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Users are warned that this historic issue of this publication series may contain language or views which, reflecting the authors' attitudes or that of the period in which the item was written, may be considered to be inappropriate or offensive today.

CHAPTER 23

RURAL INDUSTRY

This chapter is divided into five major parts:

Introduction, dealing with general rural activity in Australia;

The soils of Australia, a special feature in this issue;

Agricultural production;

Pastoral production; and

Other rural industries, which includes the dairying, poultry and bee industries.

For greater detail on the subjects dealt with in this chapter *see* the annual bulletins *Rural Industries, Non-Rural Primary Industries and Value of Production*, and *Secondary Industries* (regarding butter, cheese, etc., factories) issued by this Bureau. Current information on commodities produced is obtainable in the *Quarterly Summary of Australian Statistics*, *Monthly Review of Business Statistics*, *Monthly Bulletin of Production Statistics*, and *Digest of Current Economic Statistics* (monthly). The series of bulletins *Classification of Rural Holdings by Size and Type of Activity*, 1959–60 shows particulars of rural holdings classified by size, nature and area of crops, and numbers of livestock, and also according to main type of activity. The mimeographed annual *Report on Food Production and the Apparent Consumption of Foodstuffs and Nutrients in Australia* contains details of the production and utilization of foodstuffs. The following mimeographed publications also contain considerable detail on the particular subjects dealt with.

General. *Value of Production and Indexes of Price and Quantum of Farm Production* (annual), *Value of Primary Production* (*Preliminary Statement*) (annual), *Farm Machinery on Rural Holdings* (annual), *Tractors on Rural Holdings*, 31 *March* 1963 (detailed information), *New Tractors: Receipts, Sales and Stocks* (quarterly), and *New Agricultural Machinery* (quarterly).

Agricultural production. *Rural Land Use and Crop Production* (annual), *Agricultural Statistics* (*Preliminary Statement*) (annual), *The Wheat Industry* (two a year), *The Fruit Growing Industry* (annual), and *Fruit Statistics* (*Preliminary Statement*) (annual).

Pastoral production. *Livestock Statistics* (annual), *Livestock Numbers* (annual), *The Meat Industry* (monthly), *Wool Production* (annual), and *Wool Production and Utilization* (annual).

Other rural production. *The Dairying Industry* (monthly and half-yearly), *Livestock Statistics* (annual), *Livestock Numbers* (annual), *Manufacturing Industries No.* 20.—*Bacon Curing* and *No.* 21.—*Butter, Cheese and Condensed, Concentrated, etc., Milk* (annual), *Production Summaries No.* 36.—*Preserved Milk Products* and *No.* 55.—*Butter and Cheese* (monthly), and *Bee-farming* (annual).

Values of Australian oversea trade shown throughout this chapter are expressed as $A f.o.b. port of shipment.

Throughout this chapter yearly periods for area and production of crops relate to years ended 31 March. Other periods in respect of e.g. factory and trade statistics relate to years ended 30 June.

INTRODUCTION: RURAL ACTIVITY

Number and area of rural holdings

Number and area

A holding in Australia has been defined by statisticians on a more or less uniform basis, and discrepancies which exist are not of sufficient importance to prevent comparisons. For the purpose of these statistics a holding has been defined as land of one acre or more in extent used in the production of agricultural produce or for the raising of livestock and the production of livestock products.

There are considerable fluctuations from time to time in the numbers of very small holdings, and it is very difficult to determine in some cases whether or not they are rural holdings within the definition. In addition, in the very dry parts, such as the far west of New South Wales and Queensland and the remoter parts of South Australia and Western Australia, there are large areas of marginal lands sporadically occupied for extensive grazing under short-term lease or other arrangement, and the areas so occupied tend to fluctuate with the seasons. Similarly, there are rugged areas in the mountain country of some States which are also occasionally occupied.

RURAL HOLDINGS: NUMBER AND AREA, STATES AND TERRITORIES
1960–61 TO 1964–65

Year	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
NUMBER OF RURAL HOLDINGS									
1960–61	76,871	69,623	43,155	28,711	21,922	11,201	275	224	251,982
1961–62	76,949	69,866	43,287	28,886	22,082	11,117	284	217	252,688
1962–63	76,294	69,700	43,284	28,922	22,554	10,974	281	217	252,226
1963–64	77,339	69,775	43,183	28,711	22,770	10,949	299	214	253,240
1964–65	77,098	69,737	43,565	28,754	22,856	10,979	307	207	253,503
TOTAL AREA OF RURAL HOLDINGS ('000 acres)									
1960–61	172,697	37,934	373,995	156,456	247,737	6,510	161,099	374	1,156,802
1961–62	172,327	37,754	374,501	156,898	252,783	6,551	171,244	377	1,172,435
1962–63	172,038	37,709	376,788	156,697	262,660	6,422	164,955	376	1,177,645
1963–64	172,076	37,798	376,687	158,905	266,556	6,377	165,734	373	1,184,506
1964–65	172,148	37,844	377,010	156,955	268,553	6,420	171,482	358	1,190,770

Land utilization of rural holdings

The following table shows the purposes for which the land on the rural holdings referred to in the preceding paragraph was used.

RURAL HOLDINGS: LAND UTILIZATION, 1960–61 TO 1964–65
('000 acres)

Year	Area used for crops(*a*)	Land lying fallow(*b*)	Area under sown grasses and clovers(*c*)	Balance of holdings (*d*)	Total area of holdings
1960–61	27,101	7,438	35,589	1,086,674	1,156,802
1961–62	27,907	8,049	39,063	1,097,416	1,172,435
1962–63	30,056	8,719	40,991	1,097,879	1,177,645
1963–64	29,948	8,510	44,211	1,101,837	1,184,506
1964–65—					
New South Wales	10,000	2,223	11,074	148,851	172,148
Victoria	5,019	2,484	14,830	15,511	37,844
Queensland	3,874	691	3,438	369.007	377,010
South Australia	5,831	1,231	5,673	144,220	156,955
Western Australia	7,289	1,757	10,427	249,080	268,553
Tasmania	227	79	1,610	4,504	6,420
Northern Territory	4	..	15	171,463	171,482
Australian Capital Territory	7	1	92	258	358
Australia	**32,251**	**8,466**	**47,159**	**1,102,894**	**1,190,770**

(*a*) Excludes (*i*) duplication on account of area double cropped, except for New South Wales and South Australia, and (ii) clovers and grasses cut for hay and seed which have been included in Area under sown grasses and clovers, and differs therefore from crop area figures shown later in this chapter. (*b*) Excludes short or summer fallow. (*c*) Includes paspalum. (*d*) Used for grazing, lying idle, etc.

Classification by size and type of activity

Some of the information obtained from the 1959–60 Agricultural and Pastoral Census was classified by size of principal characteristics (area of holdings, area of sown grasses and clovers, area of selected crops, and numbers of livestock). In addition, all holdings were classified according to type of activity. Tables showing this information, for statistical divisions and States, and an outline of the methods used have been published in a series of bulletins *Classification of Rural Holdings by Size and Type of Activity*, 1959–60. Similar information on size classification for each State was published in a series of bulletins for the year 1955–56.

Employment on rural holdings

Persons engaged

The following table shows, for each State except Victoria, the recorded number of males working on rural holdings. Particulars for females are not available except for New South Wales. Additional particulars relating to the number of males employed in agriculture up to 1941–42 are shown in Year Book No. 36, page 852, and previous issues. Similar details for later years are not available.

MALES(*a*) ENGAGED ON RURAL HOLDINGS: STATES AND TERRITORIES
31 MARCH 1965

Males engaged	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.(*b*)	A.C.T.	Aust.
Permanent—									
Owners, lessees or share-farmers	63,100	(*c*)	44,546	23,136	20,569	7,651	211	158	n.a.
Relatives of owner, lessee or share-farmer over 14 years of age, not receiving wages or salary	2,690		2,958	1,207	1,232	20	15	5	
Employees, including managers and relatives working for wages or salary	28,776		18,619	8,247	8,502	4,075	645	162	
Total permanent males	*94,566*		*66,123*	*32,590*	*30,303*	*11,746*	*871*	*325*	
Temporary	22,198		10,206	10,984	2,797	5,993	1,323	27	
Total males	**116,764**		**76,329**	**43,574**	**33,100**	**17,739**	**2,194**	**352**	

(*a*) Details for females not available except for New South Wales. (*b*) Includes 1,125 male full-blood Aboriginals employed as temporary employees. (*c*) Not available; subject to investigation.

Information regarding the number of persons working full-time on rural holdings in Australia at 31 March of years to 1958 appears in Year Book No. 50, page 987, and in earlier Year Books. Data for subsequent years are the subject of investigation and are not available at this stage.

Salaries and wages paid

Particulars of salaries and wages paid to employees (including amounts paid to contractors) working full-time on rural holdings are shown below for the year 1964-65. Data for New South Wales and Victoria, and hence Australia, are not available.

EMPLOYEES ON RURAL HOLDINGS: SALARIES AND WAGES PAID(*a*)
STATES AND TERRITORIES, 1964-65

($'000)

Employees	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
Permanent—Males	(*b*)	(*b*)	33,152	13,492	15,474	7,034	1,302	432	n.a.
Females			2,172	484		140	138	36	
Temporary(*c*)—Males			49,114	9,952	12,326	3,702	694	150	
Females				1,158		984		10	
Total			**84,438**	**25,086**	**27,800**	**11,860**	**2,134**	**628**	

(*a*) Includes value of keep. (*b*) Not available; subject to investigation. (*c*) Includes amounts paid to contractors.

Similar information for Australia for years up to 1957–58 is given in Year Book No. 50, page 988, and in earlier Year Books. Particulars for subsequent years are the subject of investigation and are not available at this stage.

Persons residing permanently on holdings

Particulars of persons (of all ages) residing permanently on rural holdings in each State and Territory at 31 March 1965, and throughout Australia for a series of years, are shown below.

PERSONS (OF ALL AGES) RESIDING PERMANENTLY ON RURAL HOLDINGS STATES AND TERRITORIES, 31 MARCH 1965

—	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
Males	156,171	141,850	104,482	58,016	50,353	25,893	1,253	478	538,496
Females	135,439	125,139	86,215	51,361	41,917	23,297	661	387	464,416
Total	**291,610**	**266,989**	**190,697**	**109,377**	**92,270**	**49,190**	**1,914**	**865**	**1,002,912**

PERSONS (OF ALL AGES) RESIDING PERMANENTLY ON RURAL HOLDINGS AUSTRALIA, 31 MARCH 1961 TO 1965

—	31 March—				
	1961	1962	1963	1964	1965
Males	547,594	544,709	540,893	541,394	538,496
Females	467,539	465,238	464,048	465,990	464,416
Total	**1,015,133**	**1,009,947**	**1,004,941**	**1,007,384**	**1,002,912**

Technical aspects of rural industry

Farm machinery on rural holdings

The history of the development of large-scale field crops and sown pastures in Australia is essentially also the history of the mechanization of the rural industries. This may be divided into four phases.

The first phase extended from initial settlement to the mid-nineteenth century, when agriculture was primarily local and non-commercial, and confined by hand methods to small areas and low production per farm worker.

The invention of an effective wheat stripper in South Australia in 1843 and the extension of its use into Victoria and New South Wales, however, greatly increased the area which could be harvested in a season. This initiated the second phase, which continued with the development of stump-jump implements in the 1870's and the scrub roller and mullenizer in the 1890's. These later developments made possible an extension of the wheat belt into the drier mallee lands of Victoria and South Australia. By the turn of the century machinery had thus been developed to conduct all cropping operations on an extensive basis.

The third major change in farm machinery followed the 1914–18 War, when tractor power became increasingly available in a variety of models and sizes. The increase in numbers of tractors on rural holdings and higher operating speeds led in turn to new and improved types of farm machinery drawn by tractors. These trends were interrupted by the economic depression of the 1930's.

After the 1939–45 War there was a widespread expansion of labour-saving machinery and devices in all sectors of rural industry. Clearing methods were extended with the bulldozer, log, chain, and hi-ball units, and cultivation was improved by means of large disc ploughs and disc harrows, and seeding and harvesting machinery. These methods were extended to crops for which methods involving greater use of manual labour had previously been employed. Milking machines

almost entirely replaced hand milking on dairy farms, and labour-saving machinery was introduced into farm and station development and maintenance operations. These operations included fencing, bulk transport of grain and fodder, pasture treatment, fodder conservation, and pasture improvement.

The tables following show data for the principal types of farm machinery on rural holdings in the several States and Territories at 31 March 1965 and throughout Australia for a series of years. A more detailed analysis of tractors on rural holdings according to horse-power, type of fuel used, and age of tractor was published in the Statistical Bulletin *Tractors on Rural Holdings—Australia, 31 March* 1963, issued on 11 May 1965.

FARM MACHINERY ON RURAL HOLDINGS: STATES AND TERRITORIES 31 MARCH 1965

Machinery	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
Cultivating—									
Rotary hoes and rotary tillers—									
Self-contained power unit	14,269	7,508	3,479	4,199	1,579	1,270	68	n.a.	(a) 40,195
Tractor-drawn		4,249	n.a.	1,471	1,406	680	17		
Seeding and planting—									
Grain drills—									
Combine type	27,528	19,442	12,468	15,617	13,496	1,392	..	65	90,008
Other types	5,668	9,846	2,282	5,168	4,894	2,644	..	35	30,537
Maize and cotton planters	7,627	756	6,736	..	74	..	23	4	15,220
Fertilizer distributors and broadcasters	21,229	29,212	12,758	8,743	8,941	5,635	21	114	86,653
Harvesting—									
Grain and seed headers, strippers and harvesters	19,582	14,177	7,220	12,659	11,185	717	..	28	65,568
Mowers—									
Power-driven	21,653	29,824	9,494	7,980	7,382	4,940	54	83	81,410
Ground-drive	4,526	4,878	4,804	994	752	1,176	7	16	17,153
Hay rakes—									
Side delivery	11,897	15,215	3,587	5,033	4,683	2,336	25	56	42,832
Buck	2,106	4,574	2,939	901	368	1,017	3	9	11,917
Dump	3,593	3,944	6,002	986	961	1,060	3	15	16,564
Pick-up balers	9,404	11,405	2,112	4,258	3,432	1,596	19	49	32,275
Potato diggers	1,364	2,196	1,123	596	383	951	..	n.a.	(a) 6,613
Forage harvesters	1,943	1,305	961	675	530	239	9	12	5,674
Peanut pickers	5	..	310	..	..	..	n.a.	..	(a) 315
Corn pickers	238	104	904	..	..	..	..	..	1,246
Other—									
Shearing machines (number of stands)	70,747	41,112	19,359	28,844	21,517	4,493	16	305	186,393
Milking machines (number of units)	42,209	101,994	44,074	19,135	10,055	13,806	23	93	231,389
Tractors—									
Wheel	78,482	71,950	64,440	30,772	32,028	10,250	200	202	295,502
Crawler		2,574		3,392		1,129	78	5	
Hammer mills	6,290	4,949	7,027	1,765	1,639	440	..	18	22,128

(a) Incomplete.

FARM MACHINERY ON RURAL HOLDINGS: AUSTRALIA 31 MARCH 1961 TO 1965

Machinery	31 March—				
	1961	1962	1963	1964	1965
Cultivating(*a*)—					
Mouldboard ploughs	(*b*)	n.a.	n.a.	102,228	n.a.
Disc implements (including disc ploughs, disc cultivators, disc tillers and disc harrows)	(*b*)			229,818	
Tyne implements—					
Chisel ploughs, scarifiers, cultivators and rippers	(*b*)			175,928	
Tyne harrows (number of leaves)	n.a.			511,346	
Rotary hoes and rotary tillers	(*c*) 36,896	(*c*) 38,868	(*c*) 38,896	(*d*) 37,561	(*d*) 40,195
Seeding and planting—					
Grain drills—					
Combine type	82,277	84,743	116,116	117,271	90,008
Other types	28,776	29,191			30,537
Maize and cotton planters	(*e*) 15,567	(*e*) 16,050	(*e*) 15,509	(*e*) 14,635	15,220
Fertilizer distributors and broadcasters	80,654	82,820	83,499	84,320	86,653
Harvesting—					
Grain and seed headers, strippers and harvesters	63,158	64,891	65,628	64,697	65,568
Mowers(*a*)—					
Power-driven	n.a.	71,585	n.a.	n.a.	81,410
Ground drive		23,076			17,153
Hay rakes(*a*)—					
Side delivery	n.a.	35,777	n.a.	n.a.	42,832
Buck		12,347			11,917
Dump		20,267			16,564
Pick-up balers	25,264	26,647	28,725	30,411	32,275
Potato diggers(*a*)	n.a.	6,223	n.a.	n.a.	(*f*) 6,613
Forage harvesters		4,073	5,083	5,509	5,674
Peanut pickers(*a*)		255	n.a.	n.a.	(*g*) 315
Corn pickers(*a*)		1,264	n.a.	n.a.	1,246
Other—					
Shearing machines (number of stands)	172,697	177,579	178,805	180,370	186,393
Milking machines (number of units)	223,815	228,228	229,270	229,042	231,389
Tractors—					
Wheel	253,515	264,069	249,783	283,748	295,502
Crawler			21,277		
Hammer mills(*a*)	n.a.	17,508	n.a.	n.a.	22,128

(*a*) Details for all States are collected at triennial intervals only. (*b*) Particulars of ploughs only were collected in 1961 and details (excluding Northern Territory, which reported 154 ploughs of all types) are as follows: mouldboard ploughs, 103,403; disc ploughs (including disc cultivators), 173,205; ploughs of all other types (chisel, stubble, mulch, blade, etc.), 46,841. (*c*) Rotary hoes, all types. (*d*) Incomplete; excludes tractor-drawn rotary hoes and rotary tillers in Queensland. (*e*) Incomplete; particulars for Victoria not available. (*f*) Incomplete; particulars for the Australian Capital Territory not available. (*g*) Incomplete; particulars for the Northern Territory not available.

THE SOILS OF AUSTRALIA*

Nature and development of Australian soils

The soils of Australia constitute one of her greatest natural resources. Spread over a continent of nearly 3,000,000 square miles, of which approximately one-third lies within the tropics, they include soils developed on a wide range of rock types and under climatic conditions varying from the alpine zones of south-eastern Australia and Tasmania, through the Mediterranean zones of southern and south-western Australia and the wet and dry tropics of Queensland, to the very low rainfall areas of the centre.

* The following report on the soils of Australia was specially prepared for this issue of the Year Book by officers of the Soils Division of the Commonwealth Scientific and Industrial Research Organization. A soil map of Australia and illustrations are included on plates 47 to 51 between pages 896 and 897.

Australia provides two features which distinguish it from the continents of the Northern Hemisphere, where the scientific study of soil developed and where most investigations have been made. In the first place, the biological components of the environment in which Australian soils developed were widely different from those encountered elsewhere. The dominance of eucalypt and acacia species in the vegetation, the absence of modern herbivores from the native fauna, and the fact that the Aboriginal Australian did not cultivate the soil mean that, since British settlement commenced 177 years ago, the soils have been progressively exposed to biotic influences widely different from those under which they formed, and with which they were approximately in equilibrium. That the soils are changing or have changed under the impact of these new factors is often obvious, and the extent to which they are eroding shows that new equilibria have not yet been achieved.

