pieces of legislation; additional legislation has been enacted to provide for the stabilisation of the egg industry and for the transfer of the Veterinary Research Institute and the control of abattoirs and meat inspection to the Department of Agriculture.

The *Bees Act* 1971 contained substantially the same provisions as the

Bees Act 1966 relating to the registration and inspection of apiaries to control diseases and maintain proper hygiene standards in the preparation of honey, with the addition of sections to provide for a compensation scheme to alleviate the losses experienced by beekeepers when disease occurs in their apiaries. The *Seeds Act* 1971 took cognisance of developments in the seed industry over a number of years. The legislation relates to seed sold or intended for sale for the purpose of sowing, other than seeds of wheat, oats, barley, and cereal rye except where the seeds are used or intended to be used for mixing with other kinds of seeds to form a seed mixture. Significant new principles in the Act were the compulsory examination of all seed prior to sale in relation to physical purity and germination, the follow-up examination at prescribed periods, and the registration of all seed cleaning plants. The *Fertilizers Act* 1974 consolidated and amended the law relating to the sale of agricultural limes, fertilisers, and soil conditioners.

The *Veterinary Research Institute Act* 1972 provided for the transfer of the Institute and appropriate staff from the University of Melbourne to the Department of Agriculture as part of a programme of establishment and development of veterinary diagnostic and research laboratories by the Department throughout Victoria. The *Abattoir and Meat Inspection Act* 1973 provided for the transfer of the control of abattoirs and meat inspection (other than the public health control of meat at retail outlets, which is still exercised by the Department of Health and municipal health inspectors), previously exercised by the Department of Health and municipal councils under the provisions of the Health Act, to the Department of Agriculture. The legislation provided for the establishment of a Victorian Abattoir and Meat Inspection Authority and for the licensing of abattoirs, slaughterhouses, meat inspection depots, meat processing works, knackeries, and pet food establishments. The *Egg Industry Stabilization Act* 1973 provided for the stabilisation of the egg industry by the introduction of a poultry farmer licensing scheme, and the allocation of a hen quota to each licensee.

AGRICULTURAL EDUCATION, RESEARCH, AND EXTENSION SERVICES

Agricultural education

Agricultural colleges

The Department of Agriculture administers four colleges through its Division of Agricultural Education. The main purpose of the colleges is to provide appropriate education for practising and future farmers and for those wishing to work in industries related to farming. The colleges are financed chiefly from Victorian Government funds, but some Australian Government assistance is attracted at the tertiary level by Burnley Horticultural College, Dookie Agricultural College, and Longerenong Agricultural College (State Grants [Advanced Education] Acts for the period 1967–1975). Glenormiston Agricultural College has received assistance from the State Grants (Technical Training) Acts.

Dookie Agricultural College, established in 1886, and *Longerenong Agricultural College*, established in 1889, provide a three year course leading to the Diploma of Agricultural Science. The course is open to applicants who have passed in five subjects, including English, at Form V level of a secondary or technical school. Also, it is important that applicants should have studied chemistry, at this level at least; preference is given to those who have passed in chemistry. Other subjects recommended to

provide applicants with a good preparatory background are mathematics, physics, biology, economics, and agricultural science.

The course for the Diploma of Agricultural Science has developed from the needs of those whose first wish is to follow a career in farming or in an allied field as an alternative. To meet these dual needs, it was necessary to provide a course of study reaching tertiary level which emphasised the training of technologists to assist in agricultural research and extension and in the many government and private enterprises which service agriculture.

Training is given in the basic technical, scientific, and economic principles underlying all aspects of production management and business management relevant to farming in southern Australia. Lectures on all topics are complemented by laboratory work, field demonstrations, personal assignments, visits to commercial farms and agricultural industries, and by practical work on the farm which is part of each college campus.

Burnley Horticultural College, established in 1891, provides a three year course for the Diploma of Horticultural Science, with the same pre-requisite entrance requirements as for the agricultural colleges. The course is comprehensive, giving tuition and practical experience in fruit and vegetable production, ornamental horticulture, nursery management, and landscape design, as well as training in the basic physical, biological, and applied sciences.

Glenormiston Agricultural College, established in 1971, has an annual intake of about sixty students. It was established to meet the needs of those young men and women who, having already gained some experience in farming, wish to be trained in the principles and practices of farm management before returning to a farm career. The college, built with Victorian Government funds at a cost of \$2.5m, provides unrivalled facilities for the many educational functions for which it is used.

In December 1974 the Victorian Government decided to establish, at Warragul, a new agricultural college to provide for the continuing education of primary producers, principally those in the Gippsland region.

The colleges have traditionally provided the location and much of the content of short courses and field days for farmers. A significant change in the concept of adult farmer education has taken place since 1971 when the Department established a regionally-structured Extension Services Branch which became a Division in 1974. All colleges are now involved in an active programme of adult farmer education in co-operation with this Division to provide a wide variety of activities including short courses and seminars based on regional needs.

Part-time evening classes are conducted at the colleges, the majority being given at Burnley Horticultural College. Subjects in horticultural, agricultural, and associated sciences were available to the 1,350 persons enrolled in 1973, and included such specialist areas of instruction as greenkeeping, weeds and their control, and the genetics of sheep breeding. The Agricultural Education Division also administers the Victorian Government grant to the Victorian Young Farmers movement.

University of Melbourne

School of Agriculture

The Faculty of Agriculture was established in 1905 by statute of the Council of the University, and the first Professor of Agriculture, Dr Thomas

Cherry, was appointed in 1911. However, it was not until 1921, following the passing of the *Agricultural Education Act 1920*, that provision was made for a building to house the school and for the appointment of permanent staff.

The purpose of the four year course is to give students a sound basic training in scientific principles as applied to agriculture. The first year is devoted to science subjects, and is followed by a year in residence at the University Field Station at Mount Derrimut, Deer Park. This is a property of 320 hectares, about 21 kilometres from the School, where students are introduced to the variety of farm operations involved in a mixed farming enterprise while taking lectures and practical classes in various sciences applied to agriculture. They return to the University campus for more advanced training in economics and the soil, plant, and animal sciences in the third and fourth years of the course. In the final year the students have a restricted choice of subjects, which ensures that all students receive a general training in all aspects of agricultural science, while allowing a measure of specialisation.

Since the establishment of the Faculty of Agriculture, 1,000 graduates have entered the profession. A quota of 70 is placed on the numbers in the first year of the B.Agr.Sc. course ; the number of graduates averages about 55 per annum. There are some 30 students working for higher degrees (Ph.D. and M.Agr.Sc.) either at the University or at Mount Derrimut, and about ten postgraduate students attend the course for the Diploma in Agricultural Extension. The buildings and facilities provided at Mount Derrimut Field Station for training students and for research in the soil, plant, and animal sciences, have been made possible by generous grants from primary industry funds from the Victorian and Australian Governments.

Department of Civil Engineering—Agricultural Engineering Section

In addition to the degree course in agricultural science at the University of Melbourne, in which emphasis is placed on biological studies, the University also offers training in the more physical aspects of agriculture, leading to a degree in agricultural engineering. This course is the only one of its type at an Australian university, and is closely linked with complementary postgraduate and research programmes.

Some of the specific field tasks handled are the interactions between soil, crops, and machinery in regard to function, safety, and economics ; the control of natural and irrigation waters to achieve maximised production ; the estimation of water resources and disposal of wastes ; work study and organisation of farming systems ; processing of farm products such as refrigeration and drying ; and mechanical handling and transport of a wide range of materials such as fruit, grain, and wool.

The course is of four years duration, and leads to a B.E. (Agr.). Although close links are maintained with the School of Agriculture and its B.Agr.Sc. programme, students interested in the agricultural engineering course must enrol through the Faculty of Engineering.

Latrobe University—School of Agriculture

Latrobe University, which admitted its first students in March 1967, opened its School of Agriculture a year later. The emphasis of the course

is on the sciences relevant to an understanding of the rural environment, and covers the relation between the soil, the plant, the animal, and the environment. Substantial emphasis is also given to the study of the economic and social aspects of agriculture and farm management. The four year course leads to a B.Agr.Sc. (pass or honours degree).

Some six hectares of the University campus are presently used by the School of Agriculture for field work involving crops, pastures, and livestock, enabling students to have day to day contact with agricultural experimentation as well as with the more applied aspects of crops and animal husbandry. These on-campus facilities are supplemented by the provision of at least twelve weeks practical experience on approved farms for students.

Agricultural extension services

The maintenance and progress of successful primary industries depend largely on the information which is available to the farmer and on his ability to make the best decisions regarding his farm operations. Technical skill alone is not the key to successful modern farming; financial management is becoming increasingly important in rural industries as well as in manufacturing and commerce. Advancing technology and increasing competition on world markets have intensified the need for farmers to be advised quickly about each new development and to establish sound bases for the many decisions which are necessary as consequences of rapid change. Extension services to provide advice and training in these matters are conducted by several government departments and also by commercial firms such as the manufacturers of agricultural chemicals, farm machinery, and stock foods and medicines. Some farmers employ professional consultants to advise them personally.

In Victoria, the major extension service is provided by the Department of Agriculture which, in addition to its research and regulatory staffs, has a large group of extension workers throughout the State. Whereas the main emphasis of this service for many years was on the answering of farmers' questions and the dissemination of research results and other information, it is now devoting increasing attention to educational programmes which help to train farmers to make decisions according to their individual circumstances. Consequently, special emphasis is given to farm economics and financial management.

The Department's extension services are co-ordinated throughout Victoria by a regionalised Extension Services Division. Administered locally by Regional Officers, regional centres are located at Ballarat, Bendigo, Benalla, and Warragul. Within each region, district offices have the appropriate staff to serve a more limited area. These are under senior district officers and are located at Bairnsdale, Ballarat, Benalla, Bendigo, Colac, Echuca, Hamilton, Horsham, Leongatha, Maffra, Melbourne (Port Phillip District), Mildura, Shepparton, Swan Hill, Warragul, Warrnambool, and Wodonga. Each Regional Officer co-ordinates the activities of a group of extension specialists, according to the needs of his region, e.g., agronomy, dairy husbandry, sheep and wool, beef, or horticulture. A growing team of agricultural economists is serving at regional and district centres. Close relationships are maintained with the Department's research stations and other experimental centres, agricultural colleges, regulatory staff, the rural com-

munity, commercial firms that serve agriculture, and associated government departments.

While the Department's continuing programme aims to promote efficient primary production and maintain the viability of the farming community, the regional service occasionally has to divert its immediate activity to special campaigns such as the alleviation of drought or the consequences of other crises such as floods and bushfires. Sometimes it is necessary for extension specialists to visit individual farms and to use other person-to-person methods such as office consultations, telephone discussions, and correspondence. However, to make the most efficient use of available resources and to serve as many farmers as possible, extension officers do much of their work with groups of primary producers and use media outlets such as publications, radio, television, and films. Quite often these methods are used in combination: a pamphlet might be used to answer a query through the post; a guide book may complement the information which is given at a field day; or a film could stimulate discussion among a group of farmers.

If a farmer has a problem which could be common in a locality, several farmers are asked to meet on the one property, rather than involve the extension officer in additional time while he attends to the same problem on several properties. More formal group activities occur at regular field days on research stations, experiment plot sites, and other places of interest such as the winning farm in a soil conservation competition. Whereas field days on major research stations attract up to 800 visitors, smaller farm talks involving up to 20 farmers provide effective informal discussions about current methods and problems. More than 200 discussion groups of dairy farmers meet regularly in farm homes to exchange ideas on developments in their industry. Department of Agriculture specialists often visit these groups to provide information about the subject under discussion.

Occasionally groups within a district combine to hold schools for farmers or to tour together to other dairying areas in Victoria, other States, and even New Zealand. Subsequent discussions are helpful in assessing the potential local application of ideas which have been seen elsewhere. More formal schools for farmers are held in local halls, woolsheds, and Education Department classrooms. Emphasis is being given to financial management in courses which continue, one night a week, for several weeks. Between classes, farmers apply what they have learned to their individual circumstances and raise points for discussion at the next session. Meetings and conferences also provide opportunities for farmers to receive new information and discuss problems. Exhibits at agricultural shows are often focal points of discussion.

Both person-to-person activities and group work are complemented strongly by articles in newspapers and magazines, the *Journal of Agriculture*, industry digests for all dairy farmers, fruit growers, and apiarists, a wide range of books and pamphlets, farm radio and television programmes, and films. In fact, farmers often become aware of new developments through the media before seeking further advice to help them to decide on the adoption of the new ideas. The Department of Agriculture's Media Services Branch in Melbourne has the printing facilities, studios, and other resources for providing this complementary information to, and through, extension workers in the field. In addition to its direct services, the Department of Agriculture provides much information which reaches farmers through other departments and commercial organisations, including consultants.

Farming for unstable markets

In 1973 Victorian agriculture experienced high prices for the major commodities and favourable weather conditions for crop and livestock production. This followed lower rural returns in the preceding few years as a result of drought, wool price recession, and quotas on wheat. These events again illustrated that farmers and agricultural institutions have to adapt production and marketing systems to cope with the underlying fluctuations of Australian agriculture.

A large part of the short-term variation in output can be explained in terms of climate—especially the amount of rainfall and its time pattern of incidence. Although low crop yields and loss of livestock production occur most often in low rainfall years, there are also dangers of substantial plant and animal disease losses in a high rainfall year such as 1973, as well as the losses from floods and the dislocation of cropping operations in some areas.

The reasons for price fluctuations are more complex. For some commodities, prices are mainly determined overseas: for example, wool, beef, mutton, and lamb in the export season. In other cases, such as fresh fruit and vegetables, prices are mainly determined in a local market which extends to other States as well as Victoria. Frequently, prices are administered by institutional arrangements which attempt to ameliorate the effects of price fluctuations. Among the export products, wheat, dried vine fruits, and butter are notable examples, while milk is an important example on the domestic market.

Price fluctuations in overseas markets occur because agricultural output elsewhere is also subject to the vagaries of climate, disease, and such: at least in the short-term, there is not much variation in food consumption. Australian agriculture is vulnerable because, although a major exporter of many commodities, this country produces a small proportion of global production. Trade volumes and prices, therefore, are subject to unpredictable output fluctuations, and, in the extreme, with policies of self-sufficiency in food being followed by many countries, variations in their output can change their status from net importers to net exporters and vice versa.

Wool price fluctuations are a special problem. As an industrial raw material, wool has more in common in its economic behaviour with metals and with other fibres such as cotton, jute, and sisal than it has with food products. Most of the variation in wool prices arises from changes in demand for wool products in consuming countries. As textiles are durable and expensive, and wool products especially so, textile expenditures are postponed or advanced by processors according to economic conditions, so that there is a cycle of activity in the wool processing industry which is linked to other economic fluctuations.

Another source of instability in wool prices arises from speculation in wool stocks. Wool processors may increase purchases in a period of rising prices to protect themselves against future price rises. Conversely, when prices are falling, processors may buy less than their consumption at the time by running down their stocks in order to avoid losses on stocks as prices fall. This behaviour may mean rapid price rises and declines in wool auction markets. Such destabilising speculation will be offset by

stabilising speculation which aims at making profits in the process of "buying cheap and selling dear". This was traditionally undertaken by specialist operators in the wool market or by wool merchants or processors until 1970 when the Australian Wool Commission, a statutory body set up by the Australian Government and whose activities are now performed by the Australian Wool Corporation, commenced large scale stockholding operations designed to stabilise the price of wool on behalf of woolgrowers. This body accumulated about one million bales of wool during the wool price recession, which were successfully disposed of in 1972 when the wool market recovered. The key to success in such public stockholding operations is the ability to forecast the direction of wool price movements.

Another source of fluctuations in demand for wool is "fashion" or consumer preference for wool relative to other fibres. After a long period of intense competition from synthetic fibres, wool's position now seems to be stronger as part of the world-wide consumer interest in "natural" rather than "artificial" products. Synthetic fibre prices have also risen because of widespread difficulties in the petrochemical industry arising from oil shortages. Unlike the cyclical behaviour that arises because of income changes, fashion influences are not amenable to economic explanation or prediction. Fibre choice by processors, however, is also affected by differences in manufacturing costs. Synthetic fibres have some advantage in high speed knitting processes because of their more consistent breaking strength. The more variable breaking strength of wool can lead to greater losses of machine time. The decline in wool prices from 1969 to 1971 coincided with fashion preference for knitted fabrics as well as the economic and textile recession in major wool consuming countries.

Wool is also a special case among Australian farm products in the sense that as the major world producer of fine or apparel wool, Australian output has considerable influence on the price received for wool. For other farm commodities, Australian output has only a marginal impact on world prices except where by tradition or trade arrangement, Australia exports a large proportion of supplies to particular markets.

