

AGRICULTURE

FARMING IN VICTORIA

Land settlement

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 Fawkner who in 1835 similarly squatted on the present site of Melbourne. Although squatting was illegal, settlement had extended some 130 kilometres inland by 1836.

Efforts were made to legalise the position of the squatters and in 1836 regulations were drafted to enable them to acquire for \$20 as much land as they wished. This resulted in some very large holdings. At one time four pastoralists held approximately three million hectares of the District. By 1840, most of the southern and western parts had been occupied. Also, because of 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.

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

The early settlers were all pastoralists. Such crops as were grown were for their own consumption and for food for livestock. With the large increase in population that came with the gold rushes and in the aftermath of the Irish potato famines, land-use had to be diverted from grazing to agriculture and 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 repurchased 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.

Land occupation

The following tables show alienation and utilisation of Crown land in Victoria:

ALIENATION OF LAND, VICTORIA, AT 30 JUNE 1983

Particulars	Area
	hectares
Lands alienated in fee simple	13,849,175
Lands in process of alienation	124,740
Crown lands	8,786,085
Total	22,760,000

CROWN LANDS, VICTORIA, AT 30 JUNE 1983

Particulars	Area
	hectares
Land in occupation under – Perpetual leases	12,812

CROWN LANDS, VICTORIA, AT 30 JUNE 1983 — *continued*

Particulars	Area
Land in occupation under — <i>continued</i>	hectares
Grazing leases and licences	2,135,227
Other leases and licences	12,313
Reservations —	
Reserved forest	2,882,428
Timber reserves (under Land Act)	49,331
Water catchment and drainage purposes	83,108
National parks (under National Parks Act)	983,586
Wildlife reserves	62,691
Water frontages, beds of streams and lakes (not included above)	308,167
Other reserves	145,714
Unoccupied and unreserved but including areas set aside for roads	2,110,708
Total	8,786,085

Physical characteristics of statistical divisions*Introduction*

In earlier editions of the *Victorian Year Book*, the description of land utilisation in Victoria was based on the division of the State into eight Agricultural Districts which were combinations of counties, i.e. land areas with immutable boundaries.

Since the *Victorian Year Book* 1978, land utilisation has been described in terms of twelve statistical divisions, the standard Australian Bureau of Statistics regions, which are combinations of local government areas forming coherent socio-economic zones. These regions were adopted by the Victorian Government for planning purposes. Statistical divisions are subject to change as local government areas change and as socio-economic conditions change. A map of statistical divisions in Victoria can be found on page 325 of the *Victorian Year Book* 1979.

Melbourne Statistical Division

As the Melbourne Statistical Division is largely occupied by the metropolitan area, it is of comparatively small agricultural significance. Nevertheless there is quite a range of soils, climates, and agricultural activities.

The basalt plains stretch eastwards from the western plains to the mountains and hills. The topography in the west is quite flat, and hilly to mountainous in the north and east. The Mornington Peninsula comprises the southern boundary.

The predominant soils are Podsollic derived from basalt, sedimentary rocks, and unconsolidated sediments, and Red-Brown Earths. Other soils are the Krazozems (red loams) and the peaty soils (very acidic, black, and consisting mainly of organic matter over clay subsoils). Rainfall varies from 475 mm in the west to 1,250 mm in the east.

The western area has been well regarded for its oaten hay and barley production. The peripheral shires in most of the remainder of the Division support mainly small farms with dairying, orchards, poultry raising, flower growing, and stud farming of cattle, horses, goats, and sheep. Some of these areas are under wooded hills and mountains, although the land is much clearer to the south.

A continuing development has been the proliferation of subdivisions into small farms, many of which are owned by city residents. Many of these properties are kept for recreation; others for small commercial ventures. Recreation is in fact a substantial industry in this Division, as there are a number of golf courses and country clubs. Another trend has been the industrialisation of areas away from Melbourne, e.g. Dandenong and Hastings, which has resulted in additional inroads into the rural areas.

AGRICULTURAL ESTABLISHMENTS (a) IN THE MELBOURNE STATISTICAL DIVISION, 1982-83 (b)

Main activity of establishment (a)	Estimated value of agricultural operations (\$'000)					Total establishments
	2.5-9	10-19	20-39	40-99	100+	
Meat cattle	458	263	129	67	13	930
Orchard and other fruit	44	75	79	82	26	306
Vegetables	30	47	83	145	120	425
Nurseries	20	32	46	74	62	234

AGRICULTURAL ESTABLISHMENTS (a) IN THE MELBOURNE STATISTICAL
DIVISION, 1982-83 (b) — *continued*

Main activity of establishment (a)	Estimated value of agricultural operations (\$'000)					Total establishments
	2.5-9	10-19	20-39	40-99	100+	
Poultry	9	19	18	44	77	167
Potatoes	1	4	8	20	18	51
Other	280	218	241	236	49	1,024
Total	842	658	604	668	365	3,137

(a) Establishment is a term used in economic statistics and refers to the full range of activities at the smallest operating level of a business, which in general corresponds to a location. Establishments are classified according to their predominant activity based on the estimated value of commodities produced; the sum of these comprises the 'estimated value of operations' of the establishment as a whole. This table excludes those establishments with an estimated value of agricultural operations of less than \$2,500.

(b) The period covered in this and most subsequent tables in this Chapter is the 1982-83 season which in general refers to the year ended 31 March, 1983 but also includes activities which may have been finalised after 31 March (e.g. grape picking). In most of these the growing period occurred before 31 March.

Barwon Statistical Division

Barwon is one of Victoria's smallest statistical divisions and lies west of the south-west corner of Port Phillip Bay. It comprises nine shires. In the south, the main topographical feature is the Otway Ranges, a steep mountainous region with high rainfall, ideally suited to forestry. To the north is the flat volcanic plain which is used mainly for grazing as well as a little cropping. Intermediate between these extremes are the coastal plains which have a mixture of soil types and topography.

Most of the soils are Podsollic, being derived from basalt, unconsolidated sediments, and sedimentary rocks. Others are Red-Brown Earths. The average annual rainfall varies between 450 mm and 1,800 mm in various parts of the Division.

About 75 per cent of the Division is under primary production. The main agricultural industries are dairying, and beef and sheep raising, but there are also quite significant areas of cereal and oilseed crops as well as grass seed production, potatoes, beekeeping, pigs, and poultry. Forestry is also important in and around the Otway Ranges.

There has been a tendency during recent years for farmers to leave the dairying industry. Beef and wool production are the main activities on the volcanic plains, and prime lambs are raised in the southern areas of the Division.

AGRICULTURAL ESTABLISHMENTS (a) IN THE BARWON STATISTICAL
DIVISION, 1982-83 (b)

Main activity of establishment (a)	Estimated value of agricultural operations (\$'000)					Total establishments
	2.5-9	10-19	20-39	40-99	100+	
Milk cattle	24	66	202	404	36	732
Meat cattle	232	128	61	34	10	465
Sheep	135	121	136	99	21	512
Other	145	136	184	170	96	731
Total	536	451	583	707	163	2,440

(a) See footnote to table above.

(b) See footnote to table above.

South Western Statistical Division

The South Western Statistical Division covers a large portion of the south-west of Victoria, being bounded on the south by the sea and the west by the State boundary with South Australia. It is mainly located on volcanic and coastal plains, with some rising country in the south-east of the Division. Rainfall varies from about 500 mm in the extreme north to over 1,400 mm in the Otway Ranges in the south-east corner.

Few rivers flow through the area, and those that do show a considerable variation in the content of dissolved salts. Lakes in the basalt areas vary from fresh water to brine. Underground water is widely available at fairly shallow levels with salt content varying from 1,000 to 7,000 parts per million.

Many of the soils have developed from lava flows with acid grey loams and sandy loams coming from the older flows. Some of the more recent lava has not weathered greatly and the soils from it are skeletal with stony rises. The dominant soil types are derived from basalt and unconsolidated

sediments. Sub-dominants are derived from sedimentary rocks and the miscellaneous soil group. Soils in the red gum areas have a sandy topsoil with clay below.

A large portion of the Division is farmed; the remainder is covered by natural forest or planted commercial forests. Substantial areas of the farmed land are under improved pasture.

The Western District, within this Division, is a traditional woolgrowing area. Sheep numbers declined during the early 1970s but are now recovering. Dairying is popular along the southern section and prime lambs and beef cattle are also raised. Numbers of the latter have begun to decline.

The main crops are oats, wheat, and barley. Oilseed crops such as sunflowers, linseed, rape, and lupins have gained popularity during recent years.

AGRICULTURAL ESTABLISHMENTS (a) IN THE SOUTH WESTERN STATISTICAL DIVISION, 1982-83 (b)

Main activity of establishment (a)	Estimated value of agricultural operations (\$'000)					Total establishments
	2.5-9	10-19	20-39	40-99	100+	
Milk cattle	45	121	564	1,108	120	1,958
Sheep	195	279	583	636	138	1,831
Sheep and meat cattle	82	109	302	433	255	1,181
Meat cattle	330	264	190	115	47	946
Other	66	77	110	155	68	476
Total	718	850	1,749	2,447	628	6,392

(a) See footnote to table on page 341.

(b) See footnote to table on page 341.

Central Highlands Statistical Division

The Central Highlands is an important statistical division, with Ballarat near its eastern boundary and Ararat near the west. The Division is a mixture of extinct volcanic cores, basaltic plains, and uplifted sedimentary strata of Ordovician age. Elevation ranges from about 200 metres to 500 metres above sea level. The Great Dividing Range passes a few kilometres north of Ballarat, and the Pyrenees Range enters the north-west corner of the Division. The western section stretches into plains, and finishes near the Grampians.

Three soil types predominate in the region: deep friable red volcanic soils, mainly in the east; grey duplex soils on the basalt plains; and shallow hard-setting duplex soils on the Ordovician sedimentary rocks. Annual rainfall varies from 425 mm to 1,050 mm. The main streams which rise in the area are the Wimmera, Avoca, Loddon, and Campaspe Rivers, flowing north, and the Mt Emu, Fiery, Hopkins, Leigh, Woody Yallock, Moorabool, and Werribee Rivers flowing south.

About 75 per cent of the Division is farmed, the remainder being Crown land and forest. Most of the Crown land and forest is in the Daylesford-Trentham, Smythesdale, Enfield, and Mt Cole areas.

The main agricultural produce comprises wool, prime lambs, potatoes, beef, cereals, and oilseeds, with some dairying and small seeds production. The plains produce very heavy crops of oats and good crops of wheat.

Improved pastures have increased the carrying capacity of the plains and have improved soil fertility, which in turn assists crop production.

AGRICULTURAL ESTABLISHMENTS (a) IN THE CENTRAL HIGHLANDS STATISTICAL DIVISION 1982-83 (b)

Main activity of establishment (a)	Estimated value of agricultural operations (\$'000)					Total establishments
	2.5-9	10-19	20-39	40-99	100+	
Sheep	245	229	336	316	74	1,200
Meat cattle	169	75	35	17	5	301
Sheep and meat cattle	66	79	78	108	36	367
Sheep and cereals	19	24	68	106	34	251
Potatoes	10	21	32	73	76	212
Other	133	75	95	86	31	420
Total	642	503	644	706	256	2,751

(a) See footnote to table on page 341.

(b) See footnote to table on page 341.

Wimmera Statistical Division

The Wimmera is one of Victoria's largest statistical divisions. It stretches broadly from the South Australian border in the west to Stawell in the south-east and Hopetoun in the north-east. It is primarily a large plain, sloping gently to the north, but has the distinctive Grampians on its south-east border.

The dominant soils groups are Grey and Brown soils of heavy texture (alkaline clay loams and clays over clay subsoils — friable calcareous self-mulching grey soils) and Podsolc soils derived from unconsolidated sediments. The sub-dominant groups are Red-Brown Earths, Mallee soils, Podsolc soils derived from sedimentary rocks, and the Miscellaneous Soil Group. Rainfall ranges from 350 mm to 880 mm a year.

Most of the area, except the uncleared desert country in the north-west and south-west of the Division, is farmed.

Cereal growing is the dominant agricultural industry, with heavy crops of wheat being produced in good seasons. Barley is grown primarily on the Roseberry Ridge between Beulah and Hopetoun, while oats and rye, which are grown in the lighter soils, are also produced. Some sunflowers have also been grown in recent years.

Grazing, which encompasses both the running of some excellent medium to strong Merino sheep flocks in the south and of fat lambs in the north, is also important. A number of beekeepers also use the flowering eucalyptus to advantage.

**AGRICULTURAL ESTABLISHMENTS (a) IN THE WIMMERA STATISTICAL
DIVISION 1982-83 (b)**

Main activity of establishment (a)	Estimated value of agricultural operations (\$'000)					Total establishments
	2.5-9	10-19	20-39	40-99	100+	
Sheep and cereals	61	257	681	688	99	1,786
Cereal grains	113	236	319	274	56	998
Sheep	153	150	221	186	32	742
Other	93	69	100	93	60	415
Total	420	712	1,321	1,241	247	3,941

(a) See footnote to table on page 341.

(b) See footnote to table on page 341.

Northern Mallee Statistical Division

This large Division extends along the Murray Valley from the Kerang area to Mildura and on to the South Australian border. It is essentially a vast plain, sloping to the north-west from about 100 metres above sea level in the south to 35 metres at Lake Cullulleraine. Low superficial land forms of ridges and dunes are also present.

The dominant soil group is the Solonised Brown soils (Mallee soils) — alkaline brown sandy soils over more clayey, highly calcareous soils. Several sub-dominant groups occur. These are Grey and Brown soils of heavy texture, Red-Brown Earths, and Alluvial soils. This Division is relatively dry, with rainfall ranging from 240 mm to 370 mm a year.

Most of the Division has been cleared for agriculture except for two major tracts of country along the South Australian border — the Sunset Country, south-west of Mildura, and the Big Desert which extends south into the Wimmera Statistical Division.

The main broadacre farming is cereal growing, usually associated with wool and prime lambs. Wheat is the principal crop, followed in order by barley and oats. Irrigated land around Kerang and Swan Hill is used for mixed farming. Cattle (dairy and beef) and prime lambs are the major enterprises but there is an increased interest in cropping.

Horticulture is concentrated around Mildura, Robinvale, and Swan Hill. A high proportion of Victoria's grapes (for drying, table use, and wine), and citrus fruits are grown in this Division. Stone fruits (including avocados), edible tree nuts, and vegetables are also grown.

AGRICULTURAL ESTABLISHMENTS (a) IN THE NORTHERN MALLEE STATISTICAL DIVISION 1982-83 (b)

Main activity of establishment (a)	Estimated value of agricultural operations (\$'000)					Total establishments
	2.5-9	10-19	20-39	40-99	100+	
Grapes	75	226	803	596	56	1,756
Cereal grains	41	82	190	338	93	744
Sheep and cereals	18	53	173	356	83	683
Orchard and other fruit	42	19	44	71	58	234
Other	174	151	247	255	76	903
Total	350	531	1,457	1,616	366	4,320

(a) See footnote to table on page 341.

(b) See footnote to table on page 341.

Loddon-Campaspe Statistical Division

The Loddon-Campaspe Statistical Division stretches from the Central Highlands in the south to the Murray River. The hilly and woody country of the south gives way to flat, treeless plains. Red-Brown Earths (slightly acid brown loams over alkaline clay subsoils containing calcium carbonate) are the dominant soils. Sub-dominant groups are Grey and Brown soils of heavy texture (both friable and dense Grey soils), Podsolc soils derived from sedimentary rocks, and Alluvial soils. Rainfall ranges from about 350 mm to 650 mm a year.