In the second place, the great proportion of Europe and of North America were stripped of their former soils by the ice-sheets of the Pleistocene age, and soil formation started anew on fresh rock surfaces or on the deposits of fluvo-glacial transport about 10,000 years ago. By contrast, in Australia, apart from the very small areas that were glaciated in the south-east and Tasmania, or the much larger areas of Pleistocene and Recent alluvia, the soils have been formed on land surfaces that have been continually exposed to weathering, probably since the late Tertiary age. Ancient and deeply weathered profiles† are consequently a widely distributed feature of the Australian landscape. They dominate the soil pattern in many areas, and by virtue of the intense weathering to which they have been subjected they pose problems in plant nutrition that are not encountered in younger soils. The nature and distribution of the present day soils in many areas is consequently closely related to the geomorphology, which reflects the manner in which the land surface has been sculptured by erosion and deposition.

The result depends on whether the land surface maintains its ancient form, or whether it has subsequently been dissected. When little or no dissection is occurring, the soils of the old land surface remain, strongly leached and deeply weathered, and in the drier regions quite out of harmony with the present climate. In this category are the arid red earths of the centre, the soils of the Cobar peneplain in New South Wales and the broad divide north of Clermont in western Queensland.

Where dissection is occurring, the influence of the old land surface is most marked where weathering had produced a laterite. Laterite profiles have a massive or concretionary horizon‡ in which oxides of iron and aluminium are concentrated, overlying a kaolinized zone which is commonly bleached—the so-called pallid zone, which in turn overlies an horizon which is largely kaolinized, although still maintaining the form of the parent rock. If the old top soil is still present, it will be white or light-coloured sand or loam on acid rocks such as granite, or red, friable and granular clay on basic rocks such as basalt. Since the depth to unweathered rock commonly exceeds 70 feet and may reach 175 feet, the surface soil found at present depends largely on which horizon of the laterite has formed its base, and on the extent to which other horizons have contributed. As a result, a characteristic pattern of soils is associated with the lateritic residuals. Agricultural development of these soils has not been possible until comparatively recently because of extreme deficiencies of phosphorus, potassium and nitrogen, and widespread deficiencies of the minor elements copper, zinc, molybdenum, and manganese.

Agricultural development of Australian soils

In general, the productivity of Australian soils is largely determined by the moisture supply. On only about ten per cent of the continent is natural rainfall sufficient, or excessive, for plant growth for nine to twelve months of the year, and some of this falls or drains on to soils too steep and stony, or too elevated and cold. However, many swamps and fens and several areas of excessively wet podsolic and rendzina soils have been rendered highly productive by drainage and the use of appropriate fertilizers.

Where moisture is continuously or seasonally abundant, but not excessive, in the southern parts of the continent, productivity is governed largely by the almost universal need for phosphatic fertilizer. There is also a widespread need for sulphur, which has often been masked by the large content of gypsum present in the form of superphosphate that has been used. The need for potassium is increasing. In these regions the yields of crops and sown pastures are normally increased severalfold by the use of superphosphate, aided as necessary by trace elements. On several soils a large increase with the use of fertilizers is also obtained in plantations of *Pinus radiata* and other tree species.

Where similar moisture conditions occur in tropical and sub-tropical areas, as in coastal Queensland and northern New South Wales, the pattern of production is dominated by sugarcane, but sown pastures are increasing in importance. Here phosphatic, potassic and nitrogenous fertilizers are used, and yields are high. In areas of rather lower rainfall, cane production is assisted by irrigation.

† A section through the soil showing the different horizons (*see* ‡ below) or layers which extend downwards from the surface to the parent material.

‡ Plane of stratification assumed to have been once horizontal and continuous.

Where seasonal rainfall is of shorter duration and not so reliable, as in much of the wheat-growing area, the rhythm of agricultural production is synchronized with this. In general, yields of crops and the carrying capacity of the associated pastures in the rotation are dependent on the use of superphosphate, except in some areas of black earths in southern Queensland and northern New South Wales.

Because of low and unreliable rainfall, no arable agriculture or sown pasture production is possible over much the greater part of Australia. In these arid to semi-arid regions pastoral activities at low carrying capacity are all that can be expected. Production is so limited by low soil moisture that there would appear to be no economic place for fertilizers. The surface and underground water resources of the area are so low or so saline that little development of irrigation is possible.

Types of Australian soils

Stony and shallow soils

A large part of the Northern Territory and of the northern part of Western Australia, exceeding 400,000 square miles in area, is covered by rocky country almost devoid of soil. Such soil as occurs is usually shallow, leached and mildly acid, and of generally low fertility. It is probably incapable of development and provides only sparse grazing for cattle.

Soils of the alpine and perhumid zones

These soils include the high moor peats and alpine humus soils of the Australian Alps and Tasmanian highlands and the peaty podsols of the cold perhumid western region of Tasmania. The characteristics common to them are highly organic surface horizons, extreme acidity, and excessive moisture supply. No form of arable agriculture is undertaken, not only because of the above-mentioned properties, but also because of their unsuitable climate and rugged terrain. To a large extent the soils are mixed with much exposed rock and are themselves often excessively stony.

Of these soils the alpine humus soils are forested in part, and some timber is extracted. However, the commonest form of land use on all of them has been the seasonal grazing of sheep and cattle, stock being moved on to them in late spring and removed to lower and more hospitable areas in autumn. Because of their abundant rainfall and seasonal snow cover both the Australian Alps and the Tasmanian highlands have progressively become the scene of major engineering enterprises connected with water storage. The objectives are the development of electric power and the regulated supply of water for irrigation of lands outside the mountain regions themselves. These projects have brought a re-appraisal of the long-term value of seasonal grazing and its effects on the alpine vegetation. These arise from ancillary practices such as burning to stimulate new growth of greater palatability to stock. As a consequence there has been some erosion damage to the landscape. Engineering works themselves, such as roads and channels, have also brought problems of landscape stability in their train. Techniques to combat these are being developed. Meanwhile there is a trend towards the stricter control or elimination of the trans-humance, or seasonal moving, of stock in an effort to conserve the alpine areas for their most valuable long-term national use, the conservation and regulation of water.

Soils of the humid zones

Leached soils. Under this heading are grouped the acid soils of the moderately humid regions where, because of perennially or seasonally abundant moisture, sown pastures and arable agriculture are widespread. These soils also carry the bulk of the useful natural forests of Australia and include the majority of the areas devoted to plantations of exotic and indigenous species. The *acid swamp soils* with their more or less peaty surfaces, although restricted in area, are widely exploited with the aid of artificial drainage. Together with much smaller areas of neutral to alkaline fen peats, they are devoted mainly to sown pastures and vegetable production. They reach their highest level of productivity in the drained and irrigated swamps of the lower Murray Valley, where carrying capacity exceeds a milking cow to the acre.

Podsols, usually sandy, have a bleached subsoil overlying an organic and ferruginous pan. This pan may be so indurated that root penetration is difficult and temporary water-tables form above it. The most extensive areas of these soils are on the coastal plains of south-western Australia, southern Queensland, New South Wales, and the large sand islands of the southern Queensland coast. Their coarse texture and poverty in all nutrients has caused them to be neglected until recently. In Queensland, with heavy use of fertilizers, it is possible to develop good pastures. In southern Australia plantations of the exotic trees *Pinus radiata* and *Pinus pinaster* give responses to zinc, phosphorus and nitrogen.

The *podsolic soils*, formed on finer textured or less siliceous rocks, have a clay subsoil beneath sandy to loam surface soils. These soils are more widespread than the podsols, and are generally less acid. Practically universal responses to superphosphate, and very frequent responses to one or more of the trace elements, copper, zinc, molybdenum, and boron, have been obtained. The most extensive use of the podsolic soils has been for pastures based on subterranean clover, usually top-dressed annually with superphosphate. This form of land use has increased stock carrying capacity severalfold and built up soil fertility to the stage where increasing use is being made of arable crops, such as potatoes and cereals, to take advantage of the enhanced nitrogen status. After a protracted period of use, the podsolic soils exhibit an uneven incidence of potassium deficiency, but the correction of this is straightforward once it has been recognized. These soils are used for horticultural purposes, particularly for pome fruits, and for forest plantations, especially of *Pinus radiata*. In more northerly areas some sugar cane is grown on them.

Krasnozems, deep friable red clay soils, often strongly acid, are found mainly on the volcanic rocks which have a scattered distribution in the eastern States. The krasnozems were originally densely forested, but, with little proper exploitation of their timber resources, these soils were rapidly cleared and converted to intensive forms of agriculture ranging from perennial pastures and temperate fodder crops, vegetable and grain crops in southern areas, to sugar, maize, peanuts, and some sown pastures in tropical and sub-tropical localities. The initial fertility of the soils has declined rather rapidly, and they have a restricted response to superphosphate due to a high rate of reversion of phosphorus to less available forms. They respond widely to molybdenum, and, over increasing areas, to potassium. Despite their limitations, however, including a somewhat difficult fertilizer economy, these soils retain their position amongst the most productive in Australia.

Red earths and *yellow earths* are associated with old land surfaces, sometimes forming divides, sometimes prominent mesas and sometimes broad terraces. They have brown, grey or red brown surface horizons merging into red or yellow, massive, but porous, subsoils, mainly acid at the surface and normally becoming more acid with depth. They are of low inherent fertility, markedly deficient in phosphorus, nitrogen and trace elements, but responding well to good management. Where they are located favourably in relation to markets, a wide range of crops is grown on them, e.g. tropical fruit and vegetables near Brisbane, and sugar cane in coastal country.

The *chocolate soils* occur mainly on basalt on the tablelands of New South Wales. They are brown soils with a friable clay surface horizon overlying a tighter clay subsoil, with floaters of parent rock throughout. Only moderately acid on the surface and becoming neutral with depth, they present few problems, respond readily to fertilizers, and are intensively farmed for perennial pastures and such vegetable crops as potatoes and peas.

Soils on calcareous materials. Shallow, neutral to alkaline soils resting on limestones can be either red—terra rossas—or black—rendzinas. The terra rossas are variable in texture, but the rendzinas are generally well structured clay soils, some having seasonally rising and falling groundwater.

The only extensive occurrence of rendzinas is in the south-east of South Australia, where they occupy the wet calcareous floors of long swales between ridges of ancient stranded coastal dunes. These soils have been extensively drained and developed, and are now mostly devoted to pastures. They respond to superphosphate and, variably, to the trace elements copper, zinc and manganese.

Terra rossas, which are well drained shallow soils, are often so stony or intruded by so much outcropping limestone that their usefulness is frequently very limited. The largest aggregate area is on the better drained positions in association with rendzinas in the south-east of South Australia. They are most frequently used for pastures, either natural or sown, and, where deeper, for vines and stone fruits.

Soils of the seasonally humid zones

In these climatic zones the rainfall is sharply seasonal, with a winter incidence in the south and a summer incidence in the north. In the latter it is also erratic. The soils fall into five main groups, the red-brown earths, black earths (or chernozems), solodic soils, red and yellow earths, and lateritic podsolic soils.

The *red-brown earths* have developed commonly on slates, shales and granites and on areas of old alluvium that are now above the level of modern floods. They have brown to grey brown, loam to sandy-loam, surface soil overlying a reddish-brown clay subsoil. The surface soil is mildly acid, but the acidity diminishes with depth and concretions of calcium carbonate are present in the deeper layers. The organic matter is concentrated in the surface soil, and where this has been lost by erosion fertility falls. The soils are well supplied with potassium, calcium and magnesium, but are always deficient in phosphorus and nitrogen. They are widely used for cereal production in the winter rainfall regions of southern Australia, and in New South Wales and Victoria have been extensively irrigated for pasture and horticultural production.

The *black earths* or *chernozems* are black or dark brown in colour and clay in texture, with a good granular structure in the surface soil which becomes cloddy and massive in the deeper layers. They are usually slightly acid to neutral in the surface, becoming neutral to alkaline with depth, with an horizon of calcium carbonate concretions at varying levels from eight inches to three feet below the surface. These occur on either side of the Eastern Divide from central Queensland to Tasmania. Those in northern New South Wales and Queensland have areas where the surface soil is alkaline. All Australian soils in this group differ from their counterparts in Europe and north America in containing less organic matter, which falls with diminishing rainfall and increasing temperatures, and they are usually heavier in texture. On drying out these soils crack widely and deeply, and on wetting become very sticky. Prior to cultivation they show gilgai (*see* page 878) micro-relief. These are the most fertile arable soils in Australia, and are unique in the high levels of available phosphate they contain. They are also relatively rich in nitrogen, and, unlike the red-brown earths, the organic matter is distributed through the top two or three feet of soil. The addition of sulphur as fertilizer is sometimes necessary, and responses to zinc are obtained. Where they are formed on alluvium or on parent materials low in phosphorus they may also respond to phosphate. Rotations in the northern summer rainfall areas are more varied than in the south, and include wheat, sorghum and lucerne, linseed, safflower, millet, and maize. Many farmers grow wheat continuously for several years, using a short summer fallow to conserve the summer rainfall for the winter growing crop. Only a small part of these soils is irrigated, but this includes the high producing cotton growing areas irrigated from the Namoi River. Arable development of these soils was originally restricted because cultivation is only possible over a very narrow moisture range. and consequently only became an economic possibility with the use of tractors sufficiently powerful to complete the necessary cultivation in the limited time available.

The *euchrozems* of northern New South Wales and Queensland are formed on the deeply weathered lower horizons of ancient laterites formed on basalt. They have a friable dark brownish red clay loam at the surface, merging into blocky structured orange to orange-yellow clay, with decomposing basalt at depths of four feet or deeper. They differ from the chernozems mainly in containing more free ferric oxide, and they do not crack so widely. Agriculturally their properties are similar to the chernozems but they are generally lower in available phosphate, although they respond well to superphosphate.

The solodic and solodized-solonetz soils occur in all States and are particularly extensive in the sub-coastal regions of Queensland, where they form the bulk of the spear-grass country. They have commonly formed on old alluvial deposits and on a wide range of rocks. The soils have a grey sandy to loamy surface, moderately to strongly acid in reaction, sharply differentiated from a mottled yellow, brown, orange, and grey dense clay subsoil. The subsoil may exhibit a strong prismatic structure with well-marked flat topped columns at the junction with the surface soil. Usually in the lower horizons the acidity falls, and in some cases calcareous concretions are present. In their natural state these soils are very infertile, and are deficient in nitrogen and phosphorus as well as trace elements. Although commonly containing concretionary calcium carbonate in the deep subsoil, the calcium levels of the surface soil are often so low as to be deficient for such shallow rooting plants as the introduced pasture species. Deficiencies of potassium occur in many areas, and molybdenum deficiency is widespread. Their development, which has so far only been undertaken in limited areas, requires the rectification of these deficiencies and the introduction of a suitable legume.

The *lateritic podsolic soils* have light coloured sandy horizons over a concretionary ironstone horizon over mottled or white leached clay. They are mildly to strongly acid throughout and are strongly weathered and leached. They usually occur on ancient lateritic land surfaces. Extensive areas of these soils occur in north Australia, in south-western Western Australia and in South Australia. In the natural state they carry heath vegetation and low mallee. They are extremely deficient in phosphorus and nitrogen, as well as in trace elements. However, clearing costs are low, and in the winter rainfall areas of Western Australia very considerable areas of these soils are now being developed for improved pastures, with blue lupin or subterranean clover as the pioneer crop.

Soils of the semi-arid zones

The major soils of the semi-arid zones include the highly calcareous solonized brown soils restricted to southern Australia, the massive structured, variably calcareous and gypseous grey and brown soils of heavy texture, and the red earths of the old land surfaces.

The *solonized brown soils* lie largely in a zone of low rainfall, approximately 9 to 15 inches per annum of unreliable, winter incidence. They are deep sandy to shallow loamy soils overlying deep rubbly and powdery calcareous clay subsoils, and are neutral to alkaline at the surface, becoming more alkaline with depth. Their landscape is frequently characterized by a parallel east-west dune system. These soils make up a large part of the low yielding wheat lands of southern Australia. They are farmed on a wide rotation, comprising volunteer pasture-fallow-wheat, in which superphosphate is used solely with the wheat. Sheep graze the pastures. These

soils, especially the sands, are very susceptible to wind erosion, and much effort is now devoted to the stabilization of the once cleared and cultivated dunes. The common plant for reclamation is cereal rye. Where the solonized brown soils lie adjacent to the Murray River they are widely irrigated, especially for horticultural production, principally of grapes and citrus fruits. Under skilled management they are very productive, but are liable to rising groundwater and secondary salinity problems where drainage is inadequate.

The *grey and brown soils of heavy texture* are uniform clays, ranging from grey to brown and becoming mottled with depth. They are slightly acid, neutral or slightly alkaline at the surface, becoming moderately to strongly alkaline with depth. Gypsum is often present in the subsoils, and excessive salinity may occasionally be a problem. They occur on alluvial deposits of Pleistocene and Recent age as well as on contemporary alluvium, and on sedimentary rocks of varying ages, in a great arc from the south-east of South Australia through eastern Australia to the Barkly Tableland in the Northern Territory, with smaller outliers in the Kimberleys. In Queensland and northern New South Wales considerable areas carry a tall scrub of brigalow (*Acacia harpophylla*). Where this occurs on old alluvium more than half the soils show the unusual feature of having a neutral to alkaline surface soil overlying a strongly acid subsoil. They are generally of moderate fertility, but the phosphorus contents are very variable. On the wetter fringe, as in the Wimmera district of Victoria and the Namoi and Macquarie regions of New South Wales, these soils are used for wheat growing. In Queensland, with moisture conservation by bare fallowing, a wide range of summer and winter crops can be grown. Elsewhere they make up a high proportion of the better natural pasture lands used for cattle and sheep grazing. Where they occur in the irrigation areas of the Murrumbidgee and Murray rivers in New South Wales and Victoria their low infiltration rate poses some difficulties in the irrigation of pastures but makes them particularly suitable for rice. Most of the soils are gilgaied (*see* below) to some degree, and strongly so on the wetter fringes.

Red earths associated with old land surfaces are widely distributed throughout the semi-arid areas, and constitute a major component of the wool-producing lands of south-west Queensland and north-west New South Wales, as well as larger areas of the Northern Territory. They are usually covered with scrub and are practically unused for agriculture. They are generally devoted to sheep and cattle grazing.

Soils of the arid zones

The soils of the arid zones fall into three broad categories:

(*a*) those that are coarse-textured enough to be moved by wind action—the desert sandhills and desert sand plains;

(*b*) those that resist wind action—the arid red earths, the desert loams and the stony desert soils; and

(*c*) the calcareous desert soils of the Nullarbor Plain.

The *desert sandhill country* is covered by long parallel sand ridges separated by inter-dune corridors ranging from 25 feet to a half a mile wide. In general the whole surface from dune crest to swale is covered by deep sandy soils, mildly acid throughout, usually bright red brown. The desert sandplains have similar soils on a very gently undulating landscape. These areas carry spinifex and some shrubs and are mainly useless for grazing. At slightly higher rainfalls on the South Australian-New South Wales border the inter-dune corridors are covered with grey clay or loam of varying depth and covered with roughly octagonal cracks in their normal dry state. After the occasional rain storms these areas are briefly flooded. The dune corridors carry grass, but over considerable areas the flanks of the dunes carry a scrub of drought resistant shrubs with mulga (*Acacia aneura*) as the principal component.

The finer textured soils, the *arid red earths*, the *desert loams* and the *stony desert soils* differ in texture from each other and in the degree of profile development, but are all red-brown to brown in colour. They make up a large proportion of the country utilized for grazing. The vegetation includes grasses and edible shrubs such as mulga on the arid red earths and shrub steppe on the desert loams. The stony desert soils carry a layer of stones on their surface and are almost treeless.

The *calcareous desert soils* are shallow powdery calcareous soils, sedentary on limestone. They are covered by a shrub steppe and are particularly susceptible to wind and water erosion, especially where their vegetative cover has been reduced by overgrazing.