For agricultural products which are solely traded on the local market, prices will be determined essentially by variations in supplies, although demand, too, can be subject to weather influences. For perishable products, prices are determined by supplies available and demand in the short period since storage operations are impossible. This causes some wide swings in prices, particularly of some vegetables, but producers have learnt to protect themselves against these sorts of risks by spreading their efforts across the production of a wide range of vegetables. Furthermore, for a lot of vegetables the time of marketing is flexible, so producers can "average" prices by spreading their consignments over a number of markets. Fruit and vegetable marketing has also been subject to major technological developments in processing and storage techniques. These changes have been based on developments in food technology and, in the case of frozen vegetables, domestic refrigerators needed to be widespread throughout the community before this simple innovation could be adopted on a wide scale. Such changes have also had complex ramifications for the production of vegetables. For example, production has tended to become concentrated in areas where

processors' facilities are located to minimise transport costs. Moreover, to assure continuity of supplies, a contract system of production has developed and although disputes naturally arise about prices paid under such contracts, they clearly offer advantages to both producers and processors. Risks are considerably reduced for producers under a guaranteed price system and they can more readily plan their farming operations: this encourages investment in plant that enables lower cost methods of production. On the other hand, a contract system is necessary for processors to invest in costly processing and storage facilities without risks of shortages. Another effect of storage is that it reduces the benefits of "out-of-season" production of vegetables since consumers may substitute frozen or canned vegetables for more expensive fresh vegetables at such times. This further concentrates the production of vegetables on specialist farms in locations of least cost.

The benefits of technological change in the vegetable industry, which caters solely for the local market, have been enjoyed much more by Australian consumers rather than by producers since rationalisation of production has involved the departure from the industry of many producers. It is noteworthy that, seasonal factors aside, the retail prices of fresh fruit and vegetables have scarcely risen in money terms in the past decade or more, which means that "real" prices have fallen considerably. The exit of producers from this industry has not been accompanied by much controversy because it is, in any case, a small industry and being often located close to major centres of population, those leaving have often benefited from capital gains on their land.

Much more controversy and governmental intervention has taken place in large industries, such as wheat, characterised by fluctuating fortunes, or by a general tendency towards a long-term decline, such as has occurred with butter, affecting the dairy industry.

The major measure adopted by Australian governments in response to the economic problems of wheat and butter has been to establish guaranteed or equalised prices for part of the output of the industry. For wheat, the guarantees extend to domestic consumption plus 200 million bushels of exports, which is about one half of output in an average season, while for butter an acceptable price is assured for Australian consumption, now about 60 per cent of output. This acceptable price for butter has been reinforced by restrictions on the import and manufacture of margarine, and further protection has been afforded through the payment of a subsidy, although this is now being phased out. Returns from the unstable export market are "equalised" by payment to producers of an average return from the local and export markets.

These methods have in the past depended on price rather than output stabilisation. However, the attempt to stabilise prices has often been achieved at the cost of distorting physical output of various commodities. Also, the instability of incomes in Australian agriculture places great strains on financial institutions in devising suitable credit arrangements for farmers. There are three major sources of demand for credit facilities: credit to maintain the consumption expenditure of the farm family, credit for the farm business, both for current expenses and for investment in capital improvements, and finally, credit for purchasing land for extending existing

farms or for new entrants into farming. For all types of credit, the instability of prices and output creates difficulties.

These have included a lack of flexibility to maintain reasonable living standards on the farm during times of drought or serious price falls; difficulties in repaying loans incurred on farm expenditure and investment during low income years; and the element of sheer chance (brought about by good or bad seasons) which affects the farmer's ability to service long-term loans for farm purchase or enlargement.

Closely connected to these problems of stabilisation and credit management is the Australian tradition of purchasing the farm in a single generation; it is to be seen whether all these factors can be resolved harmoniously without basic innovations in rural financial management.

Further reference, 1966; Farm management, 1967; Agricultural extension services, 1968; Size distribution of rural holdings, 1969; Research and extension activities of the Department of Agriculture, 1970; Application of scientific research to agriculture, 1970; Research stations of the Department of Agriculture, 1971; Bureau of Agricultural Economics: activities in Victoria, 1972; Research activities of the Department of Agriculture, 1974

AGRICULTURAL AND PASTORAL ACTIVITY

General

Collection of statistics

Before 1904 agricultural and pastoral 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. During the period 1904 to 1966, police officers were required to collect agricultural, pastoral, and dairying statistics from land-holders in Victoria. Commencing with the 1966-67 Farm Census, the collection of these statistics has been carried out on a direct postal basis by the Australian Bureau of Statistics.

The rural statistics contained in this section are mainly compiled from annual returns of agricultural and pastoral production collected from some 70,000 rural holdings in Victoria at 31 March each year. Statistics from these schedules are compiled for each county and local government area.

Every holding used for the commercial production of agricultural products or for the raising of livestock and the production of livestock products is required to supply full particulars of the area occupied, the number of persons employed, the area and yield of each kind of crop cultivated, artificial fertiliser usage, numbers of certain items of farm machinery, the number and description of livestock, the quantity of wool clipped, and other relevant matters.

Data relating to area sown, production, yield per hectare, and number of holdings growing crops are for the season ended 31 March, thus including crops which are sown and harvested, or harvested, during the twelve months ended 31 March. In cases where harvesting of certain crops has not been completed by 31 March (potatoes, fruit, vines, etc.), supplementary collections are made later in the year. Livestock numbers and farm machinery on rural holdings are reported at 31 March.

Summary of Australian statistics

The following table, which summarises the principal farming activities in Australia during the 1972-73 season, shows the position of farming in Victoria relative to other States:

AUSTRALIA—PRINCIPAL ITEMS OF FARM ACTIVITY, 1972-73

Particulars	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T. and A.C.T.	Australia
Rural holdings—								
Number	74,587	66,890	42,329	29,001	21,128	9,733	587	244,255
Area ('000 hectares)	68,849	15,771	155,136	65,372	113,961	2,592	78,135	499,815
Principal crops—								
Wheat—								
Area ('000 hectares)	2,618	1,087	471	986	2,437	4	..	7,604
Production ('000 tonnes)	1,954	1,249	405	815	2,003	8	..	6,434
Oats—								
Area ('000 hectares)	285	255	10	142	297	6	..	995
Production ('000 tonnes)	196	238	8	74	212	7	..	736
Barley—								
Area ('000 hectares)	336	277	78	692	744	13	..	2,140
Production ('000 tonnes)	266	214	80	509	640	19	..	1,727
Hay—all types—								
Area ('000 hectares)	304	517	61	210	224	58	3	1,378
Production ('000 tonnes)	1,041	1,975	349	623	664	233	8	4,893
Tobacco—								
Area (hectares)	898	4,068	4,632	..	..	..	..	9,598
Production (dried leaf '000 kg)	1,449	5,769	8,203	..	..	..	..	15,421
Onions—								
Area (hectares)	910	922	1,370	900	132	224	6	4,464
Production (tonnes)	19,246	13,608	25,662	23,014	4,877	6,752	75	93,234
Potatoes—								
Area (hectares)	9,134	13,120	5,960	2,673	2,378	3,330	12	36,607
Production (tonnes)	130,301	286,990	92,164	69,483	63,282	78,286	198	692,606
Other vegetables—Area (hectares)	17,410	17,258	17,628	7,512	3,184	6,683	201	69,876
Fruit—Area (hectares)	34,887	25,785	22,111	16,730	8,680	7,223	84	115,500
Vineyards—								
Area (hectares)	13,274	21,526	1,560	29,528	2,614	..	..	68,502
Table grapes (tonnes)	6,422	9,583	4,567	1,213	1,611	..	..	23,396
Wine made ('000 litres)	61,579	25,840	n.a.	188,315	n.a.	..	..	279,943
Currants (tonnes)	373	2,323	..	2,026	936	..	..	5,658
Sultanas and raisins (tonnes)	7,443	40,158	..	3,712	36	..	..	51,349
Livestock numbers, 31 March 1973—								
Sheep ('000)	52,037	24,105	13,346	15,651	30,919	3,824	146	140,029
Cattle ('000)	7,918	5,464	9,795	1,583	2,182	900	1,257	29,101
Pigs ('000)	1,065	585	542	499	476	85	7	3,259
Livestock slaughtered for human consumption—								
Sheep ('000)	6,357	7,856	1,713	2,397	4,229	637	13	23,202
Lambs ('000)	6,241	6,673	740	2,141	1,319	642	177	17,932
Cattle ('000)	2,071	1,895	1,676	337	463	235	97	6,774
Calves ('000)	278	665	329	56	15	26	5	1,374
Pigs ('000)	1,324	1,210	964	527	538	152	28	4,743
Wool production (million kg)	226	172	71	101	147	18	1	736
Wholemilk production—								
All purposes ('000 litres)	1,176,962	3,944,600	736,792	424,265	242,060	423,841	2,990	6,951,509
Tractors on rural holdings—(number)	89,390	82,568	74,614	37,258	35,519	12,905	792	333,046
Gross value of production—								
Crops (\$'000)	436,206	282,696	452,137	177,768	203,417	43,693	2,133	1,598,050
Pastoral (\$'000)	840,790	607,812	399,232	270,233	321,111	72,357	30,873	2,542,408
Dairying (\$'000)	176,991	263,161	78,436	47,808	34,022	29,914	777	631,109
Poultry (\$'000)	89,032	49,099	29,020	14,274	15,069	5,822	1,626	203,942

Land occupied in different districts, 1972-73

For the season 1972-73 the number of rural holdings was 66,890, the area devoted to agriculture 2,729,502 hectares, and the total area occupied 15,771,423 hectares.

It should be noted that statistics in this section of the *Year Book* have been compiled for statistical districts, which are groups of counties, i.e., land areas with immutable boundaries. A map defining the boundary of each statistical district appears on page 421.

The following table shows the land in occupation for agricultural and pastoral purposes in each statistical district for the season 1972-73 :

VICTORIA—LAND IN OCCUPATION FOR AGRICULTURAL AND PASTORAL PURPOSES IN EACH DISTRICT, SEASON 1972-73

Statistical district	Total area of district	Number of holdings	Area occupied				Total
			For agricultural purposes		Pasture sown, grasses, clover, or lucerne	Balance of holdings (b)	
			Crops (a)	Fallow			
	'000 hectares		'000 hectares	'000 hectares	'000 hectares	'000 hectares	
Central	1,645	13,656	82	11	602	333	1,028
North Central	1,186	4,312	30	3	397	391	821
Western	3,551	12,272	130	9	1,878	735	2,752
Wimmera	2,992	5,704	559	267	879	808	2,513
Mallee	4,364	5,789	698	417	503	1,484	3,102
Northern	2,565	11,201	375	87	965	846	2,273
North Eastern	2,922	5,109	42	3	510	900	1,456
Gippsland	3,537	8,847	23	6	721	1,075	1,826
Total	22,762	66,890	1,939	804	6,456	6,573	15,771
PERCENTAGE OF ABOVE TO AREA OCCUPIED							
Central	..	..	7.98	1.07	58.56	32.39	100.00
North Central	..	..	3.65	0.37	48.36	47.62	100.00
Western	..	..	4.72	0.33	68.24	26.71	100.00
Wimmera	..	..	22.24	10.62	34.98	32.15	100.00
Mallee	..	..	22.50	13.44	16.22	47.84	100.00
Northern	..	..	16.50	3.83	42.45	37.22	100.00
North Eastern	..	..	2.89	0.21	35.05	61.86	100.00
Gippsland	..	..	1.26	0.33	39.51	58.90	100.00
Total	..	..	12.29	5.10	40.94	41.68	100.00
PERCENTAGE IN EACH DISTRICT OF TOTAL IN STATE							
Central	7.23	20.42	4.23	1.37	9.33	5.07	6.52
North Central	5.21	6.45	1.55	0.37	6.15	5.95	5.21
Western	15.60	18.35	6.70	1.12	29.09	11.18	17.45
Wimmera	13.14	8.53	28.83	33.25	13.62	12.29	15.94
Mallee	19.17	8.65	36.00	51.93	7.79	22.58	19.67
Northern	11.27	16.75	19.34	10.83	14.95	12.87	14.41
North Eastern	12.84	7.64	2.17	0.37	7.90	13.69	9.23
Gippsland	15.54	13.23	1.19	0.75	11.17	16.36	11.57
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00

(a) Excludes area of clover and grasses cut for hay and seed.

(b) Native grasses and unused and unproductive land.

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, 1959-60, 1965-66, 1968-69, and 1970-71.

VICTORIA—HOLDINGS CLASSIFIED ACCORDING TO SIZE OF HOLDING: NUMBER AND TOTAL AREA OF HOLDINGS

Size of holding (hectares)	1965-66		1968-69		1970-71	
	Number of holdings	Total area of holdings	Number of holdings	Total area of holdings	Number of holdings	Total area of holdings
		hectares		hectares		hectares
0.4- 39.9	21,340	325,816	23,298	333,233	21,462	314,965
40.0- 79.9	12,219	705,236	12,077	702,815	11,787	687,791
80.0- 119.0	6,693	656,895	6,657	653,614	6,646	651,461
120.0- 159.0	5,312	729,968	5,292	727,407	5,157	709,246
160.0- 199.0	3,297	595,057	3,342	602,040	3,298	594,033
200.0- 399.0	11,037	3,155,449	10,754	3,083,437	10,489	3,006,857
400.0- 499.0	3,738	1,782,574	3,811	1,820,385	3,814	1,821,093
500.0- 799.0	2,573	1,722,287	2,662	1,789,029	2,683	1,805,291
800.0-1,199.0	1,599	1,544,762	1,665	1,607,580	1,701	1,643,898
1,200.0-1,999.0	926	1,397,750	972	1,461,989	986	1,487,049
2,000.0 and over	465	2,698,755	526	3,074,455	532	3,038,388
Total	69,199	15,314,549	71,056	15,855,984	68,555	15,760,072

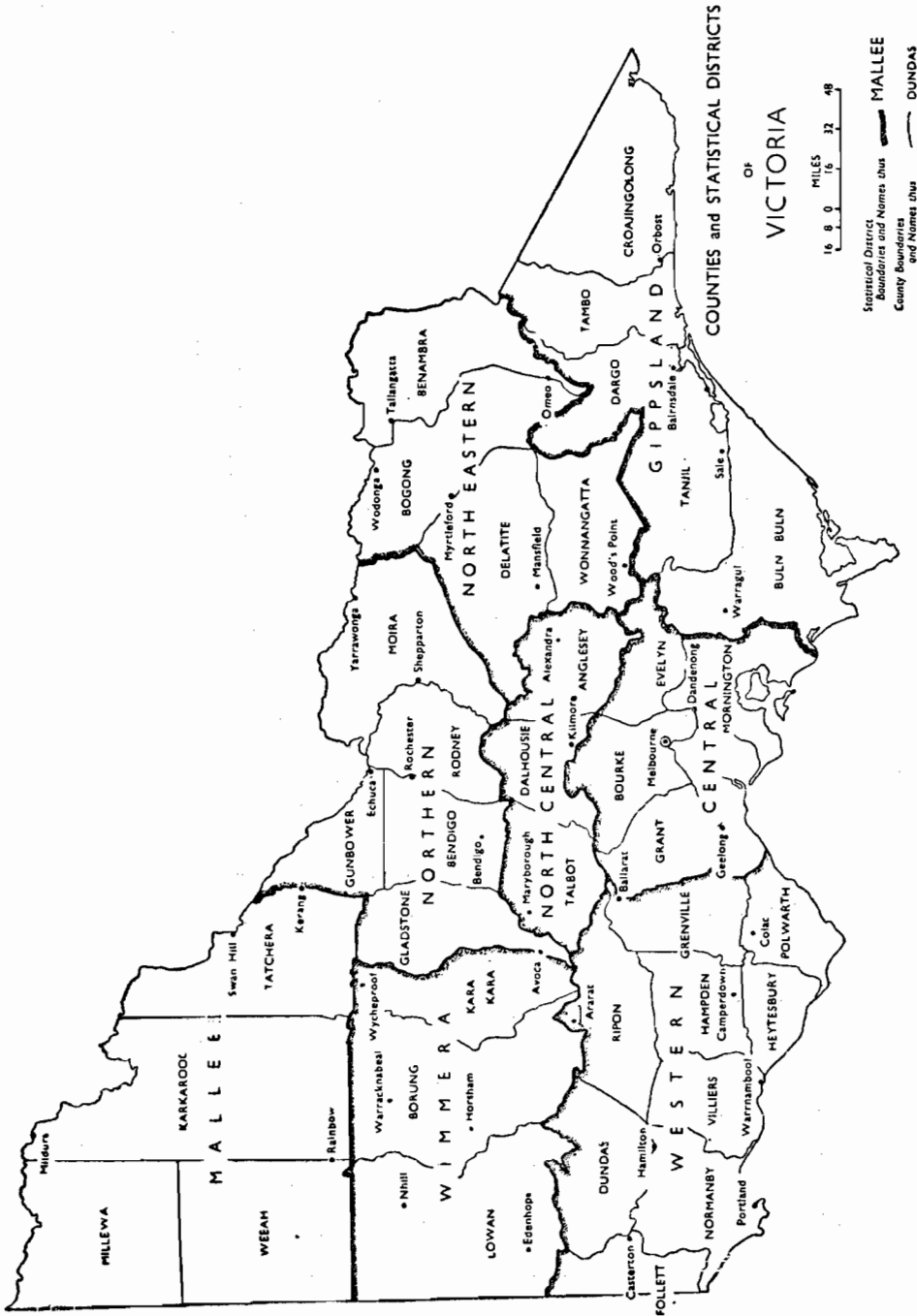


FIGURE 11. Counties and Statistical Districts of Victoria.

