16

AGRICULTURE

INTRODUCTION

The history of agriculture in Victoria since 1934 is a record of the interaction between farmers and their families with the forces of nature on the one hand, and the pursuit of better land utilisation through technical inventions and refinements on the other.

Agriculture in Victoria has been and continues to be diverse and many faceted. It has ranged from small holdings on which dairying or horticulture such as fruit growing or vegetable production have been carried out, to large properties, mainly devoted to sheep and cattle but, at times, combined with cereals. The type of enterprise is related to geographical location as well as to the size of holdings. In general, the dairying, horticultural, fruit growing, and vegetable industries are located in the higher rainfall districts of the State in Gippsland and the Western District. The exceptions to this are the irrigated areas north of the Great Dividing Range. Cropping and extensive grazing on the other hand are located mainly in the Wimmera and Mallee and to a lesser extent in the non-irrigated areas in the north and north-east of the State and the drier parts of the Western District and East Gippsland.

NUMBER OF ESTABLISHMENTS WITH AGRICULTURAL ACTIVITY AND LAND UTILISATION: VICTORIA, 1935 TO 1982

Year ended 31 March—	Number of establishments with agricultural activity	Area (hectares) utilised for—				Total area occupied (inc. balance) *(c)*
		Crops *(a)*	Fallow	Sown pasture *(b)*	Native pasture	
1935	74,473	1,892,993	896,972	772,725	10,333,184	15,726,573
1940	72,557	2,024,386	962,103	1,400,291	10,199,641	16,451,791
1945	70,856	1,744,258	685,577	1,458,503	10,714,862	16,523,436
1950	70,486	1,813,075	983,342	3,164,716	6,884,458	15,516,599
1955	69,551	1,778,373	888,768	3,300,277	7,340,946	15,302,631
1960	69,778	1,814,109	882,323	3,939,242	6,639,784	15,271,445
1965	69,737	2,031,313	1,005,411	6,001,327	5,045,500	15,315,073
1970	69,498	2,175,096	706,230	8,159,815	3,785,727	15,806,004
1975	62,926	1,775,306	*(d)*	6,978,276	2,639,361	15,226,176
1980	49,616	2,246,656	*(d)*	6,224,275	2,880,678	14,735,140
1981	49,399	2,183,811	*(d)*	6,194,508	2,615,994	14,665,830
1982	48,608	2,184,048	*(d)*	6,007,165	2,651,256	14,447,376

(a) Commencing with season 1960-61 the area of pasture cut for hay or seed has been excluded from the area of crops.
(b) Includes oats, barley, and lucerne sown for grazing.
(c) Native pasture included in balance of holding.
(d) Information not collected.
NOTE. In recent years, in order to minimise respondent burden and reduce processing costs, the ABS has been gradually excluding from the statistics those establishments which make only a small contribution to overall agricultural production. Since 1976-77, establishments with agricultural activity have been included in the census where the enterprise operating one or more of the establishments had, or was expected to have, an Estimated Value of Agricultural Operations (EVAO) of $1,500 or more. In 1981-82 the EVAO criterion was increased to $2,500 in order to allow for inflation. While these changes have resulted in some changes in the counts of numbers of establishments appearing in the publications, the effect on the statistics of production of major commodities is small. Statistics of minor commodities normally associated with small-scale operations may be affected to a greater extent.

In 1981, in terms of value Victoria produced 24 per cent of Australia's agricultural production, 20 per cent of wool, 23 per cent of beef, 21 per cent of cereals, and 21 per cent of the nation's total agricultural exports. It thus forms a very significant segment in

national agricultural output, which contributed 7 per cent to Gross Domestic Product in 1981. The percentage of the labour force engaged in agriculture fell from 14 per cent in the mid-1930s to 5 per cent in 1981.

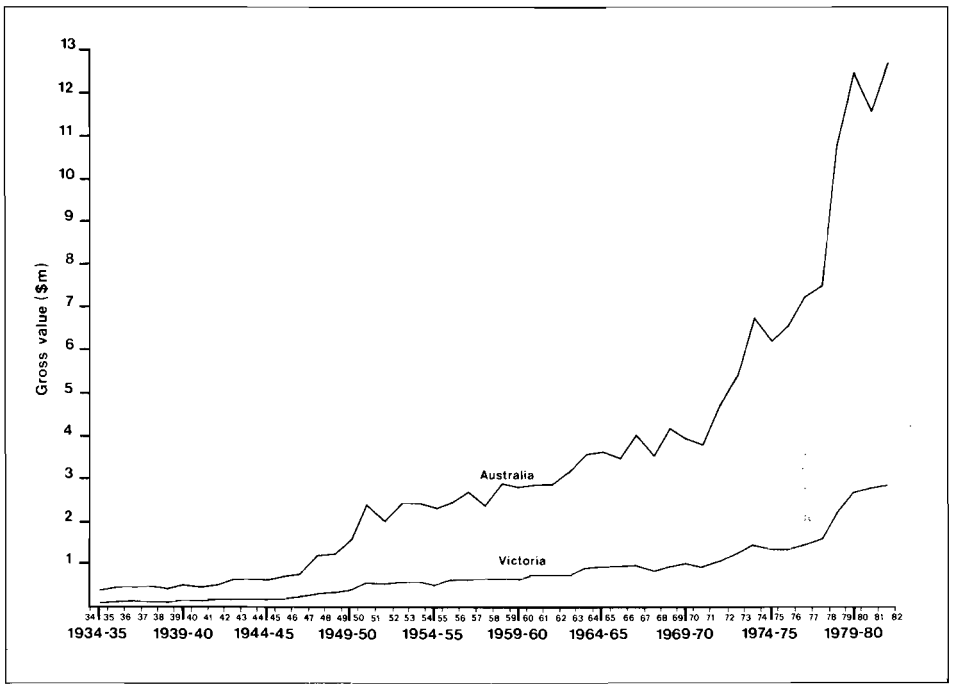


FIGURE 22. Australia and Victoria—Gross value of agricultural commodities produced (excluding mining), 1934-35 to 1981-82.

1934 TO 1939: RECOVERY FROM THE DEPRESSION

Victoria's farming community in 1934 had no electricity (though it was on the way), few wirelesses and telephones, and few sealed roads. Motorised transport was a luxury enjoyed by a few, holidays a rarity for many. Education was largely restricted to primary level. Few farm houses had refrigeration, and cooking was done on woodburning stoves. Home-made bread and salted meat were kept in crocks; in the hot months, a "Coolgardie safe" kept fresh food wholesome, and there was a continuing contest with house flies which were swatted or trapped on sticky brown paper coils hanging from ceilings or lamp shades.

On bath nights, in the country no less than in the city, water was heated in the wash-house "copper" or in a woodchip heater positioned over the tub. Flat irons and perhaps mangles were the main aids in the laundry.

Farm families were large: children helped with the farm work and, often barefoot, walked or rode a pony to school. Most farmers' sons who married found their wives within the neighbourhood; yet no wives were to be found for some, and many a farm family had its "bachelor brothers", who were often itinerant workers, heavy drinkers, and masters of five or six dogs apiece which they used to catch rabbits for pocket money or meat for the table.

Across the countryside, men carrying swags and seeking work symbolised the hard times brought by the economic depression, whose effects were still being felt. Prices paid for farm products were depressed because of world economic conditions. Only the moratorium on repayment of debts, imposed by the government in 1932 and the Farmers' Debts Adjustment Act in 1935, which extended credit allowed by local tradespeople, saved many farmers from walking off their farms (which some had to do on marginal land). The

moratorium had, however, a negative side. It transferred hardship to creditors and others, cut across the ideas of responsibility held by some rural people, and created bitterness in the agriculture community. There was a very serious loss of morale among the farming population, and many farmers turned to the government for help.

In the 1930s, the problem of erosion became evident because farming methods in many districts were ruining the land. City dwellers were occasionally reminded of the reality of wind erosion when a dust storm swept down from the north and "red rain" fell on Melbourne. Many wheatgrowing blocks in the Mallee were too small (below 350 hectares per farm) for economic survival and this necessitated the indiscriminate clearing of natural growth, the thoughtless cultivation of sandy areas, and intensive cropping under a fallow-wheat or fallow-wheat-oats rotation.

In other areas of Victoria where the ground was not protected by sufficient grass or forest litter, water erosion washed the finer topsoil off hillsides and cut deep gullies. This was a particular problem on hilly areas around Melbourne and in many parts of the Great Dividing Range.

Irrigation of pastures and crops increased enormously in the period and this eventually produced salting of some land, which was already taking place around Kerang as early as the 1920s. Excessive percolation losses from irrigation water led to a rise in watertables. Salt deposited in the subsoil during the retreat of the inland sea in ancient times went back into solution as the watertables rose. The salty water reached the root zone, evaporated at the bare surface and decimated large areas. Salting was a problem that persisted into the 1980s. Others, such as drought and fires, occurred intermittently. For farmers, the improvement in economic conditions towards the end of the 1930s was partly offset by erratic and dry seasons, some parts of the State experiencing drought during most of 1937 and 1938. Rabbits, another major problem for farmers across the State, bred rapidly in good seasons and ravaged pastures in poor seasons. Disastrous fires in 1939, 1944, 1969, 1977, and 1983 took a heavy toll of human life, livestock, homes, buildings, fences, and fodder.

LAND UNDER IRRIGATED CULTURE: VICTORIA, 1935 TO 1982
(hectares)

Year ended 31 March—	Cereals	Lucerne grown for pasture and hay	Sorghum and other annual fodders	Pasture			Vineyards	Orchards	Market gardens	Other	Total
				Native	Annual	Perennial					
1935	25,586	38,729	10,362	..	89,226	..	..	27,098	..	2,724	193,725
1940	13,438	30,171	5,879	..	125,657	..	..	29,530	..	4,914	209,588
1945	25,472	26,016	13,891	..	166,333	..	..	33,913	..	3,577	269,201
1950	14,287	24,320	3,198	31,768	75,049	76,647	..	37,650	..	5,101	268,020
1955	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	..	n.a.	..	n.a.	n.a.
1960	10,694	16,875	5,618	29,680	154,636	158,699	17,716	16,030	8,348	7,749	426,046
1965	3,257	17,126	5,713	20,724	179,368	196,125	19,335	18,107	10,880	10,560	481,194
1970	9,167	21,160	7,008	19,479	213,277	228,889	19,242	16,089	10,895	16,908	562,114
1975	3,643	14,546	12,653	13,895	217,240	252,350	23,892	17,199	13,133	17,647	586,199
1980	19,329	8,515	2,823	14,006	211,431	230,477	22,620	15,433	17,843	26,171	568,648
1981	31,581	8,276	3,627	8,901	213,714	229,689	22,707	15,975	18,622	24,027	577,119
1982	20,485	7,818	8,217	8,239	217,776	232,731	22,996	16,005	19,332	22,572	576,171

Source: State Rivers and Water Supply Commission.

Despite the bad times, agriculture made many important advances. The gradual extension of electricity supply to country towns and adjacent areas, as economic conditions eased in the mid-1930s, began the start of improvement of production and handling methods in some industries and, of course, improvement of living conditions in farm homes. The electrification of Victoria's country areas during the last 50 years was one of the most important social and economic developments in agriculture. The widespread adoption of "wireless" radio receivers and the establishment of country radio stations put country people in closer touch with world events.

The horse-drawn single-furrow plough was a common sight on small farms while large teams of "Clydesdale" draught horses provided the power on larger properties. But the steel-wheeled tractor was ending the era of horse power. Mechanisation of farming was imminent.

Livestock

The spread of the Wimmera-Mallee channel system greatly eased stock water problems, allowed expansion of stock numbers, and made home life easier for those in the areas serviced.

Many farmers made major efforts to raise the carrying capacity of their pastures by the use of superphosphate and subterranean clover. By the 1930s, there was a great deal of interest shown in pasture improvement, though mainly in the Gippsland dairying districts and irrigation areas. The use of superphosphate spread rapidly, helped by a government subsidy. Pasture improvement in sheep districts was, however, rare before 1946, except near Hamilton and Caramut, and in the north-east. Grazing properties varied greatly in size and extensive areas were still occupied by very large properties developed as "squatter's runs" in the nineteenth century. Most sheep pastures were still in the "native" state and were only able to support a quarter of the grazing stock numbers of today. Research by the Department of Agriculture and the Victorian Pasture Improvement League, which had been formed in 1932, determined the fertilisers and pasture species suited to particular soils and areas. Pastures in varying districts were found to respond to potash, but little was applied until the late 1940s.

The Australian Wool Board was established in 1936 and compulsory levies on wool rates paid by growers were introduced to finance research and promotion. The principal reasons behind its establishment were the Depression which sent wool prices plummeting and hence drastically reduced Australia's export earnings, suspicions by growers that traders were not always acting in the growers' interest, and potential competition for the wool industry from the development of wool substitutes.

The number of milking cows reached a record high level of 2.1 million in 1935-36. Most farmers ran a few "house" cows, relying heavily on the monthly cream cheque to make ends meet until seasonal returns from wool, lambs, or crops came in. More than half the dairy farms in Victoria milked from five to nineteen cows. On these small dairy farms the work was long, hard, and unremunerative. The women and children helped with the hand milking, separating, cleaning out the sheds and the dairy, and sometimes with the other jobs common to the dairy farm such as the care of the pigs, the harrowing of pastures, and gardening.