The gilgai phenomena

This feature, which is widely developed throughout the heavier soils, consists of small-scale undulations of the land, the alternate hummocks and hollows of which show some degree of regularity. They have been called variously 'gilgai', 'crab-hole', 'melon-hole', and 'Bay of Biscay country'. Considerable differences in magnitude and form of the undulations occur, and since the different names are not applied consistently to any one form, the term 'gilgai' is now used for

all manifestations. They all show a characteristic swelling pattern on wetting, the subsoil swelling more than the topsoil. Originally described in Australia, this phenomena has subsequently been recognized in many other countries where a suitable combination of soil and climate exists.

Soil improvement and conservation

Fertilizers

In the early days of settlement in Australia the principles of scientific cultivation were little understood. It was common for the land to be cropped continuously until the natural fertility was almost exhausted. More scientific methods have been adopted in recent decades, much of the improvement in this regard being due to the assistance and guidance offered to farmers by various State and Commonwealth departments and authorities.

Fertilizer is generally applied to pastures at the time of sowing, and periodical (usually annual) top-dressings are carried out afterwards to keep the pastures in good condition. The introduction of the modern seed-drill, acting also as a fertilizer distributor, has greatly facilitated the use of artificial manures, and much land formerly regarded as useless for cultivation has now been brought into production. With the rapid increase in the area of sown pastures, particularly since the 1939–45 War, large quantities of artificial fertilizers have been used. In addition, increasing areas of native pastures have been top-dressed. The use of aircraft for the distribution of fertilizers has increased greatly in recent years (*see* page 880) and, in particular, has enabled the fertilizing of some areas which would otherwise be inaccessible. In 1964–65 pastures (sown and native) accounted for over 60 per cent of both the total area fertilized and the total quantity of fertilizer used.

The Australian output of prepared fertilizers is derived chiefly from imported rock phosphate. Complete information regarding local production of fertilizers is not available. The number of firms engaged in the manufacture of chemical fertilizers in Australia for the year 1964–65 was 48 made up as follows: New South Wales, 12; Victoria, 6; Queensland, 5; South Australia, 9; Western Australia, 8; and Tasmania, 8. The production of superphosphate in Australia during 1964–65 amounted to 3,702,960 tons.

Information regarding the area treated with artificial fertilizers and the quantity of artificial fertilizers (superphosphate, bonedust, nitrates, etc.) used in each State during the 1964–65 season is given in the following table.

AREA FERTILIZED AND QUANTITY OF ARTIFICIAL FERTILIZERS USED STATES AND TERRITORIES, 1964–65

State or Territory	Crops			Pastures			Total		
	Area fertilized	Superphosphate used	Other artificial fertilizers used	Area fertilized	Superphosphate used	Other artificial fertilizers used	Area fertilized	Superphosphate used	Other artificial fertilizers used
	'000 acres	tons	tons	'000 acres	tons	tons	'000 acres	tons	tons
New South Wales	5,222	194,326	41,039	10,967	595,068	7,526	16,189	789,394	48,565
Victoria	4,703	200,843	46,658	11,496	695,876	44,729	16,199	896,719	91,387
Queensland	821	21,166	168,273	88	7,497	1,760	909	28,663	170,033
South Australia	4,775	241,817	12,452	4,714	272,954	1,604	9,489	514,771	14,056
Western Australia	7,271	357,513	27,831	8,888	453,205	5,906	16,159	810,718	33,737
Tasmania	218	21,184	9,708	1,380	106,287	5,481	1,598	127,471	15,189
Northern Territory	2	92	71	3	100	44	5	192	115
Australian Capital Territory	5	280	87	91	4,836	22	96	5,116	109
Australia	23,017	1,037,221	306,119	37,627	2,135,823	67,072	60,644	3,173,044	373,191

Particulars of the quantity of artificial fertilizers used in each State and Territory during each of the seasons 1960–61 to 1964–65 are shown in the next table. These details include the quantity used for the top-dressing of pasture lands.

QUANTITY OF ARTIFICIAL FERTILIZERS USED: STATES AND TERRITORIES 1960-61 TO 1964-65

(Tons)

Year	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
1960–61	497,492	745,522	108,220	399,091	621,435	107,027	209	3,798	2,482,794
1961–62	512,201	777,429	126,301	404,233	649,323	112,785	216	4,492	2,586,980
1962–63	576,561	822,488	135,896	430,561	713,067	124,523	226	4,501	2,807,823
1963–64	683,968	880,941	183,326	465,583	720,943	141,507	305	5,213	3,081,786
1964–65	837,959	988,106	198,696	528,827	844,455	142,660	307	5,225	3,546,235

The chief sources of Australia's supplies of rock phosphate are Nauru, Christmas Island (Indian Ocean) and the Gilbert and Ellice Islands. Sodium nitrate is obtained chiefly from Chile.

The imports of artificial fertilizers during the five years ended 1964–65 are shown in the following table.

ARTIFICIAL FERTILIZERS: IMPORTS INTO AUSTRALIA, 1960-61 TO 1964-65

Fertilizer	1960–61	1961–62	1962–63	1963–64	1964–65
	QUANTITY (Tons)				
Ammonium fertilizers	110	18,636	37,458	117,592	71,406
Potassium fertilizers	52,212	74,789	58,327	96,724	109,024
Rock phosphate	1,647,928	1,950,834	1,694,916	1,989,413	2,517,318
Sodium nitrate	5,670	7,709	7,193	9,673	11,038
Other	26,361	37,888	35,001	25,888	44,127
	VALUE ($A'000 f.o.b.)				
Ammonium fertilizers	5	762	1,244	3,547	2,848
Potassium fertilizers	1,512	2,555	1,847	2,856	3,441
Rock phosphate	8,631	9,949	9,875	12,487	17,978
Sodium nitrate	267	310	336	478	443
Other	1,492	2,096	1,842	1,479	2,816
Total	**11,907**	**15,672**	**15,144**	**20,847**	**27,526**

Exports of fertilizers (practically all of which were manufactured locally) amounted to 2,040 tons valued at $176,682 in 1964–65 compared with 4,794 tons valued at $269,190 in 1963–64.

Aerial agriculture

During recent years increasing use has been made of aircraft for top-dressing and seeding, for spraying and dusting of crops and pastures, and for pest and vermin extermination.

For 1956–57 (the first year for which data are available) the total area treated was 1,466,000 acres; in 1964–65 the total was 16,640,000 acres, more than eleven times as great. The following table shows details of area treated and materials used for each State for the five years ended 31 March 1965.

AERIAL AGRICULTURE: OPERATIONS, STATES 1960-61 TO 1964-65

—	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	Aust.
1960-61 . . . acres	4,134,327	806,592	413,498	222,877	581,871	80,359	6,239,524
1961-62 . . . ,,	4,687,232	972,269	231,220	279,541	908,508	84,000	7,162,770
1962-63 . . . ,,	5,480,999	923,776	539,714	470,476	1,262,346	86,150	8,763,461
1963-64 . . . ,,	8,083,748	1,512,819	497,518	1,181,349	1,424,479	87,786	12,787,699
1964-65—							
Top-dressing and seeding—							
Area treated with—							
Superphosphate alone ,,	9,223,062	1,245,050	135,620	1,140,575	590,191	206,405	12,540,903
Seed alone . . ,,	554,969	49,509	425,165	40,577	1,300	8,150	1,079,670
Superphosphate and seed together . . ,,	126,925	133,400	2,290	..	92,151	..	354,766
Gypsum . . . ,,	313,811	..	..	..	..	..	313,811
Other . . . ,,	102,172	3,850	1,446	..	36,311	..	143,779
Total area treated, top-dressing, etc.(a) ,,	*10,046,578*	*1,429,159*	*563,581*	*1,181,152*	*711,498*	*214,555*	*14,146,523*
Materials used—							
Superphosphate . tons	446,362	92,213	7,502	54,454	38,506	17,057	656,094
Seed on—							
Pasture . . lb.	1,710,812	162,140	628,643	575,103	172,169	39,950	3,288,817
Other . . . ,,	..	..	230	172,900	5,000	..	178,130
Spraying and dusting—							
Area treated—							
Pasture . . . acres	28,604	56,179	1,543	80,064	10,499	364	177,253
Crops . . . ,,	651,929	328,823	223,509	94,525	917,565	310	2,216,661
Other . . . ,,	..	1,100	13,512	7,140	150	25	21,927
Total area treated, spraying, etc. . ,,	*680,533*	*386,102*	*238,564*	*181,729*	*928,214*	*699*	*2,415,841*
Grand total, area treated(a) . . ,,	10,771,791 (b)	1,896,461 (c)	760,505	1,362,881	1,633,312	215,254	16,640,204 (d)

(a) Where an area has been treated with a mixture of materials or more than one material, the area treated is included in the line relating to each of the various materials but is counted in the total once only. (b) Includes 62,380 acres baited for rabbit destruction, etc. (c) Includes 81,200 acres baited for rabbit destruction, etc. (d) Includes 143,580 acres baited for rabbit destruction, etc.

NOTE. The information contained in this table was collected by the Department of Civil Aviation.

Pasture improvement

An article on pasture improvement, which includes notes on indigenous and introduced species of grasses and which traces the development of pasture research in Australia, appears on pages 1001–2 of Year Book No. 49.

Soil conservation

Year Book No. 49 contains an article (pages 1003–4) on soil conservation which deals with the following matters: land use and soil erosion, agents of erosion, prevention and control, and the activities of various Commonwealth and State authorities which promote and co-ordinate research into the problems of soil erosion and the initiation of preventive measures.

AGRICULTURAL PRODUCTION

In general, statistics in this chapter relating to agricultural production are derived from 'census' returns supplied by approximately 250,000 farmers who utilize one acre or more of land for agricultural or pastoral purposes. The latest figures available are those for the year 1964–65. The returns are collected on a substantially uniform basis in all States at 31 March each year, and relate mainly to crops sown in the previous twelve months. Where harvests are not completed by March (e.g. potatoes), provision is made in some States for a special collection after the harvest is completed and in others for the inclusion of the total estimated yield expected from the complete harvest. In cases where additional data are available from marketing authorities or other sources these are used in conjunction with the 'census' returns. The statistics published in this chapter are therefore shown in 'agricultural' years. For most purposes there will be little error involved in considering them as applying to years ended 30 June.

For more detailed information on period covered and details of the weights and measures used in recording production of agricultural commodities *see* introductory notes to the bulletin *Rural Industries*.

Progress, assistance and control

Early development

The coastal districts of southern Australia are characterized to a large degree by leached soils of low fertility, with limited areas suitable for intensive crop cultivation. This, combined with an unfamiliar climate and problems associated with the clearance of scrub-land, severely checked early attempts to establish crops. A brief reference to these attempts at cultivation by the first settlers in New South Wales and to the discovery of suitable agricultural land on the Parramatta and Hawkesbury Rivers prior to the year 1813 and west of the Blue Mountains thereafter is contained in early issues of the Year Book. (*See* No. 22, page 670.)

In an *Account of Live Stock and Ground under Crop in New South Wales, 19th August*, 1797 Governor Hunter gives the acreage of crops as follows: wheat, 3,361 acres; maize, 1,527 acres; barley, 26 acres; potatoes, 11 acres; and vines, 8 acres. The following details of crops were collected in 1808: wheat, 6,874 acres; maize, 3,389 acres; barley, 544 acres; oats, 92 acres; peas and beans, 100 acres; potatoes, 301 acres; turnips, 13 acres; orchards, 546 acres; and flax and hemp, 37 acres.

By the year 1850 the area of crops had increased to 491,000 acres, of which 198,000 acres were cultivated in what is now the State of New South Wales and 169,000 acres in Tasmania. At the end of 1850 the area under cultivation in Victoria, which was then the Port Phillip District of New South Wales, was 52,190 acres. The bulk of the arable land in this part of the colony was devoted to the extensive grazing of sheep.

The gold discoveries of 1851 (at Bathurst in New South Wales and later at Ballarat and Bendigo in Victoria) had at first a very disturbing effect on agricultural progress. The area of crops declined from 491,000 acres in 1850 to 458,000 acres in 1854, as landowners and rural labourers joined in the various gold rushes. The demand for agricultural products occasioned by the large influx of population was, however, soon reflected in the increased area cultivated, for at the end of 1858 the land under crop in Australia exceeded a million acres. There was still a shortage of rural labour, and the increased acreage was due largely to the increasing mechanization of crop operations.

Progress of cultivation

The following table shows the area of crops in each of the States and Territories of Australia at ten-yearly intervals since 1860–61 and during each of the ten seasons 1955–56 to 1964–65. Plate 52 in this chapter shows the area of crops in Australia from 1900–01 onward.

AREA OF CROPS: STATES AND TERRITORIES, 1860-61 TO 1964-65

('000 acres)

Year	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
1860–61	246	387	4	359	25	153	..	..	1,174
1870–71	385	693	52	802	55	157	..	..	2,144
1880–81	606	1,549	114	2,087	64	141	..	..	4,561
1890–91	853	2,032	225	2,093	70	157	..	..	5,430
1900–01	2,447	3,114	458	2,370	201	224	..	..	8,814
1910–11	3,386	3,952	667	2,747	855	287	..	..	11,894
1920–21	4,465	4,490	780	3,231	1,805	297	..	2	15,070
1930–31	6,811	6,716	1,144	5,426	4,792	268	2	5	25,164
1940–41	6,375	4,467	1,734	4,255	4,027	254	..	6	21,118
1950–51	4,761	4,537	2,077	3,812	4,650	290	n.a.	6	20,133
1955–56	5,660	4,812	2,604	4,220	5,342	327	1	7	22,973
1956–57	3,789	3,904	2,469	4,273	5,233	288	1	5	19,962
1957–58	5,000	4,431	2,600	4,233	5,615	292	1	5	22,177
1958–59	6,820	5,040	2,852	4,436	6,135	339	1	8	25,631
1959–60	7,137	4,817	2,926	4,400	6,495	322	1	7	26,105
1960–61	8,044	5,838	3,057	5,399	6,871	357	2	8	29,576
1961–62	8,288	5,626	3,216	5,024	7,112	364	2	7	29,639
1962–63	8,903	6,318	3,490	5,495	7,482	395	2	7	32,092
1963–64	8,997	6,102	3,665	5,975	6,915	380	3	8	32,045
1964–65	10,334	6,477	3,967	5,965	7,505	404	4	9	34,665

The progress of agriculture was practically uninterrupted from 1860–61 to 1915–16, when, as the result of a special effort to increase wheat production during the 1914–18 War, 18.5 million acres were cultivated in Australia. There was a temporary setback in later war years, but after the end of the war the area continued to expand and increased steadily to the record area of 25.2 million acres in 1930–31. In the following years the slump in wheat prices seriously depressed incomes in the agricultural industry, and the area of crops decreased to just under 20 million acres in 1935–36.

By 1938–39 the industry was recovering from the depression, and the total area under cultivation reached the high level of 23.5 million acres. Thereafter, as a result of war-time manpower shortages and shipping difficulties, the area declined to less than 16 million acres in 1943–44. After that year production gradually increased again until, in 1947–48, 22.5 million acres were sown to crops. This upward trend was reversed after 1948–49, largely because many primary producers transferred from wheat to wool production as a result of the high prices of wool. After 1951–52, however, when the area sown was 20.0 million acres, the area under crops increased steadily except for 1956–57, when excessively wet conditions caused reductions in the area sown to wheat. Subsequent to that year the area of all crops has shown an upward trend (except for a slight decrease in 1963–64), and in 1964–65 a record level of 34.7 million acres was reached. As the area under wheat in Australia constitutes a large proportion of the total area cropped (51 per cent during the five years ended 1964–65), fluctuations in the former have been largely responsible for year to year variation in total crop area.

The Australian Agricultural Council

The influence of governmental and semi-governmental authorities on Australian rural industry is most apparent in the fields of guaranteed prices, subsidies and controlled marketing. Many of these aspects of intervention at the national level take place indirectly through the Australian Agricultural Council. This is a permanent organization which was formed following a conference of Commonwealth and State Ministers on agricultural and marketing matters, held at Canberra in December 1934. The Council consists of the Commonwealth Ministers for Primary Industry and Territories and the State Ministers of Agriculture, with power to co-opt the services of other Commonwealth and State Ministers as required. The principal functions of the Council are: the promotion of the welfare and development of agricultural industries generally; the exchange of information on agricultural production and marketing; the improvement of the quality of agricultural products and the maintenance of high grade standards; to ensure, as far as possible, balance between production and available markets; and organized marketing.

In addition, a permanent Standing Committee on Agriculture was formed to advise the Council, to secure co-operation and co-ordination in agricultural research, to advise State and Commonwealth Governments on the initiation and development of agricultural research, and to secure co-operation between all Governments in respect of quarantine measures against pests and diseases of plants and animals.

The Standing Committee on Agriculture comprises the permanent heads of the State Departments of Agriculture, the Secretary, Department of Primary Industry, and a representative each from the Commonwealth Departments of the Treasury, Health, Trade and Industry, and Territories, and from the Commonwealth Scientific and Industrial Research Organization.

Bounties paid to producers

Direct financial assistance to primary producers by the Commonwealth Government takes the form of bounties, subsidies and other financial assistance. One of the most important is the Cotton Bounty. The *Cotton Bounty Act* 1951–1958 providing for payment of a bounty on seed cotton of a grade higher than 'strict good ordinary' expired on 31 December 1963. Under the *Raw Cotton Bounty Act* 1963 which came into effect from 1 January 1964 to operate for a period of five years, the Commonwealth will pay a bounty on raw cotton produced and sold for use in Australia. The level of bounty is 13.437 cents per lb. for Middling 1-in. White raw cotton with premiums and discounts for grades and staple lengths above and below Middling 1-in. White. There is a ceiling on bounty payments of $4,000,000 in any one year.

Other financial assistance

Other forms of assistance to producers include payments for cattle tick control, the Commonwealth Dairy Industry Extension Grant, Commonwealth Extension Services Grant, flood, drought and bush fire relief, fisheries research, and farm mechanization research.

Over recent years legislative research schemes, financed by matching contributions from the Commonwealth and industry and/or States, have been initiated in regard to wheat, wool, tobacco, dairy produce, beef cattle, and wine. Non-legislative schemes, on a similar financial basis, have

been operative in relation to brown rot, Australian plague locusts, tractor testing, apple and pear spray residue research, aerial seeding research, barley research, banana research, and fruit fly research. For further information on these matters, *see* pages 763–71, 773–4 and 781–2.

Agricultural training and research

Agricultural colleges have been established in all States except Tasmania. The primary function of these colleges is the training of students in the various phases of agriculture and livestock husbandry. Students are required to undertake a considerable amount of practical work in addition to lectures and theory. A secondary function of the colleges is agricultural re-research and experimentation. To a lesser degree, they carry out extension work in the form of public field days. Upon graduation, students receive diplomas in agriculture, dairying, etc., according to the course undertaken.

Experimental farms have been set up by State Departments of Agriculture in all States. They are concerned primarily with agricultural research and experimentation, each farm concentrating on problems specific to the region in which it is located. The results of the work undertaken are passed on to farmers at field days which are held at regular intervals, through publication in various agricultural or scientific journals, and through the agricultural extension services of the State Departments of Agriculture.

The Commonwealth Scientific and Industrial Research Organization has field stations in many parts of Australia, and sometimes undertakes research jointly with the appropriate State authorities. It also has regional laboratories in several States, conducting research into agronomic and livestock problems as they occur in each particular region (*see also* the chapter Education, Cultural Activities and Research). The State Departments of Agriculture study problems of particular significance within their own boundaries. In addition, the universities carry out valuable work in their laboratories and on their experimental farms.