The following tables show some of the information, in summary form, from the 1970-71 classification of rural holdings by size and type of activity :

VICTORIA—HOLDINGS CLASSIFIED ACCORDING TO TYPE OF ACTIVITY : NUMBER AND TOTAL AREA OF HOLDINGS, 1970-71

Predominant activity	Number of holdings	Total area of holdings hectares
Sheep—Cereal grain	5,850	3,742,923
Sheep	15,885	7,232,380
Cereal grain	881	338,183
Beef cattle	4,908	1,533,439
Dairying	16,263	1,657,755
Vineyards	1,987	33,181
Fruit (other than vine)	1,815	48,564
Vegetables—		
Potatoes	655	44,251
Other and mixed	999	47,394
Poultry	946	26,599
Pigs	620	41,710
Tobacco	327	37,231
Other	331	15,807
Multi-purpose	463	111,707
Total classified holdings	51,930	14,911,124
Unclassified holdings—		
Sub-commercial	11,506	488,360
Unused, special, etc.	5,119	360,751
Total all holdings	68,555	15,760,235

VICTORIA—NUMBER OF HOLDINGS GROWING WHEAT, AND NUMBER OF HOLDINGS ON WHICH LIVESTOCK WERE DEPASTURED, CLASSIFIED ACCORDING TO SIZE OF HOLDING, 1970-71

Size of holding hectares	Number of holdings with—				
	Wheat	Sheep	Cattle for		Pigs
			Milk production	Beef production	
0.4- 39.9	70	2,541	4,958	8,443	1,461
40.0- 79.9	191	2,670	7,003	7,242	1,170
80.0- 119.0	267	2,322	3,716	4,673	724
120.0- 159.0	586	2,692	2,252	3,697	571
160.0- 199.0	521	2,145	1,205	2,492	361
200.0- 399.0	3,485	8,600	2,681	7,520	1,388
400.0- 499.0	1,835	3,462	827	2,772	557
500.0- 799.0	1,442	2,483	474	1,969	441
800.0-1,199.0	998	1,592	460	1,248	496
1,200.0-1,999.0	604	941			
2,000.0 and over	262	470	85	411	83
Total	10,261	29,918	23,661	41,206	7,252

NOTE. Individual holdings may appear in more than one category.

Superphosphate and fertiliser development

Approximately 80 per cent of the annual tonnage of fertilisers used in Victoria is superphosphate.

James Cuming, who arrived in Victoria in 1862, established the superphosphate industry in Australia. The phosphatic material used in the manufacture of the early superphosphate consisted of bone char, ground bones, and guano, but subsequently rock phosphate was imported from Florida and Tennessee, U.S.A. However, since the First World War, high grade deposits of rock phosphate from Nauru and Ocean and Christmas Islands have provided almost all of the rock phosphate used for superphosphate manufacture in Australia.

Since the 1920s there has been a growing consciousness of the need to topdress pastures with superphosphate for maximum productivity. In 1972-73, 853,545 tonnes of superphosphate were used in Victoria, of which 659,125 tonnes were used on pastures.

Fertiliser developments

Next to phosphorus, nitrogen is the most important nutrient in Victorian agriculture. For many years animal manures supplemented by nitrate of soda and sulphate of ammonia were the only nitrogenous fertilisers available. Production of animal manures is now insignificant, but urea, ammonium nitrate, calcium ammonium nitrate, urea-formaldehyde, and anhydrous ammonia are additions to the list of manufactured fertilisers.

Legislation

Since the Artificial Manures Act was introduced in 1897, the law has required fertilisers to be sold according to a guaranteed analysis. Under the *Fertilizer Act* 1958 manufacturers must register the brands, analyses, and prices of their product with the Department of Agriculture. A list of registrations is published annually in the *Government Gazette*.

In 1972-73 artificial fertilisers were used on 959,095 hectares of wheat; 523,644 hectares of other cereal crops; 21,784 hectares of vegetables; 27,269 hectares of orchards; 32,708 hectares of other crops; and 4,277,125 hectares of pastures. Superphosphate is the main fertiliser used on both crops and pastures and in 1972-73 amounted to 232,485 tonnes of single strength equivalent, or 84 per cent of the total artificial fertiliser used on all crops, and 659,125 tonnes or 84 per cent of that used on pastures.

VICTORIA—ARTIFICIAL FERTILISERS

Year	Crops			Pastures		
	Number of holdings	Area fertilised '000 hectares	Quantity used '000 tonnes	Number of holdings	Area fertilised '000 hectares	Quantity used '000 tonnes
1968-69	n.a.	2,286	321	34,994	3,737	648
1969-70	27,055	2,001	299	35,426	4,212	725
1970-71	24,164	1,529	326	34,668	3,979	695
1971-72	22,147	1,585	237	33,827	3,763	684
1972-73	n.a.	1,565	232	34,274	4,277	782

Artificial fertilisers, 1970; Superphosphate, 1971

Aerial agriculture

Aircraft are used extensively in Victoria for agricultural purposes such as topdressing, and less frequently 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 may be found on pages 494 and 764-5 of the *Victorian Year Book* 1966.

Before 1 January 1967, statistics on aerial agriculture were collected by the Department of Civil Aviation (now part of the Department of Transport), who developed the series in 1956. Since 1 January 1967 these statistics have been compiled from quarterly returns collected by the Australian Bureau of Statistics from operators of aircraft engaged in aerial topdressing, seeding, spraying, and allied activities such as rabbit and dingo baiting.

VICTORIA—AERIAL AGRICULTURE AT 31 MARCH

Particulars	Unit	1969	1970	1971	1972	1973
Total area treated (a)—	'000 hectares	792	946	754	640	659
Topdressed or seeded	'000 hectares	(b)	726	621	489	559
Sprayed or dusted	'000 hectares	(b)	196	96	99	82
Rabbit baiting, etc.	'000 hectares	18	23	38	53	19
Materials used—						
Superphosphate	tonnes	88,625	117,988	92,317	68,515	86,505
Seed	'000 kg	71	45	79	76	66
Aircraft utilisation (flying time)	hours	15,536	20,893	15,294	11,767	15,197

(a) Areas treated with more than one type of material on one operation are counted once only.

(b) Not available for publication.

Farm machinery

The numbers of the selected items of farm machinery on rural holdings at 31 March during each of the five years 1969 to 1973 are given in the following table :

VICTORIA—FARM MACHINERY ON RURAL HOLDINGS AT 31 MARCH

Particulars	1969	1970	1971	1972	1973
Milking machines—Units	112,618	112,012	(a)	108,745	113,335
Shearing machines—Stands	43,393	43,152	(a)	42,876	(a)
Tractors—Wheeled type	79,101	79,188	78,830	79,369	79,449
Crawler type	2,958	3,130	3,071	3,101	3,119
Rotary hoes	12,915	11,646	12,373	12,736	12,229
Fertiliser distributors and broadcasters	30,383	30,036	29,337	28,552	27,829
Grain drills—Combine	20,217	19,919	19,710	20,175	19,999
Other	9,002	8,641	8,395	7,202	6,948
Maize planters	909	877	811	837	790
Headers, strippers, and harvesters	14,179	13,310	13,289	13,068	12,549
Pick-up balers	14,106	14,337	14,692	14,822	14,814
Forage harvesters	2,080	2,108	2,134	2,217	2,211

(a) Not collected.

NOTE. Details of items which have not been collected since 1955 are published in the *Victorian Year Book* 1954-1958, page 88.

Mechanisation of farming, 1962 ; Farm machinery, 1974

Land cultivation

The first Statistical Register of Victoria published in 1854 shows that in 1836 there were 20 hectares of land under cultivation in Victoria.

By 1840 this figure had increased to 1,299 hectares. This progress continued until 1852 when 23,258 hectares were under cultivation. With the discovery of gold, agricultural progress slackened temporarily, the area of land cultivated declining to 14,090 hectares in 1854. However, with population growth came a demand for agricultural products and, by the end of 1860, the area of land under cultivation amounted to 165,007 hectares.

VICTORIA—AREA CULTIVATED ANNUALLY

Period or year (ended March)	Annual average area in each decennium, 1856 to 1965, and actual area each year 1967 to 1973, under—		
	Crop (a)	Fallow	Total cultivation (a)
	hectares	hectares	hectares
1856 to 1865	131,795	4,915	136,710
1866 to 1875	252,673	23,178	275,851
1876 to 1885	528,884	55,658	584,542
1886 to 1895	853,602	147,418	1,001,020
1896 to 1905	1,223,313	212,132	1,435,445
1906 to 1915	1,520,063	516,432	2,036,495
1916 to 1925	1,859,199	749,526	2,608,725
1926 to 1935	2,118,052	1,012,249	3,130,301
1936 to 1945	1,795,017	867,210	2,662,227
1946 to 1955	1,876,089	935,378	2,811,467
1956 to 1965	1,708,718	886,654	2,595,372
1967	2,081,469	1,113,477	3,194,946
1968	(b)2,105,440	(b)1,070,987	(b)3,176,427
1969	2,491,442	1,103,673	3,595,115
1970	2,175,096	706,231	2,881,327
1971	1,698,536	930,910	2,629,446
1972	1,937,207	904,527	2,841,734
1973	1,925,984	803,518	2,729,502

(a) Until 1960 the area of crop included pasture cut for hay and seed. For the decennium 1956 to 1965 and 1961 onwards, area of pasture cut for hay and seed is excluded in the above table.
 (b) Includes 54,864 hectares under crop and 22,587 hectares under fallow resulting from change in coverage referred to on page 418.

Crops and growers

The information below has no relation to the number of rural holdings in the State, as some growers cultivate more than one of the crops specified.

VICTORIA—NUMBER OF GROWERS OF CERTAIN CROPS, SEASON 1972-73

Crops grown	Statistical district								Total
	Central	North Central	Western	Wimmera	Mallee	North-ern	North-Eastern	Gipps-land	
Grain crops—									
Wheat	385	250	650	3,552	2,415	2,860	297	19	10,428
Oats	279	317	1,348	2,291	958	1,859	351	31	7,434
Barley	498	110	471	1,727	1,452	1,222	56	26	5,562
Maize	..	1	1	1	..	1	3	39	46
Rape	48	26	254	49	4	33	26	20	460
Safflower	..	2	3	15	4	6	1	..	31
Sunflower	1	..	6	2	18	76	..	1	104
Other—									
Potatoes	886	251	283	6	10	11	45	231	1,723
Onions	190	..	83	4	30	4	..	2	313
Other vegetables	1,542	266	489	31	344	369	65	354	3,460
Orchards	1,143	96	31	50	975	830	108	35	3,268
Vineyards	23	13	8	9	2,235	140	35	3	2,466
Grass and clover seed	1	36	37	18	7	13	52	2	166
Tobacco	..	..	..	..	..	20	350	..	370

A summary of the area under cultivation and yield of crops in each statistical district of Victoria for the season 1972-73 is given in the following tables :

VICTORIA—AREA UNDER CULTIVATION, SEASON 1972-73
(hectares)

Crop	Statistical district								Total
	Central	North Central	Western	Wimmera	Mallee	Northern	North Eastern	Gippsland	
Grain crops—									
Wheat	10,215	7,013	20,349	359,629	486,337	189,702	13,376	756	1,087,377
Oats	4,599	6,253	42,385	90,956	47,980	55,163	6,950	370	254,656
Barley	22,161	2,323	10,762	78,891	115,455	45,404	1,052	1,037	277,085
Rye	9	10	80	172	2,293	43	8	8	2,615
Maize	2	2	1	1	..	53	3	436	496
Field peas	2,133	193	1,104	806	40	301	9	42	4,628
All hay	54,387	28,990	124,655	40,379	20,242	146,881	32,467	68,678	516,679
Green fodder	8,201	2,661	11,648	4,796	14,904	13,673	6,183	11,213	73,279
Grass, clover, and lucerne for seed	2	1,261	655	913	452	509	1,838	85	5,715
Tobacco	..	..	..	..	..	149	3,919	..	4,068
Potatoes	6,931	2,158	1,850	4	24	199	160	1,794	13,120
Onions	362	..	381	1	96	67	..	15	922
All other vegetables	8,050	59	3,664	18	1,465	2,072	86	1,843	17,258
Vines	74	293	77	379	19,669	404	627	4	21,527
Fruit	6,302	595	128	819	3,566	13,667	559	148	25,784
All other crops	2,536	602	13,716	1,880	962	3,697	1,003	1,210	25,606
Total area under crop	125,962	52,413	231,455	579,644	713,485	471,984	68,240	87,631	(a)2,330,815
Land in fallow	11,156	3,269	9,209	266,689	417,017	86,832	3,057	6,289	803,518
Total area under cultivation	137,118	55,682	240,664	846,333	1,130,502	558,816	71,297	93,921	3,134,333

(a) The total area under crop includes 377,333 hectares of grass and clover cut for hay and 13,402 hectares double-cropped.

VICTORIA—PRODUCTION OF PRINCIPAL CROPS, SEASON 1972-73

Crop	Statistical district								Total
	Central	North Central	Western	Wimmera	Mallee	Northern	North Eastern	Gippsland	
Grain crops—									
Wheat tonnes	13,950	12,618	34,234	578,332	373,202	219,337	16,469	1,161	1,249,303
Oats ..	4,941	8,137	73,029	89,177	11,605	43,288	7,814	236	238,227
Barley ..	29,306	3,214	16,680	69,016	53,871	39,527	997	976	213,587
Maize ..	2	2	(b)	3	..	205	10	1,288	1,506
Field peas ..	2,276	234	1,388	241	1	80	16	(b)	4,236
All hay ..	225,256	118,432	527,062	117,947	48,042	534,228	114,714	289,462	1,975,143
Linseed ..	386	..	4,990	..	17	..	..	78	5,471
Rapeseed ..	500	329	5,431	836	34	541	127	218	8,016
Tobacco ..	..	..	..	..	..	189	5,580	..	5,769
Potatoes ..	146,873	50,569	38,972	64	457	3,969	2,728	43,358	286,990
Onions ..	5,248	..	5,484	7	1,562	1,157	..	150	13,608
Wine made kilolitres	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	24,866
Dried vine fruit—									
Raisins tonnes	..	..	..	..	3,834	..	..	..	3,834
Sultanas ..	..	..	..	..	36,324	..	..	..	36,324
Currants ..	..	..	..	..	2,323	..	..	..	2,323

(a) Details for individual districts are not available for publication.

(b) Crop failure.

Principal crops

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 pages some detailed descriptive and statistical information is given on all main crops grown in Victoria, including those mentioned above.

Wheat

The area sown to wheat in recent years has been more than 1.0 million hectares, which represents approximately half the total area under crop in Victoria. Virtually all the wheat crop is used for grain production, with only about 1 per cent cut for hay. The average annual production for the five years ended 1972-73 was about 1.75 million tonnes of which about 65 per cent is normally exported. Grain yields during these five years averaged about 1.51 tonnes per hectare, although yields as high as 4.00 tonnes per hectare or more are harvested on individual farms in most seasons. The highest yield officially recorded is 5.30 tonnes per hectare from 20.25 hectares grown near Murtoa in 1960. The lowest yield in recent years was recorded in the drought year of 1967-68, when production fell to 0.77 million tonnes at an average yield of 0.59 tonnes per hectare.

Record production occurred in the year following the 1967 drought when an area of just over 1.61 million hectares produced almost 2.47 million tonnes of grain. Similar increases in several other States led to considerable surplus over the requirements for export with the result that quotas on production were introduced. The Wheat Marketing Act, proclaimed on 9 December 1969, implemented in Victoria the Wheat Delivery Quota Scheme proposed by the Australian Wheat Growers' Federation, and provided the administrative machinery decided upon by the Victorian Farmers' Union for the operation of the scheme. Victoria's quotas for the first five years of the scheme were as follows: 1969-70 (1.77 million tonnes), 1970-71 (1.41 million tonnes), 1971-72 (1.55 million tonnes), 1972-73 (1.82 million tonnes), and 1973-74 (2.49 million tonnes).

An amendment to the Wheat Marketing Act in 1972 provided for all wheat supplies in excess of growers' quotas to be treated as quota wheat in special circumstances. Declarations to this effect were made in 1972 when production failed to reach the quota, and again in 1973 when, although the State quota was raised by nearly 30 per cent, individual growers' quotas were slightly reduced because of a very large accumulation of unfilled quotas in previous seasons.

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 varies from about 305 mm in the north-west of Victoria to 500 mm to 750 mm in the eastern and southern regions. About three quarters of the wheat crop is sown on bare fallowed land.

Phosphorus fertiliser is applied to virtually all crops. Zinc is added in the Wimmera District, applications normally being made to each third or fourth wheat crop. Nitrogen fertilisers are used in particular circumstances, namely, on light sandy soils and land infested with skeleton weed in the Mallee and on heavily cropped land in the Wimmera and southern areas. Diseases are not normally a major problem, but heavy losses can occur due to root rot and cereal cyst nematode in some seasons. Ball smut is effectively controlled by pickling with fungicide powder which is done at the same time as the seed 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 cereal crops, and pastures. The use of subterranean clover and medic leys has greatly improved soil fertility, with resultant benefit to wheat yields and quality. Sheep grazed on these, and on native pastures, contribute materially to Victoria's wool and prime lamb production, especially to the production of early prime lambs.

Wheat is grown on three major soil types : Mallee soils referred to as solonised brown soils ; self-mulching grey soils of heavy texture and high fertility in the southern Wimmera ; and 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 limited areas of the hard variety Emblem are sown in the eastern Mallee where wheat with protein content above the Victorian average is usually produced.