Sheep and cattle grazing predominate in the south of the Division, while sheep-cereal properties are the main form of farming in the central and western areas. Dairying predominates in the irrigation areas in the north of the Division. Intensive piggeries and poultry farms are also important.

AGRICULTURAL ESTABLISHMENTS (a) IN THE LODDON-CAMPASPE STATISTICAL DIVISION, 1982-83 (b)

Main activity of establishment (a)	Estimated value of agricultural operations (\$'000)					Total establishments
	2.5-9	10-19	20-39	40-99	100+	
Meat cattle	276	132	89	50	6	553
Sheep	264	222	223	177	32	918
Milk cattle	18	26	262	490	49	845
Sheep and cereals	61	169	357	290	47	924
Sheep and meat cattle	90	100	111	101	21	423
Pigs	8	11	25	45	48	137
Other	199	168	194	166	81	808
Total	916	828	1,261	1,319	284	4,608

(a) See footnote to table on page 341.

(b) See footnote to table on page 341.

Goulburn Statistical Division

The Goulburn Statistical Division, which occupies an area on the east side of central Victoria, encompasses a wide range of topography and agricultural activities. From the mountainous part of the Great Dividing Range in the south, it stretches to the Murray River as a wide plain, much of which is known as the Goulburn Valley. In the north-west corner, the principal landscape features are treeless plains, old watercourses, riverside woodland, and swamps. The Goulburn, Loddon, and Campaspe Rivers drain the area to the north.

The main soils are Red-Brown Earths and Podsolc soils derived from sedimentary rocks (grey loams, silty loams, and fine sandy loams with a more or less bleached sub-surface over clay subsoils). A sub-dominant group of alluvial soils occurs. Rainfall varies from 430 mm to 1,400 mm a year.

Most of the area, apart from the wooded hills, is farmed. Farming activities range from dairying (in the river valleys and highly productive irrigated country) to cereal growing; orchards, especially in the Shepparton and Cobram districts; and grazing of beef cattle and sheep. Irrigated crops of wheat or oilseeds (principally sunflowers) are becoming important. Vegetables are also grown.

During recent years there has been a decline in dairying, especially in the dry country, and, in the early 1970s an increase in cattle raising. However, cattle numbers have declined with the fall in prices for beef and the effects of drought.

In irrigated areas the threat of salinity, has hastened the adoption of improved irrigation management techniques including laser levelling, and sub-surface pumping to lower water tables, and the provision of additional water for irrigation.

**AGRICULTURAL ESTABLISHMENTS (a) IN THE GOULBURN STATISTICAL
DIVISION, 1982-83 (b)**

Main activity of establishment (a)	Estimated value of agricultural operations (\$'000)					Total establishments
	2.5-9	10-19	20-39	40-99	100+	
Milk cattle	37	103	723	1,146	71	2,080
Meat cattle	443	317	223	133	26	1,142
Sheep and meat cattle	76	162	283	222	58	801
Sheep and cereals	32	130	259	187	16	624
Orchard and other fruit	19	32	82	173	121	427
Cereal grains	82	50	30	17	3	182
Meat cattle and cereals	17	32	50	24	3	126
Other	279	303	387	259	124	1,352
Total	985	1,129	2,037	2,161	422	6,734

(a) See footnote to table on page 341.

(b) See footnote to table on page 341.

North Eastern Statistical Division

The North Eastern Statistical Division is characterised by mountainous country and some highly productive river valleys. There is also some arable country in the north-west corner of the Division.

Two dominant soil groups occur – Podsollic soils derived from sedimentary rocks and a miscellaneous group comprised of Podsollic, Peaty, and Skeletal soils, and red loams of the mountainous regions. Rainfall varies from 500 mm to 1,900 mm a year.

Traditional agricultural industries include cropping, especially around Rutherglen, Yarrawonga, and north of Benalla. Prime lamb production is usually associated with cropping. Beef cattle are in the higher rainfall areas and the river valleys, and to a lesser extent dairy cattle. Wine grape production takes place around Rutherglen and the King River Valley. Most of Victoria's tobacco is grown in the north-east, mainly in the Ovens Valley near Myrtleford. Lesser crops include apples, stone fruits, edible tree nuts, and hops.

There have been in recent years increases in the area of vines and lucerne, and in the area irrigated. The area sown to lupins has stabilised after several years of increases. Dairying and hops have decreased recently due mainly to falling profitability.

**AGRICULTURAL ESTABLISHMENTS (a) IN THE NORTH EASTERN STATISTICAL
DIVISION, 1982-83 (b)**

Main activity of establishment (a)	Estimated value of agricultural operations (\$'000)					Total establishments
	2.5-9	10-19	20-39	40-99	100+	
Meat cattle	370	310	326	198	36	1,240
Milk cattle	16	24	131	260	31	462
Tobacco	-	2	28	151	92	273
Sheep and meat cattle	37	73	111	88	13	322
Other	133	129	155	169	60	646
Total	556	538	751	866	232	2,943

(a) See footnote to table on page 341.

(b) See footnote to table on page 341.

East Gippsland Statistical Division

East Gippsland covers a large area of south-eastern Victoria with the Great Dividing Range in the north, the New South Wales border on the north-east, and Bass Strait on the south. The Division can be divided into five main areas: (1) The coastal plain from south of Sale to Lakes Entrance, including the Gippsland Lakes. Here there are mainly sandy to sandy loam soils over clay or gravel. Sheep and cattle are the main industries in this area; (2) the foothills, undulating country which carries mainly sheep and cattle; (3) the highlands, carrying sheep and cattle on undulating to steep country; (4) the

river valleys beginning in the west at the sources of the La Trobe and McAlister Rivers, and running east along the Tambo, Snowy, Cann, and other rivers; and (5) the productive irrigation (dairying) district around Sale and Maffra.

Soils are mainly Podsollic, derived from sedimentary rocks, and the Miscellaneous Soil Group. The sub-dominant group comprises Podsols derived from unconsolidated sediments. This Division has quite a wide range of annual rainfall varying from 520 mm west of Bairnsdale to 1,150 mm in the mountains.

Apart from major areas of development in the plains in the western part of the Division which includes the irrigated area around Sale and Maffra, and the Omeo and Gelantipy districts, most agriculture is confined to the river valleys.

Beef cattle, sheep, fine wool production and dairying are the most important livestock industries in the area. There is little broadacre cultivation. Vegetables are grown on the river flats at Lindenow and Orbost. The main crop, beans, is harvested green and sent to Melbourne to be frozen. Other crops include sweetcorn, capsicums, and gherkins.

AGRICULTURAL ESTABLISHMENTS (a) IN THE EAST GIPPSLAND STATISTICAL DIVISION, 1982-83 (b)

Main activity of establishment (a)	Estimated value of agricultural operations (\$'000)					Total establishments
	2.5-9	10-19	20-39	40-99	100+	
Meat cattle	271	200	114	89	16	690
Milk cattle	17	28	118	259	39	461
Sheep and meat cattle	44	68	99	113	22	346
Other	110	95	114	91	44	454
Total	442	391	445	552	121	1,951

(a) See footnote to table on page 341.

(b) See footnote to table on page 341.

Central Gippsland Division

Central Gippsland is bounded on the south by Bass Strait, on the north by the mountains, on the west by an irregular line running north from near Wonthaggi, and on the east by a diagonal line passing just east of Sale. The main part of the area consists essentially of two mountain systems – the foothills of the Great Dividing Range and the Strzeleckis – separated by an east-west trough known as the Great Valley of Victoria. The remainder consists of low-lying hills and coastal plains.

The average rainfall ranges from 900 mm to 1,150 mm over most of the area, falling to about 700 mm at Yarram and 760 mm in the vicinity of Western Port Bay. The Division has a large number of soil types ranging from sands to clays and loams, with some Acid Swamp soils and Calcareous sand dunes. The dominant group is the Podsols, derived from sedimentary rocks and unconsolidated sediments. Kranozems also occur.

A substantial portion of rural establishments in the Division are under pasture. The main improved pasture species are perennial ryegrass, cocksfoot, white clover, and subterranean clover.

The main agricultural and pastoral industries are dairying, beef raising, fat lamb production, and intensive horticultural and vegetable production (including potatoes). Other industries include forestry, coal mining, and sand mining. There are several milk processing factories and an important paper mill in the Division.

AGRICULTURAL ESTABLISHMENTS (a) IN THE CENTRAL GIPPSLAND STATISTICAL DIVISION, 1982-83 (b)

Main activity of establishment (a)	Estimated value of agricultural operations (\$'000)					Total establishments
	2.5-9	10-19	20-39	40-99	100+	
Milk cattle	63	143	823	1,394	132	2,555
Meat cattle	513	432	320	196	62	1,523
Other	182	137	205	251	151	926
Total	758	712	1,348	1,841	345	5,004

(a) See footnote to table on page 341.

(b) See footnote to table on page 341.

East Central Statistical Division

The East Central Statistical Division forms a very narrow corridor between what is virtually Melbourne's metropolitan area and Central Gippsland. The East Central Statistical Division stretches from Bass Strait to the Upper Yarra area of the Great Dividing Range.

The soils are mainly Podsollic, derived from sedimentary rocks and unconsolidated sediments (sandy loams over clay subsoils and deep sands). Other groups include peaty soils and Kranozems (red loams). Rainfall is fairly uniform at about 900 mm to 1,000 mm a year. Some of the Division is still under forest, scrub, and Crown land. There is a relatively small orchard industry around Pakenham, some berry growing and nut tree plantations in the hills, and dairying in some of the valleys. There are a number of small farms engaged in potato growing and flower production, and some cattle and horse stud properties.

**AGRICULTURAL ESTABLISHMENTS (a) IN THE EAST CENTRAL STATISTICAL
DIVISION, 1982-83 (b)**

Main activity of establishment (a)	Estimated value of agricultural operations (\$'000)					Total establishments
	2.5-9	10-19	20-39	40-99	100+	
Meat cattle	223	138	80	53	9	503
Milk cattle	23	38	170	175	18	424
Other	76	79	93	96	72	416
Total	322	255	343	324	99	1,343

(a) See footnote to table on page 341.

(b) See footnote to table on page 341.

Further reference: *Agricultural Finance Survey, Victorian Year Book 1981, pp. 341-2*

Agricultural improvements

Pasture improvement

Most of Victoria's sheep, beef, and dairy animals are grazed on pastures described in official statistics as 'improved'. These pastures are based on clovers or medics introduced from overseas, and also contain varying proportions of sown or unsown perennial or annual grasses (also mostly introduced) and of unwanted species ('weeds'). With adequate fertiliser, the introduced species are capable of supporting much greater animal production than pastures of native species.

During the past forty years, the area of improved pastures in Victoria increased from about 2 million to 5.6 million hectares (two-thirds of the total pasture area in the State). Much of this increase has resulted from the widespread use of subterranean clover and superphosphate, which alleviated the almost universal soil shortages of nitrogen and phosphorus.

The remaining 3.1 million hectares of pastures (listed as 'native' pastures in the statistics) comprise indigenous perennial grasses (e.g. spear, wallaby, and kangaroo grasses) or more commonly a range of volunteer exotic species of low productivity. The native pastures contain no useful legumes, receive little or no fertiliser, and are unproductive compared with improved pastures.

Where annual rainfall is 750 mm or more, mainly south of the Great Dividing Range improved pastures of perennial grasses (e.g. perennial ryegrass and cocksfoot), white clover and subterranean clover are used for intensive dairying and beef production. In the medium rainfall areas (500-750 mm) of north-east through to south-west Victoria, sheep and beef cattle are run on pastures comprised of annual clovers, mainly subterranean clover, together with volunteer annual grasses and sown perennial grasses (perennial ryegrass, phalaris, cocksfoot, and tall fescue). The remaining pastoral areas (250-500 mm annual rainfall) grow pastures of annual medics or clovers, with volunteer annual grasses such as barley grass, Wimmera ryegrass, annual fescues, and bromes. Commonly, these pastures are grown in rotation with cereal crops, and are grazed by sheep.

Irrigated pastures of heavily fertilised, highly productive clovers and grasses, principally white clover, perennial ryegrass, and paspalum, are used mainly for dairying. They occupy about 380,000 hectares of the northern plains and 44,000 hectares in southern Victoria, mainly Gippsland.

The widespread use of superphosphate has been a key factor in increasing the productivity of Victorian pastures, and it is still the main fertiliser used (eighty-two per cent). However, potash, nitrogen, and trace elements (molybdenum and copper in particular) are playing an increasingly important role in maintaining high levels of herbage production.

The productivity from pastures continues to increase steadily, though perhaps less spectacularly than in the early years of pasture improvement. The main advances in recent years have been through

the introduction of more productive, higher quality cultivars of pasture grasses and legumes, use of more appropriate types and rates of fertiliser, better pasture management methods, more efficient use of irrigation water, and more effective control of pests, diseases, and weeds.

Of major concern is the expanding area of pasture land affected by either dryland or irrigation-related salinity. Considerable efforts by a wide range of individuals and organisations are being directed towards finding ways of reversing this trend and of making effective use of existing salt-affected land. Current research has also identified some of the main causes of a widespread serious decline in the proportion of subterranean clover in pastures – they include soil compaction, attacks by root-rotting fungi, and increasing soil acidity leading to lack of beneficial nitrogen-fixing *Rhizobium* bacteria and to toxic levels of aluminium and manganese in the soil.

Fertiliser

James Cuming, who arrived in Victoria in 1862, established the superphosphate industry in Australia, using bones and guano as a source of phosphate. Later, rock phosphate was imported from the United States of America. Since the First World War, supplies of rock phosphate from Nauru, Ocean Island, and Christmas Island provided almost all of the requirements for superphosphate manufacture in Australia. Recently, Christmas Island has become the major supplier, with Nauru remaining important, but Ocean Island now provides none. Rock phosphate is also imported intermittently, depending on price differentials at the time, from various other sources, mainly the United States of America (USA) and African countries. A new process being developed may enable the use of huge phosphate deposits in Queensland, which are unsuitable for the manufacture of superphosphate by present methods. Most of the sulphur used in the manufacture of Australian superphosphate comes from Canada, which is also the source of potash fertilisers.

The need to topdress pastures with superphosphate for high productivity has been generally accepted since the 1920s, and soil fertility has been much improved by this practice. Although superphosphate is designed to supply mainly phosphorus, it contains sulphur and calcium which are also essential elements for plant growth. Phosphorus is by far the most important plant nutrient supplied in Victoria as fertiliser, but fertilisers containing nitrogen, potassium, sulphur, and the trace elements molybdenum, copper, cobalt, and zinc are also needed in various parts of the State to produce healthy and vigorous growth of crops and pastures. Nitrogen is applied mainly as nitrate, urea, or ammonium sulphate. Usually, potassium and trace elements are applied as mixtures with superphosphate.

Superphosphate is now relatively much more expensive than in the twenty-five years since the Second World War. Despite this, its usage has steadily increased in recent years after a dramatic slump in the mid-1970s. In 1982-83, 575,000 tonnes of superphosphate were used in Victoria, of which 357,000 tonnes (62 per cent) were applied to pasture. The use of potash on pastures has been increasing slowly. The use of nitrogenous fertilisers has remained almost static in recent years, probably because of rapidly rising costs and the progressive withdrawal of a government bounty.

Since the Artificial Manures Act was introduced in 1897, the law has required that fertilisers sold in Victoria have a guaranteed analysis. Under the *Fertilisers Act* 1974, suppliers must register the brands and analyses of their products with the Department of Agriculture. A list of registrations is published in the *Victorian Government Gazette*.