Distribution, production and value of crops

Distribution of crops

The wide range of climatic and soil conditions over the agricultural regions of Australia has resulted in a diversity of crops being grown throughout the Commonwealth. Generally, cereal crops (excluding rice and sorghum) are grown in all States over wide areas, while industrial crops are confined to specific locations in a few States. The following was the distribution in the 1964–65 season.

AREA OF CROPS: STATES AND TERRITORIES, 1964-65

(Acres)

Crop	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
Cereals for grain—									
Barley—									
2-row	148,239	177,242	202,926	1,053,068	57,982	15,130	..	..	1,654,587
6-row	90,744	9,695	22,366	41,672	244,651	349	..	..	409,477
Maize—Hybrid	(a) 36,655	2,148	(a)137,688	..	(b)	..	..	..	(c)176,491
Other	(a) 5,005	205	(a) 30,612	..	10	..	..	..	35,832
Oats	850,147	966,280	55,464	443,794	1,151,969	28,086	..	1,487	3,497,227
Panicum, millet and setaria	1,031	1,762	50,991	..	..	..	..	..	53,784
Rice	61,617	..	..	..	(d)	..	(e)	..	(c) 61,617
Rye	4,188	13,581	318	43,852	9,754	85	..	..	71,778
Sorghum	(a) 51,699	..	(a)292,769	..	..	..	1,269	..	345,737
Wheat	5,760,090	3,236,039	1,025,521	2,726,826	5,151,267	16,805	..	2,094	17,918,642
Hay	599,821	1,306,366	82,419	314,318	304,610	180,256	1,280	3,469	2,792,539
Green fodder	2,397,497	454,267	1,111,197	1,135,288	446,032	67,431	649	1,166	5,613,527
Other stock fodder	5,359	20,355	3,717	35,326	2,788	30,180	n.a.	..	(c) 97,725
Grass seed—									
Lucerne	10,327	(f)	610	28,612	..	..	444	..	(c) 39,993
Clover	28,116	15,237	20	8,645	62,732	2,400	..	..	117,150
Other	13,617	40,365	11,918	14,578	13,269	(g) 6,613	286	404	(c)101,050
Industrial crops—									
Broom millet	1,945	228	302	..	10	..	..	..	2,485
Canary seed	..	(d)	11,435	(d)	..	..	..	..	(c) 11,435
Cotton	(a) 18,897	(d)	(a) 13,550	..	(a) 5,475	..	..	..	(c) 37,922
Flax—									
For fibre	..	..	..	..	729	..	..	..	729
For linseed	23,769	9,953	97,092	898	2,135	..	..	..	133,847
Hops	..	633	..	..	(d)	(h) 1,573	..	..	(c) 2,206
Peanuts	400	..	45,554	..	..	..	(d)	..	(c) 45,954
Sugar cane—									
For crushing	19,429	..	450,956	..	..	..	..	..	470,385
Stand-over and cut for plants	17,771	..	139,802	..	..	..	..	..	157,573
Safflower	2,253	1,902	43,350	(d)	4	..	..	..	(c) 47,509
Sunflower	89	(d)	7,666	..	..	..	..	..	(c) 7,755
Tobacco	2,546	9,720	14,042	..	..	..	..	..	26,308
Other	..	821	254	..	..	334	..	..	1,409
Vegetables for human consumption—									
Onions	803	3,825	3,422	1,146	428	83	(i)	(i)	(c) 9,707
Potatoes	20,530	32,931	14,005	5,247	5,797	9,393	(i)	16	(c) 87,919
Other	41,094	45,861	42,180	9,204	7,872	21,482	150	109	167,952
Vineyards—									
Bearing	17,220	44,203	2,902	53,386	7,577	..	..	..	125,288
Not bearing	3,244	3,793	397	5,471	733	..	..	..	13,638
Fruit—									
Bearing	77,303	56,254	31,977	29,293	19,504	19,398	67	48	233,844
Not bearing	19,918	19,255	13,941	13,719	6,921	2,977	63	8	76,802
Nurseries and cut flowers	1,121	2,532	494	248	280	88	..	11	4,774
All other crops	1,961	1,606	4,988	147	2,029	1,725	28	3	12,487
Total area	**10,334,445**	**6,477,059**	**3,966,845**	**5,964,738**	**7,504,558**	**404,388**	**4,236**	**8,815**	**34,665,084**

(a) Sown 1963–64. (b) Included in Other maize. (c) Incomplete: *see* individual States. (d) Not available for publication. Included in All other crops. (e) Not available for publication. Excluded from totals. (f) Not available separately. Included in All other crops. (g) Excludes area sown simultaneously to oats. (h) Includes 98 acres not bearing. (i) Not available for publication. Included in Other vegetables.

The proportion of each of the major crops cultivated in the various States and Territories to the total area of crops for the season 1964–65 is shown in the next table.

RELATIVE AREAS OF CROPS: STATES AND TERRITORIES, 1964-65

(Per cent)

Crop	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
Wheat (grain)	55.7	50 0	25.9	45.7	68.6	4.2	..	23.8	51.7
Green fodder	23 2	7 0	28.0	19.0	5.9	16.7	15.3	13.2	16.2
Oats (grain)	8 2	14 9	1.4	7.4	15.4	6.9	..	16.9	10.1
Hay	5.8	20.2	2.1	5.3	4.1	44.6	30.2	39.4	8.1
Barley (grain)	2.3	2.9	5.7	18.4	4.0	3.8	..	..	6.0
Sugar cane for crushing	0 2	..	11.4	..	..	..	..	..	1.4
Sorghum	0 5	..	7.4	..	..	..	30.0	..	1.0
Fruit	0 9	1.2	1.2	0.7	0.4	5.5	3.1	0.6	0.9
Maize (grain)	0 4	..	4.2	..	..	..	..	..	0.6
Vineyards	0 2	0.7	0.1	1.0	0.1	..	..	..	0.4
Potatoes	0.2	0.5	0 4	0.1	0.1	2.3	(*a*)	0.2	(*b*) 0.3
All other	2.4	2.6	12.2	2.4	1.4	16.0	21.4	5.9	3.3
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

(*a*) Not available for publication. Included in All other. (*b*) Incomplete.

The area of crops during each of the five seasons ended 1964–65 is shown hereunder.

AREA OF CROPS: AUSTRALIA, 1960-61 TO 1964-65

('000 acres)

Crop	1960–61	1961–62	1962–63	1963–64	1964–65
Cereals for grain—					
Barley—					
2-row	2,830	2,383	1,553	1,621	1,655
6-row			474	392	409
Maize—					
Hybrid	185	211	161	172	176
Other			48	43	36
Oats	3,637	3,097	3,292	3,392	3,497
Rice	46	50	55	59	62
Sorghum	255	363	391	366	346
Wheat	13,439	14,723	16,469	16,474	17,919
Hay	2,973	2,274	2,720	2,602	2,793
Green fodder	4,408	4,702	4,952	4,877	5,614
Grass seed	150	138	162	219	258
Industrial crops—					
Cotton	37	29	38	41	38
Flax for linseed	96	62	97	118	134
Hops	2	2	2	2	2
Peanuts	43	34	36	45	46
Sugar cane	475	499	506	539	628
Safflower	5	9	6	19	48
Tobacco	29	27	29	29	26
Vegetables for human consumption—					
Onions	9	9	11	9	10
Potatoes	92	94	114	102	88
Other	155	163	163	166	168
Vineyards	131	133	134	136	139
Fruit	289	294	305	310	311
All other crops	290	343	374	312	262
Total	**29,576**	**29,639**	**32,092**	**32,045**	**34,665**

Production of crops

The following table shows production of crops in the various States and Territories for the season 1964–65.

PRODUCTION OF CROPS: STATES AND TERRITORIES, 1964–65

Crop	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
Cereals for grain—									
Barley—									
2-row '000 bus.	4,040	4,141	6,440	26,021	614	519	..	..	41,775
6-row „	2,667	194	671	911	3,087	10	..	..	7,540
Maize—									
Hybrid „	(a)1,699	108	(a)4,089	..	..	..	..	..	5,896
Other „	(a) 179	6	(a) 798	..	..	..	..	..	983
Oats „	22,885	22,446	1,171	8,977	14,011	521	..	32	70,043
Panicum, millet and setaria „	10	30	847	..	..	..	..	..	887
Rice „	8,030	..	..	..	(b)	..	(b)	..	(c) 8,030
Rye „	73	109	4	261	65	2	..	..	514
Sorghum „	(a)1,270	..	(a)5,883	..	..	..	11	..	7,164
Wheat „	151,483	78,166	22,830	52,817	63,071	364	..	58	368,789
Hay '000 tons	1,040	2,506	167	487	390	365	1	7	4,963
Grass seed—									
Lucerne cwt.	9,874	n.a.	378	31,331	..	..	1,194	..	(c) 42,777
Clover „	56,084	28,598	1	21,045	122,077	1,789	..	..	229,594
Other „	9,103	70,050	6,196	18,718	17,260	18,144	41	36	139,548
Industrial crops—									
Broom millet—									
Fibre cwt.	9,634	975	1,047	..	60	..	..	..	11,716
Grain bushels	11,766	735	n.a.	..	..	..	..	..	(c) 12,501
Canary seed '000 bus.	..	(b)	140	(b)	..	..	..	..	(c) 140
Cotton, unginned '000 lb.	a 45,951	(b)	(a)6,268	..	a 10,790	..	..	..	(c) 63,009
Flax—									
Fibre tons	..	..	..	..	1,388	..	..	..	1,388
Linseed „	8,761	2,671	34,175	426	567	..	..	..	46,600
Hops (dry weight) cwt.	..	9,253	..	..	(b)	18,640	..	..	(c) 27,893
Peanuts „	4,746	..	202,369	..	..	..	(b)	..	(c) 207,115
Sugar cane for crushing '000 tons	784	..	14,286	..	..	..	..	..	15,070
Safflower bushels	33,373	20,218	643,524	(b)	280	..	..	..	(c)697,395
Sunflower cwt.	194	(b)	39,065	..	..	..	..	..	(c) 39,259
Tobacco, dried leaf '000 lb.	2,356	12,080	10,675	..	..	..	..	..	25,111
Vegetables for human consumption—									
Onions tons	6,378	22,963	22,853	11,061	5,981	465	(b)	(b)	(c) 69,701
Potatoes „	75,659	183,665	82,389	48,400	60,739	57,062	(b)	105	(c)508,019
Vineyards—									
Grapes—									
For drying „	53,144	292,060	..	85,476	9,756	..	..	..	440,436
„ table „	8,251	9,495	3,825	1,167	2,256	..	..	..	24,994
„ wine „	40,833	20,180	191	158,340	5,335	..	..	..	224,879

(a) Harvested from crop sown in 1963–64. (b) Not available for publication. (c) Incomplete; *see* individual States.

The following tables show the production and yield per acre of the principal crops for the five years ended 1964–65.

PRODUCTION OF PRINCIPAL CROPS: AUSTRALIA, 1960–61 TO 1964–65

Crop		1960–61	1961–62	1962–63	1963–64	1964–65
Cereals for grain—						
Barley—						
2-row	'000 bus.	67,970	41,504	31,370	36,464	41,775
6-row	,,			8,209	6,931	7,540
Maize—Hybrid	,,	6,245	7,307	6,064	5,592	5,896
Other	,,			1,393	1,130	983
Oats	,,	76,107	55,130	68,809	68,234	70,043
Rice	,,	6,001	7,045	7,129	7,455	8,030
Sorghum	,,	5,996	9,361	10,252	7,889	7,164
Wheat	,,	273,716	247,178	306,912	327,912	368,789
Hay	'000 tons	5,079	3,693	4,717	4,269	4,963
Grass seed	cwt.	197,120	187,810	232,669	333,286	411,919
Industrial crops—						
Cotton, unginned	'000 lb.	15,544	10,948	15,762	18,223	63,009
Flax for linseed	tons	13,565	12,589	25,717	29,516	46,600
Hops (dry weight)	cwt.	33,099	32,936	33,629	19,858	27,893
Peanuts	,,	457,008	299,613	319,402	460,726	207,115
Sugar cane for crushing	'000 tons	9,166	9,577	12,736	12,118	15,070
Safflower	'000 bus.	58	86	90	303	697
Tobacco (dried leaf)	'000 lb.	29,862	22,578	27,148	34,342	25,111
Vegetables for human consumption—						
Onions	'000 tons	54	58	68	59	70
Potatoes	,,	451	526	667	562	508
Vineyards—						
Grapes	,,	527	628	471	655	690
Wine made(*a*)	'000 gals.	33,762	41,736	29,893	37,536	38,610
Dried vine fruits	'000 tons	82	96	71	104	108

(*a*) Net factory and farm production of beverage and distillation wine. This excludes the liquid gallonage of spirits added in wine fortifying.

YIELD PER ACRE OF PRINCIPAL CROPS: AUSTRALIA 1960–61 TO 1964–65

Crop		1960–61	1961–62	1962–63	1963–64	1964–65
Cereals for grain—						
Barley—						
2-row	bushels	24.0	17.4	20.2	22.5	25.2
6-row	,,			17.3	17.7	18.4
Maize—Hybrid	,,	33.8	34.7	37.7	32 6	33.4
Other	,,			28.7	26.2	27.4
Oats	,,	20.9	17.8	20.9	20.1	20.0
Rice	,,	130.1	140.4	129.8	125.5	130.3
Sorghum	,,	23.5	25.8	26.2	21.6	20.7
Wheat	,,	20.4	16.8	18.6	19.9	20.6
Hay	tons	1.71	1.62	1.73	1.64	1.78
Industrial crops—						
Cotton, unginned	lb.	420	380	418	445	1,662
Flax for linseed	tons	0.14	0.20	0.26	0.25	0.35
Hops (dry weight)(*a*)	cwt.	17.8	17.1	16.8	9.7	13.2
Peanuts	,,	10.68	8.81	8.89	10.25	4.51
Sugar cane for crushing(*a*)	tons	26.9	24.8	31.7	29.0	32.0
Safflower	bushels	10.7	9.6	15.8	15.6	14.7
Tobacco (dried leaf)	lb.	1,022	848	924	1,183	954
Vegetables for human consumption—						
Onions	tons	5.87	6.20	6.34	6.43	7.18
Potatoes	,,	4.91	5.57	5.86	5.51	5.78
Vineyards—						
Grapes(*a*)	,,	4.32	5.14	3.86	5.28	5.51

(*a*) Per acre of productive crops.

Gross value of agricultural production

The following table shows the gross value of principal crops and of total agricultural production in Australia for the five years ended 1964–65.

Further reference to the value of production of agriculture and other industries in Australia as well as a brief explanation of the terms used may be found in the chapter Miscellaneous.

GROSS VALUE(*a*) OF AGRICULTURAL PRODUCTION: AUSTRALIA
1960–61 TO 1964–65
($'000)

Crop	1960–61	1961–62	1962–63	1963–64	1964–65
Cereals for grain—					
Barley	62,144	43,866	42,656	47,484	55,620
Maize	10,528	10,570	9,524	10,364	9,999
Oats	51,070	40,002	51,258	49,666	51,449
Rice	8,250	7,664	7,676	7,912	8,529
Wheat	391,356	372,344	449,064	467,432	517,702
Hay	100,362	75,492	92,958	87,462	99,209
Green fodder	19,294	17,486	19,224	20,990	25,011
Industrial crops—					
Cotton, unginned	1,834	1,294	1,876	2,212	7,685
Hops	2,358	2,484	2,570	1,534	2,372
Sugar cane	101,160	99,216	131,038	162,880	133,372
Tobacco (dried leaf)	26,102	24,244	30,022	33,408	24,608
Vegetables for human consumption—					
Onions	3,666	5,094	3,628	4,096	5,340
Potatoes	38,730	41,394	27,960	33,226	60,713
Other vegetables for human consumption	59,436	57,486	57,552	66,514	72,073
Grapes	35,736	39,630	32,048	46,416	50,385
Fruit and nuts	119,546	126,726	128,860	135,133	146,242
All other crops	39,790	43,352	48,712	51,758	53,413
Total	**1,071,362**	**1,008,344**	**1,136,626**	**1,228,487**	**1,323,722**

(*a*) Includes amounts paid as bounty, relief, etc.

Values of agricultural production in the various States and Territories are shown for 1964–65 in the following table. In computing the net value of production, no deduction has been made for the cost of maintenance of farm buildings and fences, nor for the depreciation of farm plant.

GROSS, LOCAL AND NET VALUES OF AGRICULTURAL PRODUCTION
STATES AND TERRITORIES, 1964–65
($'000)

State or Territory	Gross production valued at principal markets	Marketing costs	Local value of production	Value of materials used in process of production	Net value of production (*a*)
New South Wales	395,283	76,488	318,795	(*b*) 24,912	293,883
Victoria	298,751	40,696	258,055	21,673	236,382
Queensland	270,639	33,164	237,475	43,802	193,673
South Australia	178,132	21,276	156,856	22,617	134,239
Western Australia	139,426	18,126	121,300	28,500	92,800
Tasmania	40,875	7,900	32,975	5,752	27,223
Northern Territory	222	n.a.	222	n.a.	222
Australian Capital Territory	394	28	366	17	349
Australia	**1,323,722**	**197,678**	**1,126,044**	**147,273**	**978,771**

(*a*) No deduction has been made for depreciation and maintenance. (*b*) No allowance has been made for costs of power, power kerosene, petrol and other oils.

In the following table the net value of agricultural production and the net value per head of population are shown by States for the years 1960–61 to 1964–65.

NET VALUE OF AGRICULTURAL PRODUCTION(*a*)
STATES AND TERRITORIES, 1960-61 TO 1964-65

Year	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
Net value ($'000)—									
1960–61	196,342	208,062	146,942	116,646	93,416	21,878	160	276	783,722
1961–62	187,716	176,490	150,152	90,934	102,650	24,690	150	224	733,006
1962–63	226,072	193,972	185,728	93,358	108,506	22,312	168	298	830,414
1963–64	245,906	218,136	222,370	125,180	79,622	25,729	169	276	917,388
1964–65	293,883	236,382	193,673	134,239	92,800	27,223	222	349	978,771
Per head of population ($)—									
1960–61	50.7	71.9	97.7	121.9	128.0	62.5	6.2	5.0	75.4
1961–62	47.5	59.6	98.3	92.8	137.6	69.2	5.7	3.6	69.1
1962–63	56.3	64.2	119.7	93.5	141.9	61.6	6.1	4.3	76.8
1963–64	60.2	70.6	141.3	122.7	101.8	70.3	5.6	3.6	83.2
1964–65	70.7	74.6	121.3	128.7	116.4	74.0	6.8	4.1	87.0

(*a*) No deduction has been made for depreciation and maintenance.

Indexes of quantum and price of agricultural production

Indexes of quantum and price of agricultural production are shown in the following table. The quantum indexes relate to gross output of farm products valued at constant prices. The quantities of each farm product produced each year have been re-valued at the unit gross value for the period 1936–37 to 1938–39. The price indexes relate to average 'prices' of farm products realized at the principal markets of Australia. Average quantities of each product marketed in the period 1946–47 to 1950–51 have been used as fixed weights. Further details on weights used, etc. are to be found in the chapter Miscellaneous.

INDEXES OF QUANTUM(*a*) AND PRICE OF AGRICULTURAL PRODUCTION, 1960-61 TO 1964-65

(*Base: Average three years ended June,* 1939 = 100)

——	1960–61	1961–62	1962–63	1963–64	1964–65
Quantum produced—					
Wheat	166	150	186	199	224
Other crops	184	171	194	194	214
Total, all crops	*177*	*163*	*191*	*196*	*218*
Per head of population	*117*	*106*	*121*	*122*	*133*
Price—					
Wheat	355	380	366	356	351
Other crops	344	323	309	348	351
Total, all crops	*349*	*348*	*334*	*351*	*351*

(*a*) Indexes of value at constant prices, i.e. quantities revalued at average unit values of the base years (1936–37 to 1938–39).