VICTORIA—PRINCIPAL VARIETIES OF WHEAT SOWN

Variety in order of popularity, season 1972-73	Season 1970-71		Season 1971-72		Season 1972-73	
	Hectares sown	Percentage of total area sown	Hectares sown	Percentage of total area sown	Hectares sown	Percentage of total area sown
Insignia	269,100	35.0	345,402	32.8	255,154	22.8
Olympic	149,158	19.4	203,240	19.3	238,873	21.4
Summit	86,881	11.3	153,746	14.6	204,206	18.3
Halberd	(a)	(a)	7,371	0.7	137,652	12.3
Heron	86,881	11.3	113,730	10.8	86,396	7.7
Pinnacle	53,051	6.9	66,342	6.3	66,214	5.9
Emblem	35,367	4.6	61,077	5.8	64,659	5.8
Insignia 49	38,443	5.0	67,396	6.4	45,718	4.1
Robin	4,613	0.6	7,371	0.7	5,666	0.5
Sherpa	3,844	0.5	4,212	0.4	3,473	0.3
Falcon	2,307	0.3	4,212	0.4	2,307	0.2
Beacon	3,076	0.4	3,159	0.3	2,049	0.2
All other (incl. mixed and unspecified)	36,136	4.7	15,796	1.5	5,290	0.5
Total	768,857	100.0	1,053,054	100.0	1,117,657	100.0

(a) Included in other.

Almost all the varieties grown in Victoria in recent years have been developed by the Department of Agriculture. One exception is the South Australian variety Halberd, which was introduced into Victoria in 1970, and by 1972-73 occupied 12 per cent of the total Victorian area. Because of its superior yielding ability in the drier areas, Halberd is expected to further increase in popularity. Marked improvement in wheat quality has been achieved by plant breeding during the past 30 years, and the leading soft wheats grown at present have excellent bread making characteristics.

VICTORIA—WHEAT FOR GRAIN

Season	Holdings growing wheat (8 hectares and over)	Area	Production	Average yield per hectare	Gross value	F.a.q. wheat standard
	number	'000 hectares	'000 tonnes	tonnes	\$'000	kg/h.l.
1968-69	11,686	1,612	(a) 2,469	1.53	122,008	81.1
1969-70	11,618	1,335	2,274	1.70	116,747	81.7
1970-71	9,669	760	1,004	1.32	51,127	81.4
1971-72	10,273	1,040	1,797	1.73	96,765	80.4
1972-73	10,002	1,087	1,249	1.15	68,263	82.3

(a) Record production.

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. The greater part of the crop is marketed as one grade known as f.a.q. (fair average quality), although this may require amendment under new stabilisation proposals to Australian standard white. A small amount of the semi-hard wheat grown in the eastern Mallee is segregated for separate sale.

Australian Wheat Board

History

After the outbreak of the Second World War, the Australian Wheat Board was established in September 1939 under national security legislation. When the war ended in 1945 the Board continued to operate until 1948 as an agent for the Australian Government under "transitional legislation".

In 1948 agreement was reached between the Australian and State Governments for the first of the wheat industry stabilisation schemes. For constitutional reasons, it was necessary for each State to pass legislation accepting the Australian Wheat Board as the central marketing authority, and to permit it to operate within the States. Before the outbreak of the war, progress had been made in Australian—State Government Conferences towards a comprehensive stabilisation scheme. The war intervened and full control over the sale of Australian wheat was given to the Board under the exigencies of war-time conditions.

The marketing experience of the Board and the desires of the growers were finally combined in the wheat stabilisation legislation of 1948 and renewed under successive five year schemes. The Australian Wheat Board now functions under the present *Wheat Stabilization Act* 1968. This Act authorises the Board to market all wheat harvested between 1 October 1968 and 30 September 1975 (seven seasons) but limits the application of the revised guaranteed price provisions to wheat harvested between 1 October 1968 and 30 September 1973 (five seasons). This five season plan was extended for the 1973–74 season to give the Australian Government time to review the next five season proposal submitted by the Board. A Wheat Stabilisation Plan to operate beyond 30 September 1974 has been negotiated between the Australian Government and the Australian Wheatgrowers Federation but the appropriate legislation has yet to be passed by the Australian and State Governments.

Constitution

The Board comprises fourteen members, two growers from each of the five mainland States together with the chairman, a finance member, a millers' representative, and an employees' representative.

Functions and operations

Under complementary Australian and State legislation:

1. the Board is the sole authority for the marketing of wheat in Australia and for both wheat and flour for export;
2. growers are required to deliver to the Board all wheat grown by them except that required as seed or feed on the farms where it is grown; and

3. the Board becomes the owner of all wheat delivered to it.

The Board employs various bulk handling authorities and wheat merchant-shippers for the receipt of bagged wheat.

The bulk of local sales of wheat is made to flour millers under agreements which provide for the Board to keep mills stocked with sufficient wheat to meet their trade requirements. The mills account to the Board for all wheat delivered to them. The local trade in wheat for stock and/or poultry feeding is arranged through distributing agents who lodge orders through the Board for their clients' requirements. The local price of wheat f.o.r. (free on rail) ports is a uniform home consumption price in all States established by legislation based on an annual review of the cost of production plus a surcharge to cover the cost of transporting the wheat from the mainland to Tasmania.

Export sales are negotiated by Head Office for all markets except those negotiated by the Australian Wheat Committee in London for the United Kingdom, European countries, and certain other markets in the Middle East. Sales of export flour are made by Head Office where the purchasers are government controlled instrumentalities, but mills and approved exporters are able to negotiate sales to private buyers subject to purchase of the flour from the Board. All export prices are determined by the Board on a competitive basis with other exporting countries, having due regard to the provisions of the International Grains Arrangement to which the Australian Government is a signatory.

Total deliveries by wheat growers to the Victorian branch of the Australian Wheat Board during the 1972-73 season were 1,171,506 tonnes including 42,800 tonnes of southern New South Wales wheat delivered to storages at railway sidings operated by Victorian Railways in New South Wales, and 10,790 tonnes of southern New South Wales wheat delivered to storages in Victoria.

Wheat standard

The fair average quality (f.a.q.) standard is determined 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. The f.a.q. standard was set at 82.3 kg per hectare for 1972-73.

Wheat breeding

The objective of wheat breeding in Victoria is to produce new varieties which will give higher yields of better baking quality grain than existing varieties. Included in the yield objective is the reduction of losses due to drought and various diseases, which include cereal cyst nematode (eelworm), stem rust, leaf rust, septoria, 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. In current breeding programmes, selections are being made from crosses between semi-dwarf and dwarf imported varieties of high yielding ability and established Victorian varieties.

The wheat breeding activities of the Department are centred on the State Research Farm at Werribee and the Victorian Wheat Research

Institute at Horsham where the hybridisation is carried out, the early generations raised, and the initial quality and disease testing done. This work is supplemented by regional selection centres in other wheat growing districts.

Field testing is undertaken in all districts at Departmental research stations and colleges and on farmers' properties. There are about thirty-five centres for varietal testing in Victoria. Disease testing is carried out at research stations in appropriate areas and at the Victorian Plant Research Institute at Burnley. After the early generation quality testing, which is done at the State Research Farm at Werribee and the Victorian Wheat Research Institute at Horsham, final 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 fifty years over forty 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), Olympic (1956), Emblem (1963), Summit (1966), and Zenith (1973). Almost 80 per cent of the wheat area in Victoria is sown to varieties bred by the Department and for some years Insignia has been the most widely grown variety in Australia.

Since 1930 the baking quality of Victorian wheat has improved markedly. This has been due to varietal improvement and improved soil fertility by the use of legume leys with a resultant continuing effect on grain protein content.

Grain Elevators Board of Victoria

In 1934 an Act was passed to provide for the handling of wheat in bulk in Victoria. The Act gave the Victorian Government power to constitute a Board of three members to implement the provisions of the Act. As a result of submissions made by the Board to, and approved by, the Government, 226 country receiving elevators and a 1,100,000 cubic metres capacity shipping terminal at Geelong and storage facilities for 145,000 cubic metres at Portland have been constructed, the necessary finance being obtained from loans totalling \$31,218,000. 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 and first received barley in bulk for the 1963-64 season.

The main shipping terminal is at Geelong where the storage comprises concrete vertical storage bins with a capacity of 285,000 cubic metres and horizontal shed type storage with a capacity of 815,000 cubic metres.

Grain can be received from rail trucks at the rate of 1,600 tonnes per hour and loaded into ships at the rate of 2,000 tonnes per hour.

Ships are loaded at the Board's pier at which there is accommodation for two vessels. At Portland, the shipping rate is 600 tonnes per hour, and the rail truck receipt rate is 500 tonnes per hour.

The Grain Elevators Board has under its control storage for 3.8 million tonnes of wheat and barley. In comparison with the season 1971-72, when the quantity of 1.8 million tonnes of bulk wheat and 270,000 tonnes of

bulk barley were delivered to the Board, the receivals for the 1972-73 season were 1.2 million tonnes of bulk wheat and 92,000 tonnes of bulk barley. Wheat quotas were introduced for the 1969-70 season, Victoria's quota being fixed at 1.77 million tonnes and the balance of the receivals, 566,000 tonnes being over-quota wheat. The Victorian quota for 1972-73 was 1.82 million tonnes.

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 31 October—				
	1969	1970	1971	1972	1973
Revenue—					
Grain handling charges	4,654	5,022	5,506	5,818	5,133
Interest on investments	552	584	649	765	862
Total revenue	5,206	5,606	6,155	6,583	5,995
Expenditure—					
Operating and maintenance expenses	1,651	1,949	2,329	2,568	1,849
Administration expenses	458	505	582	648	667
Depreciation and renewals	573	600	576	589	587
Interest on loans	1,516	1,590	1,638	1,631	1,646
Sinking fund charges	288	292	301	304	306
Appropriations to reserves	720	669	558	973	940
Other	..	..	41	..	..
Total expenditure	5,206	5,605	6,025	6,713	5,995
Net surplus	..	1	130	--130	..
Fixed assets at 31 October	31,823	32,825	31,668	31,839	31,305
Loan indebtedness at 31 October—					
Victorian Government	1,672	1,630	1,598	1,568	1,526
Public	26,572	26,734	27,232	27,164	27,000

Alternative crops to wheat, 1974

Oats

Oats are the second most widely grown crop in Victoria, and in recent years the area of this cereal has averaged about 0.53 million hectares. Nearly 72 per cent of this is normally harvested for grain, some of it after winter grazing. Although oaten hay was important in the past, only about 15 per cent of the area 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 as well prepared as that intended for wheat, production of oats shows greater fluctuations than wheat production. This seasonal variability is particularly marked in the northern parts of Victoria. While the average annual grain production is about 0.45 million tonnes, it has ranged from 0.13 million tonnes in 1967-68 to 0.56 million tonnes in 1966-67.

Over half the oaten grain produced in Victoria is held on farms or 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. Milling quality oats usually

command a higher price 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 No. 1" grade. Oaten grain is sold in an open market through merchants or through the voluntary pool, and prices fluctuate widely according to seasonal conditions and supplies available. The merchants and the pool provide facilities for bulk deliveries at most main centres.

During the past ten years the area cut for hay has fluctuated around 81,000 hectares in normal seasons with an average production of about 340,000 tonnes. About double the normal area was cut for hay during the 1967-68 drought and production increased by about 100,000 tonnes. 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 completely fed-off 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 oaten grain producing areas are in the Mallee, Wimmera, Northern, and Western Districts. The popularity of varieties has undergone marked changes in recent years. For forty years up to 1962 Algerian was the leading oats variety; it was supplanted, in turn, by Orient and Avon. In the 1972-73 season the variety Swan, developed in Western Australia, was the most popular, occupying almost 41 per cent of the total oats area.

The following table shows the area, yield, and gross value of oats for grain for each of the five seasons 1968-69 to 1972-73:

VICTORIA—OATS FOR GRAIN

Season	Area	Production	Average yield per hectare	Gross value
	'000 hectares	'000 tonnes	tonnes	\$'000
1968-69	401	548	1.37	13,029
1969-70	358	470	1.31	10,495
1970-71	399	467	1.17	13,558
1971-72	329	449	1.36	11,334
1972-73	255	238	0.93	8 345

Barley

In 1958-59, 146,500 hectares, a record at that time, were sown to barley, producing approximately 0.20 million tonnes. After that, production declined in the early 1960s and in 1964-65 only 76,000 hectares were sown. However, greatly increased production has been sustained since that time, aided undoubtedly in the late 1960s by the introduction of wheat quotas, when many wheat growers increased their barley sowings at the expense of wheat. In 1972-73, more than 324,000 hectares were sown. About 95 per cent of the barley grown in Victoria is of the two-row or malting type. The remainder is sown with six-row varieties, which are used primarily for stock feed.

Although some barley is grown in all districts, the production has been traditionally 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, barley 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. Weeah, released by the Department of Agriculture in 1968, is the most popular variety sown in this area. Superphosphate is the standard fertiliser applied. Average district yields are about 1.10 tonnes per hectare.

The other important area is in southern Victoria between Melbourne, Geelong, and Bacchus Marsh. Here, barley is the main crop, and the normal practice is to sow it with phosphorus fertiliser on fallowed land. The main varieties in recent years have been Research and Resibee, but Lara, released by the Department of Agriculture in 1971, is now being grown to an increasing extent. Lara has a 12 per cent yield advantage over Research and Resibee, and the malt is superior in quality. Yields are considerably higher than those obtained in the north, the average yield being about 1.8 tonnes per hectare. This region is close to the main barley shipping terminals, and growers' freight costs are much lower than in the northern areas.

The Victorian Grain Elevators Board has provided a bulk handling scheme for barley since 1963. The provision of extra facilities, including special aerated storages at Hopetoun, Rainbow, and Jeparit, and terminal storages at Geelong and Sunshine, with the use of existing elevators on a throughput basis before the wheat harvest, has made it possible for the crop to be handled in bulk in almost all the districts where it is grown. The increased production in 1969-70 exceeded the storage space available, and growers' deliveries were regulated pending disposal of part of the crop.

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. The barley is classified to suit specific purposes on delivery. Classification is, first, on varietal type—Chevalier (Weeah, and similar varieties), Research (Research, Resibee), and Lara, and second, on quality—Malting, Milling (No. 3), and Feed (Nos. 4 and 5). There are price differentials between each grade.

The Victorian malting industry takes most of the malting quality grain for malt for local use and also uses some of the lower grade grain for

VICTORIA—BARLEY PRODUCTION

Season	Area		Production		Average yield per hectare			Gross value \$'000
	2-row	6-row	2-row	6-row	2-row	6-row	Total	
	'000 hectares	'000 hectares	'000 tonnes	'000 tonnes	tonnes	tonnes	tonnes	
1968-69	157	9	190	11	1.21	1.22	1.21	8,868
1969-70	187	10	245	13	1.31	1.30	1.31	11,060
1970-71	259	10	306	12	1.18	1.20	1.18	16,379
1971-72	286	9	382	13	1.34	1.44	1.34	15,689
1972-73	269	9	207	7	0.77	0.78	0.77	11,352

producing malt for export, principally to eastern Asia, the Pacific islands, and Africa. Lower quality barley is used for stock feeding as whole grain and manufacturing in the distilling, pearling, and prepared stock feed industries. Barley surplus to these requirements is exported.

Australian Barley Board, 1974

Maize

Maize is grown in Victoria both for grain and for green fodder and cultivated mainly in Gippsland. Lower values in the late 1960s and other more profitable alternatives in vegetables and livestock led to a substantial decline in the production of maize grain. The area, yield, and gross value of maize for each of the five seasons 1968-69 to 1972-73 are given in the following table :

VICTORIA—MAIZE PRODUCTION

Season	For green fodder	For grain						Av. yield per hectare	Gross value
		Area			Production				
		Hybrid	Other	Total	Hybrid	Other	Total		
hectares	hectares	hectares	hectares	tonnes	tonnes	tonnes	tonnes	\$'000	
1968-69	1,452	429	41	470	1,741	91	1,832	3.90	108
1969-70	985	436	27	463	1,760	67	1,827	3.95	111
1970-71	546	520	15	535	1,546	32	1,578	2.95	101
1971-72	806	370	5	375	1,907	12	1,919	5.12	122
1972-73	1,132	493	3	496	1,490	16	1,506	3.04	96

Rye

Cereal rye is of minor importance in Victoria and is not usually grown as a cash crop. European migrants to Australia have created a small demand for this cereal for human consumption, thus helping to stabilise the market for rye grain. The chief purpose for which rye is grown is the stabilisation 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 1968-69 to 1972-73 :

VICTORIA—RYE PRODUCTION

Season	Area	Production	Average yield per hectare	Gross value
	hectares	tonnes	tonnes	\$'000
1968-69	4,730	1,912	0.40	73
1969-70	4,678	1,551	0.33	58
1970-71	4,992	2,746	0.55	111
1971-72	5,062	2,597	0.51	81
1972-73	2,615	975	0.37	47

Oilseeds

Linseed

For many years linseed has been the major oil producing crop grown in Victoria. Its commercial production, which began in 1947, has increased to over 10,000 hectares in suitable years, with an output in excess of 7,620 tonnes. In wet seasons, however, such as 1963-64, weather and soil conditions seriously cut the intended area. Since 1964, area has fluctuated following

a reduction in demand due to the introduction of synthetic paints and floor coverings. In 1971-72, 3,700 hectares and, in 1972-73, about 6,000 hectares, were sown.