In 1982-83, 593,000 tonnes of artificial fertilisers were used on 1,146,000 hectares of wheat and 2,600,000 hectares of pastures. Superphosphate is the main fertiliser used on both crops and pastures, and in 1982-83 amounted to 82 per cent of the total fertiliser used.

ARTIFICIAL FERTILISERS, VICTORIA

Year (a)	Crops		Pastures	
	Area fertilised	Quantity used	Area fertilised	Quantity used
	'000 hectares	'000 tonnes	'000 hectares	'000 tonnes
1977-78	1,851	277	2,670	408
1978-79	1,913	277	3,093	476
1979-80	n.a.	263	3,530	552
1980-81	n.a.	257	3,494	556
1981-82	1,842	289	3,340	556
1982-83	n.a.	261	2,599	438

(a) See footnote (b) to table on page 341.

Further references: Superphosphate, *Victorian Year Book* 1971, p. 302-3; Forest clearing, 1978, pp. 358-60

Private storage dams

Early Victorian pastoralists commenced constructing small private dams and weirs in the 1850s. By the turn of the century small dams were being built throughout the State, particularly in areas near highly populated cities. Doncaster orchardists, for example, had built a vast network of dams by this time.

Originally, in the 1850s, private dams were erected with a centre core of puddle clay. These dams were built up gradually from thin layers of materials set in place by using horse-drawn carts or barrows. Compaction of these thin layers was effected by the combined traffic of feet, both human and animal, and vehicle wheels. Later contractors, using horse teams and scoops, developed successful techniques of placing layers of soil, which were trodden down and compacted by the horses.

Horse power was gradually replaced by mechanised earth-moving plant during the Second World War. With the adoption of this equipment in private dam construction, it was reasonably assumed that improved compaction would result, but unfortunately this progress did not automatically follow. A major problem was that, when a bulldozer alone was used, many small dams suffered from inadequate compaction, because the tracks of bulldozers are designed to spread and not concentrate their load. In the absence at the time of suitable rollers, such as the modern sheepsfoot roller, many private dams failed because of insufficient compaction.

Due to the concentration on large-scale public irrigation schemes by successive Victorian Governments, the later development of private dams did not progress as rapidly as it did in other States. However, a start was made in 1944, when the Victorian Government passed the Farm Water Supplies Act, which established a scheme under which advances were made to farmers to finance farm water supply projects. The Act was administered by the Department of Lands. The State Rivers and Water Supply Commission formed a Farm Water Supplies Branch for the special purpose of providing advice to all farmers interested in taking advantage of its provisions.

In 1965, the Soil Conservation (Water Resources) Act was passed, which permitted the Soil Conservation Authority of Victoria to '... provide for landholders an advisory service with respect to the development and use of the water resources available to them'. Under this Act, the Authority provides advisory, survey, and design services. A loan scheme to finance private soil and water conservation projects (the latter not to be located within declared irrigation districts), including the construction of private farm dams, was initiated in 1971. The Soil Conservation Authority assesses the technical feasibility of the projects and the Rural Finance and Settlement Commission of Victoria administers the financial aspects of the scheme.

Livestock disease eradication

Victoria is free of many of the most serious livestock diseases as a result of its favourable climate, successful government quarantine, and other disease control measures. The nature of many livestock diseases makes their eradication difficult or practically impossible, but control measures can minimise their impact.

The Department of Agriculture conducts several major programmes to control and eradicate animal disease. Meat inspection is used to ensure a high quality of meat for human consumption and to detect disease in slaughtered animals. Traceback procedures are used to identify the properties of origin of diseased cattle and pigs. Animal health field staff, supported by Regional Veterinary Laboratories, investigate disease in livestock and conduct control and eradication procedures.

As part of the National Brucellosis and Tuberculosis Eradication Programme, all Victorian breeding cattle are tested for brucellosis by Department of Agriculture staff. Infected animals are slaughtered, and the owners compensated. Herds free of disease can become accredited. Victoria is already provisionally free of bovine tuberculosis and brucellosis, and plans to be declared free of both diseases in 1987.

An ovine brucellosis ram-flock accreditation scheme is also conducted to encourage stud breeders to have rams examined and tested annually. A Footrot Control Area exists in western Victoria in which sheep footrot is subject to rigorous control. The impact of the disease has been greatly reduced and it is hoped that it can be eliminated. Various other diseases are also subject to control under the Stock Diseases Act.

Through its research and extension activities the Department of Agriculture assists the livestock

industries in overcoming disease problems and keeping abreast of new developments in control and eradication.

Vermin and noxious weeds control

The control of pest animals and plants affects the whole range of agricultural industries of Victoria, as well as the forests and natural bushland environments, such as wildlife and game reserves. The Vermin and Noxious Weeds Destruction Board, which was established in 1959 to work with the Department of Crown Lands and Survey, is responsible for intensifying the control of vermin and noxious weeds and implementing a philosophy of pest control.

The targets of the Board's operation are the 95 plants which are proclaimed noxious weeds, under the *Vermin and Noxious Weeds Act* 1958, throughout Victoria except in the Melbourne metropolitan area, and the eight proclaimed vermin animals, such as rabbits and foxes. Two birds, the sparrow and the starling, are also considered vermin. Blackberries, ragwort, and rabbits are the most serious pests in Victoria.

Noxious weeds and vermin control policy is implemented by the Board throughout Victoria by 142 Departmental Land Inspectors under the supervision of eighteen regional Senior Land Inspectors. Each Land Inspector has a team of workmen together with appropriate equipment to carry out weed and vermin control, and is backed up by workshop and research facilities.

As well as being responsible for maintaining a good working relationship with landholders, the Land Inspector is also responsible for the control of vermin and noxious weeds on Crown land, and as the Board has agreements with many other government departments concerned with agriculture, forestry, national parks, roads, railways, municipalities, and so on, he may also be called upon to carry out control work in these areas.

Land cultivation

The following table shows details of the broad utilisation of land under occupation in Victoria for agricultural purposes for the season 1982-83.

LAND IN OCCUPATION FOR AGRICULTURAL PURPOSES, VICTORIA, 1982-83 (a)

Statistical division	Number of establishments (b)	Area of crops hectares	Area of sown pasture and lucerne hectares	Native pasture hectares	Total area of establishments hectares
Melbourne	3,399	28,944	127,117	66,371	262,336
Barwon	2,613	53,773	274,978	95,320	495,239
South Western	6,570	98,866	1,253,251	335,459	1,854,275
Central Highlands	2,966	108,476	484,138	181,200	869,477
Wimmera	4,055	715,799	750,305	382,841	2,424,566
Northern Mallee	4,453	631,397	430,031	567,589	2,567,844
Loddon-Campaspe	5,004	302,039	575,774	419,505	1,598,024
Goulburn	7,031	201,821	675,488	370,634	1,491,869
North Eastern	3,104	63,671	274,599	211,918	835,122
East Gippsland	2,062	9,407	226,969	371,592	1,019,815
Central Gippsland	5,162	15,560	449,725	86,801	650,263
East Central	1,443	3,942	75,907	19,902	120,251
Total	47,862	2,233,695	5,598,282	3,109,132	14,189,081

(a) See footnote (b) to table on page 341.

(b) This table excludes data for establishments where the legal entities operating those establishments have an estimated value of agricultural operations of less than \$2,500.

Economic contribution

Gross value of agricultural production

The gross value of agricultural commodities produced provides a measure of the output from farming. The gross value of commodities produced is the value placed on recorded production at the wholesale prices realised in the principal markets. In general, the 'principal markets' are the metropolitan markets in each State. In cases where commodities are consumed locally or where they become raw materials for a secondary industry, these points are presumed to be the principal markets.

Quantity data is, in the main, obtained from the agricultural census held at 31 March each year, and from supplementary collections which cover crops that have not been harvested at the time of the census. Information covering such commodities as livestock slaughterings, dairy produce, and bee

farming is obtained from separate collections and from organisations such as the Department of Primary Industry. Price data for commodities is obtained from a variety of sources including statutory authorities responsible for marketing products, e.g. the Australian Wheat Board, marketing reports, wholesalers and brokers, and auctioneers. For all commodities, values are in respect of production during the year, irrespective of whether or when payments are made.

The gross value of agricultural commodities produced in Victoria during 1982-83 was \$2,536m. This figure is ten per cent below the gross value of production for 1981-82, and is a consequence of the drought which ravaged large tracts of the Victorian countryside during 1982-83. In 1982-83, Victoria contributed twenty-two per cent of the Australian total value of agricultural production of \$11,708m.

VALUE OF AGRICULTURAL COMMODITIES PRODUCED, VICTORIA
(\$'000)

Particulars	Year ended 30 June -					
	1978	1979	1980	1981	1982	1983
Crops -						
Cereals for grain	196,950	465,670	587,338	505,360	476,231	99,719
Hay	47,418	64,793	71,752	99,461	153,261	177,858
Industrial crops	29,177	27,708	32,486	33,655	28,606	26,362
Vegetables	98,472	124,332	123,468	148,245	153,446	138,890
Grapes	60,363	63,747	128,333	95,867	99,623	113,664
Fruit	58,697	78,420	94,431	110,621	91,641	104,002
Other	27,492	51,545	70,765	63,945	70,917	60,563
Livestock slaughterings and other disposals -						
Cattle and calves	318,997	419,554	455,072	485,372	420,062	467,668
Sheep and lambs	95,691	116,879	180,896	227,051	182,052	154,686
Other	104,484	123,572	146,468	160,356	183,897	210,702
Livestock products -						
Wool	228,813	271,243	341,201	334,356	358,805	324,109
Dairy products	246,977	281,155	307,987	455,713	520,208	586,188
Other	40,550	41,614	47,005	51,087	69,913	71,100
Total	1,554,081	2,130,232	2,587,202	2,771,089	2,808,662	2,535,511

AGRICULTURAL COMMODITIES

Introduction

In the following pages some detailed descriptions and statistical information about all the main crops, livestock, and livestock products produced in Victoria are given. The section deals, first, with the field crops including wheat, oats, and barley; and then with the intensive crops including fruit and vegetables. The section then discusses livestock including sheep, milk and meat cattle, pigs, poultry, goats, deer, and bees, together with the various livestock products.

Field crops

The cereals wheat, oats, and barley are the principal field crops in Victoria. These, together with hay production, green feed, and silage, represent about ninety-two per cent of the total area sown, although there is some variation from year to year.

Wheat

Wheat is Victoria's largest crop. The average area sown in the six-year period 1977-78 to 1982-83 was 1.4 million hectares, about sixty-two per cent of the State's total area under crop. The area under wheat is normally subject to fairly minor fluctuations. The 1982-83 drought-affected season produced a Victorian harvest of 393.9 thousand tonnes of wheat for grain from 1.33 million hectares.

Approximately eighty-four per cent of Victorian wheat is grown in the Northern Mallee, Wimmera, and Loddon-Campaspe Statistical Divisions. The average annual rainfall in the main wheat belt varies from about 300 mm in the north-west to about 500 mm to 750 mm in the eastern and southern areas. Wheat is normally grown in rotation with fallow, pastures, and other crops, principally oats and barley but with increasing areas of grain legume crops - lupins and peas. Surveys of the Wimmera have shown that the potential exists to increase cropping intensity without risk to the stability of the farm system. Soil nitrogen measurements in the region are highly correlated with the ability to support cereal crops, and a soil nitrogen testing service introduced by the Department of Agriculture adds

precision to the complex decision on cropping rotations within the ley farming system of the Wimmera.

Since the adoption of legume based pastures (subterranean clover or medic) and the addition of grain legumes into Victorian cropping rotations, nitrogenous fertilisers have found only limited application. Nitrogen is applied only in specific circumstances, namely, on light sandy soils and land infested with skeleton weed in the Northern Mallee, and on intensively cropped land in the Wimmera and southern areas. Superphosphate is applied at seeding to virtually all crops to correct a phosphorous deficiency inherent in nearly all Australian soils.

Diseases of wheat are usually not a major problem because routine crop management includes precautionary action. Resistant varieties, seed treatment with fungicides, and crop rotation are usually adequate controls, but there are seasons favourable to outbreaks of rusts, root rots, and cereal cyst nematode. In 1973-74 heavy losses were incurred through attack by stem rust, Septoria leaf spot, and root diseases. The root disease known as 'takeall' took a heavy toll in parts of the Northern Mallee in 1978 where crop yields were reduced by more than twenty-five per cent.

During the 72 years from 1911 to 1983, stem rust occurred in some parts of Victoria, in varying degrees of severity, in sixteen years. In only four of these years, 1934, 1947, 1955, and 1973, did the disease cause heavy losses of production, 1973 being the heaviest on record. The only effective control is to breed disease-resistant varieties, a continuing project in Victoria since 1950. The variety, Millewa, which was released in 1979, is currently resistant to all strains of stem rust, and other rust resistant varieties are included in recommendation lists.

Yellow (stripe) rust occurred for the first time in 1979-80 and, with the exception of the drought season 1982, has re-appeared each subsequent year. Yellow rust forced an immediate re-evaluation of variety recommendations. The search for varieties with yellow rust resistance imposed another constraint on plant breeding research.

Fungicidal sprays are another control option. The extent of leaf infection can be used as a guide to evaluate the economics of spraying and the best time to do so.

The cereal cyst nematode, which exists in most wheat soils in the Wimmera and Northern Mallee is a chronic source of loss and can cause severe damage in some seasons, particularly on more intensively cropped land. A recent development in nematode control is a prediction capability which requires soil samples before sowing and bio-assay to determine the extent of soil infestation. The test results indicate the extent of investment requirement for nematode suppression.

A serious problem facing the cereal industries, wheat in particular, is the control of insect pests in grain storage, as the loading of wheat and other cereals for export is prohibited if insects are present. The prevention of insect infestation of farm stored grain and of grain residues in machinery is a prerequisite for ensuring the delivery of insect free grains to the export terminals.

Wheat marketing in Australia is controlled by the Australian Wheat Board under the provisions of marketing legislation prepared after negotiations between the States, the Commonwealth, and farmer organisations. Each Wheat Marketing Act since 1945 has differed in detail from its predecessors but some basic principles have been maintained through a succession of Commonwealth and State Acts which provided a complementary coverage of Commonwealth and State powers.

The current Act provides for a guaranteed minimum price adjusted annually in response to market signals. The Act introduces the option for direct producer to buyer domestic sales and payment of an allowance for deferred deliveries, two innovations which reflect current ideas about the best way to make the principles and logistics of wheat marketing responsive to the needs of all sectors of the industry.

Wheat varieties grown in Victoria were, until recently, almost exclusively of the soft white class. The hard wheat varieties if grown in areas other than the Mallee usually produced flours with unacceptable baking characteristics. However, technological change within the baking industry and the flour quality properties of the newer types of hard wheat varieties such as Millewa, Condor, and Oxley, enabled a re-assessment of the soft wheat policy.

Since 1981, hard wheats only have been recommended for north-west Victoria, the region where wheat with a protein content above the Victorian average is usually produced, while the recommendations for the rest of the State include both hard and soft varieties.

WHEAT FOR GRAIN, VICTORIA

Season	Area	Production	Average yield per hectare	A.S.W. (a) wheat standard
	'000 hectares	'000 tonnes	tonnes	kg/h.l
1977-78	1,270	1,497	1.18	81.8
1978-79	1,337	2,998	2.24	80.9
1979-80	1,457	3,250	2.23	81.5
1980-81	1,431	2,538	1.77	80.5
1981-82	1,322	2,467	1.87	81.3
1982-83	1,327	394	0.30	83.0

(a) Australian Standard White, quoted in kg/h.l (kilograms per hectolitre).