However, mechanisation was starting to appear on dairy farms. With the installation of the milking machine a dairy farmer could look after twice the number of cows that he could when they were milked by hand and with more ease, thereby increasing his profitability and standard of life.

A Milk Board was established in 1934 to register and supervise private milk contracts (for city milk) made between farmers and vendors, and a voluntary scheme of equalising export and domestic market returns from butter and cheese was introduced to help stabilise returns to dairy farmers. The Department of Agriculture also established a Division of Dairying in 1934 to serve the industry and a School of Dairy Technology in 1939 to train dairy factory operatives and undertake research into dairy manufacturing.

The livestock industries were stimulated in 1930 by the expansion of refrigerated facilities that enabled frozen meat and dairy produce to be more readily shipped overseas. Also, under the Ottawa Agreement of 1932, export markets for all primary products were assisted through Great Britian granting "Imperial Preference" to imports from Empire countries.

Poultry production was generally still in the backyard or sideline stage. Pigs were kept as disposers of waste products, though grain, when it was cheap, was fed to them.

However, with the development of power and technology the poultry industry was greatly stimulated by the development of electric forced draught incubators, which allowed mass production of chicks and enabled the industry to expand on larger farms. Other developments brought about significant changes in the industry. Artificial lighting was introduced for layers in 1937. The use of cod liver oils (vitamin A) removed the need for greenfeed, which had made production seasonal. Fully enclosed deep litter housing systems were developed, stockfeed companies produced ready mixed feeds, and chicksexing techniques were introduced from Japan. The Victorian Egg Marketing Board was established in 1937 to regulate the marketing arrangements. In the period unemployed and under-employed persons moved into the industry, settling into low cost, makeshift farms around Melbourne (for example, Springvale), and large country towns.

Crops

Wheat was sold by open trading through merchants or grower co-operatives. World markets were over-supplied and the price of wheat in 1934 was about eleven dollars per tonne. A Royal Commission on the Wheat, Flour, and Bread Industries (1934 to 1939) recommended measures to overcome the economic crisis. However, little immediate headway was made with proposals for centralised marketing control and a home consumption price plan.

The Grain Elevators Board was established in 1936 to provide facilities for the receival of wheat in bulk from farms and delivery into ships without the use of wheat bags. Construction of elevators (silos) at country sidings and a shipping terminal at Geelong was begun.

Important findings started to emerge from the Department of Agriculture's research programme. Wheat breeders, G.S. Gordon and A.R. Raw, working at the State Research Farm, Werribee, produced several high yielding varieties—Ghurka, Quadrat, Insignia, Olympic—that became the leading wheats sown in Victoria in their day. The importance of clover-ley farming for improving soil nitrogen and soil structure and for increasing the yield and quality of wheat was first demonstrated in experimental plots at the Rutherglen Research Station in 1937-38. This rotation system of subterranean clover and crops revolutionised agriculture in the wheat/sheep belt of southern Australia in the 1950s.

Wheat yields were improved by discovery and correction of a zinc deficiency in the black soil plains of the Wimmera in 1938.

The tobacco industry was depressed, prices were low (about 45 cents per kilogram), and the area declined from 3,620 to 1,925 hectares between 1934 and 1938. The Victorian Government appointed a Tobacco Committee in 1935 to examine hardship among growers.

AGRICULTURAL PRODUCTION: VICTORIA, 1935 TO 1982

Year ended 31 March—	Wheat for grain			Oats for grain			Barley for grain		
	Area	Production	Yield per hectare	Area	Production	Yield per hectare	Area	Production	Yield per hectare
	hectares	tonnes	tonnes	hectares	tonnes	tonnes	hectares	tonnes	tonnes
1935	994,954	703,536	0.7	205,029	95,232	0.5	35,450	36,503	1.0
1940	1,144,216	1,226,185	1.1	177,882	150,241	0.8	82,653	84,779	1.0
1945	866,728	95,191	0.1	292,252	24,230	0.1	52,226	8,154	0.2
1950	1,144,562	1,563,093	1.4	195,540	158,182	0.8	95,556	110,590	1.2
1955	967,270	1,319,533	1.4	260,797	181,813	0.7	113,553	112,167	1.0
1960	914,886	1,055,762	1.2	272,354	230,443	0.8	112,341	126,843	1.1
1965	1,309,580	2,127,322	1.6	391,040	407,253	1.0	75,651	98,304	1.3
1970	1,334,757	2,273,692	1.7	357,601	470,412	1.3	196,930	257,927	1.3
1975	1,140,653	2,091,303	1.8	197,807	186,023	0.9	242,952	319,358	1.3
1980	1,456,901	3,249,550	2.2	255,737	390,300	1.5	325,356	494,106	1.5
1981	1,431,042	2,538,004	1.8	218,682	321,664	1.5	302,777	418,049	1.4
1982	1,321,674	2,466,794	1.9	245,148	305,997	1.2	314,909	459,426	1.5

	Maize for grain			Hay			Potatoes		
	Area	Production	Yield per hectare	Area	Production	Yield per hectare	Area	Production	Yield per hectare
	hectares	tonnes	tonnes	hectares	tonnes	tonnes	hectares	tonnes	tonnes
1935	7,579	18,273	2.4	510,532	1,487,765	2.9	21,940	111,084	5.1
1940	7,674	9,670	1.3	487,570	1,850,103	3.8	13,022	89,342	6.9
1945	1,839	4,200	2.3	365,020	715,549	2.0	33,685	310,115	9.2
1950	2,078	4,931	2.4	245,452	1,016,919	4.1	20,498	170,575	8.3
1955	1,772	5,811	3.3	299,103	1,227,062	4.1	17,837	209,893	11.8
1960	1,369	4,584	3.4	342,991	1,372,687	4.0	19,630	246,441	12.6
1965	952	2,900	3.1	528,668	2,546,172	4.8	13,327	186,613	14.0
1970	463	1,827	4.0	485,606	2,500,451	5.1	16,092	284,040	17.7
1975	543	1,912	3.5	505,609	2,016,529	4.0	13,010	282,547	21.7
1980	575	2,850	5.0	411,812	1,615,035	3.9	13,077	333,614	25.5
1981	568	3,002	5.3	497,327	1,894,298	3.8	13,702	348,950	25.5
1982	476	2,357	5.0	556,335	1,982,371	3.6	13,668	354,197	25.9

SILAGE: VICTORIA, 1935 TO 1982
(tonnes)

Year ended 31 March—	Made	On hand
1935	22,500	n.a.
1940	79,448	n.a.
1945	20,314	n.a.
1950	26,099	n.a.
1955	87,759	n.a.
1960	286,085	204,819
1965	255,026	209,615
1970	294,058	255,923
1975	139,891	164,265
1980	126,253	130,895
1981	158,045	115,237
1982	174,994	76,812

Horticulture

Fruit was produced mostly on small family orchards in the Goulburn Valley and Sunraysia regions and also around Melbourne, where suburban brick veneer homes now stand in Doncaster, Templestowe, Box Hill, Ringwood, and Croydon. Vegetables were produced mainly in Melbourne metropolitan market gardens, and the potato industry was already well established in southern and central Victoria.

In the fruit industry, most growers relied on horse-drawn implements for cultivation and only a few had a dam or bore for supplementary irrigation. Relatively few chemicals were available to orchardists to control pests and diseases. They relied on copper sprays (mainly Bordeaux mixture), lime sulphur, and sulphur dust to control disease, and arsenate of lead, nicotine sulphate, lime sulphur, and mineral spraying oils to control insects. The diluted spray was made up in large casks or wooden vats and applied with a handspraying gun from a horse-drawn cart.

Most of the fruit was packed in district co-operative packing sheds, many of which had cool stores, and from these, during winter months, some fruit was sent by rail to Melbourne for wholesale market or export. Fruitgrowers in the Goulburn Valley, many of whom were soldier settlers after the First World War, had reticulated water for flood irrigation made available to them in the late 1930s. The irrigated area around Mildura had increased to 14,000 hectares and was used mainly for production of grapes for drying. Most vine blocks had 1 to 2 hectares of citrus; a few growers concentrated on producing vegetables.

The Commonwealth Scientific and Industrial Research Organisation (CSIRO), then the Council for Scientific and Industrial Research, established an experimental vineyard at Merbein and the Department of Agriculture established the first horticultural research station at Tatura with the first trees planted in 1937.

By the end of the 1930s, vegetable growers were adapting horse-drawn equipment for use with tractors, which were beginning to replace horses. As the use of horses declined, and the consequent supply of horse manure dwindled, growers began using greater amounts of fowl manure, blood and bone, and inorganic fertilisers. Like orchardists, they had few chemicals to fight pests and diseases. They used arsenate of lead to control chewing insects and nicotine sulphate to control sucking insects. Bordeaux mixture was the only fungicide used.

Victoria was the dominant potato and onion growing State in this period. Onion growers took up orderly marketing in 1934, pooling their crops, fixing prices, and distributing the produce as local and export markets required. An Onion Marketing Board was set up in 1936 and lasted until 1976. A Seed Potato Certification Scheme was established in 1938. This raised the standard of potato growing by stimulating production and distribution of seed that could be certified as having a low level of disease.

THE 1940s: WARTIME SHORTAGES AND POST-WAR DEVELOPMENTS

1939 to 1945

The outbreak of war in 1939 slowed the progress of agriculture. Young men and women throughout the country joined the Armed Forces. Food production became a major war effort. Persons remaining on farms responded to this challenge, and increased production in essential agricultural industries. Work in these essential industries was classified as "reserved occupations", and workers could not leave or enlist without the approval of the Director-General of Manpower. To offset the loss of farm workers, a Women's Land Army was formed. In total, 3,500 women, of whom 1,500 were in Victoria, became involved in food and flax production. These Land Army women were in addition to those who already lived and worked on farms. Internees and prisoners of war also assisted on many farms.

War Agricultural Committees, established in October 1942, were assisted by the Department of Agriculture in the direction, stimulation and control of agricultural production, so that production was maintained at as high a level as possible in industries for which the Government had set priorities. They allocated scarce resources such as agricultural machinery and piping, fencing material and fuel for tractors, while the Department conducted rationing schemes for superphosphate, bran, pollard, and chaff.

The War Agricultural Committees as well as the Acting Commonwealth Statistician, S.R. (later Sir Stanley) Carver, advised the Director-General of Manpower of seasonal labour needs and of the progressive need for release from active duty of servicemen who were experienced in agricultural work, so they could resume their part in agricultural production. The committees were also responsible, under the Director-General of Manpower, for deployment of members of the Women's Land Army and for organising volunteers to help with seasonal work.

Some of the worst fires to affect the State occurred in January and February 1944 in the Western District, Gippsland, and the North-east, when farm homes, buildings, fences, and large numbers of stock were destroyed, and the War Agricultural Committees were immediately co-opted to assist with relief operations by distributing available fencing material to affected farms.

The manpower shortage caused a relaxation of farm management in some industries; the rabbit problem, for example, tended to be ignored until after the war.

Australian farmers were relied on largely to feed Australian and United States Forces based in the South-west Pacific from early 1942 onwards. The vegetable, potato, poultry, and pig industries were all involved in special efforts to increase production, and among other innovations, suburban households were urged to dig up their back and front gardens and grow vegetables. The Commonwealth Government placed production of vegetables and vegetable seeds first on the nation's list of priorities, together with flax, which was needed to make tents, tarpaulins, parachute harnesses, and canvas bags for use by the Armed Forces. Dairy products were next on the list, followed by meat and cereal products. The vegetable seed industry was given highest priority because much of Australia's seed supplies (and those of the United States) came from Europe. Under the National Security (Vegetable Seeds) Regulations all seed growers had to register with the Department of Agriculture and seed could not be sold or exchanged without the permission of the Department.

The call to grow more vegetables was followed by the introduction of new production methods and new equipment from the United States. Row crop tractors, especially the "Farmall", which had hydraulic and pneumatic equipment, brought about changes in production, as did the new spray equipment, dusters, seeders, and transplanters.

Navy bean production was also developed and special pick-up fronts for headers were imported to harvest the crop. Processing of vegetables also increased greatly.

Meanwhile, pigmeat production also grew rapidly to help feed the Armed Forces. This was done by using surplus wheat which was available at subsidised prices, and by increasing the slaughter weight of pigs. Victorian pigmeat production reached a peak in 1942, when about 21,000 pig keepers raised 600,000 pigs, yielding about 42,000 tonnes of carcase meat; some of this was exported, mostly to Britain. However, because of restrictions, Victorians had little pork to eat. It disappeared from shops and tables, and a large number of children

never tasted pork until years later. Beef, too, was scarce for civilians because of the demand from the Armed Forces, especially the Americans, who generally did not eat sheep meat.

The wartime boost to egg and poultry meat production was achieved through backyard production of eggs, establishment of new farms, and expansion of existing farms to contain up to 5,000 hens—a farm at Werribee with 250,000 birds was claimed to be the biggest producer in the world at that time.