Linseed has proved to be well adapted to broad hectare production over a wide area of mixed farming and pastoral country in the 500 mm to 750 mm rainfall zone in the western part of Victoria. Initially, the industry was developed on imported varieties, and, in the period to 1955, yields were low because these varieties were not fully suited to Victorian conditions and susceptible to disease. Greater stability was given to the industry with the release by the Victorian Department of Agriculture of disease resistant and better adapted varieties.

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 1968-69 to 1972-73 :

VICTORIA—LINSEED PRODUCTION

Season	Area	Production	Average yield per hectare	Gross value
	hectares	tonnes	tonnes	\$'000
1968-69	5,789	5,160	0.89	658
1969-70	7,640	9,502	1.24	1,167
1970-71	6,830	6,472	0.95	763
1971-72	3,694	3,388	0.92	343
1972-73	5,843	5,471	0.94	590

Rapeseed

Rapeseed growing underwent rapid expansion in the late 1960s, mainly because of the introduction of wheat delivery quotas. The area sown to rapeseed increased from 24 hectares in 1967-68 to a peak of 18,600 hectares in 1970-71. After that season the area steadily declined until by 1973-74 only some 5,000 hectares were sown.

Rapeseed contains about 40 per cent of oil, which is mainly used for edible purposes, particularly in blended cooking oils. Rapeseed grows satisfactorily on a wide range of soils, the highest yields being obtained in cool, damp districts. About 60 per cent of the Victorian crop is produced in the Western District. The Northern District is the next most prominent area with 15 per cent of the total crop.

Phosphorus is the major fertiliser element required by rapeseed—the optimum rate of application is similar to that for wheat. The varieties currently being grown in Victoria were produced in Canada but plant breeders and agronomists of the Department of Agriculture are actively engaged in developing varieties that are better suited to Victorian conditions.

Blackleg is a major disease problem of rapeseed, to which all currently grown varieties are susceptible. In years favourable to the disease, large yield losses (up to 40 per cent) have been experienced. At present, there are no effective control methods although sound crop rotation can greatly minimise its incidence.

VICTORIA—RAPESEED PRODUCTION

Season	Area	Production	Average yield per hectare	Gross value
	hectares	tonnes	tonnes	\$'000
1968-69	1,416	510	0.36	55
1969-70	4,367	3,946	0.90	459
1970-71	18,740	16,160	0.86	1,401
1971-72	14,881	12,610	0.85	1,152
1972-73	13,674	8,016	0.59	751

Other oilseeds

Production of other oilseeds has also increased in recent years due to the introduction of wheat quotas and the world-wide shortage of feed grains. Production of the more significant of these other oilseeds is shown below :

VICTORIA—SELECTED OILSEED PRODUCTION

Season	Area	Production	Average yield per hectare	Gross value
	hectares	tonnes	tonnes	\$'000
SAFFLOWER				
1968-69	n.a.	n.a.	n.a.	2
1969-70	n.a.	3	n.a.	3
1970-71	5,071	1,569	0.31	153
1971-72	1,272	722	0.57	70
1972-73	556	328	0.59	34
SUNFLOWER				
1968-69	379	358	0.94	51
1969-70	1,217	918	0.75	90
1970-71	1,422	1,583	1.11	171
1971-72	2,141	2,384	1.11	274
1972-73	2,129	2,046	0.96	261

Tobacco

Flue-cured Virginia tobacco is the only type produced in quantity 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 also 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. This has been 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. Growers are now able to control this disease by implementing fungicidal spray programmes and this is perhaps the main factor in current yield improvement.

The implementation in 1965 of a Tobacco Stabilisation Scheme, whereby a market is guaranteed for the annual sale of up to 12.9 million kg of leaf meeting certain quality standards, has promoted further stability in the industry.

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 substation 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 1968-69 to 1972-73 :

VICTORIA—TOBACCO PRODUCTION

Season	Area	Production	Average yield per hectare	Gross value
	hectares	tonnes (dry)	tonnes (dry)	\$'000
1968-69	3,936	5,477	1.39	13,910
1969-70	4,458	7,038	1.58	15,348
1970-71	4,241	6,902	1.63	16,087
1971-72	3,844	5,765	1.50	14,690
1972-73	4,068	5,769	1.42	13,918

Further reference, 1963 ; Marketing of tobacco, 1969

Fruit

Victoria is a major producer of a wide variety of fruit and almost 48,000 hectares are used for orchards and vineyards. Victoria produces about 75 per cent of Australia's pears and dried sultanas, about 50 per cent of the peaches and cherries, 20 to 25 per cent of navel oranges, apricots, and apples; it is also a large producer of other citrus fruits and grapes. Many fruit and nut crops are grown commercially in Victoria. The three most important districts are : the area within 80 kilometres of Melbourne (fresh market pome, stone, and other tree fruits, and berries), the Goulburn valley (canning fruit), and the Mallee (vine fruit and citrus). Fruit growing within 30 kilometres of Melbourne is declining as a result of housing development.

Most of the fruit growing districts south of the Great Dividing Range receive an annual rainfall of between 600 mm and 900 mm. This rainfall

is fairly evenly spread, but in many areas irrigation is essential from January to March. This water is supplied from natural catchments, rivers, or town supplies. The north-eastern section of the State has a rainfall of from 500 mm to 1,250 mm, but the average rainfall in the Goulburn valley is about 480 mm and in the Mallee only 250 mm. In these districts the 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 by gravity, except for some areas under spray irrigation.

The Australian market is insufficient to support the extensive production of horticultural crops, and the overseas markets are vital for the economic survival of this activity. Dried vine fruits, and canned peaches, pears, and apricots are mostly exported, as are large quantities of fresh apples, pears, and oranges.

Growers maintain a satisfactory level of efficiency by mechanisation to reduce labour costs; high capacity spraying units for pest and disease control, bulk handling of the crop, modern packing shed equipment, the use of fruit thinning sprays and weedicides, and the lighter pruning of apple trees contribute to reduce 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 1968-69 to 1972-73 are given in the following table :

VICTORIA—FRUIT GROWING

Particulars	Unit	1968-69	1969-70	1970-71	1971-72	1972-73
Number of growers		4,197	3,937	3,660	3,388	3,268
Area	hectare	28,975	28,685	26,957	26,851	25,784
Gross value of fruit produced	\$'000	30,804	45,093	46,723	42,107	49,867
Production—						
Apples	bushel	4,857,746	5,330,770	5,078,604	3,628,886	5,081,703
Pears	"	3,419,992	7,043,916	7,061,229	7,145,265	7,211,184
Quinces	"	17,515	22,257	15,346	13,474	11,008
Apricots	"	440,205	574,483	677,143	618,381	589,567
Cherries	"	148,824	141,741	184,709	189,150	199,318
Nectarines	"	33,358	34,502	35,897	42,618	61,198
Peaches	"	2,721,995	2,974,780	2,925,282	2,924,656	3,258,556
Plums	"	124,591	114,003	159,116	142,488	160,859
Prunes	"	12,874	18,416	16,516	15,149	13,251
Lemons and limes	"	215,255	163,930	236,450	229,415	265,119
Oranges—						
Navels	"	527,480	504,589	641,704	679,874	727,507
Valencias	"	808,095	742,038	1,111,198	980,581	1,290,147
Other	"	24,217	33,216	32,870	17,094	20,680
Mandarins	"	81,181	77,752	110,606	118,485	119,887
Grapefruit	"	95,498	111,382	133,805	149,831	152,588
Figs	"	1,049	626	1,840	2,599	2,058
Passionfruit	"	5,532	4,534	3,274	2,269	1,052
Olives	"	23,957	34,595	29,591	37,589	40,296
Gooseberries	kg	19,305	30,939	44,452	36,222	48,163
Loganberries	"	32,564	23,877	57,711	12,599	11,259
Raspberries	"	108,615	165,920	173,236	152,559	136,013
Strawberries	"	1,700,506	1,951,571	1,514,721	1,400,924	1,351,925
Youngberries	"	136,912	243,140	226,832	248,626	261,881
Other berries	"	16,816	42,725	44,300	35,308	23,520
Almonds	"	8,141	15,267	5,170	15,230	3,661
Filberts	"	1,331	2,997	1,724	528	662
Walnuts	"	82,957	67,902	122,663	71,538	46,435
Chestnuts	"	6,468	12,582	18,682	19,605	14,053

Information on the number of trees of each variety is collected annually ; before 1971-72 the collection was triennial. The extent of cultivation of each important class of fruit and nuts grown on commercial holdings during the seasons 1971-72 and 1972-73 is shown in the following table :

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

Fruit and nuts	1971-72			1972-73		
	Bearing	Not bearing	Total	Bearing	Not bearing	Total
			number of trees			
Apples	1,354,119	344,738	1,698,857	1,323,644	282,302	1,605,946
Pears	1,440,261	203,508	1,643,769	1,472,759	160,046	1,632,805
Quinces	3,553	2,657	6,210	3,443	1,738	5,181
Plums	112,864	43,968	156,832	112,016	40,583	152,599
Prunes	15,493	2,437	17,930	10,854	3,545	14,399
Cherries	150,555	58,396	208,951	147,855	48,937	196,792
Peaches	1,089,741	263,593	1,353,334	1,030,293	249,925	1,280,218
Apricots	266,559	59,101	325,660	258,729	48,494	307,223
Nectarines	30,634	20,836	51,470	36,719	18,394	55,113
Oranges—						
Navels	225,640	52,439	278,079	226,197	47,554	273,751
Valencias	324,053	50,370	374,423	330,497	42,541	373,038
Other	5,354	348	5,702	5,099	1,251	6,350
Mandarins	50,151	10,989	61,140	50,587	9,036	59,623
Grapefruit	27,090	17,436	44,526	29,594	20,543	50,137
Lemons and limes	72,639	39,746	112,385	75,557	45,410	120,967
Figs	1,804	845	2,649	2,234	505	2,739
Olives	70,785	20,053	90,838	72,887	23,411	96,298
			hectares			
Passionfruit	20	5	25	14	6	20
Raspberries	52	12	64	50	7	57
Loganberries	5	..	5	4	..	4
Strawberries	162	17	179	151	22	173
Gooseberries	9	8	17	9	7	16
Youngberries	49	8	57	50	4	54
Other berries	8	2	10	7	2	9
			number of trees			
Almonds	8,426	12,108	20,534	7,546	28,398	35,944
Walnuts	4,819	2,076	6,895	5,684	3,476	9,160
Filberts	455	1,553	2,008	1,173	1,700	2,873
Chestnuts	671	2,058	2,729	717	6,260	6,977

(a) Berries and passionfruit collected on an area basis only.

The distribution of the fruit industry over Victoria is set out in the following table, where the number of trees of each kind in each statistical district is given for the season 1972-73 :

VICTORIA—NUMBER OF FRUIT TREES, PLANTS, ETC., SEASON 1972-73

Particulars	Unit	Statistical district								Total
		Central	North Central	Western	Wimmera	Mallee	Northern	North Eastern	Gippsland	
Growers Area	number hectare	1,308	105	33	51	976	833	111	38	3,455
		6,302	595	128	819	3,566	13,667	559	148	25,784
Apples	tree	967,974	102,951	30,290	7,096	11,203	369,178	84,514	32,740	1,605,946
Pears	"	83,446	36,565	465	3,091	1,572	1,506,871	425	370	1,632,805
Peaches	"	139,471	2,347	195	6,422	12,109	1,115,669	2,885	1,120	1,280,218
Apricots	"	11,801	99	232	4,088	82,209	208,201	378	215	307,223
Plums	"	52,441	2,668	27	571	51,751	44,995	110	36	152,599
Prunes	"	605	24	..	1,320	3,908	8,542	..	..	14,399
Cherries	"	165,460	2,470	..	720	1,030	19,673	6,439	1,000	196,792
Quinces	"	2,553	..	..	72	..	2,556	..	..	5,181
Nectarines	"	23,115	589	..	51	22,986	8,099	173	100	55,113
Figs	"	1,439	..	..	20	55	1,225	..	..	2,739
Olives	"	836	377	..	45,769	45,140	1,656	2,470	50	96,298
Oranges	"	200	..	200	..	523,391	128,990	358	..	653,139
Mandarins	"	200	..	..	..	57,244	2,179	..	..	59,623
Grapefruit	"	50	..	..	..	38,976	11,025	86	..	50,137
Lemons and limes	"	43,407	100	..	100	41,365	29,956	646	393	115,967
Passionfruit	hectare	7	..	..	..	(a)	..	6	6	20
Strawberries	"	164	1	2	(a)	(a)	(a)	4	1	173
Raspberries	"	56	(a)	..	..	..	..	..	1	57
Loganberries	"	4	..	..	..	..	..	..	..	4
Gooseberries	"	13	(a)	..	(a)	..	..	..	3	16
Youngberries	"	54	..	..	..	..	..	..	..	54
Other berries	"	8	..	..	..	..	..	..	1	9
Almonds	tree	727	20	..	3,300	26,474	1,647	3,776	..	35,944
Walnuts	"	859	100	..	..	524	739	6,503	435	9,160
Filberts	"	490	1,100	150	..	..	..	1,133	..	2,873
Chestnuts	"	390	80	100	..	..	..	6,107	300	6,977

(a) Less than 1 hectare.

The production of the principal kinds of dried tree fruits for each of the seasons 1968-69 to 1972-73 is shown in the following table. Particulars in respect of dried vine fruits appear on page 442.

VICTORIA—DRIED TREE FRUITS
(kg)

Season	Apricots	Peaches	Pears	Prunes	Others	Total
1968-69	13,532	1,378	4,498	74,801	32	94,241
1969-70	2,144	356		89,962		92,462
1970-71	4,463	317	2,540	43,913	726	51,959
1971-72	10,525	1,572	29,309	64,633	26	106,065
1972-73	18,463	711	18,797	77,796	2,540	118,307

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, besides the first Government Cool Stores at Flinders Street, Melbourne. The Victorian Government also built and operated five other stores situated in the fruit growing districts close to Melbourne. These have gradually been 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. In the last few years, "controlled atmosphere" stored apples have been in strong demand.

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 80 kilometres of Melbourne, with the larger co-operative and proprietary stores, are used 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 to 9 months calls for considerable skill and knowledge. The fruit picked is still alive and 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 overseas 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 or in canned fruit cocktail. Some 19,670 hectares of vines are grown in the Murray River irrigation districts 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 the season 1972-73 amounted to 36,324 tonnes of sultanas, 2,323 tonnes of currants, and 3,834 tonnes of raisins. Approximately 60 per cent of this produce was exported.

During recent years the growing of grapes for table use has expanded rapidly and with some growers has become a specialised industry. The main varieties are Waltham Cross, Purple Cornichon, Ohanez, Sultana, and Muscat Gordo Blanco. Melbourne and Sydney are the main market outlets, and continuing efforts are being made to develop overseas markets.

Grapes are grown specifically for wine production at Rutherglen, Great Western, Avoca, Drumborg, and Nagambie. While the wine growing area around Rutherglen is slowly expanding, the other districts mentioned are expanding more rapidly. Increasing quantities of grapes for wine making are produced in the Murray River irrigation districts. In 1972-73, 24,866 kilolitres of wine were produced.

The Victorian Department of Agriculture has introduced a large number of virus-indexed wine and table grape varieties for testing and evaluation under local conditions and is undertaking the selection of superior clones of established varieties. Research associated with the propagation of dried and other varieties of fruit on nematode resistant and salt tolerant rootstocks has reached an advanced stage.

Particulars of vine production for the five seasons 1968-69 to 1972-73 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
hectares	hectares	tonnes	kilolitres	tonnes	tonnes	tonnes		
1968-69	2,443	18,097	1,720	208,361	28,112	3,630	34,874	2,730
1969-70	2,493	18,473	1,696	343,997	31,934	3,322	64,825	3,438
1970-71	2,487	18,559	2,053	218,452	30,078	3,894	37,342	3,083
1971-72	2,463	18,988	1,805	354,973	35,835	4,854	68,292	3,409
1972-73	2,470	19,947	1,580	212,701	24,866	3,834	36,324	2,323

Growing of grapes for wine, 1964; Dried fruits industry, 1967; Wine, 1968

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, see page 444), worth about \$22m to Victoria, are harvested from about 17,000 hectares.

About half the area under vegetables is within 80 kilometres of 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, for dry edible bean seed, and for seed bean production). These areas are fairly free of frosts and have a well distributed annual rainfall ranging from 500 mm to 875 mm. Vegetables are grown on a wide variety of soils (sand, sandy loam, clay loam, peat, and volcanic). Many vegetable growers use irrigation from town water supplies, storage catchments, streams, and dams to supplement rainfall.

North of the Dividing Range the summer is longer and hotter, but winter frosts are more frequent. Many areas along the lower Murray are ideal for growing early spring crops and efficient transport enables produce to be shipped to both Melbourne and Sydney. In some instances intercropping in orchards and vineyards is practised. Tomato production for processing is largely concentrated in the Goulburn valley but other important production areas are situated along the Murray and Campaspe Rivers and in the Maffra irrigation district in Gippsland.

Returns from vegetable growing can fluctuate greatly according to weather and market conditions, and production methods have to be highly efficient. Market gardens near Melbourne may grow two and sometimes three crops in the one year. While a number of hand operations are still essential, mechanisation and the use of selective weedicides have greatly reduced labour costs. Peas, beans, and onions can be harvested mechanically, and several tomato harvesting machines are now in use; a number of mechanical aids are used for harvesting other crops. New varieties and improved storage and transport techniques have also increased production efficiency.