Further references: Australian Wheat Board, *Victorian Year Book 1977*, pp.439-40; Grain Elevators Board of Victoria, 1977, pp. 440-1

Oats

Oats are sown for grain production, winter grazing, and hay production. The average annual area sown for grain, grazing, and hay between 1977-78 and 1982-83 was 327,467 hectares of which about 74 per cent was harvested for grain, some of it after being grazed during the winter. During the last decade, oats have been displaced by barley as Victoria's second most widely grown cereal crop. This change has been most evident on the lighter soils where winter waterlogging is not a problem.

The predominance of oats in the higher rainfall areas has been maintained by the greater tolerance shown by oats to wet conditions and by the demand for oats for stock feed. About half of the oats produced in Victoria are held on farms or used as stock feed, especially during periods of seasonal shortage or in drought conditions. About a quarter of the crop goes to mills, but only a small fraction of this is processed for human consumption. The bulk of the 'milled' oats is destined for incorporation in proprietary stock feeds or as unkilned groats for export. The remaining twenty-five per cent of the crop is exported as grain.

Unlike wheat and barley which are marketed through the Australian Wheat Board and the Australian Barley Board, respectively, oats are sold on the free market. Domestic prices are markedly affected by the size of the crop, pasture conditions during winter and spring, and trends in the world markets for feed grains.

OATS FOR GRAIN, VICTORIA

Season	Area	Production	Average yield per hectare
	'000 hectares	'000 tonnes	tonnes
1977-78	228	269	1.18
1978-79	291	446	1.53
1979-80	256	390	1.52
1980-81	219	322	1.47
1981-82	245	306	1.25
1982-83	213	98	0.46

Barley

Barley is now the second largest crop grown in Victoria. The increased acceptance of barley in cereal rotations from the mid-1960s is evidenced in the statistics; the area sown to barley for all purposes in 1982-83 was 292,000 hectares, compared to 83,000 hectares in 1965-66. So far, the Australian Barley Board in Victoria has been successful in selling this large increase in production.

During this period, impetus was added to an already established trend of increased production by the introduction of the Wheat Delivery Quota Scheme in 1969-70, which had the effect of reducing the area of wheat sown in the cereal belt. Barley proved to be the most popular alternative crop to wheat, particularly in the Northern Mallee. In other areas, oilseeds, such as rapeseed and safflower, were also prominent.

Removal of wheat delivery quotas in 1973-74 resulted in a slight fall in the area sown to barley as land was diverted back into wheat. However, the general trend for increased production of barley in

Victoria is well established and seems unlikely to suffer further significant reduction in the absence of a marked shift in the price ratios between the cereal crops. The provision of bulk handling facilities for barley by the Grain Elevators Board of Victoria since 1963 has contributed to the increased production of this grain.

The Victorian malting industry processes most of Victoria's barley production for both the local brewing industry and export to overseas breweries.

While some barley is grown in all statistical divisions, production has been traditionally centred in two distinct areas where high quality grain is produced. The largest production is in the south-west of the Northern Mallee and the adjacent north-western Wimmera where the best quality barley is grown on the sandier soil types. The crop is sown either on cultivated ley ground without fallow or on wheat stubble land.

The second source of high quality barley grain is in an area between Melbourne, Geelong, and Bacchus Marsh in southern Victoria. In this area, barley is the principal crop. Yields of barley in this region normally average about 1.7 tonnes per hectare compared with about 1.2 tonnes per hectare in the Northern Mallee-Wimmera region. The area has the further advantage of proximity to the main barley shipping terminals. Consequently, freight costs are much lower than for northern areas.

The substantial increase in barley production has meant that, in normal seasons, Victoria is self-sufficient in barley for malting, food, and manufacturing in the distilling, pearling, and prepared stock feed industries. It also contributes to Australian export markets. Barley is received and marketed in Victoria through the Australian Barley Board on a pool basis. The Board is responsible for setting prices for sales to domestic users. The price received for exports is determined by the world supply and demand situation, and can vary greatly from year to year. Japan provides the main export market; smaller quantities go to the United Kingdom, Europe, Taiwan, and the Middle East. In 1973-74, the Australian Barley Board negotiated its first direct sale to the USSR and intermittent sales to this market have continued. Australia is now a major exporter of barley.

BARLEY FOR GRAIN, VICTORIA

Season	Area		Production		Average yield per hectare	
	2-row	6-row	2-row	6-row	2-row	6-row
	'000 hectares	'000 hectares	'000 tonnes	'000 tonnes	tonnes	tonnes
1977-78	413	5	354	5	0.86	1.00
1978-79	361	4	513	6	1.42	1.50
1979-80	321	4	487	7	1.52	1.75
1980-81	298	5	412	6	1.38	1.20
1981-82	311	4	455	5	1.46	1.23
1982-83	269	9	71	3	0.27	0.34

Further reference: Australian Barley Board, *Victorian Year Book 1976*, pp. 404-5

Maize

Maize is grown on a small scale in Victoria and is 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 and yield of maize for each of the six seasons to 1982-83 were:

MAIZE FOR GRAIN, VICTORIA

Season	Area			Production			Average yield per hectare
	Hybrid	Other	Total	Hybrid	Other	Total	
	hectares	hectares	hectares	tonnes	tonnes	tonnes	
1977-78	477	28	505	1,729	119	1,848	3.66
1978-79	421	92	513	1,930	64	1,994	3.89
1979-80	483	92	575	2,798	52	2,850	4.96
1980-81	557	11	568	2,939	63	3,002	5.29
1981-82	434	42	476	2,188	169	2,357	4.95
1982-83	564	38	602	2,331	118	2,449	4.07

Rye

Cereal rye is a crop of minor importance in Victoria but there is a small but specific demand for the grain in specialty breads. Rye is chiefly grown to stabilise loose sand or sandhills in the Northern Mallee Statistical Division. There is also some interest in it for winter grazing in cold areas.

RYE FOR GRAIN, VICTORIA

Season	Area	Production	Average yield per hectare
	hectares	tonnes	tonnes
1977-78	1,828	903	0.49
1978-79	2,449	1,750	0.71
1979-80	2,261	1,489	0.66
1980-81	1,898	1,390	0.73
1981-82	2,715	1,622	0.60
1982-83	3,889	875	0.22

Triticale

The synthetic cereal triticale produced from a cross between wheat and rye was grown on a limited scale following release of locally selected adapted varieties. Most crops sown in 1982-83 were grown for grain for sale to pig or poultry farmers. Triticale flour is blended with wheat and rye flours in speciality bread and biscuit production.

Fodder

The stability of livestock production on Victorian farms depends largely on fodder conservation. Natural irregularities in the diet of grazing animals are met by conserved fodders, fed as supplement, when the paddock ration of crop or pasture is deficient in quantity or quality. Such deficiencies occur regularly with seasonal changes, e.g. lush spring growth contrasts with sparse winter growth and dried off feed in summer. Deficiencies also occur during extended dry, or excessively cold or wet periods; ravishment of pasture by pests or disease; failed crops; floods; or fire. All or any of these events may result in feed shortages for grazing animals. Fodder conservation provides a means of overcoming such shortages.

HAY PRODUCTION, VICTORIA, SEASON 1982-83

Variety	Area	Production	Average yield per hectare
	hectares	tonnes	tonnes
Meadow grass and clover	223,288	773,850	3.47
Oaten	83,503	178,142	2.13
Lucerne	13,590	65,955	4.85
Wheaten	24,348	39,693	1.63
Barley and other	3,107	6,582	2.12
Total	347,836	1,064,222	3.06

SILAGE MADE AND FARM STOCKS OF SILAGE
AND HAY, VICTORIA
(tonnes)

Statistical division	Silage made, season 1982-83	Stocks at 31 March 1983	
		Silage	Hay
Melbourne	8,030	2,795	51,029
Barwon	8,469	3,608	73,412
South Western	21,833	8,078	243,274
Central Highlands	1,653	906	62,094
Wimmera	784	1,637	49,667
Northern Mallee	3,926	975	32,131

SILAGE MADE AND FARM STOCKS OF SILAGE
AND HAY, VICTORIA — *continued*
(tonnes)

Statistical division	Silage made, season 1982-83	Stocks at 31 March 1983	
		Silage	Hay
Loddon-Campaspe	3,213	1,524	112,388
Goulburn	6,890	3,170	233,845
North Eastern	5,671	5,930	68,729
East Gippsland	2,471	1,053	32,808
Central Gippsland	47,638	9,988	218,660
East Central	7,852	2,423	38,408
Total	118,430	42,087	1,216,445

Oilseeds

A demand for high protein meals for livestock feed, together with a general worldwide trend to increased consumption of vegetable oils, has been evident in Australia, where domestic oilseed prices rose in sympathy with prices on world markets and reached record levels during 1973-74. Aggregate oilseed production expanded rapidly between 1968-69 and 1971-72 in response to both increased oilseed prices and the introduction of wheat quotas. However, a return to better market prospects for wheat and coarse grains, together with agronomic problems, resulted in an immediate decline in the production of rapeseed and safflower. The area sown to sunflower increased rapidly between 1974-75 and 1976-77 due to abnormal sowing conditions for the more traditional cereal crops and attractive prices for these oilseeds. Sunflower production continued to increase in 1978-79 in both dry land and irrigation districts, and after some uncertainties appears to be established as an important summer cash crop in irrigated districts.

SELECTED OILSEEDS PRODUCTION, VICTORIA

Season	Area	Production	Average yield per hectare
	hectares	tonnes	tonnes
LINSEED			
1977-78	7,048	8,089	1.15
1978-79	4,474	4,747	1.06
1979-80	5,284	5,208	0.99
1980-81	4,567	4,057	0.89
1981-82	3,864	3,898	1.01
1982-83	2,067	942	0.46
RAPESEED			
1977-78	3,798	2,406	0.63
1978-79	2,992	2,825	0.94
1979-80	3,438	3,476	1.01
1980-81	2,539	2,078	0.82
1981-82	3,846	3,584	0.93
1982-83	3,822	1,227	0.32
SAFFLOWER			
1977-78	3,592	1,258	0.35
1978-79	3,227	2,180	0.68
1979-80	1,055	688	0.65
1980-81	3,366	1,630	0.48
1981-82	4,799	3,113	0.65
1982-83	1,305	491	0.38
SUNFLOWER			
1977-78	14,013	11,288	0.81
1978-79	14,220	10,997	0.77
1979-80	9,363	7,325	0.78
1980-81	8,195	8,552	1.04
1981-82	11,970	10,086	0.84
1982-83	1,170	790	0.68

Further reference: *Victorian Year Book 1977*, pp. 444-5

Grain legumes

Interest in the production of cheap sources of protein for both human and livestock consumption is worldwide. The legumes, including soybeans, field peas, and lupins comprise a major group of high protein grains. Of these, field peas have been grown on a limited scale over much of the wheat belt since early settlement, and recent research by the Department of Agriculture and favourable experience by growers led to the development of the lupin grain industry in Victoria in the early 1970s. Since 1973, the area sown to lupins has risen from about 100 hectares to about 21,000 hectares in 1983.

The average area sown to field peas in the decade 1973-74 to 1982-83 was about 14,000 hectares, the majority being in western and central Victoria. There was, however, renewed interest in field pea production from 1976 resulting in substantial increases in sowings in the Northern Mallee, Wimmera, and Loddon-Campaspe Statistical Divisions. In fact, most of the area of about 65,000 hectares sown in 1982-83 was in these Statistical Divisions. This was brought about by the increased awareness by farmers of the necessity of maintaining soil fertility and also the attractive prices being offered for field peas for processing locally into split peas for culinary use.

Field peas with twenty per cent protein and lupins with twenty-five to thirty per cent protein are readily acceptable as a substitute for other protein meals in rations for poultry and pigs. A potential market also exists in the production of a meat substitute for human consumption.

Intensive crops

Fruit

Introduction

When the members of the Henty family established the first settlement in Victoria at Portland in 1834, they were among the first to plant apple trees in this State. The first vineyard, which was planted around 1837, was at Yering, near Lilydale, and the first orchard was started at Hawthorn on the banks of the Yarra River in about 1848. A variety of tree fruits, berries, and grapes carted to the Melbourne market provided the main source of income of many early settlers in the hills to the north, north-east, and east of Melbourne.

In the second half of the last century, fruit and vine growing gradually extended into the western, central, north-eastern, and Gippsland areas of the State. The foundation of Mildura in 1887, and the establishment of irrigation facilities there, marked the beginning of the development of Sunraysia, one of the major horticultural districts in Victoria. With the extension of irrigation facilities in the Goulburn Valley and Murray Valley areas, a flourishing fruit canning industry was developed after the First World War. Similarly to tree fruits, vine area increased steadily until the 1870s when Phylloxera devastated vineyards at Geelong, Bendigo, and Rutherglen. However, within a few years, new vineyards had been established in the Sunraysia district. After the First World War, the planting of dried vine fruit varieties extended along the Murray River to Robinvale and Swan Hill.

In Victoria in 1982-83, the area planted with fruit, nuts, and berries was 19,236 hectares, and the area of vineyards was 20,340 hectares. This total of 39,576 hectares is approximately 1.8 per cent of the total area under crops in Victoria, yet fruit and vine growing make a valuable contribution to the economy of the State.

Tree fruit

(1) *Distribution.* In Victoria, the main fruit growing areas are in the Goulburn, Northern Mallee, Melbourne, and East Central Statistical Divisions. There are smaller areas in the North Eastern Statistical Division and also in the Gippsland, Bacchus Marsh, and Ballarat areas.

Almost all the canning fruit is grown in the Goulburn Valley-Murray irrigation area which also produces large quantities of dessert pears and Granny Smith apples. Dessert apples and stone fruit are the main crops in the southern areas and the north-east, while early stone fruit is grown in the Northern Mallee, mainly around Swan Hill. The main concentration of citrus fruit production is in the Northern Mallee Statistical Division with additional groves in the north-east. Lemons are also produced in the eastern Melbourne metropolitan area.

**NUMBER OF BEARING ORCHARD FRUIT AND NUT TREES (EXCLUDING CITRUS) BY
STATISTICAL DIVISION, VICTORIA, AT 31 MARCH 1983**

Statistical division	Apples	Pears	Peaches	Apricots	Other
Melbourne	438,057	32,150	57,924	3,425	82,217
Barwon	3,222	436	1,327	615	173
South Western	10,628	116	1,299	439	32
Central Highlands	45,851	1,928	5,415	3,423	8,534
Wimmera	1,599	1,080	1,675	762	39,924
Northern Mallee	3,377	236	14,596	46,616	207,313
Loddon-Campaspe	76,048	23,279	715	221	2,897
Goulburn	277,464	915,460	469,374	87,081	46,313
North Eastern	63,649	275	1,670	450	15,863
East Gippsland	4,322	95	50	75	213
Central Gippsland	27,022	924	752	5	2,677
East Central	109,705	7,035	10,243	197	8,885
Total	1,060,944	983,014	565,040	143,309	415,041

**NUMBER OF BEARING CITRUS TREES BY STATISTICAL
DIVISION, VICTORIA, AT 31 MARCH 1983**

Statistical division	Oranges	Lemons and limes	Other
Melbourne	2,440	17,308	1,090
Barwon	—	80	—
South Western	75	—	—
Central Highlands	—	510	1
Wimmera	20	26	—
Northern Mallee	604,036	53,606	92,118
Loddon-Campaspe	—	40	—
Goulburn	56,972	21,158	7,166
North Eastern	25,810	4,584	335
East Gippsland	—	147	—
Central Gippsland	—	1	—
East Central	—	3,091	—
Total	689,353	100,551	100,710

(2) *Size of production.* Since the early 1950s, many of the old lower producing or marginal orchards have been pulled out, and new orchards with a small number of higher yielding and more popular varieties of fruit trees have been planted on more suitable soils. These factors, as well as greatly improved technology, have increased production potential. During the 1950s and 1960s, there were only slight changes in the area planted to most types of fruit trees, yet production showed an increasing trend, particularly with canning fruits and dessert pears in the Goulburn Valley; here the Victorian production greatly exceeded local demand and increasing amounts were exported. This situation changed during the early 1970s. Following the wet winter in 1973, about 300,000 canning peach trees died, causing a significant drop in production. At about the same time, residential and industrial developments in the eastern Melbourne metropolitan and Mornington Peninsula areas greatly reduced the area planted to apples. These changes coincided with the deterioration of overseas market prospects for Victorian fresh and processed fruit and many growers have been forced to limit production or leave the industry. In the citrus industry, the same economic pressures have not operated as keenly as in other fruit industries because of an eight-fold increase in the demand for orange juice on the local market over the last twenty years, and protective measures limiting the importation of low-cost citrus juice from overseas.