The dairy industry was relatively static during the war years. Contracts for the sale of butter and cheese to the United Kingdom were arranged in 1939 to last until 1955, and in 1942 the Commonwealth began to guarantee prices to reflect the cost of efficient production and to pay subsidies to contain price increases on the domestic market. In 1949, the Milk Pasteurisation Act was passed as a public health measure following an outbreak of typhoid fever at Moorabbin. In the same year, an Official Sire Survey service was begun to assess the genetic merit of bulls. This resulted in the selection of better bulls, which were to be especially useful a few years later when artificial breeding was first practised on dairy farms.

The seasons were mostly poor during the war years. The occasional dust storms and "red rain" of earlier years now became commonplace. There were hot summers and serious bush fires, which possibly reflected war related factors such as trains which burned wood, motor car gas producers, shortages of replacement mufflers and spark arrestors, and reduced manpower to contain fires.

Severe drought affected much of the State throughout most of 1944-45. Large-scale drought feeding of stock depleted reserves of hay, oats, and wheat; this occasion was probably the first time that wheat was used in this way. Even surplus fruit and vegetables such as potatoes, carrots, and undersized apples kept stock alive.

Rural reconstruction

In 1944, the Rural Reconstruction Commission reported on land utilisation and farm settlement and the employment of returned servicemen on the land. This established the principles for the introduction of government sponsored settlement and training schemes for returned servicemen and gave opportunities for 5,926 men to take up full-time farming on their own properties in Victoria between 1946 and 1961.

The authorities developed criteria for farm or block size in relation to production potential. They had not forgotten the lesson provided by the Millewa settlement scheme after the First World War, when settlers were allotted blocks that were too small to maintain an adequate income from cropping and many had to "walk off". In the late 1940s, land was purchased from existing landholders, sub-divided, and developed so that the new settler could expect some financial return within the first couple of years. For horticultural areas the period was about five years. In the meantime settlers received payment for developmental work. Over the period 1946 to 1961 more than 3,000 farms were settled in this scheme. Another method of settlement used in this period was the "single unit" scheme. In this case the Commonwealth Government financed purchase of "approved" individual farms by qualified settlers; 2,878 farms were settled in this way.

Post-war developments

Meanwhile, innovations that would drastically change farming practices began to appear. The "Fergie" (Ferguson) tractor had arrived with its revolutionary three-point linkage and a range of matched equipment. The petrol model TE20 replaced the farm horse on many smaller properties. It was versatile, reliable, and relatively cheap to run. The general introduction of tractors was rapid. On cropping farms the way was made clear for them when the prolonged drought of 1944-45 caused many farmers in the wheat belt to send their horses away for agistment. Horse teams were broken up and never brought together again. Tractors enabled farmers to cultivate larger areas and sow their crops closer to the optimal time. The grain harvest increased substantially and many cereal growers overcame financial difficulties that had worried them for 20 years.

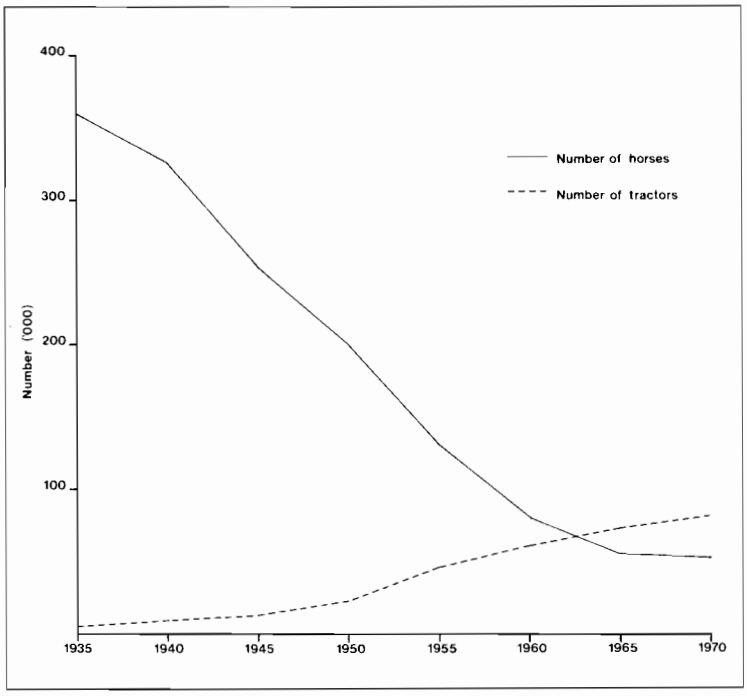


FIGURE 23. Victoria—Number of horses and tractors on establishments with agricultural activities, 1935 to 1970.

MACHINERY ON ESTABLISHMENTS WITH AGRICULTURAL ACTIVITIES: VICTORIA, 1935 TO 1975*(a)*

Year ended 31 March—	Tractors (wheeled and crawler)	Headers, strippers, and harvesters	Fertiliser distributors and broadcasters	Milking machines (units)	Shearing machines (stands)
1935	5,373	19,932	n.a.	4,353	4,057
1940	9,578	n.a.	n.a.	8,201	4,860
1945	12,431	14,724	12,756	36,234	14,862
1950	24,119	14,471	18,935	54,180	20,485
1955	47,254	14,524	24,647	74,513	30,801
1960	61,168	14,216	27,948	89,657	37,015
1965	74,524	14,177	29,212	101,994	41,112
1970	82,318	13,310	30,036	112,012	43,152
1975	81,337	11,808	26,681	n.a.	28,894

(a) Information not collected after 1975.

A major technical innovation at the end of the war was the introduction of DDT for agricultural purposes. This chemical revolutionised pest control in fruit and vegetable crops, particularly grubs in potatoes, tomatoes, and crucifers. Former wartime pilots flying modified Tiger Moths sprayed vegetable crops from low levels, signalling the beginning of aerial agriculture. DDT and the other "new generation" organic based chemicals, dieldrin and lindane, were used to control parasites on sheep properties and 2,4-D and 2,4,5-T, which were developed as by-products of military research during the war, were used to control thistles and blackberries. DDT was also used to control external parasites of poultry.

The major contribution to increased numbers of cattle during this period was the introduction of Strain 19 vaccination, controlling abortion as a result of infection of cattle with *Brucella abortus.*

In 1946, aircraft were first used successfully to check the flights of the Australian plague locust by aerial spraying with new types of insecticides. Their breeding grounds are situated in western New South Wales and south-western Queensland, and following good rains in

the inland, their numbers breed up to plague proportions; they fly south into Victoria and ravage green crops in the northern irrigation areas. Following research by the Australian Plague Locust Commission, CSIRO, and the State Departments of Agriculture, the situation was constantly monitored, and has resulted in much greater vigilance by all concerned with the problem.

Because of difficulties experienced by the Council of Agricultural Education in funding Dookie and Longerenong Agricultural Colleges, control was transferred from the Council to the Department of Agriculture. This took place in 1945. Much of the land leased by the Council to raise funds for maintaining the Colleges was then made available for Soldier Settlement. Both Dookie Agricultural College and Burnley Horticultural College played a significant role in the retraining of returned servicemen for occupations in the agricultural and horticultural industries.

In the years following the war, the outlook for agriculture progressively improved. The war had created a large demand for food and fibres. The new "soldier settlers" took up their farms enthusiastically and quickly adapted to new agricultural technology. Export markets expanded for the main agricultural products—meat, wheat, and wool. The price for agricultural commodities continued to rise and farming enterprises became profitable. The improved economic position brought prosperity to the agricultural community. By the end of the 1940s, shortages of farm materials were easing and farmers began investing in capital improvements for their properties—new fencing, better water supplies, pasture improvement, and renovations to farm houses and sheds. New machinery, tractors, and vehicles made it possible to increase production on farms and hence profits.

The electrification of rural areas progressed during the war years with connections to essential wartime industries and some dairy farms. But after the war, the extension of the State Electricity Commission's electricity grid to country towns and farms expanded and continued systematically for many years. It resulted in the use of electricity for domestic and farm purposes. This, in addition to better housing and other amenities arising from the overall improvement in the economy, brought about a considerable rise in the standard of living of the agriculture community.

AGRICULTURAL EMPLOYMENT: VICTORIA, 1945 TO 1975 *(a)*

Year ended 31 March—	Working permanently								Working temporarily	
	Owners, lesses, and share farmers		Relatives over 14 years on receiving wage or salary		Employees working for wages or salary		Total working permanently			
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
1945 *(b)*	61,662	4,752	10,616	5,347	*(c)*15,140	*(c)*1,965	87,418	12,064	8,235	746
1950	64,627	4,449	7,142	1,971	15,174	1,256	86,943	7,676	20,462	1,323
1955	69,249	3,591	6,146	1,364	17,396	1,413	92,791	6,368	20,571	1,806
1960	58,583	3,775	5,948	1,140	15,499	1,002	80,030	5,917	23,234	2,075
1965	59,941	4,802	5,447	1,428	14,837	1,072	80,225	7,302	25,976	3,181
1970	53,408	2,094	3,878	852	12,363	951	69,649	3,897	18,024	3,722
1975	51,337	13,318	3,256	1,604	10,239	1,362	64,832	16,284	20,629	4,526

(a) Information not collected after 1975.
(b) At 31 March, 1,497 prisoners of war worked on holdings.
(c) Includes managers, relatives, and members of the Women's Land Army.

Livestock

In 1945, sheep numbers and wool production fell to their lowest levels since the mid-1920s following severe drought and fires, but then began a good recovery that within a few years would take wool into a "golden" age. The increased use of superphosphate on pastures encouraged the spread of subterranean clover and this provided more feed for livestock.

The poultry industry obtained government-to-government contracts with the United Kingdom and production increased still further, but the number of pig producers in Victoria, no longer able to obtain cheap surplus wheat or other grain, and, also, having lost the American Armed Forces market, decreased to 14,500 from 21,000 in 1941; the production declined to 415,000 pigs yielding 29,000 tonnes of carcase meat; and exports fell to a very small amount of carcase meat per year.

Crops

During the post-war years, the Australian Wheat Board, which had been established under national security regulations in 1939, became the sole marketing authority for wheat under complementary Commonwealth and State legislation. The first of a series of Wheat Stabilisation Plans was adopted to reduce fluctuations in the prices received by growers. The Australian Barley Board, also established in 1939, was reconstituted in 1948 as a State Board to handle barley produced in Victoria and South Australia. The wheat industry benefited at this time from release of new varieties—Insignia for the Mallee and Pinnacle for the Wimmera. These varieties increased yields significantly. Locally adapted varieties of linseed, for long the only significant oilseed crop in Victoria, were also produced. The tobacco industry expanded slightly in the late 1940s and the Tobacco Research Station at Myrtleford became operative in 1952.

Sugar beet growing, an industry that had struggled since its beginnings about 1870 in the Maffra district, continued through the 1930s because of the poor returns from dairy produce. It survived the difficulties that beset agriculture during the war, then was confronted by the improved returns from dairying, and the more efficient production of cane sugar in Queensland and northern New South Wales. It ended in 1949.

Horticulture

The production of vegetables declined, as demand for vegetables and the area of land cropped decreased, particularly in the growing areas distant from Melbourne. Some of the wartime canneries continued to operate, but there was little demand for dehydrated vegetables. In the potato industry, the war years had brought stability through exercise of a plan that regulated supply and prevented gluts. After the war the industry continued to produce large volumes of potatoes which became increasingly difficult to sell. A Victorian Potato Marketing Board was established in 1948 but was forced to cease operations within six years as a result of the inability to control trading across State borders.

An addendum to section 92 of the Commonwealth Constitution had been proposed in 1946 to allow organised marketing of agricultural products but leave interstate trade in manufactured products unrestricted. A majority of the population supported the referendum on the proposal, but it failed to gain a majority on a States basis and was not passed. However, marketing of some fruits had been organised during the war, and limited shipping space for the fruit industry's exports led to the establishment of an Apple and Pear Board to prevent Australia-wide surpluses. The Board had the right of price setting and acquisition of the entire pome fruit crop. Growers, however, had a bare maintenance income. After the war, the number of apple and pear varieties grown commercially was greatly reduced as growers concentrated on the more popular varieties. Only about six varieties of each were planted compared with the 60 apple varieties and 16 pear varieties for which the Apple and Pear Board had set prices during the war.

Efficiency of orchard operation in the post-war years was increased by mechanisation of cultivation, spraying, and fruit collection. There was a greater awareness of the importance of fertilisers, and many growers established new plantings with generous applications of fertiliser. In 1948, vineyards were established in the recently completed Murray Valley irrigation areas near Cobram and at Robinvale, between Swan Hill and Mildura. Many of these blocks were settled by ex-servicemen.

VINEYARDS AND ORCHARDS: VICTORIA, 1935 TO 1982

Year ended 31 March—	Vineyards				Orchards				
	Total area	Wine made	Dried fruit produced		Total area	Fruit produced			
			Raisins and sultanas	Currants		Apples	Pears	Peaches	Oranges
	hectares	kilolitres	tonnes	tonnes	hectares	tonnes	tonnes	tonnes	tonnes
1935	16,665	5,802	30,176	8,961	30,859	39,723	20,856	23,944	13,920
1940	17,237	5,120	48,188	10,835	28,455	30,539	26,510	24,522	11,849
1945	17,367	3,568	33,677	6,983	27,618	21,695	35,737	28,676	13,126
1950	18,367	14,684	42,961	7,056	28,751	15,447	38,456	25,244	13,909

(Above left) Cape Barren Geese are found mainly around the coastal lakes of western Victoria, but a wild population is maintained at the Serendip Wildlife Research Station at Lara.