VICTORIA—VEGETABLES FOR HUMAN CONSUMPTION,
1972-73

Type	Area sown	Production	Gross value
	hectares	tonnes	\$'000
Potatoes	13,120	286,990	16,478
Onions	922	13,608	1,336
Carrots	826	25,954	2,161
Parsnips	194	4,740	757
Beetroot	84	2,143	100
Tomatoes	2,245	53,103	4,503
French beans	1,152	5,154	844
Green peas—			
Sold in pod	651	1,648	565
Processing	6,288	(a)8,386	755
Cabbages	687	18,062	1,444
Cauliflowers	905	31,433	1,976
Brussels sprouts	261	2,112	679
Lettuce	793	12,802	2,013
Pumpkins	915	11,580	683
Other vegetables	2,985	37,935	5,141
Total	32,028	515,650	39,435

(a) Shelled weight.

While most crops reach the consumer as fresh vegetables, an increasing amount of produce is being processed, and a feature of the Victorian industry is the increase in the production of peas, sweet corn, and beans for freezing, and tomatoes for canning and other processing.

Potatoes

Victoria is the largest producer of potatoes in Australia, contributing over one third of the total annual requirement. Potatoes are generally sold as a fresh vegetable, but about 25 per cent of the crop is processed into chips, crisps, and other prepared forms, as well as dehydrated flakes and granules. Generally regarded as a summer crop, potato planting goes on in one district or another for ten months of the year, while harvesting extends over the whole year.

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

About two thirds of the total area of potatoes planted in Victoria is grown under spray irrigation. In most cases the water is derived from farm storages or from bores. Potato growing has become increasingly mechanised, and production has, therefore, tended to pass into the hands of specialist growers having large individual areas.

VICTORIA—POTATO PRODUCTION

Season	Area	Production (a)	Average yield per hectare	Gross value
	hectares	tonnes	tonnes	\$'000
1968-69	16,179	304,774	18.84	10,343
1969-70	16,092	284,039	17.65	17,002
1970-71	14,150	303,900	21.48	20,916
1971-72	13,986	306,707	(b) 21.93	15,002
1972-73	13,120	286,990	21.87	16,478

(a) Includes amounts held on farms for seed, stock feed, etc., as follows: 36,911 tonnes in 1968-69; 30,094 tonnes in 1969-70; 27,332 tonnes in 1970-71; 37,384 tonnes in 1971-72; and 28,098 tonnes in 1972-73.

(b) Record average yield.

Onions

The principal onion growing areas are in the Central and Western Districts. In the season 1972-73 these areas were responsible for 78 per cent of the total onion production of Victoria.

VICTORIA—ONION PRODUCTION

Season	Area	Production	Average yield per hectare	Gross value
	hectares	tonnes	tonnes	\$'000
1968-69	1,471	21,624	14.70	905
1969-70	1,334	21,681	16.25	1,469
1970-71	1,049	17,178	16.38	1,366
1971-72	951	17,492	18.39	1,354
1972-73	922	13,608	14.76	1,336

Onion Marketing Board, 1974

Minor crops

There are other crops cultivated in Victoria in addition to those already mentioned. The most important of these are nursery products, cut flowers, Japanese millet, agricultural seeds, and vegetable seeds.

Pastoral
Livestock

The first great development in Victoria, or as it was then known, the Port Phillip District, was the pastoral interest. Millions of hectares of lightly timbered land lay before 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 came at first from Tasmania and eventually from New South Wales.

According to early statistical records there were 26,000 sheep, 100 cattle, and 57 horses in the Colony on 25 May 1836. On 1 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 1 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 from 1861 to 1961 and the numbers of livestock on rural holdings for each of the five years 1969 to 1973. As from 1957 no allowance has been made for the small number of livestock not on rural holdings.

VICTORIA—LIVESTOCK : NUMBERS (a)
(‘000)

Year	Horses (including foals)	Cattle (b)		Sheep	Pigs
		Dairy	Beef		
1861 at 31 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 1 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 31 March	186	1,489	727	20,012	237
1961 " "	64	1,717	1,147	26,620	319
1969 " "	(c)	1,960	1,918	30,185	422
1970 " "	53	1,975	2,488	33,157	495
1971 " "	(c)	1,974	3,086	33,761	520
1972 " "	(c)	1,927	3,508	29,496	590
1973 " "	(c)	1,957	3,488	24,105	585

(a) A table showing livestock numbers for each year from 1837 to 1971 is published in the *Victorian Year Book* 1973, pages 1090-1.

(b) Separate figures for beef and dairy cattle are not available for years before 1943.

(c) Not collected.

A table showing the sizes of holdings and the numbers of holdings depasturing stock at 31 March 1971 appears on page 422. Dot maps showing the distribution of livestock on rural holdings in Victoria at 31 March 1962 appear on pages 577-80 of the *Victorian Year Book* 1964.

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

Before 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, the detailed statistics of cattle for 1973 set out in the following table are not comparable with those for years prior to 1964.

VICTORIA—DISTRIBUTION OF LIVESTOCK AT 31 MARCH 1973
(‘000)

Particulars	Statistical district								Total
	Central	North Central	West-ern	Wim-mera	Mallee	North-ern	North East-ern	Gipps-land	
Cattle—									
Bulls for service—									
Bulls, 1 year and over—									
Dairy breeds	4	1	8	1	(a)	7	1	8	30
Beef breeds	11	5	22	4	2	10	10	12	76
Bull calves—under 1 year—									
Dairy breeds	2	(a)	3	(a)	(a)	3	1	3	12
Beef breeds	5	2	8	2	1	3	3	3	27
Cows and heifers for milk and cream—									
Cows in milk	123	12	198	5	12	289	37	280	956
Cows—dry	40	6	115	4	3	39	28	83	318
Heifers—1 year and over	44	6	78	3	4	86	17	84	321
Heifer calves—under 1 year	38	5	79	3	4	91	16	85	321
House cows and heifers	3	1	4	3	2	3	2	2	20
Other cattle and calves for meat production—									
Cows and heifers	235	123	509	93	42	200	262	267	1,730
Calves—under 1 year	148	75	259	68	35	162	148	159	1,055
Other	84	44	142	23	11	89	91	115	599
Total cattle	737	281	1,424	208	116	982	616	1,101	5,464
Pigs	78	19	53	78	59	201	47	50	585
Sheep	1,663	2,041	9,544	4,320	1,276	3,028	1,219	1,014	24,105

(a) More than nil but less than 500.

Changing patterns in animal husbandry, 1963

Fodder

Hay

The pattern of hay production in Victoria changed considerably in the 1950s. More complete mechanisation 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 tonnes to over 2 million tonnes during this period. There was also a substantial increase in the amount of lucerne hay conserved. Ensilage made mainly from pasture growth increased from about 25,000 tonnes annually to over 300,000 tonnes in the 1950s, yet it 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 utilisation 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.

VICTORIA—HAY PRODUCTION, 1972-73

Variety	Area	Production	Average yield per hectare
	hectares	tonnes	tonnes
Wheaten	28,053	79,001	2.82
Oaten	105,956	348,266	3.29
Lucerne	45,396	200,539	4.42
Barley and rye	5,218	13,752	2.64
Meadow and other	332,056	1,333,585	4.02
Total	516,679	1,975,143	3.82

Ensilage

Much ensilage is still 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 its simple cutting action and relative cheapness. It consists of swinging blades which rotate at high speed on a horizontal shaft. The crop is thrown into an accompanying trailer or truck for transport to storage. Flail cutting has opened the way to more effective ensilage making and control of the process, because the cut material packs better in storage. This excludes air and so prevents the heating which destroys nutrients and lowers digestibility of the resulting ensilage. Improved storage and feeding techniques are generally leading to more effective use of ensilage than is possible with high wastage open stack methods. Trenches and pits, if suitably sited and well made, provide excellent storage conditions. Stacks with clamp sides or bunkers also give good storage, while plastic sheeting can also be used to exclude air and water and thus reduce waste when properly applied.

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

Statistical district	Ensilage made, 1972-73	Stocks at 31 March 1973	
		Ensilage	Hay
Central	43,417	27,139	306,229
North Central	7,569	10,508	172,570
Western	16,103	38,047	700,819
Wimmera	1,900	9,507	186,923
Mallee	1,433	5,561	59,792
Northern	11,458	22,371	528,813
North Eastern	7,279	17,170	200,305
Gippsland	59,335	27,304	391,972
Total	148,494	157,607	2,547,423

Further references, 1963, 1965-1974; Fodder conservation, 1974

Dairying industry

The dairying industry in Victoria continues to change its structure in response to economic changes and a shift to new markets. Despite withdrawal of the subsidy, formerly \$27m a year, over two years commencing from July 1973, and the loss of the former British market following enlargement of the European Economic Community, an optimistic attitude prevails. In favoured districts as much as \$1,000 a hectare has been paid for dairying land.

Under pressure of high debt servicing costs and prices for farm equipment and supplies, the trend continues towards larger herds on existing farms. In 1972-73 the number of cows milked was over 1.2 million, an increase of 28,551 over the previous year, although the number of licensed dairy farms fell by 449 to 16,765. Of these, 14,409 supply milk for home consumption, while 2,295 send cream to processing factories. Of the milk suppliers, 11,302 have refrigerated bulk milk tanks. This can be seen as evidence of the belief that their farms will continue to be used for dairying, although those farms milking 60 cows or less would almost certainly require an additional source of income.

The trend continues towards fewer but larger dairy manufacturing companies which are able to make a wide range of products either in one large factory or in several plants specialising in different lines of manufacture. In August 1973 general dairy manufacture was under 26 managements. One large co-operative operated 17 factories in Victoria. One other management operated five, three had four factories, two had three factories,

VICTORIA—DAIRYING

Year	Number of cow keepers at 31 March	Number of dairy cows (in milk or dry) at 31 March	Estimated total production of milk for all purposes (year ended 30 June)	Gross value of dairy produce (a) (year ended 30 June)
		'000	'000 litres	\$'000
1969	(b)	1,209	3,715,472	183,895
1970	20,894	1,245	4,028,363	204,682
1971	19,942	1,244	4,062,068	215,412
1972	18,266	1,256	3,973,122	238,190
1973	17,817	1,274	3,944,600	237,670

(a) Includes subsidy.

(b) Not collected.

VICTORIA—BUTTER, CHEESE, CONDENSED AND
POWDERED MILK, AND CASEIN MADE
(⁰⁰⁰ kg)

Year ended 30 June—	Butter (a)	Cheese (a)	Condensed milk	Powdered full-cream milk	Casein
1969	127,101	34,136	42,620	13,884	26,909
1970	142,318	33,506	51,469	12,338	29,006
1971	135,845	35,804	58,637	17,081	25,519
1972	129,897	38,788	64,539	19,496	27,003
1973	128,029	49,001	50,105	25,631	19,359

(a) Small quantities of butter and cheese made on farms are excluded from the above table.

five had two plants, and there were 14 single-factory companies. In addition to these there were 16 small companies licensed to make varieties of cheese other than cheddar. Of the general factories, 21 were in Gippsland, 15 in the Western District, 14 in the northern irrigation area, 7 in the north-east, and 7 elsewhere.

At that date, Gippsland had almost two fifths of Victoria's dairy herd, the northern irrigation area and the Western District each had nearly one quarter, and the remaining milking cows were mainly in the north-east, the central highlands and the outer metropolitan area.

Further reference, 1971; Eradication of tuberculosis, 1962; Sharefarming in the dairying industry, 1967; Milk Board, 1971; Dairying industry, 1974

Pig industry

Victoria is a major pig producing State in Australia. In the past a substantial part of its supplies of pig meat came from other States but as a result of the development of the pig industry in Victoria most of the pig meat consumed in Victoria is now produced in the State.

Australians are relatively large meat eaters but eat much less pig meat than most other nations. Pig meat provides about only 11 per cent of the total meat consumed by Australians. This is due partly to traditional eating habits, and partly to the relative costs of sheep, poultry, and cattle meat, produced on low cost pasture, and pig meat, produced from concentrated foods such as grain. The pig industry was developed largely in conjunction with the dairy industry. Pigs were used to salvage separated milk, buttermilk, and whey, the by-products of butter, cheese, and casein manufacture, and those foods provided the greater part of their diet. In the 1950s and 1960s more milk was used for human food and less was available for pigs. Pig production then became less dependent on milk but more on grain feeding, protein foods, animal by-products such as meat, bone meal, fish meal, and whale solubles. With this change in the major source of food for pigs, the structure of the pig industry changed to fewer but larger pig herds.

Pigs mature early, are prolific, and grow fast. A sow can produce a litter when she is twelve months old, her pigs can be ready for pork when three and a half to four months old, or for bacon when five to six months old, at which time the sow can be producing her second litter. There have been large variations in the annual production of pigs and these caused fluctuations in the prices farmers received for their pigs. The variations in supply are caused more by the rapid production potential of pigs, and the absence of adequate forward information on trends, than by changes in seasonal conditions. In recent years the increased demand for pig meat has resulted in a consistent upward trend in production, with prices remaining fairly stable. For example, between 1966 and 1972, production of pig meat increased by some 60 per cent, which was all consumed by the domestic market. Usually there is ample grain to maintain pig production. There is no scheme to support pig prices in Australia.

In the 1930s and early 1940s Australia exported pig carcasses, mainly to the United Kingdom, where it had a protected market. In 1941 over one third of Australia's pig production was exported. Since then, production and demand have come closer together and only an insignificant part of the country's production is exported. In 1972-73, due mainly to orders from Japan, exports amounted to only 6-7 per cent of production.

Pigs now provide the major part of the income from the farms on which they are kept. More capital and skilled management are involved in the individual units.

The number of pigs in Victoria at 31 March 1973 was 585,227. About 70 per cent of these were held in the Central, Northern, Wimmera, and Mallee districts. The following table shows classifications (in statistical districts) of pigs, together with the numbers of pig keepers :

VICTORIA—PIGS AND PIG KEEPERS AT 31 MARCH 1973

Statistical district	Boars	Breeding sows	All other	Total pigs	Pig keepers
Central	688	8,898	67,981	77,567	557
North Central	229	2,229	16,788	19,246	289
Western	742	7,319	45,400	53,461	787
Wimmera	1,077	9,385	67,065	77,527	1,137
Mallee	833	7,179	51,242	59,254	892
Northern	2,186	24,679	174,142	201,007	1,385
North Eastern	588	5,639	41,058	47,285	543
Gippsland	608	6,577	42,640	49,825	500
Total	6,951	71,905	506,316	585,172	6,090

Sheep breeds

Sheep industry

The first sheep to arrive in Victoria were Tasmanian Saxon Merinos which were brought to the Portland area by Edward Henty in December 1834. In the following year William Furlonge landed Saxon Merinos at Port Phillip, and shared with Henty the distinction of founding the sheep industry in Victoria. Sheep numbers increased rapidly until the early 1840s, due largely to New South Wales pastoralists bringing their flocks southwards and John Batman's Port Phillip Association landing Saxon Merinos from Tasmania. In November 1836 there were only 41,000 sheep in Victoria, increasing to 310,000 by 1838; two years later the sheep population was 782,000. By 1851 Victoria had over six million sheep. At this time most of the available pastoral land had been taken up and was being used for grazing.

Despite periodic droughts, Victorian sheep numbers have shown a steady trend upwards. At the Agricultural Census of 31 March 1973, Victoria had 24 million sheep, which was 17.13 per cent of the total Australian sheep population.

Relative to other States (except Tasmania) the most noticeable feature of Victorian sheep numbers in 1971 was the smaller proportion of Merinos (49 per cent) and the larger proportion of crossbred and comeback sheep (32 per cent) and breeds other than Merino (19 per cent). By comparison the Australian flock consists of Merinos (73 per cent), comebacks and crossbreds (15 per cent), and other recognised breeds (12 per cent). These figures indicate the importance to Victoria of the prime lamb industry, which is largely based on first cross ewes (Border Leicester x Merino) and British breed rams.