**ORCHARD FRUIT PRODUCTION, VICTORIA
(tonnes)**

Type of fruit	Year ended 31 March —					
	1978	1979	1980	1981	1982	1983
Pears	80,055	100,896	96,844	121,734	85,078	98,712
Apples	62,880	89,343	75,128	77,047	68,535	77,526

ORCHARD FRUIT PRODUCTION, VICTORIA — *continued*
(tonnes)

Type of fruit	Year ended 31 March —					
	1978	1979	1980	1981	1982	1983
Peaches	24,670	28,337	35,398	41,765	33,853	34,702
Apricots	6,268	8,135	7,626	8,611	6,754	7,302
Cherries	2,436	2,295	(a)	2,273	1,920	1,705
Plums and prunes	2,550	7,069	(a)	3,263	3,160	2,810
Olives	712	1,492	(a)	556	1,812	226
Nectarines	1,009	4,607	(a)	1,201	1,658	1,816
Quinces	127	179	(a)	(a)	(a)	(a)
Figs	17	65	(a)	5	(a)	(a)
Oranges —						
Valencias	24,100	24,911	28,865	31,950	26,921	32,936
Navels	14,023	15,367	16,741	20,590	15,506	17,117
Other	519	673	911	1,064	310	468
Lemons and limes	5,361	13,883	7,281	10,197	8,004	5,349
Grapefruit	2,845	3,740	(a)	4,367	4,656	4,913
Mandarins	1,980	2,874	(a)	2,898	2,470	2,509

(a) Not collected.

(3) *Marketing.* Most of the fruit grown in Victoria for the fresh fruit market is sold locally in Melbourne, and some in Sydney and Brisbane. While in Melbourne up to half of the total crop sold as fresh fruit may be sold direct to supermarkets or at the orchard gate, the price established at the Melbourne Wholesale Fruit and Vegetable Market still provides the basis for all Victorian sales.

The Fruit and Vegetable Act and Regulations outline standards of produce and the size and marking of containers. Produce presented in accordance with this Act and within the provisions of the Health Act may be sold in Victoria. There are also restrictions on the introduction of fruit and certain vegetables from interstate to prevent the spread of pests and diseases and, in particular, fruit fly, into the main fruit growing areas of the State.

The development of cool storage techniques towards the end of the last century made possible the exporting of dessert apples and pears from Australia to Britain, during the off-season in the northern hemisphere. Since then, cool storage methods have improved constantly and with the general acceptance of controlled atmosphere storage by Victorian apple growers during the late 1960s, apples and pears can now be sold right through the year in Victoria.

While efficient cool storage techniques have extended the local market, they have also had an adverse effect on the northern hemisphere export market where the availability of locally grown fruit from cool stores has eroded the seasonal advantage of fruit from the southern hemisphere. This has been one of several factors causing the decline in the prospects of Victorian fruit on traditional markets. Other important factors have been the phasing out of preferential treatment for Australian produce following Britain's entry into the European Economic Community (EEC), disadvantages because of changes in the currency exchange rate, and greatly increased labour and other costs, including freight charges in Australia. Alternative market outlets for Victorian pome fruit are being developed in the USA, South-East Asia, and the Middle East.

In order to help the apple and pear industry to overcome marketing problems, the Commonwealth Government established the Apple and Pear Corporation in 1974. The Corporation has taken over the export control role of the former Apple and Pear Board and also has powers to trade in its own right and to promote the use of both fresh and processed apples and pears. Over the last few years export markets have been developing for dessert stone fruit in the countries of South-East Asia, the Middle East, Europe, and North America.

The establishment of the Citrus Marketing Board in Victoria in 1973 has enabled all citrus fruits to be marketed in an orderly manner. Sales of citrus fruit on export markets (mainly to New Zealand) have not been very significant and most of the crop is sold on the domestic market, either as fresh fruit or juice.

(4) *Financial assistance.* In 1971, the Commonwealth Government set up an Apple and Pear Stabilization Scheme to help pome fruit growers by lessening the effect of price fluctuations for different varieties on overseas markets. This scheme will be phased out by 1984 and an underwriting scheme will be implemented to cover all apple exports to all markets for the 1981 to 1985 period.

In recent years, citrus processors have been importing quantities of juice concentrate to overcome

periods when the demand exceeds local availability of fresh fruit. The price of the imported juice used to be significantly lower than the local product, and in order to prevent excessive imports the Commonwealth Government has imposed a variable duty on imported citrus juice.

Small fruit

(1) *Distribution.* Climatic requirements have restricted the commercial production of strawberries, and cane and bramble fruits in particular, to the cooler southern regions of Victoria, and most of the fruit is grown in the hills of the eastern Melbourne metropolitan and Mornington Peninsula areas which are relatively close to the Melbourne market. During the last few years, fruit growers in other parts of the State interested in diversification have taken up the production of strawberries and raspberries, for the fresh fruit market in particular.

(2) *Size of production.* In the 1950s, practically all strawberry planting material available in Victoria was heavily infected with virus diseases and, as a result, the industry almost ceased to exist. The successful Runner Certification Scheme conducted by the Department of Agriculture revitalised the industry between 1960 and 1970 and total production increased tenfold. More recently there has also been increasing demand for cane and bramble berries from the processors. The use of mechanical harvesters, replacing expensive hand picking, was an additional factor in the development of a viable cane and bramble berry industry in the State.

Currently the blueberry industry is in its infancy and plantings to date have not reached full productive capacity. However, by 1988 these plantings are expected to be in full production. In the meantime, the total area planted is expanding.

SMALL FRUIT PRODUCTION, VICTORIA (kilograms)

Type of fruit	Year ended 31 March -					
	1978	1979	1980	1981	1982	1983
Strawberries	945,646	1,115,344	1,030,053	1,012,226	1,044,361	1,055,270
Youngberries	80,445	53,860	(a)	(a)	(a)	(a)
Raspberries	80,949	86,741	142,864	186,464	179,905	204,430
Gooseberries	9,103	8,371	(a)	4,531	(a)	(a)
Loganberries	5,635	6,955	(a)	8,859	(a)	(a)
Other berries	16,783	63,739	(a)	(a)	(a)	(a)
Passionfruit	653	910	(a)	(a)	(a)	(a)

(a) Not collected.

(3) *Marketing.* Berry fruits are mainly sold on the fresh fruit market or sent to processors. Recently, many growers have introduced the 'pick your own' system of sales where the general public is invited to pick the fruit for themselves. This method greatly reduces harvesting and marketing costs, and growers with land on routes near holiday resorts, in particular, achieve a good public response and increased net returns.

Increased use of berry fruits in health foods e.g. (yoghurt), and cakes and tarts, is likely to produce a larger local outlet for these fruits in the future, while there are also export opportunities, particularly for blueberries.

Nuts

(1) *Distribution.* In Victoria a wide range of nuts can be grown such as almonds, walnuts, chestnuts, hazelnuts, pecans, pistachios, and others. In the past, only a few of these trees have been grown in commercial plantings. In most cases they have been planted as windbreaks around orchards and vineyards (almonds) or in groups in the farm orchard.

Almonds were mainly planted in the northern areas; walnuts and chestnuts in situations with deep soil in the north-east, the Dandenongs, and Gippsland; and hazelnuts on shallower soils in the north-east and the Dandenongs.

Since the early 1970s, many orchardists and farmers, who wanted to diversify, or others, who wanted to take up farming on a part-time basis, have shown interest in planting nuts. Along the Murray Valley, several almond groves have been established including two large plantations of over 150 hectares each. Although there has been difficulty in obtaining large numbers of young chestnut, hazelnut, and walnut trees with proven capacity, several small plantations have been established in suitable localities.

(2) *Size of production.* The production of almonds decreased from 50 tonnes in 1960-61 to less than 11 tonnes in 1976-77, but is now increasing due to recently established groves commencing production. In 1982-83, production exceeded 600 tonnes. Because of the long establishment period for most of the other nuts, recent plantings have had little effect on production at this stage.

Among the other nuts, greatest expansion has occurred with chestnuts and the area of groves has increased tenfold, to well over 200 hectares. However, most of these groves and the more recently planted other nut trees are still not bearing.

NUT PRODUCTION, VICTORIA (kilograms)

Type of nuts	Year ended 31 March -					
	1978	1979	1980	1981	1982	1983
Walnuts	77,176	68,016	(a)	122,267	(a)	(a)
Chestnuts	19,851	24,884	(a)	(a)	(a)	(a)
Almonds	98,975	277,212	272,677	444,829	507,692	603,900
Hazelnuts	4,342	1,337	(a)	(a)	(a)	(a)

(a) Not collected.

(3) *Marketing.* Nuts are keenly sought after by wholesalers who pre-pack the shelled or salted product for retail sale, and by confectioners who use nuts as ingredients for their products. To satisfy local demand, almonds, walnuts, hazelnuts, and pistachios are being imported regularly. Thus there is an opportunity to increase local production as long as the price of local nuts can be kept at or below the level of the imported product (locally produced almonds are protected by tariff).

Grapes

(1) *Distribution.* In Victoria, most vine grapes are grown under irrigation in the Northern Mallee Statistical Division, and in the Goulburn Valley and the Murray Valley areas. Wine grape varieties are also being grown in the traditional non-irrigated areas in the north-east (Rutherglen) and in the west (Great Western) of the State. With the increasing interest in wine grapes over recent years, many vineyards of varying sizes have been established in other suitable areas throughout the State.

(2) *Wine.* During the 1960s and 1970s, the demand for grapes for winemaking increased quite significantly, and as a result, many new areas were planted both by established vine growers and by many others without previous experience. Further, to satisfy winery demand, large quantities of sultanas and grapes of other varieties suitable for drying and winemaking have been diverted to wineries. Between 1960 and 1980, the intake of grapes by wineries had increased from 11,000 tonnes to over 72,000 tonnes. Many of these grapes are now mechanically harvested.

Until recently, wineries were able to absorb the greatly increased volume of grapes produced. However, since 1977 there has been evidence of over-production. This was partly caused by the stationary consumption of fortified wines and the reduced rate of increase in the consumption of red table wines. A higher rate of increase has been maintained for white table wines, but this has been mainly due to the marketing of bulk wine in soft packs (casks) at low prices.

(3) *Dried fruits.* The production of sultanas and other drying varieties has remained fairly steady at around 42,000 tonnes to 60,000 tonnes (dry weight). Only about one-third of the Victorian crop is marketed locally and the rest has to be exported. Thus growers' returns depend largely on prices established in world markets according to supply and demand. The depressing effects of world over-production on prices for dried fruit and wine have been accentuated by the entry of Greece into the EEC. Because of these effects, growers have increasing difficulties in obtaining adequate returns and the industry is facing a period of rationalisation.

(4) *Table grapes.* Table grape production in recent years has increased considerably. The table grape season is lengthening due to the introduction of new table grape cultivars, a number of which are earlier than traditional varieties. However, the greatest change to the industry has occurred through the adoption of improved practices in the vineyard and in handling and storage, which ensure the production of well sized, high quality grapes. As a result, within the last five years, sales of Victorian table grapes on local and export markets have increased to 12,000 tonnes and it is expected that this trend will continue.

VITICULTURE, AREA AND PRODUCTION, VICTORIA

Season	Area		Production for -	
	Bearing	Non-bearing	Wine-making	Drying and table (a)
	hectares	hectares	tonnes	tonnes
1977-78	19,149	1,233	56,224	173,857
1978-79	19,597	961	65,201	177,623
1979-80	19,820	944	72,485	283,550
1980-81	19,617	1,139	65,076	196,927
1981-82	19,327	1,192	57,699	292,125
1982-83	18,976	1,365	64,900	254,117

(a) Production for drying is estimated fresh weight equivalent of dried weight.

Further reference: *Victorian Year Book 1977*, pp. 461-6

Vegetables

Victoria is the leading State for vegetable production in Australia and produces approximately thirty per cent of the total national crop. Most of the fresh vegetable production is located adjacent to the Melbourne urban area at Werribee and Keilor to the west, and Narre Warren, Clyde, and Keysborough in the sandy south-eastern area. In recent years there has been a move towards larger enterprises concentrating on only one or two major crops.

As vegetables are basically a fresh market commodity, relative levels of production of different vegetables are closely correlated with consumer preferences.

Potatoes are the largest crop with major production areas in the Central Highlands around Ballarat, Thorpdale in the Gippsland Hills, and Koo Wee Rup, with additional areas around Warrnambool, the Bellarine Peninsula, Colac, the Otway Ranges, and metropolitan market gardens.

The tomato industry in Victoria is predominantly processing-orientated with most of the crop produced in the irrigated areas between Shepparton and Rochester in northern Victoria.

VEGETABLES FOR HUMAN CONSUMPTION, VICTORIA

Main type	Area sown			Production		
	1980-81 (a)	1981-82 (a)	1982-83 (a)	1980-81 (a)	1981-82 (a)	1982-83 (a)
	hectares	hectares	hectares	tonnes	tonnes	tonnes
Potatoes	13,702	13,668	13,520	348,950	354,197	291,380
Onions	733	643	627	15,164	14,391	12,229
Carrots	1,026	970	923	32,176	30,635	27,761
Parsnips	(a)	158	181	(a)	4,481	5,387
Beetroot	(a)	(a)	19	(a)	(a)	250
Tomatoes	3,272	3,413	2,928	101,766	108,136	87,403
French beans	771	742	633	3,551	3,540	2,702
Green peas -						
Market (b)	230	287	289	438	608	473
Factory (c)	1,558	2,216	1,675	3,009	5,183	1,868
Cabbages	819	752	809	35,870	29,892	23,677
Cauliflowers	1,075	1,090	1,149	41,303	37,481	26,159
Lettuce	1,147	1,104	1,215	25,441	20,846	24,977
Pumpkins	776	632	727	12,480	9,698	10,486

(a) See footnote to table on page 341.

(b) Sold in pod.

(c) Shelled weight.

Tobacco

The tobacco industry in Victoria is centred at Myrtleford in the north-east with production areas in the adjacent valleys of the Buffalo, Ovens, Upper King, and Kiewa Rivers. With 37 per cent of the national quota, the 280 tobacco growers produce around 5 million kilograms of cured leaf annually. Australian manufacturers currently use 57 per cent of local leaf in tobacco products while a usage rate of 50 per cent is specified to qualify for by-law duty remission on leaf imports.