Fisheries and Wildlife Division, Ministry for Conservation

(Above right) The spectacular mating display of the male bustard.

Fisheries and Wildlife Division, Ministry for Conservation

The Serendip Wildlife Research Station allows visitors to view local species of waterfowl in a natural environment.

Fisheries and Wildlife Division, Ministry for Conservation

The Royal Botanic Gardens following the restoration of the Ornamental Lake in 1983.

Royal Botanic Gardens, Melbourne

Brilliant coloured *Rosa rugosa* "Rubra" from the Royal Botanic Gardens' collection of old fashioned roses.

Royal Botanic Gardens, Melbourne

One of the many splendid rhododendrons in the Royal Botanic Gardens — *Rhododendron* "Charles Dickens".

Royal Botanic Gardens, Melbourne

Vineyards situated in the Pyrenees Ranges in central Victoria.

Mt Avoca Vineyards

Picking apricots in an orchard near Shepparton.

S.P.C. Ltd

As well as providing water for crops and pastures, irrigation channels also constitute a valuable source for watering stock.

State Rivers and Water Supply Commission

Intensive farming of pigs in a controlled environment.

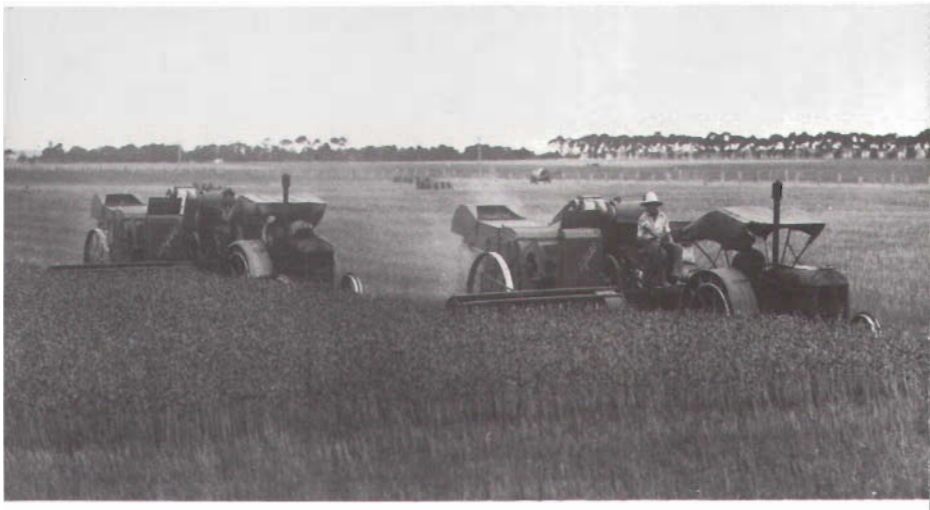
Department of Agriculture

A country sheep sale held during the 1940s.
Department of Agriculture

This modern shearing shed incorporates specialised work areas and equipment for shearing, sorting, and packaging wool.
Department of Agriculture

Teams of draught horses were often used to pull early grain harvesting equipment.

Department of Agriculture



Two-man tractor/harvester teams engaged in harvesting cereals during the 1940s.

Department of Agriculture

Three giant harvesters work their way through a bumper Wimmera wheat crop in 1979.

The Herald and Weekly Times Ltd

The stacking of loose hay into large circular or rectangular piles, often with a sloping thatched top, was a common sight on many farms in the 1930s.

Department of Agriculture

The Econ Roller hay collector enables a greater amount of hay to be "bundled" as a single unit. A comparison between the Econ and conventional hay bales is shown (inset).

Department of Agriculture

Land Army girls harvesting tomatoes during the Second World War.
The Herald and Weekly Times Ltd

This egg grading equipment is capable of handling 24,000 eggs per hour.
Fantasy Egg Farm (Vic.) Pty Ltd

VINEYARDS AND ORCHARDS: VICTORIA, 1935 TO 1982—*continued*

Year ended 31 March—	Vineyards				Orchards				
	Total area	Wine made	Dried fruit produced		Total area	Fruit produced			
			Raisins and sultanas	Currants		Apples	Pears	Peaches	Oranges
	hectares	kilolitres	tonnes	tonnes	hectares	tonnes	tonnes	tonnes	tonnes
1955	18,517	7,328	50,266	4,760	26,746	49,154	67,999	31,618	14,169
1960	17,858	9,759	45,578	3,392	27,748	57,261	73,126	24,699	22,398
1965	19,423	16,622	67,356	4,558	30,557	83,713	82,166	48,225	27,091
1970	20,169	32,963	68,290	3,445	28,685	101,556	143,778	60,720	27,865
1975	22,347	54,278	48,040	2,347	21,508	81,357	125,496	38,440	40,721
1980	20,575	n.p.	63,530	2,467	18,513	75,128	96,844	35,398	46,516
1981	20,756	n.p.	43,457	1,847	19,352	77,047	121,734	41,765	53,603
1982	20,519	n.p.	65,331	2,587	19,254	68,535	85,078	33,853	42,736

THE 1950s: MECHANISATION, PASTURE IMPROVEMENT, AND "GOLDEN" WOOL

Conditions for farm families improved steadily in the 1950s. Electricity had been connected to about half of the farms in the State by the end of the decade. Labour saving devices were added to the home and the farm. Education facilities for country children were greatly improved, and more and more children looked to vocations other than farming. Road conditions and road transport also improved dramatically.

The rabbit—a pest that ravaged pastures and crops since its introduction in the early days of settlement—was suddenly and spectacularly controlled. During the summer of 1950-51, most of the rabbits along the Murray River were killed by myxomatosis. This deadly viral disease was carried by mosquitoes from a CSIRO experiment near Corowa, New South Wales, where the myxoma virus was under test. The few survivors that had acquired resistance to the virus continued to breed, and their descendants have been kept in check by "1080" poison baits and the release of more virulent strains of the virus.

Soldier settlement began to change the face of many pastoral areas, especially the Western District. Closer settlement brought an influx of new ideas and philosophies, more intensive farming methods, a higher proportion of owner operators among farmers, and a lowering in the average age of property managers.

After the Second World War a total of 5,926 settlers participated in the Soldier Settlement programme. Of these 3,048 settlements related to land developed for farming by the Rural Finance Commission. The remaining 2,878 settlements related to loans made by the Commission to settlers who bought existing farms on the open market. Of the 3,048 settlements on land developed by the Commission, 989 were on irrigated land and 2,059 on land relying on natural rainfall. About two thirds of the irrigated settlements were devoted to dairying, with the remaining one third primarily to dried vine fruit and orchard enterprises. Of the non-irrigated settlements most were devoted to mixed grazing and cropping enterprises.

The *Land Settlement Act* 1959 extended the functions of the then Soldier Settlement Commission to cater for those men wishing to become farm owners but who were ineligible for soldier settlement. Under this scheme the Commission developed land at Heytesbury near Cobden, Yanakie on Wilsons Promontory, the East Goulburn Irrigation Area near Shepparton, the Rochester Irrigation Area, and Palpara in south-west Victoria.

Wool

A "golden age" for wool had begun. Rising wool prices accelerated the disposal of the last of the wartime stockpiles of wool held by the Australian Wool Realisation Commission. After the end of the war, the Commission had regulated disposals of wool so as to stabilise the auction market, maintaining in effect a reserve price scheme. The Commission's stockpiles were depleted just as the Korean War brought about a wave of panic buying. This led to a "wool boom" that peaked in early 1951. While wool prices rose steeply,

growers rejected a proposal that the remaining assets of the Commission should be used to finance a continuing reserve price scheme to underpin the auction system and thus the Commission was wound up. However, the Australian Wool Board (forerunner of the Australian Wool Corporation) was reinstituted in the 1950s to promote the image of wool and help finance research; it also provided limited oversight of wool marketing.

The wool boom, though short-lived (so that most growers missed its real peak), had a lasting effect on the confidence and aspirations of woolgrowers. Their confidence was strengthened by the Commonwealth Government's deliberate encouragement of agricultural production to help pay a sharply increasing imports bill. The Commonwealth Government offered taxation incentives, financial assistance for the promotion of wool, and research into sheep production and wool textile manufacturing. Although high prices for meat and wool were one factor in raising inflation rates in this early part of the decade, they also shielded producers from inflationary pressures. Thus in the five years from 1954 there was a general expansion in the sheep industry. Pasture improvement continued, partly stimulated by soldier settlers, who generally had smaller, high priced blocks and were forced into more intensive forms of production. Three-point linkage tractors, cultivating equipment, pick-up balers and other hay making machines were becoming widely used on sheep properties.

The aerial spreading of subterranean clover and superphosphate transformed the grazing potential of much of the Central Highlands and the North-east hill country. Pasture improvement enabled sheep numbers to be lifted to 27 million in 1958 (compared with 15 million in 1946, the lowest figure in the 50 year period) and to an all time high of 34 million in 1971.

Research was also helping wool producers. CSIRO developed processes for shrink proofing and permanent pleating of wool garments, while the Department of Agriculture was looking into the inheritance of growth rate, fertility, fleece weight, and other wool production characteristics in the Merino, Polwarth, and Corriedale breeds. The Pastoral Research Station at Hamilton was established in 1956.

Pasture improvement was greatly helped by the discovery that large areas in many parts of the State, especially in the Central Highlands, were deficient in molybdenum, which is essential for the healthy growth of legumes. Application of tiny amounts of molybdenum (50 grams per hectare) with superphosphate gave a spectacular increase in pasture growth in these areas. Areas where copper was deficient were also located. In addition to the generous use of superphosphate in the Western District, phalaris was widely sown and "staggers" and "sudden death" of sheep emerged as a problem. The advantages of sowing phalaris were considered to outweigh the disadvantages. Another pasture problem was a widespread disease of subterranean clover known as clover stunt virus. This was discovered in 1954 and efforts were made to breed varieties resistant to it. By 1953, Barrel medic was widely sown in the Wimmera and the Mallee to raise the fertility of the soil for the growing of cereals, and, later, Harbinger strain medic was released by the Department of Agriculture for sowing in the sandy soils of the Mallee. The medics also raised the carrying capacity of these pastures. H.I. ryegrass, a cross between perennial ryegrass and Italian ryegrass, was sown for the first time on dairy farms.

LIVESTOCK AND PASTORAL PRODUCTION: VICTORIA, 1935 TO 1982

Year	Livestock *(a)*				Greasy wool production *(b) (c)*	Milk production for all purposes *(c)*	Butter production (factory and farm) *(c)*	Cheese production (factory and farm) *(c)*
	Horses	Cattle	Sheep	Pigs				
					'000 tonnes	m. litres	tonnes	tonnes
1935	357,877	2,085,080	16,783,631	265,006	71	1,832	66,972	4,579
1940	326,217	1,787,597	18,251,870	297,655	81	2,077	74,764	11,111
1945	253,782	1,903,110	16,457,101	296,232	80	1,639	47,952	12,457
1950	200,143	2,230,948	19,161,043	212,901	102	2,133	65,709	21,542
1955	132,172	2,456,303	22,329,515	263,666	115	2,441	81,469	20,628
1960	81,225	2,624,019	26,596,613	284,505	147	2,720	91,351	19,573
1965	55,843	3,316,407	30,437,154	378,055	164	3,391	112,720	27,658
1970	53,082	4,462,391	33,156,830	495,128	196	4,057	142,316	33,505

LIVESTOCK AND PASTORAL PRODUCTION: VICTORIA, 1935 TO 1982—*continued*

Year	Livestock *(a)*				Greasy wool production *(b)* *(c)*	Milk production for all purposes *(c)*	Butter production (factory and farm) *(c)*	Cheese production (factory and farm) *(c)*
	Horses	Cattle	Sheep	Pigs				
					'000 tonnes	m. litres	tonnes	tonnes
1975	n.a.	6,192,417	26,409,930	383,144	166	3,745	119,291	44,833
1980	66,241	4,252,272	24,400,065	421,735	147	3,155	68,647	94,829
1981	66,748	4,312,123	25,486,993	400,179	146	3,065	67,765	80,490
1982	63,689	4,121,248	25,340,923	406,253	148	3,028	65,599	93,895

(a) At 31 March, except 1935 and 1940, at 1 March.
(b) Includes dead and fellmongered wool and wool exported on skins.
(c) Year ended 30 June.