Wheat

Wheat is grown on a large scale in all States except Tasmania, and is the most important crop in Australia in terms of area, production and exports. The present limits of the wheat belt have been established after considerable fluctuation over the last four decades. In January 1934 a Royal Commission was appointed to inquire into and report upon the economic condition of the growing, handling and marketing of wheat, and the manufacturing, distributing and selling of flour and bread. The Report of this Royal Commission provides an authoritative description of all aspects of the industry up to that time.

Wheat marketing and research

Two of the aspects of governmental and semi-governmental assistance and control which have contributed to the development of the industry are the organization of oversea marketing and of research.

As a large proportion of the Australian wheat crop is normally exported, the marketing of wheat plays an important part in the industry. The Australian Wheat Board was constituted in September 1939, under National Security (Wheat Acquisition) Regulations, to purchase, sell, or dispose of wheat or wheat products, and to manage and control all matters connected with the handling, storage, protection, shipment, etc. of wheat acquired, and such other matters as were necessary to give effect to the regulations. Details of the operations of the Australian Wheat Board and the Wheat Stabilization Board in licensing wheat grown during the seasons 1941–42 to 1948–49 will be found in Year Book No. 38, pages 940–1, and a detailed survey of legislation relating to stabilization of the wheat industry, including controls exercised during the 1914–18 and 1939–45 Wars and legislation establishing the Wheat Stabilization Plan in 1948, is given in the Appendix to Year Book No. 37, pages 1295–9.

The Wheat Stabilization Board ceased to function on 31 December 1948, and under the *Wheat Industry Stabilization Act* 1948 the Australian Wheat Board was reconstituted for five years to administer the first stabilization plan and was given powers similar to those held under the National Security Regulations. The new Board commenced to function on 18 December 1948. The Board has been continued in existence by the *Wheat Industry Stabilization Acts* 1954, 1958 and 1963 for the purpose of administering the second, third and fourth five-year stabilization plans. Details of the more recent plans were published in Year Book No. 40, pages 841 and 842 (1947–48 to 1952–53 Plan), No. 44, page 861 (1953–54 to 1957–58), and No. 48, pages 903 and 904 (1958–59 to 1962–63).

Fourth Post-war Wheat Industry Stabilization Plan. Following negotiations during 1962 and 1963, the fourth post-war Wheat Industry Stabilization Plan was enacted by the Commonwealth and States towards the end of 1963. The new plan operates on very much the same lines as the previous ones. However, there are some important changes in detail in the main features of the plan which are set out below.

The plan operates for five years. It commenced with the 1963–64 wheat crop and will end with the marketing of the 1967–68 crop.

The *Wheat Export Charge Act* 1963 repealed the *Wheat Export Charge Act* 1958 and provided for an export charge on wheat and wheat products for the seasons 1963–64 to 1967–68 inclusive. The charge which may be levied is the excess of the export price over the cost of production or 1s. 6d. (15 cents) per bushel, whichever is the less. The Commonwealth guaranteed a return of 14s. 5d. ($1.44) a bushel bulk basis f.o.r. ports to growers on up to 150 million bushels (previously 100 million bushels) of wheat exported from the crop in the first year of the plan. The guaranteed return of 14s. 5d. ($1.44) was based on the findings of a survey of the economic structure of the wheat industry conducted by the Bureau of Agricultural Economics. It is subject to adjustment in each of the following years of the plan in accordance with the movements in costs based on a cost index established from the survey. The guaranteed return for the third year of the plan (1965–66 season) is $1.52 a bushel. The ceiling of the stabilization fund is established at $60 million; any excess beyond this figure is returned to growers on the 'first-in, first-out' principle. Collections from the wheat export charge are paid into the Wheat Prices Stabilization Fund, out of which payments will be made to the Australian Wheat Board, when required, for the purpose of building up the average export price for any season to the guaranteed price. When the average export realizations fall below the guaranteed return the deficiency is made up first by drawing upon the stabilization fund in respect of up to 150 million bushels of wheat from each crop. If the fund is exhausted, additional payments will be made from the Consolidated Revenue Fund. As the return from exports has been below the guaranteed price, there have been no collections of the wheat export charge since the 1956–57 (No. 20) pool when £1,589,000 ($3,178,000) was collected.

The Australian Wheat Board is retained as the sole constituted authority for the marketing of wheat within Australia and for the marketing of wheat and flour for export from Australia for the period of the plan.

The home consumption base price for 1963–64, the first year of the new plan, was established at 14s. 5d. ($1.44) a bushel, bulk basis, f.o.r. ports plus 2d. (1.7 cents) per bushel loading to cover the cost of transporting wheat to Tasmania as outlined below. There is provision in the plan for annual adjustments in the following years in accordance with the guaranteed price as outlined above. The home consumption price for the 1965–66 season is $1.52 a bushel plus 1.7 cents a bushel to cover freight on wheat to Tasmania.

Provision is made for a loading on the price of all wheat sold for consumption in Australia to the extent necessary to cover the cost of transporting wheat from the mainland to Tasmania in each season of the plan.

A premium is paid from export realizations on wheat grown in Western Australia and exported from that State, in recognition of the natural freight advantage enjoyed by Western Australia owing to its proximity to the principal oversea markets for wheat. The premium is the amount of the actual freight advantage enjoyed by Western Australia up to a maximum of 3d. (2.5 cents) a bushel.

The cost of production of wheat for the first season of the current Wheat Stabilization Plan, 1963–64, was fixed at 14s. 5d. ($1.44) a bushel by the legislation. The guaranteed price for the season 1963–64 was therefore 14s. 5d. ($1.44) a bushel, while the home consumption price was 14s. 7d. ($1.46) a bushel (*see* p. 891). The guaranteed price for 1963–64 was a reduction of 1s. 5d. (14 cents) a bushel compared with the guaranteed price of 15s. 10d. ($1.58) for the 1962–63 season, the last year of the previous wheat stabilization plan. The cost of production and guaranteed price for the 1965–66 season have been established at $1.52 a bushel.

F.A.Q. standard of wheat

Sales and shipments of grain in bulk overseas are generally made on a 'fair average quality' (f.a.q.) basis. Samples of wheat are obtained each year from the different wheat districts and mixed to give a representative sample of the whole crop in each State. From this representative sample the f.a.q. weight for each State is determined by the use of the Schopper 1-litre scale chondrometer. This standard is used as a basis for sales of each crop and it varies from year to year and from State to State. F.a.q. is an Australian term, and the method of selling differs from that of other countries, which sell according to sample, or (as in Canada) according to grades which are fixed and do not vary from year to year. The f.a.q. method does not, however, take protein quantity and quality into account, and it gives no indication therefore of the baking strength of the resulting flour.

There are two classifications of Australian wheat in addition to the f.a.q. standard, namely, 'semi-hard' and 'premium'. The former applies to wheat segregated as such in New South Wales and South Australia, and the latter to higher-protein wheat of northern New South Wales and Queensland of a guaranteed minimum protein content. Both wheats sell at a premium above f.a.q. The f.a.q. weight of a bushel of wheat in each of the four main wheat-producing States for the 1964–65 season's crop was as follows: New South Wales, north (predominantly semi-hard), 64¾ lb., south and west (predominantly soft), 64½ lb.; Victoria, 64 lb.; South Australia, semi-hard, 63 lb., soft, 62¾ lb.: and Western Australia, 64½ lb.

Bulk handling and storage of wheat

A detailed description of the bulk handling system, including its advantages and disadvantages compared with other methods of handling, appears on pages 954–8 of Year Book No. 39.

New South Wales, Victoria and Western Australia have operated bulk handling systems for a number of years, and in more recent years other States have also introduced bulk systems. The bodies concerned with the administration of bulk handling in the various States are: Grain Elevators Board of New South Wales, Victorian Grain Elevators Board, State Wheat Board (Queensland), South Australian Co-operative Bulk Handling Ltd., Co-operative Bulk Handling Ltd. (Western Australia), and the Tasmanian Grain Elevators Board.

The table below sets out the bulk handling capacities of the several States for the years 1961 to 1965.

WHEAT: TOTAL CAPACITY OF BULK HANDLING FACILITIES(*a*)
STATES, 30 NOVEMBER 1961 TO 1965
('000 bushels)

State	1961	1962	1963	1964	1965
New South Wales	75,270	79,486	87,046	93,727	104,852
Victoria(*b*)	72,808	76,969	86,253	90,247	97,132
Queensland	7,486	9,525	11,081	13,178	15,956
South Australia	17,380	23,220	28,370	35,483	39,685
Western Australia	97,356	98,734	99,535	115,438	128,175
Tasmania	960	960	960	960	1,060
Australia	**271,260**	**288,894**	**313,245**	**349,033**	**386,860**

(*a*) Includes terminals, sub-terminals, country installations, and temporary storage. (*b*) Includes storage in southern New South Wales operated by the Victorian Grain Elevators Board.

Particulars of the operation of the bulk handling and storage systems in each State are set out on pages 916 and 917 of Year Book No. 48.

International wheat agreement

Details of the first and second International Wheat Agreements operative from 1 August 1949, to 31 July 1953 and from 1 August 1953 to 31 July 1956, respectively, were published in Year Book No. 42 (*see* pages 840–1) and previous issues. Details of the third and fourth International Wheat Agreements which covered the period from 1 August 1956 to 31 July 1959 and 1 August 1959 to 31 July 1962 were published in Year Books Nos. 43 (page 836) and 48 (page 906), respectively.

A fifth International Wheat Agreement, ratified by the required number of wheat exporting and importing countries, came into force on 1 August 1962. This was intended to cover the three-year period from 1 August 1962, to 31 July 1965, but at a special meeting held in February 1965 the International Wheat Council adopted the text of a protocol providing for the prolongation of the Agreement, without amendment, to 31 July 1966. The council stated that it recognized the need for the maintenance of institutional arrangements to provide for continuing international co-operation in wheat matters, and that, following its decision to recommend a one-year extension of the existing agreement, it had given immediate consideration to preparatory work designed to ensure effective arrangements to follow the expiry of the term of the protocol. The Agreement has now been extended by protocol for a further year to 31 July 1967.

The current Agreement, negotiated at an international conference convened by the United Nations, continues the basic arrangements covered by previous Agreements. It seeks to obtain an element of stability in world wheat marketing by providing that a significant proportion of wheat entering international trade will be bought and sold at prices within a prescribed price range. The maximum and minimum prices fixed under the Agreement are expressed in terms of 'Canadian currency per bushel, at the parity of the Canadian dollar determined for the purposes of the International Monetary Fund as at 1 March 1949'. Member exporting countries compete to supply at prices within the prescribed range, which is from 202.5 cents (Canadian) or about 182.9 cents (Australian) to 162 5 cents (Canadian), or about 145.0 cents (Australian) per bushel. The maximum of the range is based on the price of Canada's No. 1 Northern Manitoba wheat in bulk in store at Fort William/Port Arthur. The minimum f.o.b. price for each exporter is the equivalent of the c. and f. price in the United Kingdom of the minimum price of Canada's No. 1 Northern Manitoba wheat in bulk in store at Fort William/Port Arthur, using currently prevailing transportation costs and exchange rates and making such allowance for differences in quality as may be agreed between the exporting and importing countries concerned.

Member importing countries have undertaken to buy each year from member exporting countries a stated percentage of their total commercial requirements at prices within the agreed range. For their part, exporting countries are obliged to make wheat available for purchase by importing countries in any crop year at prices within the price range in quantities sufficient to satisfy the commercial requirements of those countries; if the price goes to the maximum, exporters have undertaken to make available, at that maximum price, specified (datum) quantities based on their past trading record with member importers.

The current Agreement empowers the International Wheat Council to make an annual review of the world wheat situation, including the international implications of national policies in respect of wheat production, stocks and marketing, and the disposal of wheat surpluses on non-commercial terms.

Provision has also been made for the right of appeal against excessive discounts from the minimum price on the basis of differences in quality between the basic wheat—Canada's No. 1 Northern Manitoba wheat—and the wheat supplied by other member importing countries.

Member countries of the fifth International Wheat Agreement are as follows.

Exporters. Argentina, Australia, Canada, France, Italy, Mexico, Spain, Sweden, Union of Soviet Socialist Republics, and United States of America.

Importers. Austria, Belgium and Luxembourg, Brazil, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Federal Republic of Germany, Finland, Greece, Guatemala, Iceland, India, Indonesia, Ireland, Israel, Japan, Liberia, Libya, the Netherlands, New Zealand, Nigeria, Norway, Peru, Philippines, Portugal, Republic of Korea, Saudi Arabia, Sierra Leone, South Africa, Southern Rhodesia, Switzerland, Tunisia, United Arab Republic, United Kingdom, Vatican City, Venezuela, and Western Samoa.

Research into the wheat industry

The extension and growth of the wheat industry in the past has been made possible to a large extent through research into new varieties of seed, crop rotation and fertilizer treatments by governmental, university and private research organizations. In recent years there has been a growing awareness of the value of this research, and funds are being raised by a direct levy on the growers' returns.

The *Wheat Tax Act* 1957 imposed a tax of one farthing (0.208 cents) for each bushel of wheat—

(*a*) which was delivered to the Wheat Board on or after the first day of October 1956 and before the date of commencement of the Act, or

(*b*) which was delivered to the Wheat Board on or after that date.

The Act was amended in October 1965 to become the *Wheat Tax Act* 1965, to provide for an increase in the rate of taxation from one farthing to three-tenths of a penny (0.25 cents) for each bushel of wheat delivered to the Board on or after 1 October 1965. The *Wheat Research Act* 1957 provided for the establishment of a Wheat Research Trust Account to receive moneys payable under the *Wheat Act* 1957, and for the setting up of a Wheat Industry Research Council to direct the expenditure of moneys from that account for research, etc. to benefit the wheat industry. This money, contributed by the growers, is being spent by the Wheat Industry Research Committees set up in the wheat-growing States. These Committees, which consist of representatives of wheatgrowers, universities and State Departments of Agriculture, also received a total of £284,000 ($568,000) under the provisions of the *Wheat Acquisition (Undistributed Moneys) Act* 1958.

The Commonwealth Government has undertaken to supply additional funds for research (with a maximum of $1 for $1 against the growers' contribution) and has set up the Wheat Industry Research Council to make recommendations on the appropriate expenditure of the Commonwealth contribution. The Council, at its inaugural meeting in February 1958, considered that possible avenues of research would include the breeding of better varieties, cereal chemistry, soil fertility, mechanization, the industry's cost structure, and marketing problems. To the end of June 1965 the Council and the State Committees had spent $6,017,142, including grants to the Commonwealth Scientific and Industrial Research Organization, State Departments of Agriculture, universities, and agricultural colleges.

Wheat farms: number and classification by activity

Particulars of the number of farms growing twenty acres and upwards of wheat for grain during each of the years 1960–61 to 1964–65 are shown in the following table. A farm worked on the share system or as a partnership is included as one holding only.

NUMBER OF FARMS GROWING TWENTY ACRES AND UPWARDS OF WHEAT FOR GRAIN: STATES AND A.C.T., 1960–61 TO 1964–65

State or Territory	1960–61	1961–62	1962–63	1963–64	1964–65
New South Wales	16,959	17,489	18,286	17,753	18,537
Victoria	10,625	11,648	12,166	11,370	11,981
Queensland	4,257	4,483	5,095	4,927	5,236
South Australia	8,913	9,434	9,881	9,902	9,657
Western Australia	8,614	8,722	8,966	8,983	8,779
Tasmania	121	222	243	251	255
Australian Capital Territory	14	25	27	29	20
Australia	**49,503**	**52,023**	**54,664**	**53,215**	**54,465**

There is in Australia a widespread combination of wheat growing with other rural activities. This is illustrated, for the 1959–60 season, by a table on pages 1016 and 1017 of Year Book No. 49.

Varieties of wheat sown

The breeding of wheat suitable to local conditions has long been established in Australia. Farrer (1845–1905) did invaluable work in pioneering this field, and the results of his labour and the continued efforts of those who have followed him have proved of immense benefit to the industry. Their efforts have resulted in the development of disease-resistant varieties, better average yields, and a greater uniformity of sample, with which have accrued certain marketing advantages, as well as an improvement in the quality of wheat grown. More than 1,000 different varieties of Australian wheats have been catalogued by the Commonwealth Scientific and Industrial Research Organization, but the number of principal varieties grown in any one season is restricted to about forty-five.

The principal varieties of wheat sown and the percentage of each to the total area sown in the five main wheat-producing States of Australia in 1964–65 were as follows: New South Wales, Heron (19.8), Falcon (11.2), Olympic (10.5); Victoria, Insignia (51.9), Pinnacle (18.7), Olympic

(17.9); Queensland, Spica (37.6), Gala (15.2), Mengavi (12.6); South Australia, Insignia (39.8), Gabo (16.1), Heron (11.6); and Western Australia, Gabo (30.0), Insignia (17.2), Insignia 49 (12.6). A detailed table of wheat varieties sown appears in the annual bulletin *The Wheat Industry*, No. 108, published in February 1966.

Wheat area, production and yield per acre

Prominent factors in the early development of the wheat industry were the increase in population following the discovery of gold and the redistribution of labour after the surface gold had been won. The economic depression of 1893 interrupted its progress, but its subsequent recovery was assisted by the invention of mechanical appliances, the use of superphosphates as an aid to production, and the introduction of new and more suitable varieties of wheat for Australian conditions. The establishment of closer settlement schemes and the settling of returned soldiers and others on the land were additional factors in its expansion.

The area, production and yield per acre of wheat for grain in each State are shown below for the years 1960–61 to 1964–65 in comparison with the averages for the three-year periods ended 1938–39, 1948–49 and 1958–59.

WHEAT FOR GRAIN: AREA, PRODUCTION AND YIELD PER ACRE STATES AND A.C.T., 1936-37 TO 1964-65

Period	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	A.C.T.	Aust.
AREA ('000 ACRES)								
Average for three years ended—								
1938–39	4,366	2,609	366	3,100	3,005	18	2	13,466
1948–49	4,519	3,241	439	2,319	2,685	7	4	13,214
1958–59	2,392	1,737	508	1,392	3,005	5	1	9,040
Year—								
1960–61	4,076	2,672	693	1,969	4,021	7	1	13,439
1961–62	4,498	2,849	750	2,229	4,380	16	1	14,723
1962–63	5,008	3,125	919	2,595	4,804	15	3	16,469
1963–64	4,964	3,109	938	2,802	4,640	18	3	16,474
1964–65	5,760	3,236	1,026	2,727	5,151	17	2	17,919
PRODUCTION ('000 BUSHELS)(*a*)								
Average for three years ended—								
1938–39	56,890	36,374	4,783	34,606	31,539	434	45	164,671
1948–49	58,537	48,332	8,569	28,856	31,517	138	78	176,027
1958–59	35,178	36,705	9,938	26,126	40,950	135	15	149,047
Year—								
1960–61	84,657	67,587	10,999	46,395	63,900	148	30	273,716
1961–62	78,350	56,879	12,018	33,854	65,700	345	32	247,178
1962–63	109,002	67,899	18,683	38,339	72,500	419	70	306,912
1963–64	122,472	76,302	22,275	53,971	52,340	483	69	327,912
1964–65	151,483	78,166	22,830	52,817	63,071	364	58	368,789
YIELD PER ACRE (BUSHELS)(*a*)								
Average for three years ended—								
1938–39	13.0	13.9	13.1	11.2	10.5	24.1	22.5	12.2
1948–49	13.0	14.9	19.5	12.4	11.7	19.7	19.5	13.3
1958–59	14.7	21.1	19.6	18.8	13.6	24.7	15.0	16.5
Year—								
1960–61	20.8	25.3	15.9	23.6	15.9	21.4	28.5	20.4
1961–62	17.4	20.0	16.0	15.2	15.0	22.2	22.7	16.8
1962–63	21.8	21.7	20.3	14.8	15.1	27.3	29.3	18.6
1963–64	24.7	24.5	23.8	19.3	11.3	27.5	24.6	19.9
1964–65	26.3	24.2	22.3	19.4	12.2	21.7	27.6	20.6

(*a*) 60 lb. per bushel.