Prior to 1965 the Australian tobacco industry was subject to wide fluctuations in production and prices received. Following an oversupply and price decline in the 1963-64 season, a four year Tobacco Stabilisation Plan was introduced in 1965. This has been succeeded by 4 further five year plans to

maintain stability in the industry. The stabilisation arrangements are effected by complementary Commonwealth and State legislation which confers powers on the Australian Tobacco Board over the marketing of Australian tobacco leaf. Tobacco Leaf Marketing Boards operate in the three producing States (Victoria, New South Wales, and Queensland).

Under Commonwealth legislation, levy contributions on leaf sales by both growers and manufacturers are matched by the Commonwealth Government in the Tobacco Industry Trust Accounts to support research and extension activities.

The Tobacco Research Station at Myrtleford undertakes a comprehensive research programme into agronomic aspects of tobacco production including plant breeding, variety evaluation, fertiliser trials, pest and disease management, and health-related aspects of leaf composition.

TOBACCO PRODUCTION, VICTORIA

Season	Area	Production	Average yield per hectare
	hectares	tonnes (dry)	tonnes (dry)
1977-78	3,621	5,788	1.60
1978-79	3,505	5,563	1.59
1979-80	3,313	6,119	1.85
1980-81	3,015	5,911	1.96
1981-82	2,757	4,418	1.60
1982-83	2,803	4,928	1.76

Hops

In Victoria, hops production is confined to the alluvial soils in the valleys of the Ovens and King Rivers where good quality irrigation water is available to supplement the natural summer rainfall. The hop is a summer growing perennial plant, propagated from root cuttings, that develops long vines supported on a post and wire trellis system about six metres above the ground surface. During 1984, there were thirty-four hop gardens in Victoria producing hops for both domestic brewers and export markets. World overproduction has curtailed exports and the industry requires restructuring to match the reduced demand.

The high quality Victorian-bred Pride of Ringwood is the most popular variety of hops and has been well received on world markets. Hops are normally grown under contract to merchants known as hop factors.

Apart from harvesting, hop growing is still labour intensive, especially for pruning and vine training. Machine harvesting is now universal. The whole vines are cut down and transported to a stationary picker which separates the cones from the rest of the plant. After kiln drying, the cones are baled for later sale.

The Department of Agriculture conducts research and extension services in the Victorian hop industry with current emphasis on hop quality, fertiliser requirements, and the control of weeds and insect pests.

HOP PRODUCTION, VICTORIA

Season	Area	Production	Average yield per hectare
	hectares	tonnes (a)	tonnes
1977-78	429	959	2.24
1978-79	427	745	1.74
1979-80	457	908	1.99
1980-81	506	751	1.48
1981-82	461	789	1.71
1982-83	499	491	0.98

(a) Dried weight.

Plant nurseries

In 1982-83, the total area of nurseries in Victoria was about 1,765 hectares.

NURSERIES (a), VICTORIA

Particulars	1980-81
Number of nurseries (b)	437
Sales of nursery products (\$'000) –	
Seeds and bulbs	3,753
Seedlings	6,327
Cut flowers (including orchids)	8,964
Cultivated turf and ferns	14,102
Fruit trees and vines	2,959
Rose bushes	1,220
Other shrubs and trees	12,043
Total nursery sales	49,367

(a) Details of sales of nursery products are only collected triennially. For the purpose of the census, a nursery was defined as a location commercially engaged in growing or raising nursery products from seeds, bulbs, cuttings, etc., or significantly 'growing-on' any of these items.

(b) There were 445 nurseries at 31 March 1982 and 445 at 31 March 1983.

Further reference: *Victorian Year Book 1977*, pp. 471-2

Livestock and livestock products

Introduction

The first significant development in Victoria, or as it was then known, the Port Phillip District, was the pastoral industry. Millions of hectares of lightly timbered land lay before the newcomers, and the quickest way to wealth was by the division of the land into runs and the depasturing of sheep and cattle. Settlers and stock came at first from Tasmania and later from north of the Murray River.

According to early statistical records there were 41,332 sheep, 155 cattle, and 75 horses in the District 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 numbers of livestock in Victoria at decennial intervals from 1901 to 1971, and the numbers of livestock on agricultural holdings for each of the twelve years 1972 to 1983. From 1957, no allowance has been made for the small numbers of livestock not on agricultural holdings.

SELECTED LIVESTOCK NUMBERS (a), VICTORIA
('000)

Year (b)	Cattle (c)			Sheep	Pigs
	Dairy	Beef	Total		
1901	n.a.	n.a.	1,602	10,842	350
1911	n.a.	n.a.	1,584	12,883	333
1921	n.a.	n.a.	1,575	12,171	175
1931	n.a.	n.a.	1,430	16,478	281
1941	n.a.	n.a.	1,922	20,412	398
1951	1,489	727	2,216	20,012	237
1961	1,717	1,147	2,864	26,620	319
1971	1,974	3,086	5,060	33,761	520
1972	1,927	3,508	5,435	29,496	590
1973	1,957	3,488	5,445	24,105	585
1974	1,933	3,906	5,839	25,787	424
1975	1,939	4,235	6,174	26,411	383
1976	1,871	3,996	5,867	25,395	393
1977	1,681	3,423	5,104	21,925	397
1978	1,609	2,963	4,572	22,021	401
1979	1,516	2,619	4,134	22,750	390
1980	1,527	2,725	4,252	24,400	422
1981	1,538	2,775	4,312	25,487	400
1982	1,530	2,591	4,121	25,341	406
1983	1,488	1,921	3,408	22,748	387

(a) A table showing livestock numbers for each year from 1837 is published in the *Victorian Year Book 1984*, pages 700-1.

(b) Figures were established at 31 March of each year except for 1911, 1921, 1931, and 1941 (1 March).

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



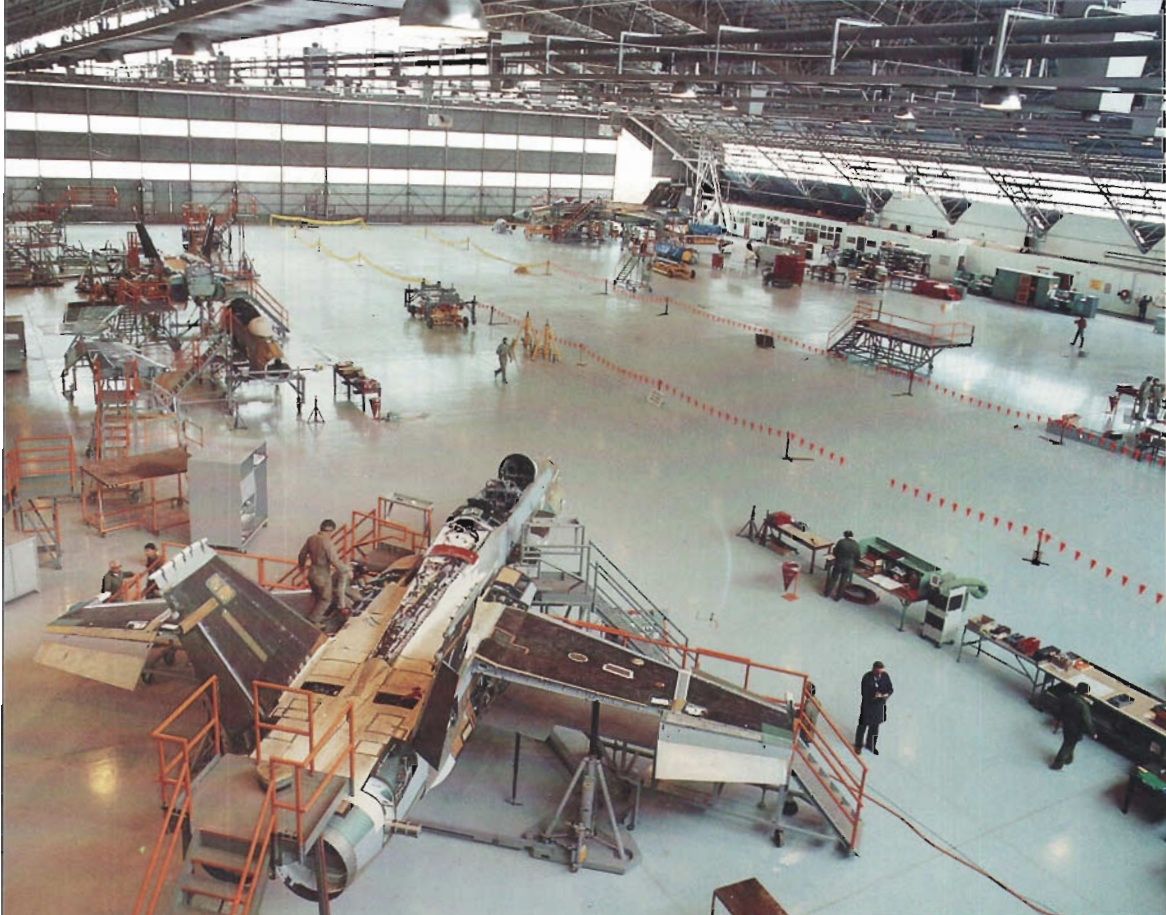
The Loy Yang A power station under construction in the La Trobe Valley. The first of four generating units of the power station commenced service in May 1984. The power station is part of the Loy Yang project comprising a new brown coal open cut and two power stations (A and B).

State Electricity Commission of Victoria

A section of the production facilities associated with the manufacture of personal computers at the IBM plant in Wangaratta.

IBM Australia Limited





(Above) Start of the F/A-18 Hornet fighter aircraft assembly line at the Government Aircraft Factories' Avalon plant.

(Below) A completed fighter, the first of seventy-three of the \$30m supersonic jets to be assembled in Australia, is displayed on the tarmac at Avalon.

Government Aircraft Factories



The following table shows details of the stock slaughtered in Victoria during each of the six years 1977-78 to 1982-83:

LIVESTOCK SLAUGHTERED, VICTORIA
(^{'000})

Particulars	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83
Sheep	4,247	3,879	4,386	5,115	3,869	3,651
Lambs	5,731	5,399	5,945	6,433	6,174	6,390
Cattle and calves	3,856	2,929	2,237	2,435	2,413	2,668
Pigs	1,017	961	978	1,149	1,138	1,167

Sheep

Distribution

During 1982-83, the Victorian sheep population decreased by 10.2 per cent to 22.7 million head — 32.8 per cent below the 1971 peak of 33.8 million head. Sheep are widely distributed throughout Victoria and the numbers of sheep in each statistical division are shown in the following table:

SHEEP AND LAMBS IN EACH STATISTICAL DIVISION
AT 31 MARCH 1983
(^{'000})

Statistical division	Rams	Ewes	Wethers	Lambs	Total
Melbourne	3	118	67	53	241
Barwon	20	720	230	308	1,278
South Western	89	3,755	1,364	1,779	6,987
Central Highlands	36	1,582	1,001	721	3,340
Wimmera	38	1,499	863	644	3,044
Northern Mallee	13	589	119	221	942
Loddon-Campaspe	30	1,221	646	501	2,397
Goulburn	32	1,307	468	447	2,254
North Eastern	9	332	105	127	573
East Gippsland	9	411	196	215	831
Central Gippsland	12	451	106	223	793
East Central	1	48	1	18	68
Total	293	12,034	5,166	5,255	22,748

Main sheep breeds

Victorian sheep can be divided broadly into 'wool' and 'meat' breeds. The distinction is necessarily an arbitrary one, since wool is an important source of income from ewes kept for prime lamb production, while mutton is produced mainly from surplus or aged sheep from 'woolgrowing' flocks.

The Merino is the most numerous breed in Victoria, although not as dominant as in the other mainland States. At 31 March 1983, the 11.9 million Merinos represented 52 per cent of the Victorian flock.

The traditional Victorian Merino is a comparatively small framed Saxon type, producing fine to superfine wool. This type is now giving way to larger, heavier cutting, broader woolled strains, in response to limited price margins for fineness (prior to 1983) and greater stress on carcase values, especially of wethers suitable for live export, all during a period of sharp increases in production costs.

Other breeds derived from Merino crossbreds and kept mainly for wool production include the Corriedale (half Merino, half Lincoln), 11.9 per cent, and Polwarth (one-quarter Lincoln), 2.5 per cent. Comebacks (predominantly Merino, fine-woolled crossbreds) made up another 5 per cent. Other stronger woolled crossbreds are used mainly for prime lamb production. At 31 March 1983, these contributed 19.3 per cent (4.4 million) to the total, compared with 25 per cent at 31 March 1974. Prime lamb breeds developed from British breed crosses, and carpet wool breeds derived from mutant Romney types, account for a very small but increasing part of the total flock.

British meat breeds and Australasian breeds developed from them, such as the Poll Dorset, are widely used as sires in crossbreeding programmes, so that their influence is much greater than their contribution to total numbers (6.5 per cent in 1983) would suggest. British longwool breeds, such as the Border Leicester and the Romney Marsh, are commonly mated to Merino ewes to produce crossbred breeding ewes and prime lambs.

Shortwool breeds, such as the Dorset Horn, Poll Dorset, and Southdown are used mainly as terminal sires, mated with crossbred, Corriedale, or Merino ewes to produce prime lambs.

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

Breed	1977		1980		1983	
	Number	Percentage of total	Number	Percentage of total	Number	Percentage of total
Merino	11,973,587	54.61	12,752,386	52.26	11,896,162	52.30
Corriedale	2,419,208	11.03	3,135,726	12.85	2,696,234	11.85
Polwarth	626,895	2.86	732,463	3.00	579,102	2.55
Border Leicester	782,107	3.57	439,662	1.80	320,141	1.41
Cheviot	4,687	0.02	6,753	0.03	3,233	0.01
Dorset Horn	389,699	1.78	556,201	2.28	237,539	1.04
Poll Dorset	209,465	0.96	443,607	1.82	251,116	1.10
Perendale	7,871	0.04	21,164	0.09	36,526	0.16
Romney Marsh	280,854	1.28	433,876	1.78	486,087	2.14
Ryeland	12,870	0.06	17,014	0.07	12,427	0.05
Southdown	89,612	0.41	134,742	0.55	81,367	0.36
Suffolk (including South Suffolk)	18,625	0.08	29,081	0.12	33,737	0.15
Cormo (b)	—	—	32,220	0.13	51,573	0.23
Zenith	40,912	0.19	30,554	0.13	26,905	0.12
Comeback	1,031,150	4.70	1,130,172	4.63	1,593,642	7.01
Crossbreed (including half breed Merino and coarser)	4,017,269	18.32	4,459,959	18.28	4,398,271	19.33
Other (including unspecified)	20,639	0.09	44,485	0.18	44,350	0.19
Total	21,925,450	100.0	24,400,065	100.00	22,748,412	100.00

(a) Collected triennially.

(b) Included under 'other'.

Lambing

The lambing performance of the Victorian flock fluctuates according to seasonal conditions around a fairly static twenty year average of 83 lambs marked for each 100 ewes mated.

Favourable seasonal conditions in the year ended 31 March 1983 contributed to the above average lambing. Ewe matings increased to 11.0 million.

Victoria's largest lambing occurred in 1970-71, when 12.7 million lambs were marked from 14.8 million ewes mated (86 per cent).

LAMBING, VICTORIA

Season	Ewes mated	Lambs marked	Percentage of lambs marked to ewes mated
	'000	'000	per cent
1977-78	9,462	7,482	79
1978-79	9,562	7,923	83
1979-80	10,723	9,099	85
1980-81	10,836	9,167	85
1981-82	11,066	8,887	80
1982-83	11,018	9,246	84

Wool production

In 1982-83, Victoria produced 109.9 million kilograms of shorn wool (greasy basis), 12.2 per cent higher than in 1981-82, and this represented 17 per cent of Australian production.