Livestock

Meanwhile, a beef cattle industry was stirring, scientific interest in beef cattle being shown in the early 1950s. In 1957, the Australian Meat Board funded the establishment and maintenance of cattle weighing centres in all of the southern States, and Departments of Agriculture were made responsible for the conduct of observations. Weighing centres were established in Victoria at Delatite, near Mansfield and at "Blackwood", Penshurst. The object was to determine the growth rates of beef cattle on existing pastures and under the owners' usual forms of management. The results showed that beef production was greatly dependent on the pattern of pasture production and established the importance of nutrition and good management in the production of young, high quality, beef animals. The beef cattle industry grew steadily throughout the 1950s helped by continued pasture improvement, higher prices for cattle following the United States of America's entry into the market for Australian beef in 1957, and a 15 year agreement (1952 to 1967) whereby Britain agreed to take Australia's surplus beef production.

The dairy industry, still the biggest producer of beef, was experiencing changes that were important to its main role of milk production. In 1952, the Methylene Blue Test was introduced to grade milk. This was the first step taken in the development of analytical testing programmes, which have resulted in substantial improvement in the quality of milk produced on farms. In the same year, the Milk Board ended the milk contract arrangements between farmers and vendors and itself entered directly into contracts with farmers. This gave dairy farmers greater opportunities to participate in liquid milk sales. Artificial breeding, developed by the Department of Agriculture, was taken over by the industry in 1958.

In the first few years of the 1950s the improvement of roads helped in the development of milk collection services by factories and accelerated a trend from supply of cream to supply of milk. Within a few more years, bulk collection from farmers of refrigerated milk would begin, reducing the physical labour of handling of milk on farms, improving milk quality, reducing milk collection costs, and increasing the distance over which milk could be transported. This accelerated the trend from cream supply to milk supply and encouraged the consolidation of dairy factories into fewer, larger units. The first herringbone milking sheds were installed in 1956. They improved the efficiency of milking and accelerated the increase in average herd size from 34 cows in 1956-57 to 96 in 1981-82. In 1953, the Department of Agriculture began discussion groups among dairy farmers (which still continue), and a year later published the *Dairy Farming Digest,* which was distributed to dairy farmers for the next 24 years.

An important development in the 1950s was the start of the Bovine Brucellosis Eradication Programme. This programme was to have an important impact on the quality of dairy products and the health of the community.

The poultry industry was also making important gains and important beginnings, although its high potential of mechanised efficiency was not realised until later. In the early years of the decade, the first English-type laying systems were introduced. Then followed the use of vitamins and drugs such as coccidiostats, which gave complete nutrition and allowed year round growing of chickens. In these early years of the 1950s, the first form of broiler production was seen. It was based on the raising of surplus crossbred

cockerels from the egg industry in wire floored brooders and weaners. Egg production expanded in response to profitable overseas markets; seeing the opportunities, farmers in grain growing districts lifted production and newly arrived migrants entered the industry.

In the mid-1950s, a survey by the Bureau of Agricultural Economics noted the low flock average production of 144 eggs per layer per year. Even so, there was surplus egg production when egg contracts with the United Kingdom were ended soon afterwards, and producers had to pay the State Egg Marketing Board compensatory levies because of lost income from exports. A public inquiry followed and the Government decided to exercise greater control over the Board.

At the beginning of the 1950s, Britain asked Australia to supply 400,000 tonnes of pig meat each year for five years, but in the determination of prices there was no recognition of the pig:grain ratio. To meet the demand the industry needed to expand, yet inadequate supplies of grain prevented that. Thus an opportunity to begin an export based industry was lost. In the 1950s, Landrace pigs were imported from Northern Ireland into Victoria as breeding stock; however, carcase competitions showed that the local Large White breed compared very favourably with the import.

Crops

The value of clover ley farming to the cereal cropping industries became evident as the system spread throughout the wheat belt in the 1950s. Benefits were in three areas: increased yields and grain protein content of crops following the pasture years in the rotation due to increased nitrogen levels in the soil; improved soil structure and thus reduced erosion hazard; and increases in wool yield and meat production arising from higher stocking rates to take advantage of feed provided by the clovers and medics. Mechanisation allowed better timing of operations and the consistent yielding ability of the Insignia variety of wheat became the basis of a period of stability and consolidation, particularly in the Mallee. Selective herbicides which killed broadleafed weeds in cereal crops became widely used and resulted in very significant yield increases.

The mistakes of the Millewa settlement in north-west Victoria of the early 1920s, which resulted in many settlers walking off their blocks in the 1930s, were rectified by the consolidation of holdings into sufficient size to allow wider rotations and less intensive cultivation. The benefits of improved farming techniques were shown in the higher yields obtained in the dry conditions of 1957 compared with those in previous droughts. In 1956, Olympic wheat, a variety with very wide adaptability and high yield potential in the better rainfall areas was introduced. It still remains a recommended variety in some districts. In the second half of the 1950s, world wheat supplies increased relative to demand and resulted in the need to carry over larger than normal quantities of wheat. Very large horizontal storages were built at the Geelong terminal and vertical concrete silos were added to many country elevators to provide the increased storage capacity.

A barley research scheme began in the mid-1950s to develop better barley varieties and production methods. It was funded by contributions from government, growers, and the malting and brewing industries. This was to have a significant effect on the barley industry in the following decade.

The tobacco growers increased their area and yield in the 1950s aided by demand and improving prices. Oil firing now replaced wood for flue curing.

Horticulture

With the exception of the dried vine fruit industry, market prospects for fresh and canned tree fruit improved in the early 1950s. As a result production increased. This was in part due to results of research which flowed from the Department of Agriculture's Research Stations established at Tatura in the late 1930s and at Scoresby, where research began in 1950. The Horticultural Research Station at Irymple started research in 1954 with an extensive citrus root stock trial. Supporting the research programme an intensified extension service developed in this decade. With financial support from the Commonwealth Extension Service Grant, the *Mallee Horticultural Digest* was first published in 1954. A few years later, the *Victorian Horticultural Digest* was printed. These Digests were

distributed free of charge to fruit growers on a regular basis throughout the next 20 years and had an important role in informing growers about new technology. As growers began to erect their own cool storage facilities, the research on this aspect of fruit production, which was done at Scoresby, became an important source of advice.

A very wet year in 1956 caused the death of about 65 per cent of the peach trees in the Goulburn Valley. Much of the area was replanted to apples and pears which can stand wetter conditions than peaches, although peaches were replanted extensively.

Chemicals became increasingly important for both fruit and vegetable producers. A range of pesticides for use in the control of insect pests, fungi, and weeds was developed in the period from the early 1950s. The threat to these industries from the Queensland fruit fly, which was endemic in Queensland and northern New South Wales, led to establishment of road blocks at the main entry points from New South Wales into Victoria in 1956. Staff were placed at these road blocks to inspect all fruit and vegetables coming into Victoria in private as well as commercial vehicles. Since then, improved methods of trapping the adult flies and more effective attractant bait sprays have been developed, and the efficacy of road blocks as a primary means of controlling fruit fly infestations has been re-examined.

Vegetable production continued to increase in the 1950s. Apart from the influence of chemicals in pest and disease control, the most significant development in vegetable production was the introduction of portable light-weight aluminium piping for irrigation. The potato industry quickly adopted this equipment and production increases were at least fourfold and often higher. The Healesville Potato Research Station opened in 1951, and was to have a significant influence on potato production in Victoria through the development of new varieties, disease control techniques, and information about efficient use of water for irrigation.

Production of a range of canned vegetables expanded rapidly to meet increasing demand. Peas, asparagus, and sweet corn were canned in greater quantities. Development in machinery for planting, harvesting, and disease control were important contributors to increasing production efficiency. However, tomato growing areas declined significantly in the early 1950s because of large stocks held by processors. Imports of tomato pulp and paste from 1953 to 1955 further depressed local production. A tariff system was introduced which provided for duty free imports only if processors could demonstrate they had made reasonable efforts to get local supplies. Because growers were unable to continue production at prices offered by tomato processors, the then Minister of Agriculture convened a meeting of growers and processors to negotiate prices for tomatoes for processing. The *Tomato Processing Industry Act* 1976 provides for a Negotiating Committee to continue this activity. A new variety, KY1, selected by the Department of Agriculture in 1955 proved to be most adaptable and high yielding and was to sustain the industry for the next 15 years.

The seed bean industry was faced with a large carry-over of beans in 1950-51 following import of large quantities of seed beans from South Africa. In 1953, a Seed Bean Marketing Board was established and because of the risk of disease importation, strict quarantine regulations were introduced to control imports. The largest area planted was 847 hectares in 1956-57. The industry gradually declined and since 1967, when the Board ceased operations, growers have obtained their seed from Queensland or from the United States.

THE 1960s: PRODUCTIVITY RISE, PRODUCT HANDLING IMPROVEMENT, AND DROUGHT

During this decade there were considerable increases in productivity and production in most agricultural commodities. A feature of the period was the growth of bulk handling of farm produce on the farm and between the farm gate and the consumer. More farms were supplied with electricity; Victoria's road system continued to improve; and facilities for education of country children advanced to the extent that increasing numbers were able to qualify for tertiary education. At the same time, country homes were rapidly acquiring all the electrical labour saving devices of their city counterparts. Access to television programmes became a reality for many of the rural community by the mid-1960s.

A significant upgrading of capital resources took place at Dookie and Longerenong Agricultural Colleges with an increase in student numbers undertaking education at these colleges. Existing courses were upgraded and Glenormiston Agricultural College was established with students undertaking a new course in farm management.

Despite the affluence of country life, a steady drift of population towards the cities commenced and extended through the 1970s. The cost of farm labour began to increase and the cost of material needed for all farming operations was rising. As the price obtained on the export market for most agricultural products was either steady or declining, the cost price squeeze had started.

PERSONS ON ESTABLISHMENTS WITH AGRICULTURAL ACTIVITY: VICTORIA, 1950 TO 1970 *(a)*

Year ended 31 March—	Males	Females	Total
1950	137,945	118,600	256,545
1955	139,549	122,106	261,655
1960	145,056	126,555	271,611
1965	141,850	125,139	266,989
1970	131,161	116,384	247,545

(a) Information not collected after 1970.

Farmers maintained their level of income by increasing production, by the use of labour saving devices, and by a reduction in the number of paid farm workers. Many of these farmhands and their families were forced to move to the cities to seek alternative employment.

TRENDS IN THE NUMBER, SIZE, AND EMPLOYMENT OF ESTABLISHMENTS WITH AGRICULTURAL ACTIVITY: VICTORIA, 1935 TO 1982

Year ended 31 March—	Establishments	Average area per establishment	Male workers per establishment	Average area per male worker	Total male workers, permanent and temporary
	number	hectares		hectares	
1935	74,473	211.2	1.4	154.0	102,100
1940	72,557	226.7	1.4	164.0	100,184
1945	70,856	232.2	1.3	170.1	97,150
1950	70,486	220.1	1.5	144.5	107,405
1955	69,551	220.0	1.6	135.0	113,362
1960	69,778	218.9	1.5	147.9	103,264
1965	69,737	219.6	1.5	144.2	106,201
1970	69,498	227.4	1.3	180.3	87,673
1975	62,926	242.0	1.4	170.8	89,142
1980	49,616	297.0	n.a.	n.a.	n.a.
1981	49,399	293.6	n.a.	n.a.	n.a.
1982	48,608	297.2	n.a.	n.a.	n.a.

NOTE. In recent years, in order to minimise respondent burden and reduce processing costs, the Australian Bureau of Statistics (ABS) has been gradually excluding from the statistics those establishments which make only a small contribution to overall agricultural production. Since 1976-77, establishments with agricultural activity have been included in the Census where the enterprise operating one or more of the establishments had, or was expected to have, an Estimated Value of Agricultural Operations (EVAO) of $1,500 or more. In 1981-82, the EVAO criterion was increased to $2,500 in order to allow for inflation. While these changes have resulted in some changes in the counts of numbers of establishments appearing in ABS publications, the effect on the statistics of production of major commodities is small. Statistics of minor commodities normally associated with small-scale operations may be affected to a greater extent.

Source: F.F. Almond and N.F. Barr, *The Agricultural Work Force in Victoria, case studies in the Division of Labour on Farms*, Agricultural Research Unit, School of Agriculture and Forestry, University of Melbourne, March 1981.

Livestock

By the late 1950s, a new assessment of beef production was being made and it was seen to be an increasingly important industry. There was also a recognition that the beef and sheep industries were complementary in biological, managerial, and economic terms.

Encouragement was given to research in 1960 when the industry provided funds through a compulsory levy on slaughterings and this was matched by contributions from the Commonwealth Government. Early research was dominated by projects searching for ways of using and overcoming the limitations of pastures and was helped by extension services specifically established by the Department of Agriculture for the beef industry during the 1960s. The drought in 1967-68 highlighted some of the problems of the beef industry where feed and water supplies were inadequate for cattle. The dramatic increase in beef cattle numbers developed between 1969 and 1975, and was largely the result of farmers making the switch from wool and cereals.

Experiments carried out by the Department of Agriculture in the early 1960s showed that improved pastures could carry more stock and provide increased returns. Farmers thus began to increase stocking rates, which also helped them to maintain a reasonable income in the face of rising costs. The Victorian sheep flock increased from 26.5 million in 1960 to 30 million by 1965. At the same time cattle numbers rose by almost 800,000, (three-quarters of which were beef cattle) from the 1960 level of 2,600,000. The drought in 1967-68 caused a decrease in numbers of 3.3 million sheep and 50,000 cattle but by 1969, the numbers were restored to pre-drought levels. This drought was the first many younger farmers had experienced as the previous one was in 1944-45. Wheat was used as a stock feed in substantial amounts and irrigation farmers faced severe water restrictions which resulted in improved irrigation techniques. Despite the restrictions, dairy farmers in irrigated areas maintained production at close to normal levels while "dry" dairyfarmers, by skilful management, were able to keep production at about 90 per cent of normal levels.