A graph showing the area sown to wheat for grain in Australia since 1900–1 appears on plate 52 of this Year Book, and a map showing the distribution of areas growing wheat for grain throughout Australia in 1962–63 appears on page 1013 of Year Book No. 50. Similar maps showing the distribution of wheat areas in 1924–25, 1938–39, 1947–48, and 1954–55 appeared respectively in Year Books No. 22, page 695, No. 34, page 451, No. 39, pages 977–8, and No. 43, page 883.

Apart from the variations in the area sown, the size of the wheat harvest in Australia is determined largely by the nature of the season, resulting in considerable year-to-year fluctuations in production. The main wheat-producing States of Australia are New South Wales, Victoria, South Australia, and Western Australia. Queensland production normally approaches local demands, but Tasmania imports wheat from the mainland to satisfy its needs, though it exports flour made from local wheat which is particularly suitable for biscuits.

Production of wheat in 1964–65, 368,789,000 bushels, was a record, exceeding the previous record harvest of 1963–64 by 40,877,000 bushels (12 per cent). Compared with the previous season, the highest absolute increases were recorded in New South Wales, 29,011,000 bushels (24 per cent) and Western Australia, 10,731,000 bushels (21 per cent). New South Wales, Victoria and Queensland had record harvests.

Short-term variations in yield per acre are due chiefly to seasonal influences. The yield per acre in 1964–65 (20.6 bushels) was the second highest recorded. A record yield of 20.7 bushels was obtained in 1958–59.

The following table shows the average area, production and yield per acre for decennial periods since 1861 together with similar details for the latest season, 1964–65. Repeated cropping and short rotations (mainly in the eastern States) are believed to have led to the decline in yield to 1900, while fallowing and the widespread use of artificial fertilizers contributed to the increased yields in the decade following. The increase in yield since 1950 has been generally ascribed to the impact of improved pastures and ley-farming (broadly, the alternation of crops and pastures) upon soil fertility in wheat-growing areas.

WHEAT FOR GRAIN: AVERAGE AREA AND PRODUCTION, AUSTRALIA, 1861 TO 1964-65

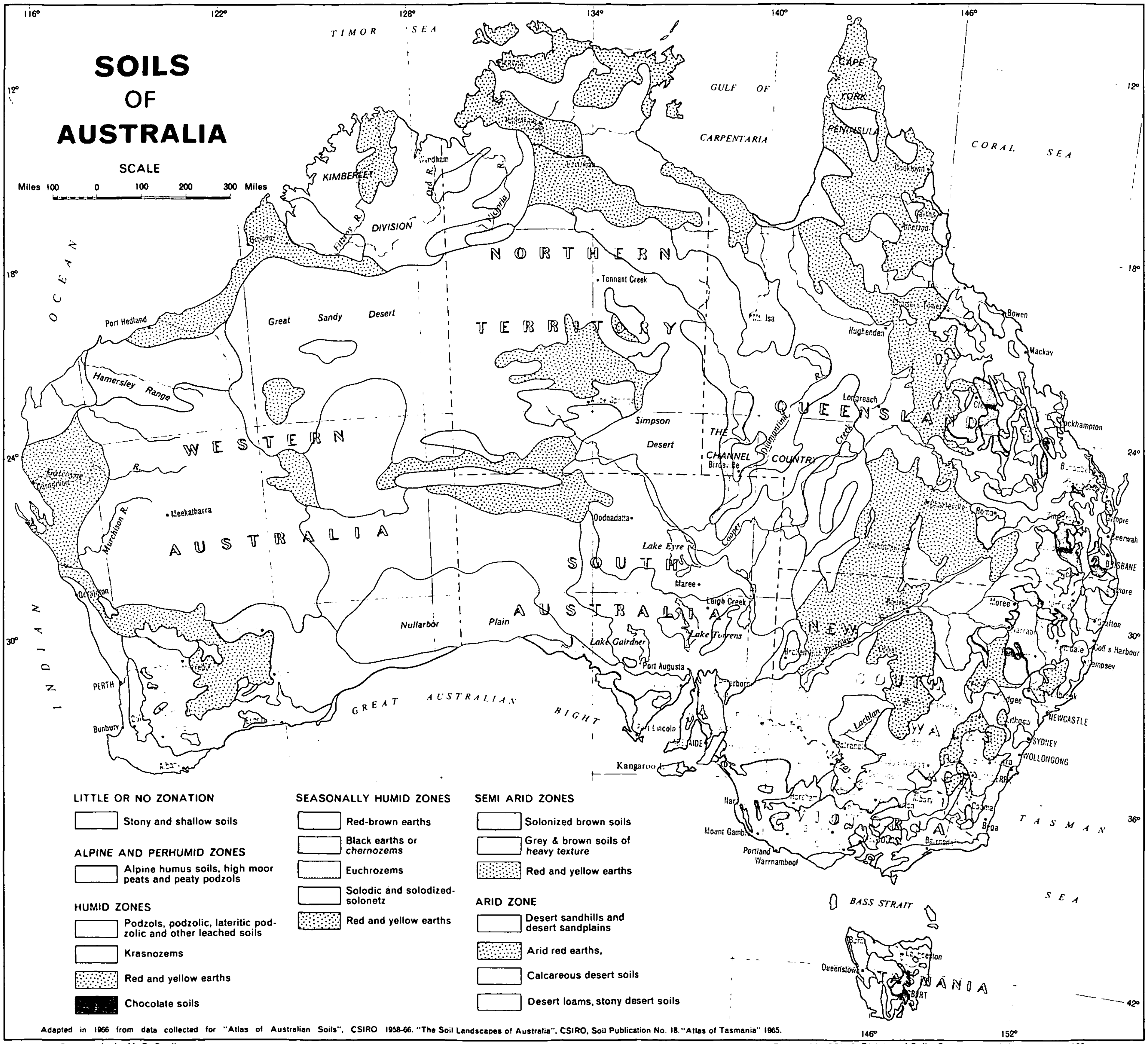
Period	Area	Production	Yield per acre
	'000 acres	'000 bushels	bushels
Yearly average—			
1861–70 . .	831	10,622	12.8
1871–80 . .	1,646	17,711	10.8
1881–90 . .	3,258	26,992	8.3
1891–1900 . .	4,087	29,934	7.3
1901–10 . .	5,711	56,058	9.8
1911–20 . .	8,928	95,480	10.7
1921–30 . .	11,291	135,400	12.0
1931–40 . .	14,176	177,758	12.5
1941–50 . .	11,358	145,599	12.8
1951–60 . .	10,164	173,622	17.1
Year—			
1964–65 . .	17,919	368,789	20.6

Price of wheat

The prices charged by the Australian Wheat Board for wheat sold to millers for gristing into flour for consumption in Australia and for wheat sold as stock feed were as follows: year ended 30 November 1962, 15s. 10d. ($1.58); 1963, 15s. 11½d. ($1.60); 1964, 14s. 7d. ($1.46); 1965, 14s. 8d. ($1.47), and 1966, $1.53. These prices include a loading to meet freight charges incurred on wheat shipped to Tasmania (1d. in 1962; 1½d. in 1963; 2d. in 1964; 1d. in 1965; and 1.7c in 1966).

The Wheat Board's monthly basic export selling prices for f.a.q. bulk wheat f.o.b. basis, both for wheat sold under the International Wheat Agreement and for 'free' wheat sold on the open market, fell in the following ranges: season ended 31 July 1962, 13s. 10d. to 14s. 10½d. ($1.38 to $1.49); 1963, 14s. 2d. to 14s. 10½d. ($1.42 to $1.49); 1964, 14s. 4d. to 15s. 10d. ($1.43 to $1.58); and 1965, $1.35 to $1.52. Actual selling prices have been lower than the basic prices in some cases, particularly where other exporting countries enjoy a geographical freight advantage.

The 1959 International Wheat Agreement set the maximum price at 200 cents (Canadian) a bushel and the minimum at 150 cents (Canadian) for f.a.q. wheat sold under the Agreement. Under the current 1962 Agreement operative from 1 August 1962 (*see* page 893) the agreed price range is between 202.5 cents (Canadian) and 162.5 cents (Canadian). Directly converted into Australian currency these limits are approximately 182.9 cents and 145.0 cents a bushel respectively.



Cartography by M. C. Coulls

Prepared in CSIRO Division of Soils Cartographic Office Adelaide 1966

PLATE 47

Photographs for Plates 48 to 51 by courtesy of C.S.I.R.O. Soils Division.

Figure 1. Scrub woodland of Wandoo and Jarrah growing on the indurated zone of an ancient laterite at Hoddy's Well in the Darling Ranges near Perth, W.A. Note the depth of the strongly leached pallid zone.

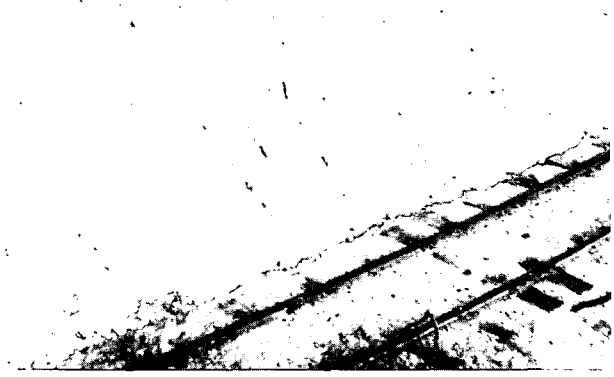


Figure 2. Horticultural development in a valley in the Darling Ranges near Perth, W.A.

The effect of the soil changes associated with extent to which the laterite has been eroded is reflected in the variation in growth of the citrus in centre of the picture.

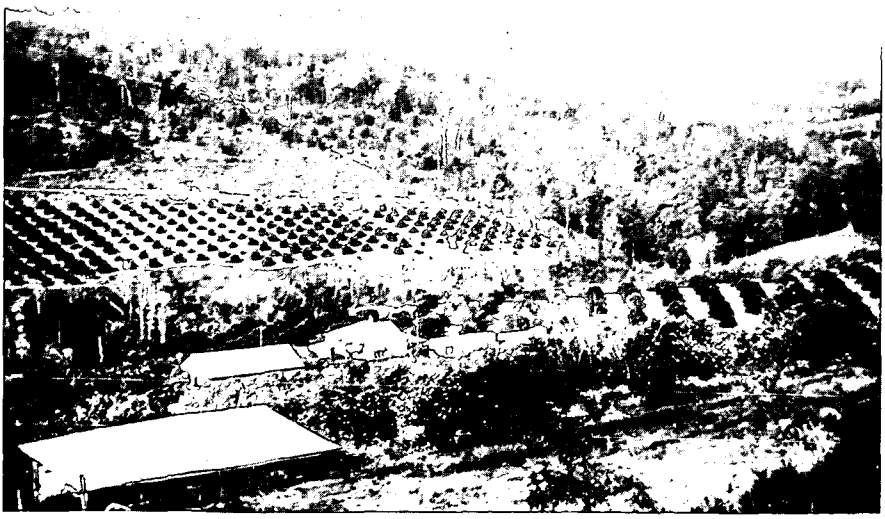


PLATE 48

Figure 1. The effect of soil differences on the growth of trees is illustrated by this oblique aerial photograph of portion of the Mount Burr Forest in the lower south-east of South Australia, where there is an extensive and rapidly expanding area of softwood plantations, principally of *Pinus radiata*. Variation in the vigour of growth of the trees is related to differences in soil type. The obviously poorer growth occurring in a zone across the centre of the plantations is associated with extremely leached sandy soils containing hardpan in the subsoil. Outside the plantations similar variation in the soil pattern is reflected in the differing remnants of the original native vegetation.

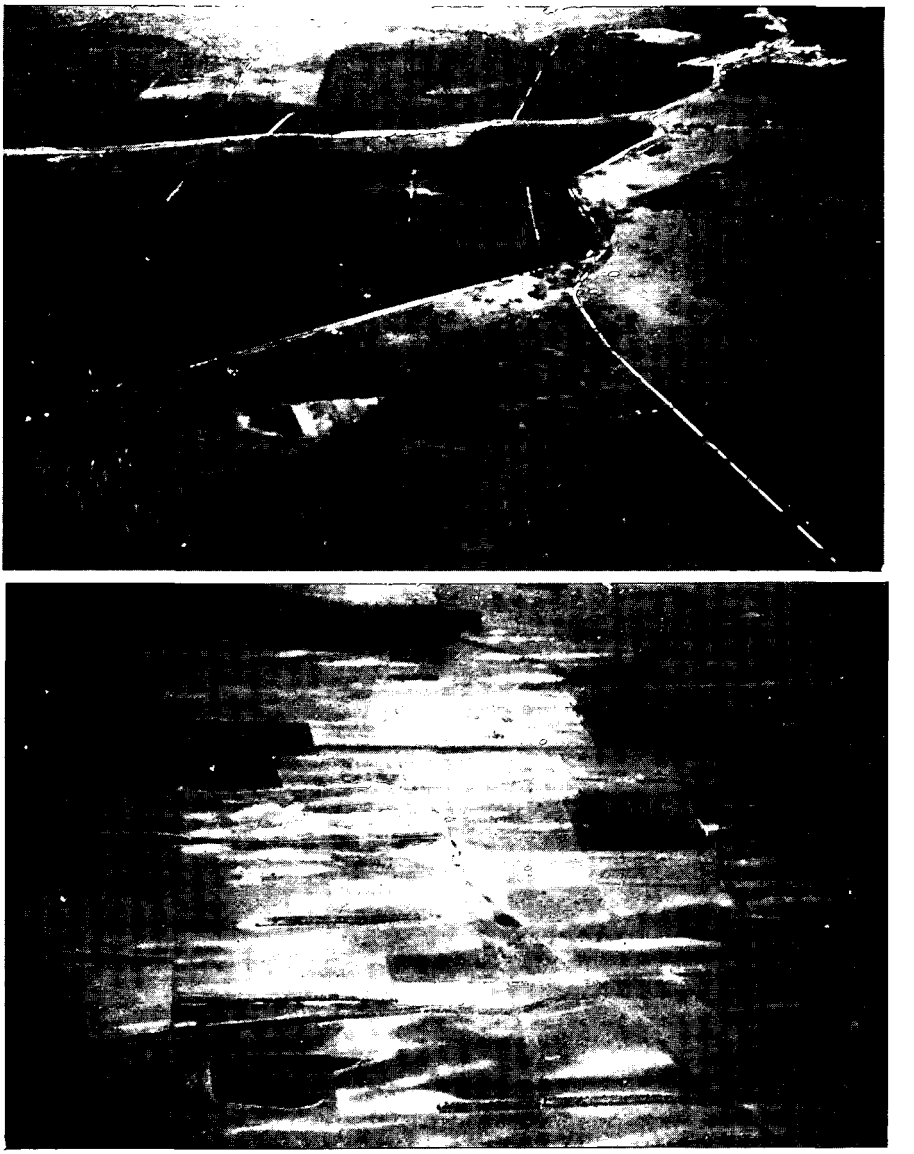


Figure 2. The east-west dunes of the solonized brown soils are prominent in the oblique aerial photograph of the country between Mildura, Victoria and Renmark, S.A. Originally covered with mallee *(E. dumosa E. viridis)*, of which patches can be seen, most of the country has been cleared for wheat-growing. Soil conservation measures to combat wind erosion, especially of the sandy soils of the dunes, is an important feature of sound agricultural practice in this region.

Figure 1. The solodic soils occupy a large proportion of the sub-humid zone. They are characterized by a tough clay subsoil that is almost impervious to water. In the more extreme forms the subsoil looks like cobblestones.

Figure 2. Gilgai on a grey clay soil near Lismore, N.S.W. After rain the depressions may remain filled with water for several weeks.

PLATE 50

Figure 1. Mount Arapiles in Western Victoria overlooks a typical portion of the Wimmera District where wheat-growing with ancillary sheep grazing is the principal primary industry. The soils of the district are grey and brown soils of heavy texture. Their use for wheat-growing depends on fallowing for some months prior to seeding so as to store moisture from the previous rainfall for the use of the wheat crop in the following year. The high proportion of fallow land evident in the photograph reflects the almost universal adoption of this rotation system.

Figure 2. This oblique aerial photograph taken south of Alice Springs in the Northern Territory illustrates the topographic character of much of the more rugged pastoral country in the arid zone of Australia. The rocky hills of very prominent strike and dip shown by the photograph are being worn down largely by water erosion, and the relative proportions of useful land covered by soil and of the virtually useless rocky country are determined by the extent to which this process of denudation has proceeded. The hills shed a large part of their rainfall on to the adjoining areas covered by soil and so increase its productivity.

Details of export prices of wheat in previous years, including those received for wheat sold under the terms of the 1949–1953 International Wheat Agreement, are given in Year Book No. 40, pages 849–50, and in the statistical bulletin *The Wheat Industry, Australia*, No. 99, March 1961, and in previous issues of these publications.

Value of the wheat crop

The estimated gross value of the wheat crop in each State and in Australia during the season 1964–65 and the value per acre are shown below.

WHEAT FOR GRAIN: VALUE OF CROPS(*a*), STATES AND A.C.T., 1964–65

——		N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	A.C.T.	Aust.
Aggregate value	$'000	212,479	109,396	32,157	74,550	88,557	486	77	517,702
Value per acre	$	36.89	33.81	31.36	27.34	17.19	28.92	36.77	28.89

(*a*) Gross value of total crop, including wheat used for seed and for stock feed on farms. Also includes payment of $18,069,000 by the Commonwealth Government.

Production and disposal of wheat in Australia

In the following tables details are given of Australian Wheat Board transactions and of total production and disposal of wheat during each of the years ended 30 November 1961 to 1965. (For particulars of production and yield from 1935–36 *see* plate 53.)

AUSTRALIAN WHEAT BOARD
WHEAT RECEIVED, STATES, 1960–61 TO 1964–65 HARVESTS
('000 bushels)

Pool	Harvest	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	Aust.
24	1960–61	72,984	66,881	8,821	43,706	59,012	63	251,467
25	1961–62	67,784	55,121	9,981	30,737	60,459	208	224,290
26	1962–63	98,677	67,215	17,537	35,120	66,898	275	285,722
27	1963–64	110,722	77,728	20,330	51,660	47,071	325	307,836
28	1964–65	137,495	80,682	20,712	49,991	57,440	188	346,508

Stocks of wheat (including flour in terms of wheat) held by the Australian Wheat Board in each State at 30 November for the years 1961 to 1965 are shown in the following table. These data relate to stocks held at mills, sidings, ports, and depots as recorded by the Australian Wheat Board.

AUSTRALIAN WHEAT BOARD: STOCKS(*a*) OF WHEAT (INCLUDING FLOUR IN TERMS OF WHEAT), STATES, 30 NOVEMBER 1961 TO 1965
('000 bushels)(*b*)

Year	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	Aust.
1961	7,701	8,780	965	3,122	3,338	452	24,358
1962	5,574	6,021	1,333	1,831	2,449	491	17,699
1963	10,879	7,000	775	1,775	2,221	625	23,275
1964	7,340	7,490	806	3,048	1,257	472	20,413
1965	15,265	3,716	862	2,602	1,556	381	24,382

(*a*) Held at mills, sidings, ports and depots. Excludes new season's wheat received from growers prior to 30 November of years shown. (*b*) One short ton (2,000 lb.) of flour is taken as being equivalent to 46.3 bushels of wheat.