Although Victoria has relatively fewer Merinos, they produce the finest quality wool. In particular, wools from the Western District enjoy a world-wide reputation for their colour, style, fineness of spinning count, and their high yielding properties. With the exception of the Mallee and Wimmera and parts of the Northern District, where the South Australian

VICTORIA—GEOGRAPHICAL DISTRIBUTION OF BREEDS OF SHEEP (INCLUDING RAMS) AT 31 MARCH 1971

Breed	Statistical district								Total	Percentage of total sheep
	Central	North Central	Western	Wimmera	Mallee	Northern	North Eastern	Gippsland		
Merino	807,925	1,528,305	5,580,892	4,023,819	1,100,875	1,922,817	827,927	947,258	16,739,818	49.58
Crossbred	958,977	671,363	1,898,216	634,746	1,740,560	1,834,064	687,056	718,838	8,143,820	24.12
Corriedale	358,524	182,736	2,224,281	357,366	79,128	225,090	135,523	154,577	3,717,225	11.01
Merino Comeback	165,913	208,954	1,142,617	140,429	114,125	199,783	119,312	107,910	2,199,043	6.51
Polwarth	150,693	15,918	732,802	9,738	3,167	26,140	61,933	7,661	1,008,052	2.99
Border Leicester	63,990	48,878	129,306	101,831	62,309	137,749	24,954	46,603	615,620	1.82
Dorset Horn	70,169	37,704	103,143	35,567	42,383	122,449	26,793	26,041	464,249	1.38
Romney Marsh	18,142	2,874	368,704	15,513	4,443	3,285	9,739	22,471	445,171	1.32
Poll Dorset	20,445	11,564	28,063	16,386	23,431	35,226	11,648	14,682	161,445	0.48
Southdown	28,110	13,638	52,132	1,184	774	11,734	3,601	22,129	133,302	0.39
Zenith	2,162	1,177	31,452	11,710	146	16,918	7,058	99	70,722	0.21
Ryeland	5,415	928	9,320	283	8	2,080	1,685	2,726	22,445	0.07
Cheviot	1,949	169	5,154	7	132	99	710	1,354	9,574	0.03
Suffolk	438	199	6,120	633	981	32	11	336	8,750	0.02
Perendale	2,257	2	2,540	79	..	64	448	404	5,794	0.02
English Leicester	189	833	1,308	155	6	112	383	1,063	4,049	0.01
All other	630	630	7,662	228	22	1,728	727	781	12,408	0.04
Total	2,655,928	2,725,872	12,323,712	5,349,674	2,172,490	4,539,370	1,919,508	2,074,933	33,761,487	100.00

RURAL INDUSTRY

VICTORIA—GEOGRAPHICAL DISTRIBUTION OF RAMS ACCORDING TO BREED AT 31 MARCH 1971

Breed	Statistical district								Total	Percentage of total rams
	Central	North Central	Western	Wimmera	Mallee	Northern	North Eastern	Gippsland		
Merino	5,601	10,264	66,395	32,403	5,098	12,525	5,370	7,113	144,769	38.13
Dorset Horn	8,130	5,375	13,121	6,011	8,773	21,453	7,817	3,681	74,361	19.58
Corriedale	3,806	2,219	25,375	5,301	767	2,252	1,095	1,856	42,671	11.24
Border Leicester	1,016	2,524	3,357	5,982	5,465	8,910	2,156	1,924	31,334	8.25
Poll Dorset	3,596	2,445	4,379	2,879	4,982	7,289	2,903	2,539	31,012	8.17
Southdown	4,816	2,641	5,362	152	116	2,198	1,176	4,153	20,614	5.43
Polwarth	1,408	383	9,721	73	49	366	625	114	12,739	3.35
Romney Marsh	232	43	7,739	696	19	140	260	523	9,652	2.54
Ryeland	851	291	1,345	53	8	344	668	739	4,299	1.13
Crossbred	234	145	805	119	93	252	189	523	2,360	0.62
Zenith	17	56	410	298	14	211	85	4	1,095	0.29
Merino Comeback	41	19	490	161	56	145	30	73	1,015	0.27
English Leicester	22	171	228	64	6	46	30	150	717	0.19
Cheviot	136	50	274	7	10	44	86	101	708	0.19
Suffolk	55	57	228	33	109	32	11	54	579	0.15
South Suffolk	11	53	268	34	20	89	48	2	525	0.14
Perendale	109	2	88	29	..	4	28	49	309	0.08
All other	64	39	529	22	2	80	104	117	957	0.25
Total	30,145	26,777	140,114	54,317	25,587	56,380	22,681	23,715	379,716	100.00

types of Merino are more numerous, a majority of Merinos found in Victoria are fine-woolled and medium-woolled types.

In 1971 Corriedales comprised 11 per cent of the sheep population of Victoria. The breed is noted for its production of high quality, fine crossbred wool, and its meat producing ability. The breed originated in 1874 in New Zealand. However, it was not until 1882 when Henry Corbett mated Merino rams to Lincoln ewes, and fixed this "half-bred" type, that the breed was established in Australia. Corriedales are found throughout most of Victoria with a heavier concentration in the Western District.

Like the Corriedale, the Polwarth is regarded as a dual-purpose animal and is based on Lincoln ($\frac{1}{4}$) and Merino ($\frac{3}{4}$) blood lines. The breed was developed in Victoria for those areas which were believed to be too wet and cold for Merino wool growing. It comprised 3 per cent of the total sheep numbers in 1971 and is concentrated in the southern parts of the Western District, the Central District, and the North Eastern District.

The main British breeds of sheep in Victoria are the Romney Marsh, Border Leicester, Dorset Horn, Poll Dorset, and Southdown. Romney Marsh and Border Leicester rams are often joined with Merino ewes to produce prime lamb dams. Southdown, Dorset Horn, and Poll Dorset rams are the most important sires for prime lamb production.

VICTORIA—BREEDS OF SHEEP (INCLUDING RAMS) AT 31 MARCH (a)

Breed	1968		1970		1971	
	Number	Percentage of total	Number	Percentage of total	Number	Percentage of total
Merino	12,810,165	45.90	16,217,856	48.91	16,739,818	49.58
Corriedale	4,081,828	14.63	3,560,181	10.74	3,717,225	11.01
Merino Comeback	1,584,194	5.67	1,970,247	5.94	2,199,043	6.51
Polwarth	981,631	3.52	999,322	3.01	1,008,052	2.99
Border Leicester	509,229	1.82	570,155	1.72	615,620	1.82
Dorset Horn	409,774	1.47	380,334	1.15	464,249	1.38
Romney Marsh	597,952	2.14	432,712	1.31	445,171	1.32
Poll Dorset	106,562	0.38	119,481	0.36	161,445	0.48
Southdown	108,508	0.39	110,583	0.33	133,302	0.39
Zenith	56,493	0.20	63,179	0.20	70,722	0.21
Ryeland	18,816	0.07	18,832	0.06	22,445	0.07
Cheviot	10,152	0.04	8,465	0.02	9,574	0.03
Suffolk	4,365	0.02	3,543	0.01	8,750	0.02
Lincoln	6,881	0.02	4,953	0.01	7,284	0.02
English Leicester	8,144	0.03	7,028	0.02	4,049	0.01
Other (including crossbreds and unspecified)	6,614,060	23.70	8,689,959	26.21	8,154,738	24.16
Total	27,908,754	100.00	33,156,830	100.00	33,761,487	100.00

(a) Not collected in 1969, 1972, or 1973.

The numbers of each of the breeds are continually changing as a result of seasonal conditions throughout the State and the relative prices of wool, meat, and cereal grains. In a poor season sheep numbers may decrease as a result of lower lambing percentages and increased slaughtering of "fat" stock. There is often a large seasonal variation in sheep numbers because of movement of fat and store sheep between Victoria and New South Wales and South Australia.

The numbers of sheep in Victoria in selected years since 1861 are shown in the table on page 445. The distribution of all livestock is shown in the table on page 446. The increase in sheep numbers in recent years has been due to pasture improvement and intensification of stocking rates on established improved pastures.

However, factors such as seasonal conditions, prices of wool, mutton, lamb, and to a lesser degree, wheat, affect the number of sheep in Victoria in any given year. In an adverse season flocks may be reduced by 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 1968-69 to 1972-73 :

VICTORIA—LAMBING

Season	Ewes intended for mating	Ewes actually mated	Lambs marked	Proportion of lambs marked to ewes mated
	'000	'000	'000	per cent
1968-69	11,797	11,557	9,255	80
1969-70	14,037	13,910	12,266	88
1970-71	14,830	14,841	12,724	86
1971-72	14,511	13,774	11,583	84
1972-73	12,389	10,840	9,003	83

Sheep and lambs in statistical districts

The following table sets out on a statistical district basis the numbers of ewes mated or intended to be mated for the 1973 lambing season classified according to whether the progeny is intended for wool or fat lamb production :

VICTORIA—LAMBING FORECAST: EWES MATED OR INTENDED TO BE MATED FOR LAMBING DURING 1973 SEASON (As advised by farmers at 31 March 1973) (‘000)

Statistical district	Breed of ram used—				Total
	Merino	Corriedale or Polwarth	Shortwool breeds	Longwool breeds	
Central	173	131	391	55	751
North Central	313	72	324	83	792
Western	1,687	993	900	352	3,932
Wimmera	997	127	418	173	1,716
Mallee	136	31	507	110	784
Northern	384	75	941	234	1,634
North Eastern	170	41	350	62	624
Gippsland	192	42	232	53	519
Total	4,052	1,513	4,063	1,123	10,751

The following table sets out the number of rams, ewes, wethers, and lambs depastured in each statistical district of Victoria at 31 March 1973 :

VICTORIA—SHEEP AND LAMBS IN EACH STATISTICAL DISTRICT AT
31 MARCH 1973
(’000)

Particulars	Statistical district								Total
	Central	North Central	Western	Wimmera	Mallee	Northern	North Eastern	Gippsland	
Rams	23	25	123	50	21	46	19	16	322
Ewes	877	934	4,815	2,107	836	1,780	699	610	12,659
Wethers	382	720	2,526	1,298	115	573	293	232	6,139
Lambs	380	362	2,080	865	305	629	208	156	4,985
Total sheep and lambs	1,663	2,041	9,544	4,320	1,276	3,028	1,219	1,014	24,105

Production of wool

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

VICTORIA—SHEEP AND LAMBS SHORN, SEASON 1972-73

Statistical district	Shorn		Wool clipped (including crutchings)		Average	
	Sheep	Lambs	Sheep's	Lambs'	Per sheep	Per lamb
	'000	'000	'000 kg	'000 kg	kg	kg
Central	1,816	508	7,914	622	4.36	1.22
North Central	2,351	472	10,577	561	4.50	1.19
Western	10,649	2,464	45,992	3,039	4.32	1.23
Wimmera	4,818	1,030	22,529	1,280	4.68	1.24
Mallee	1,420	400	6,882	548	4.85	1.37
Northern	3,527	938	16,586	1,195	4.70	1.27
North Eastern	1,484	289	6,136	318	4.13	1.10
Gippsland	1,202	245	4,604	292	3.83	1.19
Total	27,267	6,346	121,220	7,855	4.45	1.24

VICTORIA—SHEEP SHORN AND WOOL CLIPPED

Season	Shorn		Wool clipped (including crutchings)		Average	
	Sheep	Lambs	Sheep's	Lambs'	Per sheep	Per lamb
	'000	'000	'000 kg	'000 kg	kg	kg
1968-69	28,653	6,227	127,239	8,378	4.44	1.35
1969-70	30,646	8,546	148,249	11,745	4.84	1.37
1970-71	32,363	8,390	151,673	11,623	4.69	1.39
1971-72	31,316	7,502	141,434	10,247	4.52	1.37
1972-73	27,267	6,346	121,220	7,855	4.45	1.24

VICTORIA—WOOL PRODUCTION AND VALUE

Season	Clip	Stripped from and exported on skins, etc. (greasy)	Total quantity (greasy)	Gross value	Average price per kg
1968-69	135,616	31,462	167,078	155,547	93.10
1969-70	159,994	36,219	196,213	154,693	78.84
1970-71(a)	163,296	37,991	201,287	118,123	58.68
1971-72(a)	151,683	45,831	197,514	134,513	68.10
1972-73(a)	129,075	43,248	172,323	(b)254,434	147.65

(a) Excluding support payment of 0.51 cents per kilogram for 1970-71, 0.81 cents per kilogram for 1971-72, and 0.69 cents for 1972-73.

(b) Excludes estimated value of skins of non-Victorian origin exported from Victoria.

Australian Wool Corporation

In 1972 the Australian Wool Industry Conference recommended to the Australian Government that the activities of the Australian Wool Board and the Australian Wool Commission be amalgamated. On 1 January 1973 the Australian Wool Corporation was established, bringing the activities of the Board and the Commission under one body. There are two divisions within the Corporation: the General and Product Operations Division which continues the promotion and development work of the Wool Board, and the Fibre Marketing Division which continues the raw wool marketing activities, including the reserve price scheme, of the former Wool Commission. The Australian Wool Corporation has a full-time chairman and eight Corporation members, comprising four woolgrower representatives, three persons with special qualifications, and one government representative.

Wool growing districts, 1962, 1967; Wool marketing, 1963; History of pastoral industry, 1963

Beef cattle industry

Southern Australia had no indigenous beef cattle population, cattle being brought by the first settlers. These early introductions were poor stock from Africa intended to meet the needs of draught, milk, and meat. They were, however, quickly replaced by herds of the beef cattle breeds imported from Britain. Though in its early years the beef cattle industry faced many natural hazards including drought, disease, and pests, changing economic conditions and patterns of land-use have been most important in determining the size and distribution of the beef cattle population. Refrigeration, pasture improvement, the relative prices received for other primary products, and the development of overseas markets for beef meat have all been important factors.

Refrigeration allowed the export of carcass beef and with an expanded market Victoria's beef cattle population reached more than one million head in the years 1890 to 1900. Not until the late 1950s was this level again reached. Refrigeration also made the export of butter possible and, dairying being a more profitable form of land-use, little time was wasted in subdividing the large beef cattle runs into smaller dairy farms. Pasture improvement, begun in the early 1920s, accelerated during the 1950s and has been the major factor contributing to increased livestock numbers. Both the numbers of sheep and the numbers of beef cattle responded to the improvement of pastures but wool production was generally a more profitable form of land-use than beef production. However, in the late 1950s, the strong demand for manufacturing type beef for the United States market, the assured demand from the United Kingdom under the terms of an agreement, and an increased demand from an increasing local population, led to further development of the beef cattle industry. Victoria's beef production rose to a peak level in the mid-1960s and then fell again.

Continuing high prices for beef meat and marketing difficulties in the sheep, dairy, and wheat industries encouraged farmers to withhold stock from slaughter in order to build up breeding herds. As a result, from 1968 to 1972, beef cattle numbers in Victoria rose from 1.5 million to 3.5 million. With 2.0 million dairy cattle, total cattle numbers were 5.5 million in 1972. More than 60 per cent of farms run a herd of cattle for meat

production, although the majority of herds are small. On most of these farms the beef enterprise is associated with other enterprises including sheep production, dairying, and cropping.

The Victorian environment is very favourable for beef production with cattle able to graze pasture throughout the year. Levels of reproductive performance are high, growth rates of slaughter animals are high, and animals can be sold for slaughter at a young age. Turn-off of slaughter animals from breeding herds is therefore high. In the early 1970s beef production again increased rapidly and in 1972-73 reached a record level of over 400,000 tonnes. In that year Victoria was the major beef producing State, responsible for 30 per cent of Australian production.

More beef from Victoria is being sold on overseas markets. In 1972-73, 58 per cent of production was exported. The most important overseas market is the United States of America which takes lean, boneless cuts of beef suitable for manufacturing purposes. Japan is increasing in importance as an export market, taking chilled cuts of beef for table purposes as well as beef suitable for manufacturing. Other important markets are Canada, the United Kingdom, and Europe.

A table showing the sizes of holdings and the numbers of holdings depasturing stock at 31 March 1971 appears on page 422. Historical figures are set out on page 445, while a table showing distribution of livestock at 31 March 1973 appears on page 446.

The following table shows the number of slaughtering establishments and details of the stock slaughtered in Victoria during each of the five years 1968-69 to 1972-73 :

VICTORIA—STOCK SLAUGHTERED IN ESTABLISHMENTS
AND ON FARMS AND STATIONS
(‘000)

Particulars	1968-69	1969-70	1970-71	1971-72	1972-73(a)
Sheep	5,853	8,209	8,554	11,954	7,856
Lambs	7,040	7,570	7,880	8,129	6,673
Bulls and bullocks	256	385	725	811	1,015
Cows	418	458	657	705	880
Young cattle	348	413	(b)	(b)	(b)
Calves—Bobby	{ 510	465	402	492	573
Other	{ 31	30	62	66	92
Pigs	772	897	941	1,051	1,210
Number of slaughtering establishments	251	230	221	235	245

(a) Average dressed weights per carcass during 1972-73 were : sheep 20.26 kg, lambs 15.73 kg, bulls, bullocks, and steers 233.86 kg, cows and heifers 181.48 kg, bobby calves 17.89 kg, other calves 99.45 kg, and pigs 49.98 kg.

(b) A change in the collection form in July 1970 resulted in the elimination of "young cattle" which have been absorbed by "bulls, bullocks, and steers", "cows and heifers", and "other calves".

Frozen meat exported, 1969 ; Australian Meat Board, 1971 ; Meat industry, 1974

Egg industry

The trend in the Victorian egg industry is towards large specialised farms—egg producers, hatcheries, and pullet growers—utilising modern poultry housing, equipment, and labour saving machinery.

The greater proportion of the State's estimated 4.5 million adult female fowls are now part of the commercial egg industry. There are, however, small household flocks in country areas. The main areas of

PRIMARY PRODUCTION BY STATE, 1972-73

Number of dairy cattle

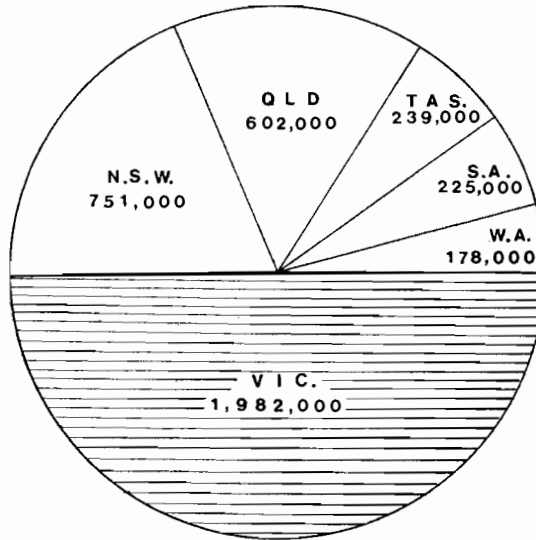


FIGURE 12. Australia—number of dairy cattle, 1972-73.