From the beginning of the 1960s, synthetic fibres began to challenge wool in the manufacture of clothing and textiles. A promotion programme was launched to highlight the unique qualities of wool in an endeavour to increase demand. It was to be some years before increasing costs of synthetic fibre as a result of rising oil prices resulted in greater demand and hence better prices for wool.

As wool prices remained low through the late 1960s, sheep farmers constantly sought to keep costs down. The numbers of sheep per labour unit rose quite markedly in many areas. New chemicals had become available for control of blowflies, lice and keds, and for worms. Because they were more effective than those which they replaced, labour required to maintain flock health was reduced. Farmers also began to study their range of management operations carefully to see whether traditional methods could be simplified and thus save labour. Many minor innovations have gradually become generally adopted. This new attitude to labour use was in fact part of a change in thinking for most farmers in Victoria. Through the 1960s, they became much more concerned with financial management of their enterprises.

As costs of production rose, there was a gradual decline in numbers of dairy farmers. Those leaving the industry tended to be farmers operating in areas which were marginally suited to dairying or farmers with small herds and little potential for increase. The dairy industry thus became much more aware of the importance of farm financial management in the early 1960s as there were indications that the British market would be lost when the European Economic Community (EEC) was established. In addition, the EEC and the United States of America were dumping surplus dairy production on world markets. With rising labour costs, there was a movement towards higher stocking rates, an increase in adoption of herringbone milking sheds for more efficient milking, and a higher use of artificial breeding. In 1968, the first rotary cow sheds were built. These were suitable for herds in excess of 150 cows and resulted in significant increases in labour efficiency. One hundred and ten of these sheds were in operation in 1981; all these innovations were designed to raise net returns to the farmers.

A consequence of higher stocking rates in this and the other grazing industries was the realisation by farmers that to provide enough feed for stock, it was essential that the right fertilisers be applied, and at the right time. Potash was used in increasing amounts in southern Victoria and nitrogenous fertilisers, which were subsidised from 1966, were being applied in limited amounts to produce quick feed for freshly calved dairy cows.

FERTILISER USED (NATURAL AND ARTIFICIAL): VICTORIA, 1935 TO 1982

Year ended 31 March—	Pastures				Crops			
	Area	Super-phosphate	Artificial fertiliser		Area	Super-phosphate	Artificial fertiliser	
	hectares	tonnes	tonnes		hectares	tonnes	tonnes	
1935	*(a)*	n.a.	*(a)*		*(b)*1,998,813	n.a.	*(b)*215,054	
1940	1,302,588	n.a.	174,294		1,667,187	n.a.	171,806	
1945	858,503	96,929	1,088		989,594	68,017	23,416	
1950	2,722,211	378,295	2,176		1,553,599	155,012	23,365	
1955	3,285,300	459,927	6,600		1,460,326	147,883	31,077	
1960	3,104,103	503,507	27,599		1,650,717	178,718	42,090	
1965	4,652,233	707,045	45,447		1,903,414	204,066	47,408	
			Nitrogenous	Other			Nitrogenous	Other
			tonnes	tonnes			tonnes	tonnes
1970	4,212,109	643,432	n.a.	81,408	2,000,944	245,547	n.a.	52,992
1975	*(c)*3,487,437	560,875	7,927	85,527	1,383,014	189,777	10,205	23,007
1980	*(c)*3,529,960	466,230	11,306	74,647	n.a.	215,019	16,114	31,987
1981	*(c)*3,494,157	464,013	12,050	79,718	n.a.	211,868	15,633	29,207
1982	*(c)*3,339,826	473,669	10,993	70,510	1,842,646	243,164	16,422	30,241

(a) Included in crops. In addition, natural fertiliser used for crops totalled 93,486 tonnes in 1935 and 88,971 tonnes in 1940.
(b) Includes pastures.
(c) Includes lucerne.

"Consumerism" became evident in the dairy industry in the 1960s. In 1962, legislation was introduced for the dye marking of antibiotics used for the treatment of mastitis to control the level of antibiotics in milk. Within two years, the incidence of antibiotics in milk had fallen from 90 per cent to less than 2 per cent. The commercial manufacture of cheddar cheese was mechanised in this period, resulting in improvements in labour productivity and in quality control. As a hedge against the expected loss of the United Kingdom market at some time in the future, the Australian Dairy Produce Board started establishing milk recombining plants in south-east Asia in 1963.

By the end of the decade, the prevalence of bovine tuberculosis had been reduced to a very low level. In 1965, the last outbreak of contagious bovine pleuropneumonia occurred in south Gippsland. Eradication of this disease from Australia was achieved in 1972.

The pig industry began to change in many ways in the mid-1960s, when the first intensive pig production unit was established in Australia at Bendigo, where two thousand sows and progeny were completely enclosed. Piggeries declined as an adjunct to the dairy industry and there was a quickening interest in the development of specialist intensive units. In 1981, about 70 per cent of pigs in Victoria were produced in such units. From 1964 to 1974, the industry experienced stable prices. As a result, slaughtering establishments expanded production in Victoria from 25,000 tonnes in 1963-64 to 56,000 tonnes in 1973-74.

The Hypar system of rearing pigs was introduced in Victoria specifically to control virus pneumonia. Virus pneumonia had caused considerable economic loss to the pig industry for many years prior to this. The first production of piglets by the Hypar system was in 1962 at the Animal Research Institute, Werribee. The Hypar system was responsible for the establishment of many herds free of specific diseases but has now been replaced by rigid management programmes to avoid disease introduction in piggeries.

Vast changes were evident in the poultry industry in the 1960s. Intensification and specialisation of production lifted productivity to new levels; small sideline egg farms went out of business; and laying cages were introduced with resultant improved labour efficiency in egg production. The first specialised broiler farms were established with breeder stock, with the result that integration of broiler production on a production line principle led to the virtual elimination of the auction system for poultry.

The next six years saw more changes. Movement from single to multiple bird laying cages caused a rapid rise in hen numbers. Productivity per bird rose as a result of modern breeding programmes based on family selection and including the artificial insemination technique developed by the CSIRO. A rapid increase in broiler production, particularly on the Mornington Peninsula, led to cheaper poultry meat and an increase in consumption,

and extended to large-scale turkey production in broiler houses. Towards the end of the 1960s, broiler production exceeded demand, which resulted in price cutting, company takeovers, and further centralisation of the industry, while egg production tended to move from country areas to specialised areas around Melbourne and Bendigo.

Crops

The wheat crop in 1960 (1.83 million tonnes) was a record up to that time both in terms of total and average yield. The People's Republic of China began to import wheat and for the time being, fears of a world wheat glut were relieved. The rising trend in wheat production led to further increases in grain storage capacity by construction of new large capacity sub-terminals at ten locations across the cereal belt.

Barley production was stimulated by the release to growers of Resibee, the first new variety released since 1942. Bulk handling of barley was introduced through the Grain Elevators Board. New silos, fitted with aeration ducts to cool the barley so that its germinative capacity would be maintained, were erected at Rainbow and Jeparit and additional storage was added at the Geelong Terminal. A new terminal to service the malting industry was erected at Sunshine in Melbourne. The change from bag to bulk handling of barley was achieved in a very short time. Release of the barley variety Weeah in 1968 by the Department of Agriculture for growing in drier districts gave further encouragement to the industry. In the mid-1960s, the bulk handling system was quickly adopted for oats following erection by the Victorian Oat Pool, a grower-owned private company, of silos in producing localities.

The 1967-68 drought affected most parts of Victoria and cereal yields were reduced to about one-third of normal. In an attempt to offset dry conditions in the spring of 1966, rain making by seeding clouds with silver iodide from aircraft was attempted. Cloud conditions were rarely suitable and subsequent studies showed that no consistent rains could be obtained in the Victorian environment by this means. Following the drought, farmers sowed much greater areas to wheat in an effort to make up for the short fall in income in that season. The result for 1968-69 was a then record crop of 2.4 million tonnes (subsequently surpassed in 1978-79 with 3 million tonnes). The 1968-69 crop coincided with large crops elsewhere in the world and prices decreased markedly. One of the factors contributing to the large Victorian crop was the availability of two new chemicals, one of which killed the broad leafed weeds and the other the grassy weeds and, in particular, Wimmera Ryegrass. Because of a decline in demand for linseed for paint manufacture, and increasing interest in production of edible vegetable oils, pilot sowings of rape seed were made; it was thought this may be a profitable alternative to wheat in the years ahead.

The Victorian Wheat Research Institute at Horsham, opened in 1967, was financed by wheat growers, and staffed by the Department of Agriculture. Later, in 1982, the Institute was extended to include research on all field crops.

Horticulture

Improved technology led to considerable changes in the fruit industries. Changes in orchard and vineyard management from 1960 were to be more significant than those which had been developed in the previous fifty years. New practices which were adopted were supplementary irrigation, better use of pesticides, more fertilisers, the use of growth regulators, the development of privately owned coolstores, and improved packaging. Growers chose to concentrate on a few of the most popular varieties and develop specialised skills to achieve production potential and maintain viability of their enterprises. They introduced lighter pruning of tree fruits, replaced frequent regular cultivation by permanent grass, increased the use of chemical sprays instead of hand thinning, and used bulk bins and forklifts for fruit handling.

The strawberry industry which had a long history of declining production recovered from its decline in the 1950s, as a result of the development of virus free strawberry runners under the 1958 Victorian Certification Scheme. Substantial yield improvement has been achieved and demand has ensured profitable markets for growers up to the present

time. This development led to the several other schemes for the production of virus tested plants.

Research by the Department of Agriculture at Scoresby led to the development of trickle irrigation of fruit trees and vines. This system enables a very much higher efficiency of use of water than other irrigation systems. A further important development has been the use of biological control of scale insects of citrus fruit. The result has been a great reduction in the use of insecticides. Research has been continued to seek biological control measures for other insect pests. Improved methods of storage aimed at extending the marketing of fruit over a full year. Controlled atmosphere storage was adopted from the United States in 1968 and by 1972, the Victorian storage capacity was over 14,000 tonnes of apples. Fruit from such storage commands good prices out of season. The viticulture industry received encouragement in the late 1960s when Australian table wine consumption increased rapidly, but it was to experience difficulties of over supply, particularly of red wines, in the 1970s.

Fruit growing in the Melbourne metropolitan area declined in the late 1950s and 1960s as urban development spread. Orchards in the eastern suburbs were sold at very high prices to land developers and this enabled many owners to establish larger orchards on cheaper land further from the city. This same trend also applied to the market gardens in the sand belt and around the Waverley area. Farmers moved to the Frankston and Cranbourne area which, however, proved to have special problems resulting from sand culture, such as leaching, water retention, and erosion. The Vegetable Research Station was established at Frankston in 1962 to seek answers to these problems. On farms, cool rooms and hydrocoolers were installed in the early 1960s to improve the quality of produce for local and interstate markets.

In the early 1960s, returns to growers were poor and it was alleged that the Victoria Market was manipulated by a cartel. A Royal Commission found that no cartel existed but legislation was introduced in 1965 to safeguard the interests of growers who sold their produce through merchants and agents. The Department of Agriculture established a Market News Service to report daily through the media on supplies, demand, and current prices.

The new process of quick freezing developed rapidly from the late 1950s. Mechanical harvesting equipment enabled large quantities of peas and beans to be quickly harvested and snap frozen. The quality and convenience of frozen vegetables assured their acceptability by consumers.

The potato industry adopted changes in handling the crop during the 1960s. A dehydration plant established at Ballarat contracted for large quantities of potatoes delivered in bulk. Farmers began to use potato diggers delivering tubers into half tonne bins or bulk trucks, and to wash and pre-pack potatoes into polythene bags for sale to consumers. Other changes of significance to the vegetable industry included the use of fibre board cartons; half tonne bulk bins for carrots, pumpkins, potatoes, and tomatoes (particularly for processing); and the release by the Department of Agriculture of a number of tomato varieties which had disease resistance, for both the fresh market and processing.

In the 1960s, the development of control of blue mould encouraged the doubling of the area under tobacco. However, poor sales in 1961 eventually prompted the initiation of the Tobacco Stabilisation Plan and the establishment of the Australian Tobacco Board.

THE 1970s AND EARLY 1980s

The main agricultural industries in the 1970s experienced considerable changes in fortune, in all of which climate, economic circumstances, and various government decisions played their part.

When the Victorian Government decided in 1970 to refrain for the time being from making further land available for dairying, 573 farms had been allotted under the Land Settlement Act (381 dairy farms under rainfall conditions, 113 irrigation dairy farms, and 79 soft fruit orchard holdings).

In 1973, the Victorian Government decided to release further farms, and at 30 June 1976 the remaining 29 farms at Rochester had been allocated as well as 25 more farms at

Heytesbury. In 1976, however, because of further difficulties in the dairying industry, it was once again decided that, for the time being, no further farms would be allocated.