Particulars of the disposal of wheat during the years ended 30 November 1961 to 1965, as recorded by the Australian Wheat Board, are shown in the following table.

AUSTRALIAN WHEAT BOARD: DISPOSAL OF WHEAT, 1961 TO 1965

('000 bushels)

	Year ended 30 November—				
	1961	1962	1963	1964	1965
Exported as wheat	202,027	152,818	203,703	221,530	243,725
Exported as flour(a)	29,438	25,123	24,903	31,797	23,318
Sold for local consumption as flour	39,814	40,736	40,389	42,954	44,160
Sold for other purposes	15,107	11,635	10,791	13,658	30,556

(a) Includes wheat equivalent of manufactured wheat products exported.

A summary of *all* transactions in wheat for Australia, as distinct from those recorded for the Wheat Board above, appears in the following table.

WHEAT: PRODUCTION AND DISPOSAL, AUSTRALIA, 1961 TO 1965

(million bushels)(a)

	Year ended 30 November—				
	1961	1962	1963	1964	1965
Opening stocks (including flour)(b)(c)(d)	60.7	24.4	17.7	23.3	20.4
Production	273.7	247.2	306.9	327.9	368.8
Total available supplies	*334.4*	*271.6*	*324.6*	*351.2*	*389.2*
Exports—					
Wheat	205.1	154.7	200.1	221.7	244.7
Flour(b)	31.6	26.6	25.1	34.3	24.1
Breakfast foods and other products(b)(d)	0.5	0.6	0.7	0.7	0.7
Local consumption—					
Flour(b)(d)	41.2	40.7	40.4	43.0	43.5
Breakfast foods and other products(b)(d)	1.9	1.6	1.7	1.8	1.8
Stock feed wheat sales(d)	13.2	10.0	9.1	12.0	28.4
Seed	13.8	15.4	15.4	16.6	17.0
Retained on farm (excluding seed)	8.4	7.4	5.8	3.4	5.3
Closing stocks (including flour)(b)(c)(d)	24.4	17.7	23.3	20.4	24.4
Total disposals	*340.1*	*274.7*	*321.6*	*353.9*	*389.9*
Excess (+) or deficiency (−) of disposals in relation to available supplies(e)	+5.7	+3.1	−3.0	+2.7	+0.7

(a) One short ton (2,000 lb.) of flour is taken as being equivalent to 46.3 bushels of wheat. (b) In terms of wheat. (c) Held at ports, depots, mills, and sidings. (d) *Source:* Australian Wheat Board. (e) Includes allowance for unrecorded movements in stocks, gain or loss in out-turn, etc.

The *Wheat Industry Stabilization Act* 1948 empowered the Minister to arrange with the Commonwealth Bank for advances to the Board, the advances being guaranteed by the Commonwealth Government. These provisions have been continued in the subsequent legislation, with the exception that advances are now arranged through the Reserve Bank.

AUSTRALIAN WHEAT BOARD: FINANCIAL OPERATIONS, POOLS NOS. 24 TO 28

($'000)

	No. 24 Pool (1960–61 Harvest)	No. 25 Pool (1961–62 Harvest)	No. 26 Pool (1962–63 Harvest)	No. 27 Pool (1963–64 Harvest)	No. 28 Pool(a) (1964–65 Harvest)
Paid to growers	305,370	288,414	351,972	373,254	322,946
Rail freight	37,430	33,886	45,358	49,270	57,874
Expenses	18,652	16,720	20,552	17,990	24,478
Total payments	*361,452*	*339,020*	*417,882*	*440,514*	*405,298*
Value of sales delivered	(b)344,206	(c)324,910	(d)395,842	(e)439,262	(f)468,594

(a) Incomplete. (b) Subject to additional $17,768,000 provided by the Commonwealth Government and payment of $522,000 to Wheat Industry Research Fund. (c) Subject to additional $14,576,000 provided by the Commonwealth Government and payment of $466,000 to Wheat Industry Research Fund. (d) Subject to additional $22,634,000 provided by the Commonwealth Government and payment of $594,000 to Wheat Industry Research Fund. (e) Subject to additional $1,892,000 provided by the Commonwealth Government and payment of $640,000 to Wheat Industry Research Fund. (f) Subject to additional $18,069,000 provided by the Commonwealth Government and payment of $722,000 to Wheat Industry Research Fund.

Details of earlier pools will be found in previous issues of the Year Book.

Imports of wheat

Wheat and flour have been imported in substantial quantities on three occasions since 1900; in 1902–3 the wheat harvest was only 12,378,000 bushels, and wheat and flour equivalent to 12,468,000 bushels of wheat were imported. An equivalent of 7,279,000 bushels was imported in 1914–15 to supplement the yield of 25 million bushels produced in that season. Owing to drought conditions in 1957–58 wheat supplies were insufficient for local requirements and, as a result, 1,485,000 bushels were imported from Canada in 1958. No wheat has since been imported.

Exports of wheat and flour

Statistics in the following three tables are for years ended 30 June and relate to the exports of *Australian produce* only.

WHEAT AND FLOUR: EXPORTS, AUSTRALIA, 1960–61 TO 1964–65

Year	Quantity				Value		
	Wheat	Flour		Total (in terms of wheat)	Wheat	Flour(a)	Total
		As flour (a)	In terms of wheat (b)				
	'000 bushels	short tons	'000 bushels	'000 bushels	$A.'000 f.o.b.	$A.'000 f.o.b.	$A.'000 f.o.b.
1960–61	152,995	679,179	31,446	184,441	204,852	39,274	244,126
1961–62	203,155	602,665	27,903	231,058	284,892	36,328	321,220
1962–63	151,970	544,441	25,208	177,178	216,904	32,660	249,565
1963–64	253,724	714,939	33,102	286,826	362,018	43,758	405,776
1964–65	209,980	598,037	27,689	237,669	297,199	39,122	336,321

(a) White flour (plain and self-raising), sharps and wheatmeal for baking. (b) One short ton (2,000 lb.) of flour is taken as being equivalent to 46.3 bushels of wheat.

WHEAT: EXPORTS TO VARIOUS COUNTRIES, AUSTRALIA, 1960–61 TO 1964–65
('000 bushels)

Country to which exported	1960–61	1961–62	1962–63	1963–64	1964–65
China (Mainland)	40,297	71,760	76,230	93,440	83,623
U.S.S.R. (Europe and Asia)	..	..	23	51,045	31,665
United Kingdom	27,410	23,282	16,317	28,146	19,132
India	4,910	21,166	7,144	7,572	17,543
Japan	13,110	15,698	12,673	18,800	16,276
Iran	1,852	582	705	1,163	8,983
New Zealand	6,108	6,252	6,088	6,687	6,104
Malaysia(*a*)	703	585	592	1,737	3,669
Norway	1,021	2,472	2,739	4,169	2,830
Other	57,584	61,358	29,459	40,965	20,155
Total	**152,995**	**203,155**	**151,970**	**253,724**	**209,980**

(*a*) Includes Singapore.

The following table shows the exports of flour to various countries for each of the years 1960–61 to 1964–65. The figures relate to exports of white flour (plain and self-raising), sharps and wheatmeal for baking.

FLOUR: EXPORTS TO VARIOUS COUNTRIES, AUSTRALIA, 1960–61 TO 1964–65
(Short tons)

Country to which exported	1960–61	1961–62	1962–63	1963–64	1964–65
Ceylon	117,590	178,538	103,503	115,273	191,144
Malaysia(*a*)	160,897	146,746	147,505	142,652	97,560
Arabian States	50,325	40,999	52,945	49,669	50,595
United Kingdom	56,136	66,560	66,641	48,744	45,579
Arabia, South	32,874	34,997	38,914	40,675	44,990
Fiji	28,102	30,240	29,554	37,993	34,915
Philippines	1,831	2,639	10,335	51,738	27,720
Mauritius	23,738	13,468	14,011	21,279	19,860
U.S.S.R. (Europe and Asia)	..	..	168	133,920	12,345
Other	207,686	88,478	80,865	72,996	73,329
Total	**679,179**	**602,665**	**544,441**	**714,939**	**598,037**

(*a*) Includes Singapore.

World area and production of wheat

The figures in the following table of the world area and production of wheat by principal countries and by continents have been compiled from the statistics published by the International Wheat Council. Harvests in the northern hemisphere occur in the first of the two years mentioned in each column heading, and in the southern hemisphere at the end of that year and the beginning of the next. Harvests of the northern hemisphere countries are thus combined with those of the southern hemisphere which immediately follow; e.g. in 1964–65 the Canadian harvest occurred from August to September 1964 and the Australian harvest from September 1964 to February 1965.

WHEAT: AREA, PRODUCTION AND YIELD PER ACRE IN VARIOUS COUNTRIES 1962-63 TO 1964-65

(*Source for countries other than Australia: World Wheat Statistics*—International Wheat Council)

Continent and country	Area			Production			Yield per acre		
	1962–63	1963–64	1964–65	1962–63	1963–64	1964–65	1962–63	1963–64	1964–65
	'000 acres	'000 acres	'000 acres	mill. bus.	mill. bus.	mill. bus.	bus.	bus.	bus.
U.S.S.R. (Europe and Asia)	166,545	159,627	167,749	2,600	1,826	2,734	15.6	11.4	16.3
Europe—									
France	11,293	9,513	10,843	516	377	509	45.7	39.9	46.9
Italy	11,258	10,858	10,892	349	299	316	31.0	27.5	30.0
Germany, Federal Republic of	3,259	3,415	3,576	169	178	185	51.8	52.2	51.8
Spain	10,534	10,495	10,341	177	179	146	16.8	17.0	14.2
Total, Europe(a)	*72,220*	*68,531*	*71,953*	*2,270*	*2,016*	*2,238*	*31.4*	*29.4*	*31.1*
Asia—									
China (Mainland)(b)	60,292	59,798	63,012	735	801	827	12.2	13.4	13.1
India	33,409	33,747	33,349	442	398	362	13.2	11.8	10.9
Turkey	19,595	19,724	19,741	311	349	307	15.8	17.7	15.5
Pakistan	12,311	12,592	12,701	149	155	154	12.1	12.3	12.1
Total, Asia(a)	*150,311*	*151,867*	*154,241*	*2,000*	*2,008*	*1,982*	*13.3*	*13.2*	*12.9*
North and Central America—									
United States	43,541	45,207	49,121	1,094	1,142	1,291	25.1	25.2	26.3
Canada	26,817	27,566	29,686	566	723	600	21.1	26.2	20.2
Total, North and Central America(a)	*72,252*	*74,896*	*80,999*	*1,716*	*1,929*	*1,970*	*23.7*	*25.8*	*24.3*
South America—									
Argentina	8,495	13,358	14,317	209	329	413	24.7	24.6	28.8
Total, South America(a)	*14,579*	*19,348*	*19,620*	*301*	*408*	*507*	*20.6*	*21.1*	*25.9*
Oceania—									
Australia	16,469	16,474	17,919	307	328	369	18.6	19.9	20.6
Total, Oceania(a)	*16,694*	*16,679*	*18,103*	*316*	*338*	*378*	*18.9*	*20.3*	*20.9*
Africa	16,877	18,854	19,323	221	236	215	13.1	12.5	11.1
World total(a)	509,478	509,802	531,988	9,424	8,760	10,024	18.5	17.2	18.9

(*a*) Includes allowances for any missing data for countries shown and for other producing countries not shown
(*b*) International Wheat Council estimate.

Principal wheat exporting and importing countries

The following table shows world exports of wheat and wheat flour (in terms of wheat) by the major wheat exporting countries, according to continents and countries of primary destination, based on statistics recently published by the International Wheat Council. While Australia's production of wheat averages about four per cent of the world's total, its exports account for a much higher proportion of the total quantities shipped. In 1964–65, for example, Australia's share of world wheat exports amounted to fourteen per cent.

WORLD EXPORTS OF WHEAT AND WHEAT FLOUR IN TERMS OF WHEAT

(*Source: World Wheat Statistics*—International Wheat Council)

(Million bushels)

Year and country of primary destination	Exporting country—							
	United States of America	Canada	Australia	France	Argentina	U.S.S.R.	Other	Total
1960–61	660.9	342.0	183.7	57.3	71.5	185.8	68.1	1,569.3
1961–62	717.8	365.2	230.6	67.4	87.3	185.6	90.2	1,744.1
1962–63	636.8	331.2	175.9	109.4	66.4	195.8	83.7	1,599.2
1963–64	848.7	554.4	287.1	98.5	102.0	47.1	134.3	2,072.1
1964–65p—								
Asia(*a*)—								
India	215.9	6.9	17.6	..	..	..	..	240.4
China (Mainland)	..	64.6	82.8	14.7	21.7	..	1.6	185.4
Japan	60.8	52.7	16.3	1.0	..	..	..	130.8
Pakistan	64.6	2.6	2.2	..	..	..	..	69.4
Iran	10.5	..	9.0	6.9	..	1.0	..	27.4
Other	81.3	14.1	38.0	12.2	1.4	2.2	19.4	168.6
Total, Asia	*433.1*	*140.9*	*165.9*	*34.8*	*23.1*	*3.2*	*21.0*	*822.0*
Europe(*a*)—								
United Kingdom	9.0	83.2	20.4	9.3	18.8	..	13.5	154.2
Germany, East	..	10.1	..	27.0	2.1	14.4	0.4	54.0
Poland	2.1	17.9	..	11.3	..	..	21.4	52.7
Yugoslavia	50.0	..	..	..	..	..	0.2	50.2
Germany, Federal Republic of	3.4	22.5	..	3.9	6.1	..	5.7	41.6
Netherlands	12.5	3.5	..	4.8	19.8	..	0.6	41.2
Czechoslovakia	..	26.2	..	3.3	..	10.1	0.9	40.5
Italy	5.4	3.9	..	12.3	11.1	..	0.7	33.4
France	6.5	6.0	..	..	8.6	..	1.5	22.6
Other	16.2	43.9	4.1	20.3	10.8	6.6	9.3	111.2
Total, Europe	*105.1*	*217.2*	*24.5*	*92.2*	*77.3*	*31.1*	*54.2*	*601.6*
Africa—								
United Arab Republic	52.5	..	0.7	7.2	..	..	11.8	72.2
Other	37.2	6.6	4.0	26.6	2.0	0.3	10.1	86.8
Total, Africa	*89.7*	*6.6*	*4.7*	*33.8*	*2.0*	*0.3*	*21.9*	*159.0*
South America—								
Brazil	40.7	..	..	..	35.4	..	0.1	76.2
Other	34.9	12.3	0.1	0.8	17.7	..	0.6	66.4
Total, South America	*75.6*	*12.3*	*0.1*	*0.8*	*53.1*	..	*0.7*	*142.6*
U.S.S.R.	1.7	34.2	32.2	3.6	0.6	..	4.7	77.0
North and Central America	13.9	23.4	0.4	3.5	0.1	8.0	1.0	50.3
Oceania	0.1	0.2	9.0	0.7	..	..	..	10.0
All other	..	..	0.8	..	..	..	4.5	5.3
World total, 1964-65	719.1	434.8	237.7	169.6	156.2	42.6	107.9	1,867.9

(*a*) Excludes U.S.S.R., details for which are shown separately.

The above particulars are based on customs clearances of the exporting countries, and relate to years ended 30 June. There is a small difference between Australian exports as shown and those on pages 899–900 since a slightly different factor was used by the International Wheat Council to convert flour to wheat equivalent.

Oats

This cereal is widely grown in all agricultural areas which have autumn, winter, and spring rainfall; it is tolerant of wet conditions and heavy soils. It has excellent feed value and produces a higher yielding crop than other winter cereals. It needs less cultivation, but requires ample fertilizer. Oats has a variety of uses—as a pasture plant when rough sown into stubble or heavy clover pastures, as silage if cut before maturity, as a hay crop when mown and baled or cut for chaff, or as a grain when stripped (the stubble then being grazed off). The grain is sold on a 'fair average quality' basis through voluntary pools in Victoria, South Australia and Western Australia.

Oats area, production and yield per acre

Oats is usually next in importance to wheat among the grain crops cultivated in Australia. However, while wheat grown for grain in 1964–65 accounted for 52 per cent of the area of all crops, oats grown for grain represented only 10 per cent. The area, production and yield per acre of oats in each State are shown below for the years 1960–61 to 1964–65 in comparison with the averages for the three-year periods ended 1938–39, 1948–49 and 1958–59.

OATS FOR GRAIN: AREA, PRODUCTION AND YIELD PER ACRE STATES AND A.C.T., 1936-37 TO 1964-65

Period	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	A.C.T.	Aust.
AREA ('000 ACRES)								
Average for three years ended—								
1938–39	297	478	8	338	425	26	..	1,572
1948–49	515	548	21	282	484	17	1	1,868
1958–59	756	735	29	445	1,178	20	..	3,163
Year—								
1960–61	917	835	19	512	1,330	23	1	3,637
1961–62	713	774	27	324	1,231	27	1	3,097
1962–63	708	932	27	416	1,177	31	1	3,292
1963–64	794	910	31	501	1,125	30	1	3,392
1964–65	850	966	55	444	1,152	28	1	3,497
PRODUCTION ('000 BUSHELS) (*a*)								
Average for three years ended—								
1938–39	4,065	4,781	65	2,575	4,159	810	6	16,461
1948–49	7,166	9,757	324	3,606	5,355	406	7	26,621
1958–59	12,619	14,140	547	7,911	15,606	409	10	51,242
Year—								
1960–61	21,466	20,666	285	11,478	21,810	391	11	76,107
1961–62	13,225	16,312	412	4,391	20,187	587	16	55,130
1962–63	16,035	27,042	545	5,770	18,572	828	17	68,809
1963–64	19,811	19,885	673	9,149	17,850	844	22	68,234
1964–65	22,885	22,446	1,171	8,977	14,011	521	32	70,043
YIELD PER ACRE (BUSHELS) (*a*)								
Average for three years ended—								
1938–39	13.7	10.0	8.1	7.6	9.8	3.1	24.3	10.5
1948–49	13.9	17.8	15.4	12.8	11.1	2.4	11.8	14.3
1958–59	16.7	19.2	18.9	17.8	13.3	20.5	22.5	16.2
Year—								
1960–61	23.5	24.7	15.0	22.4	16.4	16.8	20.9	20.9
1961–62	18.5	21.1	15.4	13.6	16.4	21.8	18.7	17.8
1962–63	22.7	29.0	20.0	13.9	15.8	26.6	25.6	20.9
1963–64	24.9	21.8	21.7	18.3	15.9	27.8	19.8	20.1
1964–65	26.9	23.2	21.1	20.2	12.2	18.5	21.6	20.0

(*a*) 40 lb. per bushel.

Graphs showing the area sown to oats and production of oats in Australia appear on pages 993 and 995 of Year Book No. 49, and a map showing the distribution of areas growing oats for grain throughout Australia in 1962–63 appears on page 1015 of Year Book No. 50. The area sown to oats from 1900–01 is shown in plate 52.

In 1964–65 the production of oats was 70,043,000 bushels, 16,862,000 bushels (19 per cent) below the record harvest of 86,905,000 bushels in 1958–59. The yield per acre in 1964–65 was 20.0 bushels, compared with the record yield of 21.9 bushels per acre established in 1958–59. The lowest yield recorded was 4.4 bushels per acre in the abnormally dry deason of 1944–45.