Victorian production peaked at 201 million kilograms in 1970-71, although the most valuable clip (\$359m) was produced in 1981-82. From 1970-71 until 1977-78, the size of the clip declined in line with the decline in sheep numbers but then stabilised until the onset of widespread drought during 1982. The Victorian clip spans a very wide range of wool types, ranging from superfine Merino, through the stronger grades of Merino and Comeback, to coarse crossbred and Lincoln and a small quantity of speciality (hairy) carpet wool.

SHEEP SHORN AND WOOL CLIPPED, VICTORIA

Season	Shorn		Wool clipped (including crutchings)		Average	
	Sheep	Lambs	Sheep	Lambs	Per sheep	Per lamb
	'000	'000	tonnes	tonnes	kg	kg
1977-78	21,449	5,194	96,421	6,867	4.50	1.32
1978-79	22,569	5,896	105,848	8,582	4.69	1.46
1979-80	23,184	6,845	110,404	9,911	4.76	1.45
1980-81	23,604	6,925	110,884	10,179	4.70	1.47
1981-82	25,360	6,802	115,633	9,509	4.56	1.40
1982-83	22,390	5,920	101,556	8,403	4.54	1.42

SHEEP AND LAMBS SHORN, SEASON 1982-83

Statistical division	Shorn		Wool clipped (including crutchings)		Average	
	Sheep	Lambs	Sheep	Lambs	Per sheep	Per lamb
	number	number	kg	kg	kg	kg
Melbourne	213,758	52,178	1,014,474	75,496	4.75	1.45
Barwon	1,232,526	344,805	5,127,574	454,862	4.16	1.32
South Western	6,620,952	2,016,623	29,301,967	2,962,182	4.43	1.47
Central Highlands	3,341,251	675,736	14,707,164	937,434	4.40	1.39
Wimmera	3,221,077	716,566	15,355,260	1,011,063	4.77	1.41
Northern Mallee	925,603	253,871	4,442,243	391,367	4.80	1.54
Loddon-Campaspe	2,644,741	621,589	12,635,360	843,042	4.78	1.36
Goulburn	2,252,700	563,098	10,033,700	769,382	4.45	1.37
North Eastern	526,680	140,726	2,265,581	186,724	4.30	1.33
East Gippsland	740,642	207,842	3,549,109	289,264	4.79	1.39
Central Gippsland	624,529	294,109	2,919,366	436,229	4.67	1.48
East Central	45,780	32,500	203,945	46,009	4.45	1.42
Total	22,390,239	5,919,643	101,555,743	8,403,053	4.54	1.42

TOTAL WOOL PRODUCTION, VICTORIA

Season	Clip	Stripped from and exported on skins, etc. (greasy)	Total quantity (greasy)
	tonnes	tonnes	tonnes
1977-78	103,288	28,346	131,634
1978-79	114,430	24,241	138,672
1979-80	120,316	27,050	147,366
1980-81	121,063	24,756	145,819
1981-82	125,142	22,445	147,587
1982-83	109,959	22,486	132,445

Further reference: Australian Wool Corporation, *Victorian Year Book 1977*, p. 452

Mutton and lamb production

Victoria is the leading State in the production of mutton and lamb. However, part of this production is derived from sheep and lambs originating in other States, especially from southern New South Wales.

Mutton, the meat from adult sheep, is mainly produced from surplus sheep from the wool industry so that production patterns correspond closely to expansions and contractions in that industry. In 1982-83, Victoria produced 72,000 tonnes of mutton, well down on the 1971-72 peak of 247,000 tonnes.

Prime lamb production was 109,000 tonnes in 1982-83, and production levels are generally more consistent from year to year than mutton. Prime lamb producers are found throughout the State. However, early to mid-season producers are distributed in a broad band across northern Victoria, including some irrigated areas in the Murray and Goulburn Valleys. In addition, a considerable number of early lambs are brought from southern New South Wales for slaughter in Victoria. Mid to late-season producers are located mainly in the South Western, Central Highlands, Central Gippsland,

and parts of the North Eastern Statistical Divisions of the State.

During 1982-83, domestic consumption of lamb in Australia decreased marginally to 16.2 kilograms per head per annum. Mutton consumption was 4.5 kilograms per head per annum during 1982-83, still well below the 20-25 kilogram level that prevailed during the early 1970s.

Export of live sheep

Exports of Australian live sheep for slaughter in the country of destination have grown from 1.3 million head in 1974-75 to 7.2 million in 1982-83 with 99 per cent consigned to the Middle East and North African markets.

During the early development of this trade Iran was the major importing country, but ceased live imports early in 1982. In 1982-83, Saudi Arabia and Kuwait imported 26 per cent and 25 per cent respectively. Libya has rapidly increased imports to 15 per cent requiring a lighter (45 kilogram) and younger (3 year old) sheep than other countries.

Western Australia, the nearest source, has been the main supplier during this period of expansion, but shippers have recently looked to the eastern States to fill their contracts. In 1982-83, Western Australia supplied 2.8 million head, while 2.2 million and 1.9 million sheep were shipped from South Australian and Victorian ports, respectively. It is estimated that Victorian flocks contributed nearly one million sheep for shipment from Victorian and South Australian ports in 1982-83, while some sheep from other States were included in shipments from Portland.

Middle East demand for sheep meat has been enhanced by rapidly growing populations and increasing wealth from oil resources. Traditional taste, religious beliefs, and the lack of refrigeration favour meat from freshly killed sheep. However, the growing demand for lamb and young mutton has been the major factor in a parallel expansion in carcase meat imports. Carcase meat imports have been built up as rapidly as suitable refrigeration storage and distribution facilities have been installed, and traditional habits modified.

The Middle East region currently takes two-thirds of Australian lamb exports and two-thirds of mutton exports. Live exports of breeding sheep are declining to insignificant levels.

Meat cattle

The cattle introduced into southern Australia by the early settlers were poor stock from Africa intended to meet the needs of meat and draught milk, and were quickly replaced by herds of meat cattle imported from Britain.

In its early years, the meat cattle industry faced many natural hazards including drought, disease, and pests. More recently, changing economic conditions and patterns of land-use have been most important in determining the size and distribution of the meat cattle population. Refrigeration, pasture improvement, the relative prices received for other primary products, and the export markets for beef, have all been important factors.

In the early 1970s, high prices for beef, and marketing difficulties in the sheep, dairy, and wheat industries, encouraged farmers to build up breeding herds. As a result, beef cattle numbers in Victoria rose from 1.5 million in 1968, to reach a peak of 4.2 million in 1975. This included a large number of heavy bullocks retained by producers anticipating some recovery in market prices, which had dropped dramatically when export demand, especially from Japan, was suddenly curtailed. After 1975, however, several factors combined to force a sharp downturn in meat cattle numbers. They included continued low beef prices, several dry autumn periods, buoyant grain prices, and a gradually improving wool market. Numbers fell to 2 million at the end of 1982-83.

The Victorian environment is very favourable for beef production with cattle able to graze on pasture throughout the year. The following table shows the numbers and types of meat cattle in each statistical division at 31 March 1983:

DISTRIBUTION OF MEAT CATTLE, VICTORIA, AT 31 MARCH 1983
('000)

Statistical division	Bulls for service		Cows and heifers	Calves under 1 year	Other (a)	Total
	1 year and over	Under 1 year				
Melbourne	3	1	70	37	15	127
Barwon	3	1	49	21	12	86
South Western	10	3	221	82	56	372
Central Highlands	2	1	42	21	9	74

DISTRIBUTION OF MEAT CATTLE, VICTORIA, AT 31 MARCH 1983 — *continued*
(^{'000})

Statistical division	Bulls for service		Cows and heifers	Calves under 1 year	Other (a)	Total
	1 year and over	Under 1 year				
Wimmera	1	—	18	10	3	33
Northern Mallee	1	—	24	16	7	48
Loddon-Campaspe	3	1	55	30	24	113
Goulburn	7	2	138	70	34	252
North Eastern	5	1	138	69	43	257
East Gippsland	4	1	90	43	15	152
Central Gippsland	7	2	157	85	79	330
East Central	2	—	39	20	16	76
Total	48	13	1,041	504	314	1,921

(a) Steers, bullocks, etc.

Most of the Victorian breeding herd (bulls and cows) are in the South Western, Goulburn, North Eastern, and Gippsland Statistical Divisions. There were large decreases from 1976 in the total meat cattle populations of the Wimmera, Loddon-Campaspe, and Goulburn Statistical Divisions.

In the early 1970s, beef cattle numbers increased rapidly and beef production reached a peak of 530,199 tonnes in 1978 as producers started to reduce their herds. Exports constituted about 49 per cent of Victorian beef and veal production in 1982-83 and the main markets were the USA, Japan, Korea, Taiwan, Canada, and the Middle East. During 1982-83, total beef and veal exports increased, as did exports to the main markets, except the Middle East.

Domestic consumption of beef and veal is very responsive to price. During the low price period of the mid 1970s, consumption rose from about 40 kilograms per head per annum to a peak of 70 kilograms in 1975-76. Consumption fell again to 45 kilograms in 1982-83 in the wake of higher prices which accounted for a large part of the decline in total meat consumption in that year. Attention is drawn to the historical table of livestock numbers and the table on livestock slaughtering on pages 364-5.

Further reference: Australian Meat Board, *Victorian Year Book 1977*, pp. 453-4

*Milk cattle**Distribution*

Dairy farming in Victoria is largely confined to the higher rainfall areas of Gippsland, the Western District, and the northern irrigation areas. Although cow numbers have been reasonably stable in recent years production per cow continues to rise.

DISTRIBUTION OF MILK CATTLE, VICTORIA, AT 31 MARCH 1983
(^{'000})

Statistical division	Bulls for service		Cows and heifers for milk and cream			House cows and heifers	Total
	1 year and over	Under 1 year	Cows in milk and dry	Heifers			
				1 year and over	Under 1 year		
Melbourne	1	—	25	8	5	—	40
Barwon	1	—	70	17	15	—	104
South Western	5	1	201	44	40	2	293
Central Highlands	—	—	8	3	2	1	15
Wimmera	—	—	2	1	—	1	4
Northern Mallee	—	—	22	5	6	1	34
Loddon-Campaspe	2	—	86	20	21	1	129
Goulburn	4	1	198	46	45	1	295
North Eastern	1	—	44	11	11	1	68
East Gippsland	1	—	50	12	12	1	77
Central Gippsland	5	1	254	58	55	1	374
East Central	1	—	37	9	8	—	55
Total	22	5	998	233	220	10	1,488

Recent developments

The high capital investment in dairying is largely a reflection of advances in dairy farming technology. These have been marked by progress in the mechanisation of milking, the introduction of farm refrigeration and tanker collection of milk from properties, and the improvement in systems of cleaning dairy shed equipment and of disposing of milking shed wastes. These advances have contributed towards expansion of dairy farm enterprises which one, two, or three persons can operate. Improvements in pasture production and grazing management, and increased mechanisation in growing and harvesting fodder, have made it possible to carry more stock on farms. The introduction of Australian Breeding Values for bulls and cows will lead to larger increases in cow productivity through genetic improvements as more farmers use superior sires and artificial insemination.

Contract labour is used by dairy farmers mainly to meet peak labour demands such as hay making. Usually the contractor owns most of the equipment.

MILK PRODUCTION, VICTORIA

Year ended 30 June	Million litres
1978	3,011
1979	3,247
1980	3,155
1981	3,065
1982	3,028
1983	3,164

Further references: Australian Dairy Corporation, *Victorian Year Book* 1977, p. 456; Marketing of milk, 1980, pp. 370-1

Pigs

Approximately two-thirds of the pig meat consumed in Victoria is produced in this State. The remaining one-third is acquired from other States.

Australians are relatively large meat eaters, but they eat much less pig meat than most other nations. Pig meat provides about fifteen per cent of the total meat consumed by Australians.

The pig industry was developed largely in conjunction with the dairy industry. Pigs were used to salvage separated milk, buttermilk, and whey – 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 and 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.

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. However, during 1973, the situation altered. An oversupply of pigs led to a sharp decline in prices at a time when food costs were rising. Many producers left the industry and by March 1974 the Victorian pig population had fallen by 27 per cent. The resultant shortage of pigs caused pig prices to rise to record levels. During 1975, the pig population fell a further 10 per cent and stabilised with a slight increase of 2.5 per cent in 1976. Pig prices during this time stabilised just above the previous record levels. Despite this, high capital costs and escalating feed prices are tending to deter producers from entering the industry. 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, more than one-third of Australia's pig production was exported. Since then, production and local demand have come closer together and only a small part of the country's production is exported. In 1972-73, as a result mainly of orders from Japan, exports amounted to only 6 to 7 per cent of production.

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

The number of pigs in Victoria at 31 March 1983 was 386,902. The following table shows classification (in statistical divisions) of pigs, together with the numbers of pig keepers. The historical table and the table on slaughtering on pages 364-5 contain further information about the pig industry.

PIGS AND PIG KEEPERS, VICTORIA, AT 31 MARCH 1983

Statistical division	Boars	Breeding sows	All other	Total pigs	Pig keepers
Melbourne	330	3,418	26,623	30,371	75
Barwon	96	1,080	6,690	7,866	56
South Western	263	2,287	15,132	17,682	174
Central Highlands	162	2,143	19,624	21,929	85
Wimmera	440	4,398	30,297	35,135	306
Northern Mallee	330	3,239	21,991	25,560	222
Loddon-Campaspe	1,231	16,999	125,421	143,651	339
Goulburn	657	7,819	57,696	66,172	291
North Eastern	238	2,810	21,308	24,356	148
East Gippsland	48	426	3,129	3,603	41
Central Gippsland	115	1,274	6,942	8,331	103
East Central	49	358	1,839	2,246	18
Total	3,959	46,251	336,692	386,902	1,858

Poultry

The trend in the Victorian egg industry has been towards large specialised farms, for example, egg producers, hatcheries, and pullet growers, all of which use modern poultry housing, equipment, and labour saving machinery.

The greater proportion of Victoria's estimated 3 million adult female fowls are now contained within the commercial egg industry. There are, however, small household flocks in suburban and country areas. The main areas of 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 the north-east.

Farms consisting of one man or one family usually manage 5,000 to 10,000 layers. There are, however, many larger farms employing labour with up to 50,000 layers, and a few with much bigger establishments.

Housing is planned on the intensive principle, with deep litter pens or multiple bird cage units. Most housing currently used is based on the laying cage system. A small proportion of layers are kept in fully enclosed, windowless houses in 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), with meatmeal used as the major protein supplement. A wide range of commercial, ready-mixed poultry rations is available.

Laying stock consists mainly of specially produced crosses between the following breeds: White Leghorn and Australorp, White Leghorn and New Hampshire, and Australorp and New Hampshire. The average State egg production is estimated at approximately 250 eggs per bird per year. Commercial stock of the local breeding farms and hatcheries is tested for profitability using the Department of Agriculture's Random Sample Laying Test at Burnley Gardens.

Chicks are hatched continuously throughout the year. Hatcheries are large and use modern incubators of about 65,000 egg capacity. Most commercial egg-type chicks are sexed at one day old. The main power source used in the brooding of chicks is gas, but electric brooders and hot water brooders fired by oil burners are also used.

The marketing of eggs is controlled by the Victorian Egg Marketing Board. Flocks with over twenty adult female fowls come within the Board's jurisdiction.