Land developed by the former Rural Finance and Settlement Commission and not allocated under settlement schemes was being progressively sold pursuant to legislation passed in 1977 following completion of previous settlement programmes.

In wetter years production reached record levels in some industries, while the drier seasons brought problems of lower farm returns. The cost/price squeeze was tightening. Farmers were striving for greater efficiency in their operations but there was a limit to what they would achieve.

The price of many agricultural products—wool, lambs, mutton, dairy products, and horticultural produce—was depressed. Wheat production—with a guaranteed price—appeared attractive but expansion was limited by the imposition of quotas from 1969 to 1972. Farmers turned to alternative crops—barley, sunflowers, and other oilseed crops—and beef production. Sales of beef to the United States of America and Japan returned goods prices until the United States market collapsed later in the decade.

The financial pressures and stress on farmers continued to increase with the rising costs associated with fuel, machinery, all farm requisites, and labour, and the appearance of new diseases and pests. As a result many small landholders decided to sell out. There was a trend towards larger properties except in those areas where properties were broken up for "hobby" farms. High land prices assisted the small farmers to leave the industry but often added to the debts of the bigger producers.

Fortunes changed in the marketing of agricultural produce. The policy of the European Economic Community of subsidising local production and/or raising tariffs severely restricted Australian exports to the United Kingdom and Europe. However, new markets were opened up in the Middle East and Far East but international politics at times created a degree of uncertainty. A profitable live sheep export trade was developed with Moslem countries, but proved to be a contentious issue in Victoria.

In 1979, the Victorian Farmers and Graziers Association was formed by an amalgamation of several primary industry associations.

Stock and station agents have had a close association with the Victorian pastoral industry particularly in the marketing of livestock and wool and in providing goods and services to producers. The economic forces to which producers were responding during the 1970s also influenced the nature and extent of agent services and substantial rationalisation of services took place.

Marketing of livestock and wool became increasingly more objective and towards the end of the 1970s the concept of sale by description on the basis of measurements was gaining acceptance.

As well as conducting full-time courses, agricultural colleges established an extensive programme of short courses for the farming community. McMillan Rural Studies Centre was established in Gippsland and concentrated on conducting non-residential part-time courses for the rural communities in Gippsland and also by home studies to the rest of Victoria. There was a significant increase in demand placed on Burnley Horticultural College in Melbourne for courses in amenities horticulture and a number of new courses were established.

Livestock

The beef industry expansion which started at the time of low wool prices and large grain surpluses became rapid in the early 1970s. World demand for beef was high and returns good. Warnings that greatly increased output may be difficult to sell if production increased simultaneously in major producing countries went largely unheeded. Prices rose sharply in 1973 as part of a world commodity boom and stimulated confidence further. In 1973, most economies in the developed world were disrupted by a rapid rise in oil prices set by the Middle East producers. This, as well as good seasons overseas which increased stock feed levels, immediately caused sharp reductions in Australian exports of many items, including beef. Prices declined dramatically and Victorian producers, who had increased cattle numbers by more than 2 million in five years, experienced a difficult time. This lasted until 1978. In 1976, about 80,000 cattle were shot and buried in mass graves because

they were worth so little on the market. Local beef consumption rose markedly because of low prices. Since 1978, despite improved markets for beef, producers have been slow to increase production again.

The dairy industry in Victoria has always been the major producer of milk in Australia. Record levels of production in Australia in 1969-70 led to Victorian and Tasmanian farmers being asked to reduce production in 1970 as a condition of financial assistance from the Commonwealth Government. In the event, Victorian production reached a record level but because of poor seasonal conditions in other States, total Australian production was within limits set by the Commonwealth Government. By 1970, all milking machines had been converted to stainless steel to improve the keeping quality of milk products containing butterfat. The numbers of dairy farmers continued to decline through the 1970s. Some changed over to beef because of the buoyant outlook for beef in the first three years of the decade.

There was increased activity from 1970 to 1973 in developing alternative export markets against the loss of access to the United Kingdom in 1973. Other States also brought continuing pressure for development of a two price scheme for dairy production which would insulate them from the effect of greater efficiency of Victorian farmers. This was not achieved by the early 1980s.

Throughout the 1970s, considerable rationalisation took place in the processing of agricultural products. Many small butter factories closed and operations became centred on a few major establishments which specialised to a degree in certain lines of manufacture. In 1974, the Commonwealth Government bounty to the dairy industry was withdrawn and a Board of Inquiry was established to examine all aspects of the industry. The Australian Dairy Corporation, which has a better balance of industry representation than its predecessor, the Australian Dairy Produce Board, was established in 1975. It has been active in development of export markets since that time.

Drought, declining butter sales, the collapse in export prices, and low values for all stock precipitated a crisis in the industry in 1976. Herd numbers had reached a record level because many farmers had kept cull cows longer than normal, as their carcase value was less than the net value of milk they could produce. Farmers came under financial stress and large numbers sought off-farm employment while their wives and families continued to run the farms. Many left the industry in the next few years. The difficulties, however, led to the formation of the United Dairyfarmers of Victoria in 1979, which organised a march of farmers through Melbourne to draw attention of the urban community to their plight.

In 1977, the Victorian Dairy Industry Authority replaced the Milk Board and began phasing out milk contracts. This gave those farmers without contracts an opportunity to participate in the liquid milk market. This move had the effect of discouraging those farmers who were able to maintain production in marginal areas only because of the high price paid for contract milk. For those farmers who continued in dairying the Commonwealth Government for its part introduced legislation which could be used to prevent interstate trade in liquid milk. It also introduced underwriting of dairy products to ensure minimum levels of returns to farmers.

For the last three years of the 1970s the numbers of dairy farms, milk cows, and total milk production declined. However, liquid milk consumption rose marginally following the introduction of a milk marketing campaign called "Big M" which promoted a new range of milk products. Consumption of manufactured dairy products on the Australian market also rose and the quantity of exports of dairy products declined substantially (but not the total return from exports).

Thirty-five per cent of farmers used production testing in their herds, and 50 per cent of dairy farmers used artificial breeding for 25 per cent of the total herd. The National Dairy Herd Improvement Scheme was established in 1980 to maximise net benefit to the industry through genetic improvement.

Because of improved returns from dairying, farmers sought an improved lifestyle. Some achieved concentrated calving patterns which allowed a shorter milking season and others employed relief milkers so they could have more leisure.

The farmers who participated in the Department of Agriculture grass budgeting programme were able to achieve an average increase of 10 per cent in milk production

with little or no increases in physical inputs. In the early 1980s due to increases in milk prices and productivity, and possibly also because of changes in relativities with other grazing industries, the decline in dairy production that occurred in the 1970s came to a halt.

The Bovine Brucellosis Control Programme began with the compulsory vaccination of heifers with Strain 19 vaccine. After five years, during which time the prevalence of the disease had been reduced, the Eradication Programme commenced and, by 1979, infection in herds and individual cattle throughout Victoria had been reduced by over 90 per cent.

The sheep industry rapidly recovered its stock numbers after the 1967-68 drought and despite falling prices for both sheep and wool, there were 33.8 million sheep in Victoria by March 1971. Relatively better beef prices at this time induced many growers to change from sheep to beef, either wholly or partly. By March 1973, flock numbers had fallen to about 24 million. In the wake of poor prices, the Commonwealth Government had introduced a deficiency payments (subsidy) scheme to guarantee minimum wool prices to producers. It was phased out when prices recovered temporarily in 1972-73. Following the oil crisis in 1973, wool prices again declined. In an effort to smooth out fluctuations in the market, although not to defy long-term market forces, the Commonwealth Government introduced a Flexible Reserve Price Scheme.

In January 1974, the Australian Wool Corporation (AWC) proposed to acquire and market all wool produced in Australia "for export". The plan has not been implemented, but is still AWC policy. In the face of continued poor prices, the Commonwealth Government introduced a Minimum Floor Price in 1974 which was to be highly significant. This minimum price for wool was based on a published annual schedule of types and prices to underpin the Flexible Reserve Price Scheme. It has been administered by the AWC and financed by a 5 per cent levy on the gross value of raw wool sold. This levy was additional to the existing 3 per cent already levied for research and promotion.

Initially a stockpile of 285 million kilograms of wool built up, but improving prices had reduced the amount to 148,000 by 1981. Prices continued to be satisfactory until the early 1980s.

Sale of wool by sample and test certificate where a small sample together with information about fibre diameter, yield, and contaminants was presented to buyers, largely replaced the old method of displaying fleeces in bales with the buyers making their own subjective assessment. The change over was initiated in 1975. An additional aid to producers was the development of objectively based reports on sales of fat sheep and cattle by the Livestock Market Reporting Service. This began in 1977.

Graziers realised throughout the 1950s and 1960s that animal diseases were causing serious losses in the livestock industries, and requested more veterinary research and diagnostic services. In 1969, the Department of Agriculture opened the Veterinary Research Laboratory at Attwood, and between 1971 and 1976 Regional Veterinary Diagnostic Laboratories were established at Hamilton, Bendigo, Bairnsdale, and Benalla.

The Department of Agriculture also assumed responsibility for the provision of services to the meat industry of Victoria with the bringing into operation of the Abattoir and Meat Inspection Act in 1974. The change in responsibility (from the Health Commission and local municipalities) has resulted in uniformity in the standards of construction and hygiene at meat processing facilities throughout Victoria and the extension of meat inspection services to all abattoirs slaughtering animals for human consumption.

Toward the end of the 1970s, the sheep industry, as well as other animal industries were challenged by animal welfare lobby groups in regard to animal husbandry practices which had long been taken for granted. These industries together with the Department of Agriculture developed suitable "Recommended Codes of Practice" for the husbandry and transport of farm animals. The principles were laid down by an Act of Parliament in 1980 and reflect the influence since the early 1970s of various conservation groups.

Pastures, which are the basis of Victoria's grazing industry and have an influence on cropping through the clover ley system, were affected in two major ways in the 1970s. In the middle of the decade, superphosphate prices rose considerably, while most products were selling at low prices. Farmers had to cut costs to survive and many reduced applications very substantially or completely. As prices for produce increased later in the decade, farmers again used more fertilisers and pasture growth quickly returned to normal.

Research into many aspects of pasture improvement continued. The spotted alfalfa aphid and the blue green aphid—pests in California—were discovered in Victoria in 1977, and they caused severe damage to stands of lucerne and other medics. Cultivars resistant to attack by these pests were introduced and developed eventually to overcome this problem.

Other pasture problems of the decade were clover scorch disease, which affects some cultivars of subterranean clover, and the need to replace current cultivars which have high oestrogenic levels and cause infertility in sheep. Research has identified cultivars which may overcome these problems—Sirosa and Sirolan—improved cultivars of phalaris and Haifa white clover.

Pig raising "migrated" from major milk producing areas to the grain producing areas in northern and western Victoria as the main diet changed to a grain base. This movement was largely completed by the early 1970s. In 1974, many sideline producers left the industry as grain prices rose and pig prices declined. By 1982, the number of producers in Victoria had decreased from 6,000 in 1974 to 2,000. The increased number of specialist producers has ensured continuing pig meat production at an annual level of about 50,000 tonnes in Victoria (with pigs being brought for slaughter from New South Wales and South Australia). The industry also became highly capitalised between 1960 and 1980.

The main problem for the poultry industry in the decade was the fluctuating market situations, particularly for the broiler industry. In 1972, development of the fast food industry led to an increased consumption of poultry meats and the broiler industry expanded. Two years later, the Broiler Chicken Industry Act set up a Broiler Industry Negotiation Committee to prepare growing contracts, negotiate grower fees, and settle industry disputes. Low red meat prices in 1976 brought wholesale prices of broilers down but the industry began another period of rapid production under the stabilising effect of the 1975 legislation. Consumption of chicken meat rose as a result of low chicken prices, a quite basic change in the food consumption pattern of Victorians. For the next five years, consumption tended to reflect the comparative prices of poultry and the red meats.

In 1976, an outbreak of Fowl Plague occurred on three properties in Victoria and a national programme was implemented to eradicate the disease. Eradication was achieved six weeks after first identification of the disease. The Egg Inquiry Committee set up by the Victorian Government in 1980 recommended freezing of the transfer of hen quotas and provided for their discontinuance in 1984.

Crops

Because of a world glut of grain, the wheat quota system was introduced, commencing with the 1969-70 harvest. Growers switched to barley and oats and some tried safflower and rape seed as sources of vegetable oils. Research by the Department of Agriculture into production of other crops sought to find a range of options for wheat growers. Quotas were lifted in 1972 as market conditions improved. Despite good winter rains in 1973, yields were greatly reduced by stem rust. As a result, a National Rust Control Programme was established in the expectation that future wheat varieties released in Australia would ultimately be rust resistant.