Gross value excluding mining (\$ m)

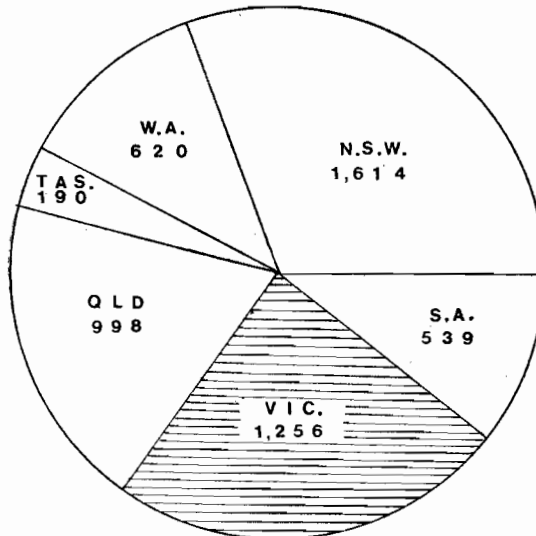


FIGURE 13. Australia—gross value of primary production, excluding mining, 1972-73.

PRIMARY PRODUCTION BY STATE, 1972-73

Number of beef cattle (thousands)

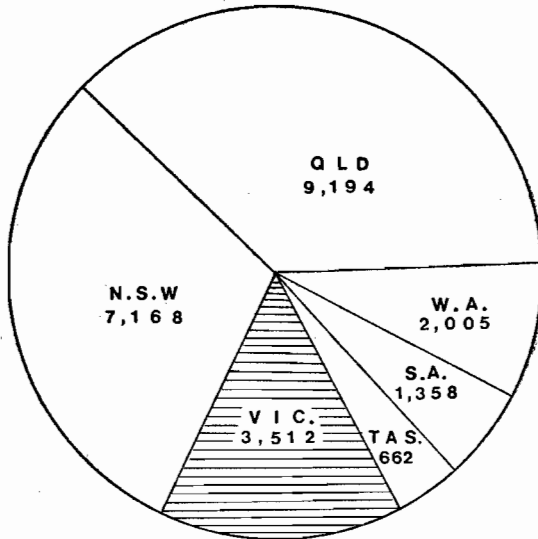


FIGURE 14. Australia—number of beef cattle, 1972-73.

Number of sheep (thousands)

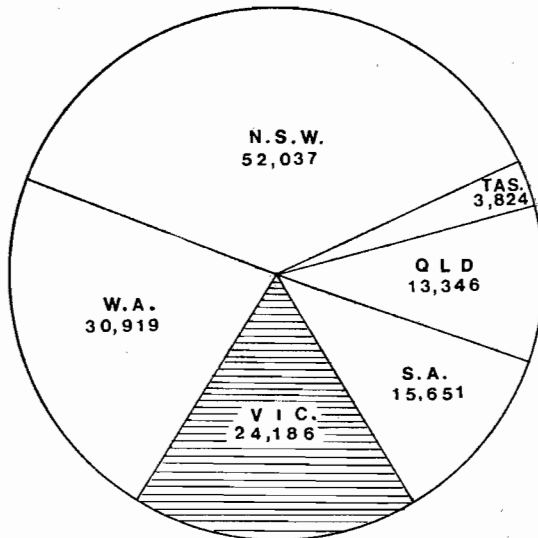


FIGURE 15. Australia—number of sheep, 1972-73.

commercial production are centred on the outskirts of the Melbourne metropolitan area and in the Bendigo district, with large centres around Ballarat and Geelong, and substantial populations in the Wimmera, Goulburn valley, and north-east.

One-man or one-family farms usually manage 5,000 to 10,000 layers. There are, however, many larger farms employing labour with up to 30,000 layers, and a few much larger farms.

Housing is planned on the intensive principle, with deep litter pens or multiple bird cage units. Most of the new housing is on the laying cage system. A small proportion of layers is kept in fully enclosed, windowless houses under a fully controlled environment. Artificial lighting is used on almost all commercial egg farms to stimulate egg production. Feeding is based on grains (wheat, oats, and barley) and their by-products (bran and pollard). Meatmeal is the major protein supplement. Wide ranges of commercial, ready-mixed poultry rations are also available.

Laying stock consists mainly of a specially produced crossbred between the White Leghorn and Australorp breeds. The average State egg production is estimated at approximately 216 eggs per bird per year. Commercial stock of the local breeding farms and hatcheries is tested for profitability at the Department of Agriculture's Random Sample Laying Test at Burnley. Chicks are hatched continuously throughout the year with an emphasis on the June–November period. Hatcheries are large and use modern incubators from 5,000 to 90,000 egg capacity. Most commercial egg-type chicks are sexed when a day old by machine or hand methods and the cockerels discarded. The main power source used in the brooding of chicks is electricity, but gas brooders and hot water brooders fired by oil burners are also used.

VICTORIA—HEN EGGS SET AND CHICKENS HATCHED
(‘000)

Period	Hen eggs set (a)	Chicks hatched (b) intended to be raised for—				Total hatched
		Meat production	Egg production	Breeding		
				Pullets	Cockerels	
MEAT STRAINS						
1968–69	20,120	15,546	(c)	..	..	15,546
1969–70	21,945	17,334	(c)	..	..	17,334
1970–71	29,400	22,104	(c)	n.a.	n.a.	(e)22,104
1971–72	35,097	26,951	(c)	n.a.	n.a.	(e)26,951
1972–73	36,487	27,746	(c)	n.a.	n.a.	(e)27,746
EGG STRAINS (d)						
1968–69	13,104	880	4,455	184	26	5,545
1969–70	14,439	1,464	4,977	211	30	6,683
1970–71	15,342	1,096	5,349	(e) 132	(e) 23	(e) 6,601
1971–72	14,251	431	4,861	153	21	5,466
1972–73	14,354	489	4,875	146	14	5,524

(a) Includes eggs which failed to hatch.

(b) Excludes chicks destroyed.

(c) Not applicable.

(d) Egg strain chicks reported as "unsexed" have been allocated half to chicks for meat production and half to chicks for egg production. The number so reported was 223,321 in 1968–69; 172,222 in 1969–70; 93,031 in 1970–71; 99,462 in 1971–72; and 81,875 in 1972–73.

(e) Incomplete.

The marketing of eggs is controlled by the Victorian Egg and Egg Pulp Marketing Board. Flocks with over twenty adult female fowls come within the Board's jurisdiction, and owners of flocks with over forty adult female fowls are required to market their eggs through the Board. Victoria produces a surplus of eggs which is exported through the Australian Egg Board.

Advisory and research services to the egg industry are provided by the Department of Agriculture, commercial firms concerned with the sale of feed, chicken drugs, and equipment, and the University of Melbourne. **Egg marketing, 1972, 1974**

Broiler industry

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

It now takes approximately 1.0 kg of poultry feed to produce 0.5 kg of poultry meat, and a 2 kg chicken is grown in ten 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, all conducive to fast growth.

The organisation of the broiler industry as 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.

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

Broiler houses are fully enclosed; each house grows a "crop" of about 10,000 to 30,000 broilers, about four times a year. A one-man or one-family farm raises approximately 120,000 to 200,000 birds a year. Growers are usually contracted to supply large broiler organisations which hatch and supply the specially bred meat chickens and receive broilers back for processing and distribution.

The following statistics have been compiled from statistical returns submitted by all known Victorian hatchers and all poultry slaughterers slaughtering more than 1,000 birds annually. It is considered that they give a high level of coverage of chicken hatchings and poultry slaughterings in Victoria.

**VICTORIA—POULTRY SLAUGHTERED
FOR HUMAN CONSUMPTION
(‘000)**

Period	Chickens (i.e., broilers, fryers, or roasters)	Hens and stags	Ducks and drakes
1968-69	13,832	1,326	272
1969-70	16,562	1,643	246
1970-71	19,854	1,908	283
1971-72	23,347	2,140	322
1972-73	23,101	1,919	219

**DRESSED WEIGHT OF POULTRY SLAUGHTERED (a),
AND INTENDED FOR SALE (b)
(‘000 kg)**

	Fresh	Frozen	Fresh	Frozen	Fresh	Frozen
1968-69	9,549	8,343	1,720	397	370	86
1969-70	12,134	8,305	1,997	645	355	44
1970-71	15,900	9,301	2,178	915	354	107
1971-72	19,788	10,337	2,519	967	367	123
1972-73	20,297	8,025	2,519	525	269	58

(a) Dressed weight of whole birds, pieces, and giblets as reported by producers.
(b) Fresh: Sold immediately after slaughter or chilled for sale soon after.
Frozen: Frozen hard for storage of indefinite duration.

Honey industry

Victoria ranks second among the States in apicultural activity. Eucalyptus species provide the bulk of the honey crop—up to 90 per cent of the total—with the balance being derived from ground flora such as clovers, lucerne, and Patterson’s Curse. The industry therefore adds considerably to the value of forest production in Victoria.

The most sought after eucalypt honeys are produced in the yellow box-ironbark areas of central and western Victoria, and the red gum stands on the Murray valley, northern rivers, and Western District. Yellow box is distributed widely over Victoria. The mallees are being used to an increasing extent where water supply and access can be obtained.

In 1972-73 there were 1,342 apiarists in Victoria owning five or more hives; they produce an average of 3.1 million kilograms of honey per annum. Colony yields, by world standards, are very good and range from 40 kilograms up to 90 kilograms. The larger commercial enterprises range up to 90 kilograms per hive per year or better.

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 farmlands. Hives, trucks, and plant have been designed and modified to suit the requirements of mobility demanded by the industry. The technological perfection of road transport has enabled a trend towards central plants to develop. Under this system the bees are still migrated and robbed at the apiary site, but the honey extraction is done at or near the beekeeper’s home.

Pollination of agricultural and horticultural crops is another aspect of the industry which is of importance to the economy and the community. Many fruit and seed crops require, or are benefited by, the activities of honey bees, and at times thousands of colonies of bees have been hired out for pollination. However, the development and increasing use of the newer

insecticides has caused grave concern among apiarists, most of whom are no longer prepared to lease their colonies for pollination following heavy losses of bees from pesticide applications. Many problems exist in this field and their ultimate solution seems to be through the development of a policy of co-operation and co-ordination by both growers and apiarists.

Hive products other than honey and beeswax have come into prominence in recent years. Bee-collected pollen is now in demand through health food stores for human consumption. It is also finding a place in cosmetic manufacture. Pollen production was previously left to the amateur beekeeper but increasing interest is now being shown by some of the larger commercial operators. Outlets for this product are now available on both domestic and export markets.

Propolis, a resinous material collected and used by bees, has aroused considerable interest, especially in Europe, as an antiseptic material and now the industry is showing some interest in testing out the market prospects for this product.

Marketing has always been difficult for the industry. With exports comprising some 40 to 60 per cent of production, world supply and demand exercise a strong influence on prices. The Australian Honey Board was established under Australian Government legislation in 1962 to regulate the export of honey from Australia. Minimum export prices are fixed by the Board and finance is made available to hold stocks of honey off the market during times of glut and unprofitable prices. Finance is derived from a levy on domestic consumption and it is now proposed to introduce a smaller levy on export honey. The Board also provides finance for promotion and research.

State interest in the industry is authorised by the *Bees Act* 1971 and extends to disease control, advisory services, research into problems of the industry, and hygiene in the production and processing of honey. A compensation scheme is now in operation to alleviate economic losses suffered by apiarists because of bee diseases. An Apicultural Research Unit operates on the Scoresby Horticultural Research Station.

Particulars relating to apiculture for the five years 1969 to 1973 are given in the following table. Since 1958 beekeepers with less than five registered hives have been excluded from the collection.

VICTORIA—BEE HIVES, HONEY, AND BEESWAX

Season ended 31 May—	Beekeepers	Hives	Production		Gross value	
			Honey	Beeswax	Honey	Beeswax
	number	number	tonnes	tonnes	\$'000	\$'000
1969	1,240	99,953	1,650	23	520	37
1970	1,256	102,100	3,729	47	800	65
1971	1,278	103,454	4,447	55	984	68
1972	1,321	105,709	2,170	24	793	32
1973	1,342	104,235	3,769	50	2,077	65

VALUE OF PRODUCTION

The value of primary production, excluding mining, as estimated in the following tables is based to a large extent on returns received annually from individual producers throughout Victoria. A detailed account of the period covered for individual rural industries is given on page 418. Statistics for the non-rural industries refer to the year ended 30 June.

Gross value of production

Gross value is defined as the value placed on recorded production at the wholesale price realised 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, etc., is included in manufacturing production value of production statistics.

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

Industry	1968-69	1969-70	1970-71	1971-72	1972-73
Agriculture (a)	331,715	314,647	262,475	299,177	282,696
Pastoral	345,275	385,025	354,607	394,451	607,812
Dairying (b)	201,595	225,614	239,626	262,507	263,161
Poultry and bees	47,377	49,325	48,849	49,659	51,241
Trapping	3,623	3,078	1,749	2,406	3,225
Forestry	28,343	25,611	34,687	35,854	36,792
Fisheries	5,933	5,979	7,310	9,507	11,471
Total gross value	963,861	1,009,279	949,303	1,053,561	1,256,398

(a) Includes net payouts: 1970-71, \$130,278; 1971-72, \$455,939; and 1972-73, \$186,297, from the Apples and Pears Stabilization Fund.

(b) Includes subsidy: 1968-69, \$16,667,000; 1969-70, \$16,597,000; 1970-71, \$27,710,000; 1971-72, \$25,700,000; and 1972-73, \$17,969,000.

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 excluding mining are shown in the table below:

VICTORIA—NET VALUE OF PRIMARY PRODUCTION EXCLUDING MINING
(\$'000)

Industry	1968-69	1969-70	1970-71	1971-72	1972-73
Rural—					
Agriculture	247,194	230,388	202,244	222,971	218,132
Pastoral	262,707	307,734	273,134	292,638	458,349
Dairying	165,486	187,786	198,768	207,258	188,066
Poultry	25,675	25,409	22,692	21,866	23,344
Bee farming	396	821	997	774	2,089
Total rural	701,458	752,139	697,835	745,507	889,980
Forestry, fishing, trapping	36,735	33,462	42,372	46,582	50,161
Total net value	738,193	785,600	740,207	792,089	940,141

Local value of production

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
EXCLUDING MINING
(\$'000)**

Produce	1968-69	1969-70	1970-71	1971-72	1972-73
Agriculture—					
Barley	6,470	8,982	13,753	13,444	10,393
Maize	80	99	88	107	84
Oats	10,560	8,189	11,077	9,677	8,263
Wheat	95,832	86,198	41,030	77,604	53,719
Onions	649	731	1,148	913	1,058
Potatoes	6,891	13,680	18,305	10,766	12,649
Other vegetables for human consumption	19,668	19,978	21,865	18,954	19,693
Hay and straw	71,956	33,841	36,205	39,874	51,564
Fruit	23,469	37,077	38,277	34,010	42,093
Vineyards	16,160	21,344	15,706	24,119	24,670
Other crops	24,688	27,781	27,552	23,638	21,724
Total	276,423	257,900	225,006	253,107	245,910
Pastoral—					
Wool	145,557	143,040	108,215	122,043	235,638
Sheep slaughtered	56,192	67,430	50,794	68,256	97,298
Cattle slaughtered	118,882	146,015	166,353	171,723	227,813
Total	320,631	356,485	325,362	362,022	560,749
Dairying—					
Whole milk used for—					
Butter	95,110	109,859	104,476	120,428	121,434
Cheese	13,727	11,991	13,088	14,650	19,158
Condensing, concentrating, etc.	13,777	12,753	16,087	19,098	21,126
Human consumption and other purposes	37,844	41,455	40,253	43,199	42,673
Subsidy paid on wholemilk for butter and cheese	16,667	16,597	27,710	25,700	17,969
Pigs, slaughtered	16,392	19,372	22,415	22,551	23,517
Total	193,517	212,027	224,029	245,627	245,877
Poultry and bees—					
Eggs	31,163	33,395	25,471	24,364	27,392
Poultry	11,731	11,830	14,068	15,333	14,946
Honey and beeswax	396	821	997	774	2,088
Total	43,291	46,046	40,536	40,471	44,426
Trapping, etc.—					
Rabbits and hares	2,875	2,371	1,196	1,889	2,473
Rabbit and hare skins, etc.	524	513	427	379	596
Total	3,400	2,884	1,623	2,268	3,069

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

Produce	1968-69	1969-70	1970-71	1971-72	1972-73
Forestry—					
Sawmills	24,288	21,739	29,980	31,019	31,583
Hewn timber	2,231	2,076	2,619	2,736	3,385
Firewood	1,371	1,348	1,600	1,579	1,387
Bark for tanning	63	59	1	1	1
Other	48	52	87	124	89
Total	28,000	25,274	34,287	35,459	36,445
Fisheries—					
Fish	2,343	2,819	2,635	2,735	2,644
Rock lobster (a)	1,436	1,481	1,696	1,926	2,018
Scallops	856	196	901	2,502	4,461
Other	701	807	1,230	1,692	1,523
Total	5,336	5,304	6,462	8,855	10,646
Total local value	870,597	905,920	857,304	947,808	1,147,123

(a) Includes freshwater crayfish.