Advisory and research services to the egg industry are provided by the Department of Agriculture and by commercial firms concerned with the sale of feed, chickens, drugs, and equipment.

Broilers

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

It now takes approximately two kilograms of poultry feed to produce one kilogram of poultry meat, and a two kilogram chicken is grown in less than seven weeks. This efficient conversion and rapid growth has been achieved by extensive breeding programmes, by the use of 'high energy' poultry

feeds, highly supplemented with vitamins and minerals, and by the development of enclosed, factory-like broiler houses with controlled temperature, humidity, ventilation, and light, all of which are conducive to fast growth. Broiler houses are fully enclosed; each house grows a 'crop' of about 40,000 to 100,000 broilers about five times a year. A one man or one family farm may raise from 200,000 to 500,000 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 organisation of the broiling industry as a continuous, production-line, factory-type operation has been a major factor in the significant reduction in the price of poultry meat to consumers. Breeders, hatcheries, contract growers, poultry processors, and distributors have all been 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 inexpensive and a normal part of the diet. Apparent per capita consumption was approximately twenty kilograms in 1982-83, second only to beef and veal.

The main broiler production centres are located on the Mornington Peninsula, in areas south-east and east of Melbourne, and in 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, but considerable numbers of interstate broilers are imported.

The Broiler Chicken Industry Act requires all commercial broiler growing to be under contract approved by the Negotiation Committee of grower and processor representatives set up under the Act. The Committee negotiates and sets growing fees and conditions for the industry.

The following statistics have been compiled from statistical returns submitted by commercial chicken hatcheries (i.e. those making sales of day-old chicks) and by commercial poultry slaughtering establishments:

POULTRY SLAUGHTERED FOR HUMAN CONSUMPTION, VICTORIA ('000)

Period (a)	Chickens (i.e. broilers, fryers, or roasters)	Hens and stags	Ducks and drakes
1977-78	35,053	2,029	261
1978-79	38,294	2,276	256
1979-80	45,379	1,775	331
1980-81	45,894	2,894	241
1981-82	42,351	2,508	316
1982-83	43,315	2,330	389

DRESSED WEIGHT OF POULTRY SLAUGHTERED (b) (c) ('000kg)

Period (a)	Fresh and frozen	Fresh and frozen	Fresh and frozen
1977-78	44,230	3,149	441
1978-79	48,359	3,423	469
1979-80	56,112	2,599	552
1980-81	56,867	4,354	437
1981-82	55,526	3,660	563
1982-83	51,960	4,051	634

(a) Year ended 30 June.

(b) Dressed weight of whole birds, pieces, and giblets intended for sale as reported by producers.

(c) Fresh: sold immediately after slaughter or chilled for sale soon after. Frozen: frozen hard for storage of indefinite duration.

Miscellaneous livestock

Goats

The main breeds of goats in Victoria are the Angora and the various milking breeds; the Saanen, Toggenburg, British Alpine, and Anglo-Nubian. Since 1977, Angora goat numbers have risen from about 4,000 to 45,000 registered purebred and part Angora breeding animals in 1983.

Angora goats produce mohair – a luxury fibre that has lustre, is light in weight, is soft to handle, and is hard wearing. The rapid rise in Angora numbers is attributed to the improved market price of mohair in the mid to late 1970s. World mohair prices tend to be cyclical and have since declined to about 50

per cent of peak prices. Angora breeding animals have broken world price records; the highest price paid for a buck bred in Victoria was \$42,000 on 8 February 1980, and for a doe, \$7,800.

Angora goats are shorn twice a year and the mohair is sorted into grades after which the fibre is sold by auction. Estimated mohair production in 1983-84 was 90,000 kilograms.

Recent interest in cashmere has stimulated the upgrading of cashmere-type feral goats for fibre production or cross breeding these with Angora goats. Cashmere is the fine undercoat of goats and is harvested by shearing the animals in spring and then removing the coarse hair in sophisticated machines overseas. Cashmere-type goats in Victoria numbered approximately 3,000 in 1981. Sale of cashmere fibre is by private treaty with overseas manufacturers. Victoria produced 1,600 kilograms of dehaired down and 4,000 kilograms of cashgora fibre (i.e. fibre intermediate between cashmere and mohair) in 1984.

Goat milk production declined in recent years because of a Commonwealth Government ruling on pharmaceutical benefits. In 1976, the upper age limit for subsidised goat milk for children allergic to cows' milk was reduced from 6 years to 18 months. As a result, the main processor and outlet ceased production of canned goat milk in 1976-77. Although goat milk has been sold in a fresh form in increasing quantities since 1978, dairy goat numbers had declined to approximately 2,000 in Victoria by 1984.

In 1983-84, 12,000 goats were slaughtered for meat in Victoria. Current slaughterings are mainly surplus stock from Victorian herds of fibre and milch goats. In the nine months ending September 1984, exports of goat meat had doubled to 64 tonnes over the corresponding period in the preceding year. However slaughterings have declined from levels of approximately 80,000 per year in the late 1970s, due mainly to the virtual cessation of slaughter in Victoria of feral goats captured in New South Wales. Many of these feral goats are now being used as breeding stock in a cashmere upgrading programme throughout Australia.

Deer

Deer produce two valuable products, namely, venison and antler velvet. Farming of deer has begun on a small scale, and in 1983 there were about 2,500 domesticated deer in Victoria. The main breeds of deer being farmed are the fallow and rusa deer. Large herds of sambar deer run wild in Victoria but are not available for capture. The small number of animals available for breeding is hindering the development of this industry.

Apiculture

Honey production in Victoria fell from 5,417.5 tonnes in 1981-82 to 2,704.8 tonnes in 1982-83. The bulk of the honey produced from the 406 beekeepers with 40 or more beehives each in Victoria, is sold to large processors who clarify and pack the honey. About 43 per cent of the annual production is exported, chiefly to the United Kingdom.

BEEHIVES, HONEY, AND BEESWAX, VICTORIA

Season ended 30 June --	Beekeepers	Hives	Production	
			Honey	Beeswax
	number	number	tonnes	tonnes
1978	455	81,569	3,106	46
1979	477	85,817	2,715	47
1980	362	75,883	4,065	69
1981	446	76,123	5,160	88
1982	444	95,038	5,388	99
1983	406	89,796	2,705	48

Further reference: *Victorian Year Book 1977*, pp. 460-1

SERVICES TO AGRICULTURE

Regulatory services

Introduction

As farming is essentially based on the land, it is subject to the various regulations on land-use which apply in Victoria as well as to regulations on farming activities. A number of government authorities exercise regulatory powers in such fields as planning, water supply, forestry, and environmental protection; the Department of Agriculture is the major body regulating farming activities.

Department of Agriculture

The Department of Agriculture, Victoria, is a client-orientated, knowledge-based Department which exists to provide services to producers and consumers of agricultural products through three main functions; regulation, research, and extension.

The Department operates three service programmes that are directed to maintaining and improving agricultural productivity and product quality in Victoria through the provision of services to various sectors of the community.

The Livestock Industry Services Program encompasses a range of scientific services directed to improving the productivity, health, and welfare of livestock and the quality and marketing of livestock products. It also seeks the eradication and control of zoonoses (TB, brucellosis, anthrax, leptospirosis, etc.).

The Crop Industry Services Program includes a range of scientific services directed to improving the productivity, quality, and marketing of horticultural and field crop products.

The Community Services Program encompasses a range of scientific services to government and the community on environmental issues, disaster relief, analysis and diagnosis, and development assistance.

The Department uses a knowledge base derived from all of its functions in providing a service to individuals, organisations, and industries throughout the State.

In regulation, the knowledge is applied in the administration of legislation regarding standards and procedures to maintain the supply, quality, and marketability of agricultural products. Regulation is authorised by legislation which is introduced in response to community needs. This legislation is reviewed as needs and knowledge change.

In research, the knowledge base is increased through local innovation and confirmation or modification of findings from research elsewhere in the world. Research produces new knowledge, solves problems, and develops new technology. Though local research is chiefly concerned with problems facing agricultural production in Victoria it inevitably makes a significant contribution to world knowledge.

In extension, knowledge is communicated between the Department of Agriculture and its clients. It encompasses communication from clients to the Department, joint integration of knowledge as a basis for management decisions, and group and individual advice on developments in agricultural technology.

The Department also has a role in disaster mitigation under the State Disaster Plan, wherein key inputs are provided during environmental emergencies.

Government objectives for agriculture

The overall goal of the Department is to maintain and improve agricultural productivity and product quality in Victoria by ensuring that producers and processors are provided with efficient technologies and accurate advice, and that demands of consumers for high quality agricultural products are satisfied.

In line with government policy for agriculture, there were four major thrusts in the work of the Department during 1983-84:

- (1) an emphasis on increased productivity, as contrasted to increased production, wherever this can be achieved;
- (2) a concentrated extension effort to disseminate available knowledge and increase the impact of research;
- (3) an emphasis on marketing wherever the Victorian Government can have a significant impact; and
- (4) an increased emphasis on obtaining industry support before government services are significantly expanded in any area.

Financial services*Introduction*

Australia's national policy for permanent land settlement has been based on the family farm. Recognition of the vulnerability of the rural industry to the changing economic conditions both at home and abroad has led the appropriate authorities to establish various schemes to assist farmers in carrying out the necessary structural changes. To enable land acquisition and clearing, the conditions of purchase were made easy and after each world war special terms of settlement were offered to ex-servicemen.

Rural Finance Commission

The Rural Finance Commission was established by legislation in 1961 under the name of Rural Finance and Settlement Commission. This legislation and further detailed legislation in 1963 merged the functions of the former Soldier Settlement Commission and the Rural Finance Corporation.

Legislation enacted in 1977, effective from 1 January 1978, changed the Commission's name to the Rural Finance Commission. It also provided greater flexibility in the management of funds administered by the Commission by bringing into the Rural Finance Fund money held or to be received by the Commission as agent for the Treasurer of Victoria, as well as providing for loans to be raised by the issue of inscribed stock or debentures. These measures had the effect of significantly increasing the availability of funds for inclusion in the Commission's lending programmes for the rural community.

Among other changes arising from the 1977 legislation was a provision for more flexible arrangements for the disposal of land in the most appropriate manner having regard to general economic and industry circumstances.

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, on such terms as the Commission thinks appropriate in each case, subject to the Act. Lending to primary industry may be for farm purchase, farm development, re-finance, soil and water conservation projects, and seasonal advances. The Commission always endeavours to work in co-operation with other lenders, particularly those within the banking system, to achieve the most appropriate financing arrangements for farmers. Loans for secondary industry – especially those allied to primary activities – are made to assist with the establishment of country based industries and include advances for plant, equipment, and factory buildings.

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 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. Major Commonwealth-State Government Schemes such as the Rural Reconstruction Scheme, Dairy Adjustment Programme, Rural Adjustment Scheme, Beef Industry Assistance Scheme, and the Fruitgrowing Reconstruction Scheme, are administered in Victoria by the Commission.

Under legislation passed in 1981 and effective from 1 July 1981, the Victorian Treasurer may determine terms and conditions to apply to special assistance for young farmers. Loans for young farmers with suitable experience and potential are provided in three categories and generally involve interest rates and other terms more favourable than those applicable to finance from other sources.

Assistance provided includes loans to assist young persons working in farming as lessees, sharefarmers, or contractors to purchase stock and equipment. Loans are also available to help young persons with experience in farming who are currently engaged in allied occupations and who intend to take up farming full-time as soon as practicable. The other category of lending is the provision of special loans at concessional interest rates to help with the purchase of a first farm property.

Loan statistics

Loan assistance provided by the Commission had totalled \$536m by 30 June 1983 and details of loans made and outstanding loan balances for recent years are provided in the following table:

LOANS BY RURAL FINANCE COMMISSION, VICTORIA
(\$'000)

Particulars	Year ended 30 June -					
	1979	1980	1981	1982	1983	1984
Lending -						
Primary industry -						
Ordinary lending	11,903	22,076	31,576	20,935	12,408	19,813
Salinity	..	27	544	582	760	206
Young Farmers Finance	..	..	..	2,175	1,061	715
Agency lending -						
General	3,867	597	733	795	30,096	12,735
Rural reconstruction	35	..	..	..	..	..
Rural adjustment (a)	9,032	6,443	3,453	4,075	3,605	4,910
Dairy adjustment	119	6	..	..	..	..
Fruit growing	..	..	..	..	587	..
Beef industry	294	4	..	..	..	..
Secondary industry -						
Ordinary lending	331	834	2,371	1,107	1,864	1,124
Agency lending	1	216	19	..	..	..
Land settlement	7	800	2,956	1,390	784	772
Total lending (b)	25,589	31,003	41,652	31,059	51,165	40,275
Loans outstanding at 30 June -						
Ordinary lending	40,873	57,812	85,870	103,660	112,499	123,361
Agency lending -						
General	12,031	9,271	7,632	6,252	37,402	32,392
Rural reconstruction	30,784	26,205	22,280	19,090	17,354	15,122
Rural adjustment (a)	22,251	26,377	27,904	30,048	31,753	34,072
Dairy adjustment	14,914	11,212	8,451	5,984	4,291	3,104
Fruit growing	1,285	1,164	1,033	310	588	841
Beef industry	3,450	2,578	1,823	1,175	684	242
Land settlement	13,634	12,998	14,952	15,379	15,282	14,856
Soldier settlement	20,381	18,118	16,391	14,858	13,997	12,850
Total loans outstanding	159,603	165,735	186,336	196,756	233,850	236,840

(a) The Rural Adjustment Scheme superseded the Rural Reconstruction Scheme on 1 January 1977.

(b) Excludes grants and subsidies.

Assistance for rural adjustment

From time to time, the farming community suffers from depressed prices for its product, largely due to overseas market conditions beyond the control of Australian farmers, as well as rising costs and other adverse conditions. In certain situations like this, assistance for reconstruction and adjustment has been provided under schemes implemented after consultation between Commonwealth and State Governments. The Rural Finance Commission administers these arrangements in Victoria.

Loan assistance provided under these arrangements is mainly for debt reconstruction, farm build-up, farm improvement, retraining and rehabilitation and, subject to special agreement from time to time between the Commonwealth and a State or States, to help with essential carry-on requirements.

Other sources of finance

There are a number of other sources of finance available to the rural sector, ranging from various bank facilities to specialised sources such as pastoral finance companies. For example, the Rural Credits Department of the Reserve Bank advances payments to growers of produce, such as wheat and barley, pending its sale; the Commonwealth Development Bank provides rural loans for farm improvement purposes; and the Farm Development Loan Fund of the trading banks and the State Bank provide all-purpose loans to the rural sector. The pastoral finance companies provide a variety of credit facilities to farmers to cover all aspects of farm activity. Additional finance is made available by the Primary Industry Bank of Australia Ltd to prime bank and other approved lending institutions for lending to the rural community to assist with re-financing arrangements.

Further references: Financial services, *Victorian Year Book* 1978, pp. 403-7; Vermin and Noxious Weeds Destruction Board, 1978, pp. 392-3; 1980, p. 376; Transport in agriculture, 1979, pp. 370-1; Department of Crown Lands and Survey, 1980, pp. 375-6; Bureau of Agricultural Economics, 1981, pp. 371-2; Farmers' organisations, 1981, pp. 378-9; Agricultural advisory services, 1983, pp. 349-50; History of the Royal Agricultural Society of Victoria and the Royal Melbourne Show, 1983, pp. 352-4; Agriculture in Victoria, 1934 to the early 1980s, 1984, pp. 342-70.

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