AREA AND PRODUCTION OF OIL SEEDS: VICTORIA, 1935 TO 1982

Year ended 31 March—	Linseed		Rape seed		Safflower		Sunflower	
	Area	Production	Area	Production	Area	Production	Area	Production
	hectares	tonnes	hectares	tonnes	hectares	tonnes	hectares	tonnes
1935	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	226	186
1940	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	135	146
1945	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	161	178
1950	3,297	1,473	n.a.	n.a.	n.a.	n.a.	181	102
1955	740	364	n.a.	n.a.	n.a.	n.a.	31	21
1960	10,056	7,510	n.a.	n.a.	n.a.	n.a.	89	64
1965	4,028	2,713	n.a.	n.a.	770	367	11	12
1970	7,640	9,502	4,367	3,947	n.a.	n.a.	1,217	918
1975	4,924	3,812	3,707	2,288	2,813	1,269	7,973	4,766
1980	5,284	5,208	3,438	3,476	1,055	688	9,363	7,325
1981	4,567	4,057	2,539	2,078	3,366	1,630	8,195	8,552
1982	3,864	3,898	3,846	3,584	4,799	3,113	11,970	10,086

Over the next few years, growers persisted with areas of oil seed crops with varying degrees of success. Sunflowers became the major oil seed crop in the State but disease, pests, and insufficient soil water reserves prior to sowing on dry land were factors which could drastically reduce yields. The crop, however, provided an additional option over a wide area of medium rainfall districts which were traditionally used for grazing.

In the mid-1970s, grain legumes began to attract interest. The Department of Agriculture tested many varieties and identified potential markets. Other technical developments included minimum tillage and direct drilling which allow crops to be sown without prior preparation of a seed bed , the release of a wide range of herbicides to deal with specific weed problems, and the development of higher yielding varieties of crops such as rape seed, triticale, field peas, lupins, and chick peas.

Two successive record wheat crops in 1978-79 and 1979-80 were harvested, the first just under and the second just over 3 million tonnes. Disease in each year reduced yields in parts of the cereal growing area. Measures to reduce losses caused by "take-all" and stripe rust, which first appeared in Australia in 1979, cereal cyst nematode, stem rust, and speckled leaf blotch were initiated to stabilise Victorian cereal production.

The large harvests of 1979 and 1980 placed a severe strain on storage and transport facilities. The storage problem was largely overcome by constructing large plastic lined earth walled bunkers. The transport task was eased by the conversion of 600 general purpose rail wagons to self emptying hopper wagons to speed up unloading and reduce labour at the sea board terminal. The shipping terminal at Portland previously used mainly for oats was transferred from the Portland Harbor Trust to the Grain Elevators Board. Wheat from most of the Wimmera and part of the Mallee was shipped through Portland from the early 1980s.

Horticulture

The overproduction of unsaleable fruit was the problem for many Victorian fruitgrowers in the early 1970s. In a period of strong competition, the distance of Victorian fruit from overseas markets was a great disadvantage. The problem was to be compounded when access to the market in the United Kingdom declined in 1973. The Commonwealth Government introduced the "Tree Pull Scheme" in 1972 as a means of reducing production. It provided financial help to growers who removed trees from their orchards. Up until 30 September 1977 when the Scheme was wound down, 190 hectares of fresh apples, 218 hectares of fresh pears, 950 hectares of canning peaches, 960 hectares of canning pears and 161 hectares of canning apricots qualified for tree removal assistance under this scheme. At the same time, alternative export markets were sought in the United States, the Middle East, and the Far East. They were not sufficiently successful to absorb available supplies of fruit.

The "Tatura trellis"—a new method of growing fruit trees on a "V" shaped trellis—was developed at the Irrigation Research Institute, Tatura. Fruit production per hectare from trees grown on "Tatura trellis" is much higher than from conventional trees and the method offers potential for improving the efficiency of fruit growing for future plantings. Advances have also been made in the mechanical harvesting of fruit.

The citrus industry, which had increased plantings of Valencia oranges and grape fruit, appeared to encounter oversupply, but the unexpected increase in orange juice consumption eased the situation. Tariff protection was sought and granted on a temporary basis to the industry against the import of cheap juice concentrates.

A novel development particularly in urban areas has been the "pick your own fruit" harvesting method. Consumers are invited to pick their own fruit as a form of recreation. They get the fruit at a relatively low cost, and the grower has reduced harvesting costs. One of the important developments in the export fruit industry was the improved packaging of fruit in cartons for transport in the large containers used by modern shipping. This has saved handling and freight costs between producer and consumer.

While the dried vine fruit industry had severe financial difficulties in the mid-1970s because of competition from other producing countries, good crops and prices towards the end of the period allowed most growers to reduce overdrafts substantially.

The post-war peak in tobacco planting was reached in 1970 with 4,309 hectares under

the crop. The area gradually declined by the end of the decade, but yields increased with improved technology and pest control.

A significant change for the vegetable industry in the 1970s was acceptance of plastic (PVC) pipe for irrigation and drainage. Growers installed fixed PVC systems in both the sand belt near Melbourne and in the Mallee. Plastic drain pipes replaced conventional tile drains. Mechanised installation was quick and relatively cheap. Tomato harvesters, first used in 1970, were steadily adopted and by 1980, about 60 per cent of the crop was harvested by machines. New varieties had to be bred to take advantage of this development. New growing techniques had to be developed and in particular, the use of direct seeding rather than transplanting.

Following the rapid growth of frozen vegetables production in the 1960, this sector of the industry underwent rationalisation during the following decade. Growers quickly accepted concentrated fertilisers when they were introduced. In 1974, the first pathogen tested seed potatoes became available. New varieties—Coliban and Tasman—were released. Mobile irrigators gained wide acceptance among potato growers and the quantity of potatoes processed had more than doubled. French fried potatoes were the main growth area. However, imports of frozen french fries in 1974-75 disrupted the industry, but as a result of an Industries Assistance Commission inquiry, the Commonwealth Government imposed a duty on processed product of 10 per cent, on a fresh equivalent basis.

Airfreighting of vegetables to south-east Asia began towards the end of the decade and a hybrid sweetcorn seed industry was established at Orbost. At about this time tomato harvesters capable of grading fruit on the basis of colour were introduced. A few commercial enterprises were showing an interest in the growing of vegetables by hydroponic culture.

In 1981, a vegetable growing apprenticeship scheme was established. Other farm apprenticeship schemes had been started in 1975, giving practical training in cropping, grazing, dairying, and fruit growing to 180 students. By 1981 there were 1,400 students.

The 1970s also saw big increases in the numbers of non-commercial farms. A non-commercial property is one which cannot generate sufficient income to meet all farm costs and provide a living, resulting in some off-farm income, generated by either full or part-time employment, being needed to maintain a rural way of life. Farms which fell into this category were commonly called "farmlets" or "hobby farms".

The non-commercial farm was not a new phenomenon. However, the magnitude of proliferation in terms of both area of land sub-divided and sold, and the effect on rural land valuations, became markedly greater than before. By 1981, district officers of the Department of Agriculture, Victoria, estimated that a total of about 13,000 non-commercial properties were located in all districts of the State, with a predominance surrounding Melbourne (4,600), Ballarat (1,500), Colac (1,400), Bendigo (900), and Leongatha (750).

Attitudes of the established "commercial" farming community toward these groups vary widely. On the one hand, high valuations of non-commercial farms, up to twice the accepted agricultural worth of the land, have led to greatly increased rate charges; absentee non-commercial farm owners are also blamed for a build up of noxious weeds and vermin and for disturbance of flocks and herds by roaming dogs. On the other hand, non-commercial owners new to farming may rely on established commercial owners to provide information, services, and machinery for development for which they are happy to pay.

Recent agricultural developments

The economic recession continued to worsen early in the 1980s and unemployment increased.

The year 1982-83 proved to be a particularly difficult year with severe and widespread drought conditions throughout most of Victoria and disastrous bush fires in a number of areas. Drought assistance schemes were implemented by the Victorian and Commonwealth Governments, together with disaster relief measures for those affected by the fires.

The export markets continued to be disrupted by international political decisions arising from troubles in Afghanistan and Iran. The export of live sheep was still a contentious issue with unions and farmers.

A Royal Commission into the Australian Meat Industry was set up in 1981 following the discovery of kangaroo and horse meat in packages of export beef in the United States

of America. The Commissioner, the Hon. Justice A.E. Woodward, found that at the Commonwealth level there were deficiencies in the arrangements and procedures for export meat supervision covering the preparation of meat for export but that there were no similar deficiencies in the supervision by Victoria of meats being prepared for domestic consumption. It was recommended that a unified meat inspection service be developed in Australia.

A major goal was achieved in 1980 when Victoria was declared provisionally free of bovine brucellosis. At this point the prevalence of the disease had been reduced to less than 0.2 per cent.

The need to maintain a vigilant animal quarantine service to protect the livestock industries from the introduction of exotic diseases received wide publicity as a result of a national publicity campaign. The Australian National Animal Health Laboratory was built for the CSIRO at Geelong to provide a maximum security laboratory to enable research and diagnostic work to be conducted on exotic animal diseases. When the project neared completion, the need to import foot and mouth disease virus so the laboratory work could proceed became a controversial issue, arising out of questioning by producer organisations and certain scientific personnel.

The Plant Breeding Rights Bill was introduced into the Commonwealth Parliament in 1981 and was subsequently referred to the Senate Standing Committee on National Resources for further consideration late in 1982. The legislation provides for proprietary rights on newly bred plant material in a similar manner to patent legislation. The objective of the legislation is to encourage the development of plant breeding in Australia in the private as well as the public sector. A further objective is to enable access by Australia to patented overseas varieties, many of which are currently unavailable.

The Victorian Advisory Committee on Agricultural Education, established in 1976, recommended that the agricultural and horticultural colleges be consolidated into a single multi-sector, multi-campus college to be called the Victorian College of Agriculture and Horticulture. Ministerial responsibility would be changed from the Minister of Agriculture to the Minister of Education and the College would be managed and controlled by a Council. The Victorian Government accepted this recommendation and the College was established in 1983.

CONCLUSION

Over the 50 years since 1934 prosperity alternated with adversity, the latter generally causing a period of depopulation, an overall declining percentage contribution to Gross Domestic Product by agriculture, restructuring of properties, and the seeking of alternative employment by farmers, their wives, or older children. This was especially marked in the mid-1970s. Drought, too, was a constant and cyclical threat and combined with a period of financial adversity, accelerated the above trends.

The various agricultural problems of the era have been examined by academics, government departments, private industry, and grower organisations. One academic whose influence was far reaching and long standing, in both agricultural theory and practice, was the late Sir Samuel Wadham, Professor of Agriculture at the University of Melbourne from 1926 to 1956 and adviser to several Commonwealth and State Governments.

Government agencies developed services to the agricultural community. The Department of Agriculture developed research activities in most agricultural areas. Its district industry extension services cover Victoria and it operates regulatory services to protect the quality, marketability, and disease risks of many products. The Department of Crown Lands and Survey has continued to attempt to control vermin and noxious weeds. Its most significant success was the large decline of the rabbit population. The Soil Conservation Authority established in 1950 has brought transformation to many areas of the State and ensured that good conservation practice is incorporated into normal agricultural management. The State Rivers and Water Supply Commission has increased water availability, vastly improved the distribution system for irrigation, stock and domestic water, and placed Victoria in a good position for future irrigation production development. The transport system has seen changes in emphasis; the roads developed by the Country Roads Board permit easy delivery of many goods, with the railway the predominant bulk carrier.

Grower organisations waxed and waned with a general move to amalgamation culminating toward the end of the period with the formation of the Victorian Farmers and Graziers

Association. Growers prompted innovations which included myxomatosis for the control of rabbits, wool price schemes, and rural fire suppression services; innovations developed by growers included wool packaging, computerised wool sales, and mechanical and marketing innovations for crops.

The contribution of volunteer organisations has also been far reaching. The Country Fire Authority is financed and directed by the Victorian Government but relies on volunteer fire fighters throughout the State. The Country Women's Association and the Young Farmers have widened the horizons of families on the land.

The contribution of the Commonwealth and State Governments has been critical in the growth of technical agricultural education since 1934. University degree courses have doubled and agricultural colleges increased from two to six, including one private institution. Extension services have attempted to provide farmers with greater technical and managerial competence. In both agricultural extension and education there has been a growing emphasis on financial management since the 1960s.

Many of the above developments have been assisted by the supply of electricity to almost the whole State—one of the major achievements for agricultural life since 1934. Likewise, the use of petroleum products for farm machinery grew rapidly after the Second World War, but when the historic rise in oil prices began in 1973, these products came to assume an ever growing importance in the rural producer's cost structure.

Producers of some crops struggled to maintain their tariffs, for example, tobacco. At the end of the period, negotiations with New Zealand for closer economic relations were seen by some as a threat and others as an opportunity. Marketing boards and other devices established first in the 1930s continued to grow, some with national coverage, such as wheat and wool, and others local, such as eggs and onions. They have been politically controversial but in retrospect have had considerable success in reducing price fluctuations. The agricultural sector, because most of its earnings come from exports, has to accept rising input costs while world market prices generally dictate the returns on the bulk of its production. This highlights the continuing dilemma of Australian agriculture: the physical ability to produce more output matched by its inability to compete on many world markets.

By the 1980s, the complex interaction of historically unprecedented high interest rates, inflation, unemployment, export difficulties, drought, and bushfires gave some reminders of the unhappy days of the 1930s.