Value of oat crop

The average wholesale price in the Melbourne market for oats of good milling quality was 7s. 8d. ($0.77) a bushel in 1964–65, compared with 7s. 6d. ($0.75) in 1963–64. The estimated gross value of the oat crop in each State for the 1964–65 season and the value per acre were as follows.

OATS: VALUE OF CROP, STATES AND A.C.T., 1964-65

——	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	A.C.T.	Aust.
Aggregate value . $'000	18,766	16,237	1,005	5,044	9,888	478	31	51,449
Value per acre . $	22.07	16.80	18.12	11.37	8.58	17.02	20.85	14.71

Exports of oats

The production of oats in Australia is sufficient to allow for an export trade which fluctuates with the incentive offered by oversea prices. The quantities and values of Australian-produced oats exported from Australia during the years 1960–61 to 1964–65 are shown below.

OATS: EXPORTS, AUSTRALIA, 1960-61 TO 1964-65

——	1960–61	1961–62	1962–63	1963–64	1964–65
Quantity . . . '000 bus.	19,005	19,064	17,744	16,673	20,161
Value . . $A'000 f.o.b.	13,707	14,957	14,152	12,623	15,616

In 1964–65 the principal countries of destination were the Federal Republic of Germany (9,946,000 bushels), China (Mainland) (2,311,000 bushels), Poland (1,283,000 bushels), the Netherlands (1,227,000 bushels), and Italy (1,151,000 bushels). Imports of oats into Australia are not recorded separately.

Oatmeal and other oat products

In 1964–65 the production of oatmeal was 12,517 tons for porridge and 26,810 tons for other purposes. This was equivalent to about 4,405,000 bushels of oats.

World production of oats

The world production of oats for the year 1964, according to figures issued by the United States Department of Agriculture, amounted to 2,910 million bushels, harvested from 75.8 million acres, resulting in an average yield of 38.4 bushels an acre. This compared with an estimated production in the previous year of 3,180 million bushels from an area of 78.4 million acres and an average yield of 40.6 bushels an acre.

Barley

This cereal contains two main groups of varieties, 2-row and 6-row. The former is generally, but not exclusively, preferred for malting purposes. Barley was formerly stubble-sown, but is now grown principally on pasture land worked up early in the year of sowing. In this way it forms an important phase in the rotation of the land. Like oats, it may also be sown for fodder production or for grain. When sown for fodder, sowing may take place either early or late in the season, as it has a short growing period. It may thus provide grazing or fodder supplies when other sources are not available. Barley grain may be crushed to meal for stock (especially pigs) or sold for malting.

Crops sown for malting purposes require well-worked, weed-free paddocks of even soil, and are thus restricted to specific districts. The main barley-growing areas in Australia are situated in South Australia (Murray-Mallee, Eyre and Yorke Peninsulas), but considerable quantities are grown also in New South Wales, Victoria, Queensland, and Western Australia.

Barley boards

The bulk of the barley crop in the various States is acquired and marketed by grower-controlled boards. Pooled returns from sales are distributed to growers at standard rates for the individual grades and varieties delivered. The Victorian and South Australian crops are marketed by the Australian Barley Board (a joint board established by the two State Governments), and the Queensland and Western Australian Barley Boards handle the crops of their respective States. Particulars of the proportion of barley production which was received by the Australian Barley Board (for Victoria and South Australia), together with details of quantity sold, advances and total payments to growers, are presented below.

AUSTRALIAN BARLEY BOARD: BARLEY RECEIVED, SOLD, ETC. 1960–61 TO 1964–65

Pool	Quantity received	Quantity sold(*a*)	Total advances made per bushel on 2-row No. 1 Grade less freight	Total net payments to growers
	'000 bushels	'000 bushels	$	$'000
No. 22 (1960–61 Crop)	44,624	44,680	0.9272	33,978
,, 23 (1961–62 ,,)	20,081	20,059	1.1607	19,414
,, 24 (1962–63 ,,)	17,195	17,285	1.1563	16,666
,, 25 (1963–64 ,,)	23,145	23,204	1.1862	22,446
,, 26 (1964–65 ,,)	25,465	25,267	*b* 1.1000	22,714

(*a*) Includes surplus or shortage in out-turn, except for No. 26 Pool for which the surplus has not yet been ascertained. (*b*) As at 31 January 1966. At that date it was estimated that the amount still to be paid to growers was 7.754 cents per bushel.

Barley area, production and yield per acre

There was a substantial increase in the area of barley sown for grain (particularly in Western Australia and Queensland) in the years up to 1960–61, and in that year the area sown reached the record level of 2,830,000 acres. However, the area sown in 1964–65, 2,064,000 acres, was 27 per cent less than the area in 1960–61. The production of barley for grain in 1964–65, 49,315,000 bushels, although 14 per cent more than production in 1963–64, was 27 per cent less than the record production of 67,970,000 bushels in 1960–61. The area, production and yield per acre of barley for grain in the several States for the years 1960–61 to 1964–65, compared with the averages for the three-year periods ended 1938–39, 1948–49 and 1958–59 are shown in the following table. Separate details for 2-row and 6-row varieties are shown for all States for 1964–65.

BARLEY FOR GRAIN: AREA, PRODUCTION AND YIELD PER ACRE STATES AND A.C.T., 1936–37 TO 1964–65

Period	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	A.C.T.	Aust.
AREA ('000 ACRES)								
Average for three years ended—								
1938–39	13	138	10	391	53	8	..	613
1948–49	23	166	18	587	65	7	..	866
1958–59	73	354	184	1,255	324	8	..	2,198
Year—								
1960–61	190	309	219	1,556	541	15	..	2,830
1961–62	201	225	177	1,271	490	19	..	2,383
1962–63	221	194	150	1,053	390	19	..	2,027
1963–64	211	190	176	1,123	299	14	..	2,013
1964–65—								
2-row	148	177	203	1,053	58	15	..	1,655
6-row	91	10	22	42	245	..	..	409
Total	*239*	*187*	*225*	*1,095*	*303*	*15*	..	*2,064*

BARLEY FOR GRAIN: AREA, PRODUCTION AND YIELD PER ACRE STATES AND A.C.T., 1936–37 TO 1964–65—*continued*

Period	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	A.C.T.	Aust.
PRODUCTION ('000 BUSHELS)(*a*)								
Average for three years ended—								
1938–39	197	2,174	135	6,816	660	252	..	10,234
1948–49	316	3,149	375	11,964	748	194	..	16,746
1958–59	1,463	7,192	4,673	29,740	4,239	267	..	47,574
Year—								
1960–61	4,786	7,718	4,393	42,233	8,496	344	..	67,970
1961–62	4,137	4,654	3,532	21,292	7,282	607	..	41,504
1962–63	5,331	5,469	4,088	18,004	6,056	631	..	39,579
1963–64	5,351	4,025	5,191	24,337	4,077	414	..	43,395
1964–65—								
2-row	4,040	4,141	6,440	26,021	614	519	..	41,775
6-row	2,667	194	671	911	3,087	10	..	7,540
Total	*6,707*	*4,335*	*7,111*	*26,932*	*3,701*	*529*	..	*49,315*
YIELD PER ACRE (BUSHELS)(*a*)								
Average for three years ended—								
1938–39	15.2	15.7	13.5	17.4	12.5	31.5	52.3	16.7
1948–49	13.7	19.0	20.8	20.4	11.5	27.7	19.5	19.3
1958–59	20.0	20.3	25.4	23.7	13.1	33.4	..	20.7
Year—								
1960–61	25.3	25.0	20.0	27.1	15.7	22.5	..	24.0
1961–62	20.6	20.6	20.0	16.8	14.8	32.4	..	17.4
1962–63	24.2	28.1	27.3	17.1	15.5	31.9	..	19.5
1963–64	25.3	21.2	29.5	21.7	13.6	30.0	..	21.6
1964–65—								
2-row	27.3	23.4	31.7	24.7	10.6	34.3	..	25.2
6-row	29.4	20.0	30.0	21.8	12.6	29.0	..	18.4
Total	*28.1*	*23.2*	*31.6*	*24.6*	*12.2*	*34.2*	..	*23.9*

(*a*) 50 lb. per bushel.

For Australia, 80 per cent of the area of barley for grain in 1964–65 was sown with 2-row barley, while the remainder consisted of 6-row varieties. The proportion, however, varied considerably in the several States. The utilization of barley during the season ended November 1965 was as follows: exports, 16,360,000 bushels; malting and distilling, 13,000,000 bushels; pearl barley, 148,000 bushels; seed, 3,000,000 bushels.

The following table sets out the acreage and production of 2- and 6-row barley in Australia during the seasons 1960–61 to 1964–65 and the averages for the three years ended 1938–39, 1948–49 and 1958–59.

BARLEY FOR GRAIN, 2- AND 6-ROW: AREA AND PRODUCTION AUSTRALIA, 1936-37 TO 1964-65

Period	Area ('000 acres)			Production ('000 bushels)(*a*)			Yield per acre (bushels)(*a*)		
	2-row	6-row	Total	2-row	6-row	Total	2-row	6-row	Total
Average for three years ended—									
1938–39	523	90	613	8,963	1,271	10,234	17.1	14.1	16.7
1948–49	769	97	866	15,142	1,604	16,746	19.7	16.5	19.3
1958–59	1,809	389	2,198	41,633	5,941	47,574	23.0	15.3	20.7
Year—									
1960–61	(*b*)2,157	(*b*) 658	2,830	*b* 55,691	*b* 11,935	67,970	(*b*) 25.8	(*b*) 18.1	24.0
1961–62	(*b*)1,777	(*b*) 587	2,383	*b* 31,739	(*b*) 9,158	41,504	(*b*) 17.9	(*b*) 15.6	17.4
1962–63	1,553	474	2,027	31,370	8,209	39,579	20.2	17.3	19.5
1963–64	1,621	392	2,013	36,464	6,931	43,395	22.5	17.7	21.6
1964–65	1,655	409	2,064	41,775	7,540	49,315	25.2	18.4	23.9

(*a*) 50 lb. per bushel. (*b*) Excludes Tasmania.

A graph showing the production of barley in Australia since 1935–36 appears on page 995 of Year Book No. 49, and a map showing the distribution of barley growing areas throughout Australia in 1962–63 appears on page 1014 of Year Book No. 50.

Value of barley crop

The average wholesale price for 2-row English malting barley in the Melbourne market was 14s. 8d. ($1.47) a bushel in 1964–65, compared with 15s. 1d. ($1.51) in 1963–64. The estimated gross value of the barley crop in each State for the 1964–65 season and the value per acre are shown in the following table.

BARLEY FOR GRAIN: VALUE OF CROP, STATES, 1964-65

——		N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	Aust.
Aggregate value.	$'000	8,294	4,828	7,688	30,135	3,939	736	55,620
Value per acre .	$	34.71	25.83	34.12	27.53	13.02	47.55	26.95

Exports of barley

South Australia was the principal exporting State in 1964–65, and Japan, Italy, the Netherlands, the United Kingdom, and the Federal Republic of Germany were the principal countries to which barley was shipped. Particulars of exports of Australian produced barley for the years 1960–61 to 1964–65 are shown in the following table.

BARLEY: EXPORTS, AUSTRALIA, 1960–61 TO 1964–65

——		1960–61	1961–62	1962–63	1963–64	1964–65
Quantity .	'000 bus.	33,900	31,435	10,322	17,756	16,281
Value .	$A.'000 f.o.b.	28,657	29,908	10,458	18,298	18,002

In addition to exports of barley grain, there are also exports of Australian pearl and Scotch barley, the total for 1964–65 amounting to 496,424 lb., valued at $17,032, the main country of consignment being Malaysia. Imports of barley into Australia are not recorded separately, but are considered to be negligible.

Barley malt

Details of the quantity of grain used and the production of barley malt in the years 1960–61 to 1964–65 are given in the following table.

BARLEY MALT: GRAIN USED AND MALT PRODUCED, AUSTRALIA 1960–61 TO 1964–65

——		1960–61	1961–62	1962–63	1963–64	1964–65
Grain used . .	'000 bus.(*a*)	9,090	10,445	10,229	12,036	11,802
Malt produced .	'000 bus.(*b*)	9,015	10,207	10,429	11,988	12,127

(*a*) 50 lb. per bushel. (*b*) 40 lb. per bushel.

Since 1952–53 the production of malt in Australia has been sufficient to meet local requirements and to provide a margin for export. Exports of Australian produce amounting to 4,076,000 bushels (value $7,808,000) and 4,058,000 bushels (value $7,842,000) were recorded in 1963–64 and 1964–65 respectively.

World production of barley

In comparison with the barley production of other countries that of Australia is extremely small. The main producers in 1964 were the Union of Socialist Soviet Republics, the United States of America and the United Kingdom. China is also normally a major producer, but details for 1964 are not available. Australian production in that year was approximately 1 per cent of the world total.

According to estimates made by the United States Department of Agriculture, world production of barley in the year 1964 amounted to 4,080 million bushels harvested from 156.8 million acres, equivalent to a yield per acre of 26.0 bushels. This compared with the production of 4,075 million bushels in the previous year from 162.1 million acres, and a yield per acre of 25.1 bushels.

Sorghum

Grain sorghum is a summer-growing annual palatable to stock, and more drought- and frost-resistant than maize. It requires a summer rainfall. The growing of this crop for grain on an extensive scale is a comparatively recent development in Australia, and, as with other cereals, operations are highly mechanized.

The climatic conditions of Queensland and northern New South Wales are particularly suited to the growing of sorghum, and development has so far been restricted mainly to these areas, more particularly to Queensland. The grain produced is fed to livestock and has become an important source for supplementing other coarse grains for this purpose. Other sorghums are grown in Australia mainly as green fodder, hay and silage (sweet sorghums and Sudan grass) and for the production of brush for broom manufacture (broom millet). In Queensland the growing of grain sorghum is concentrated in the Burnett, Dawson-Callide areas and in the central highlands. In New South Wales the north western slopes and Murrumbidgee Irrigation Area are the main areas. This crop is also suitable for the semi-tropical areas of the Northern Territory and the Kimberleys.

Particulars of the area and production of sorghum grown for grain in recent years are given in the following table.

GRAIN SORGHUM: AREA, PRODUCTION AND YIELD PER ACRE, STATES
1960-61 TO 1964-65

Year	Area			Production(*a*)			Yield per acre(*a*)		
	N.S.W.	Qld	Aust. (*b*)	N.S.W.	Qld	Aust. (*b*)	N.S.W.	Qld	Aust. (*b*)
	acres	acres	acres	'000 bushels	'000 bushels	'000 bushels	bushels	bushels	bushels
1960–61 .	41,145	213,761	255,109	577	5,418	5,996	14.0	25.3	23.5
1961–62 .	70,134	292,397	362,666	1,308	8,054	9,361	18.6	27.5	25.8
1962–63 .	80,255	311,068	391,334	1,891	8,361	10,252	23.6	26.9	26.2
1963–64 .	61,203	303,857	365,708	1,269	6,612	7,889	20.7	21.8	21.6
1964–65 .	51,699	292,769	345,737	1,270	5,883	7,164	24.6	20.1	20.7

(*a*) 60 lb. per bushel. Production in New South Wales and Queensland harvested from crop sown in previous year. (*b*) Includes small areas sown and quantities produced in other States.

Maize

Like sorghum, maize is a summer cereal demanding specific soil and climatic conditions. For grain, it is grown almost entirely in the south-east and Atherton Tablelands of Queensland and the north coast and northern tablelands of New South Wales. On the Atherton Tablelands in Queensland, and generally in New South Wales and Victoria, it provides a stock feed for dairy cattle, fat stock and pigs. In times of drought it is used also as a sheep feed. In all States except South Australia, however, this crop is grown to some extent for green fodder and silage, particularly in connection with the dairying industry. There is practically no difference between grain and fodder varieties.

There has been a considerable increase in recent years in the growing of maize from hybrid strains of seed. Varieties have been developed which are capable of producing yields per acre considerably in excess of the older open pollinated types. The expansion in areas sown to hybrid maize has led to a parallel development in the specialized industry of growing hybrid strains for seed.

Maize area, production and yield per acre

The area, production and yield per acre of maize for grain in each State for the years 1960–61 to 1964–65 compared with the averages for the three-year periods ended 1938–39, 1948–49 and 1958–59 are given in the following table. Separate details for hybrid and other varieties are shown for all States except Western Australia for 1964–65.

MAIZE FOR GRAIN: AREA, PRODUCTION AND YIELD PER ACRE STATES AND A.C.T., 1936–37 TO 1964–65

Period	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	A.C.T.	Aust.
AREA (ACRES)								
Average for three years ended—								
1938–39	121,178	19,826	179,641	20	16	..	6	320,687
1948–49	91,612	7,511	122,263	1	87	6	1	221,481
1958–59	57,662	3,629	120,417	(a)	13	1	2	(b)181,724
Year—								
1960–61	49,269	2,985	132,382	(a)	6	..	..	(b)184,642
1961–62	51,434	3,309	155,780	..	17	..	..	210,540
1962–63	46,537	3,634	159,285	(a)	34	..	..	(b)209,490
1963–64	44,679	3,399	166,598	(a)	85	..	..	(b)214,761
1964–65—								
Hybrid	36,655	2,148	137,688	..	(c)	..	..	(b)176,491
Other	5,005	205	30,612	..	10	..	..	35,832
Total	*41,660*	*2,353*	*168,300*	..	*10*	..	..	*212,323*
PRODUCTION ('000 BUSHELS)(d)								
Average for three years ended—								
1938–39	3,204	665	3,170	1	..	..	..	7,040
1948–49	2,446	314	2,960	..	1	..	..	5,721
1958–59	2,347	175	3,428	(a)	..	..	..	(b) 5,950
Year—								
1960–61	2,227	171	3,847	(a)	..	..	..	(b) 6,245
1961–62	2,349	192	4,766	..	..	..	..	7,307
1962–63	2,145	216	5,096	(a)	..	..	..	(b) 7,457
1963–64	2,089	204	4,427	(a)	2	..	..	(b) 6,722
1964–65—								
Hybrid	1,699	108	4,089	..	..	..	..	5,896
Other	179	6	798	..	..	..	..	983
Total	*1,878*	*114*	*4,887*	..	..	..	..	*6,879*
YIELD PER ACRE (BUSHELS) (d)								
Average for three years ended—								
1938–39	26.4	33.5	17.6	43.7	12.3	..	10.2	22.0
1948–49	26.7	41.8	24.2	6.7	7.2	14.8	13.7	25.8
1958–59	40.7	48.2	28.5	(a)	16.8	30.0	..	(b) 32.7
Year—								
1960–61	45.2	57.3	29.1	(a)	1.0	..	..	(b) 33.8
1961–62	45.7	58.0	30.6	..	21.9	..	..	34.7
1962–63	46.1	59.5	32.0	(a)	12.2	..	..	(b) 35.6
1963–64	46.8	59.8	26.6	(a)	18.5	..	..	(b) 31.3
1964–65—								
Hybrid	46.4	50.2	29.7	..	(c)	..	..	(b) 33.4
Other	35.7	30.6	26.1	..	15.6	..	..	27.4
Total	*45.1*	*48.5*	*29.0*	..	*15.6*	..	..	*32.4*

(a) Not available for publication. (b) Incomplete. (c) Included in Other maize. (d) 56 lb. per bushel. Production in New South Wales and Queensland harvested from crop sown in previous year.

The average yield for Australia for the five-year period ended 1964–65 was 33.5 bushels per acre. Among principal producing countries, the United States of America averaged 62.1 bushels per acre and the U.S.S.R. 28.6 bushels for 1964.

Value of maize crop

The average wholesale price of maize in the Melbourne market in 1964–65 was 18s. 11d. ($1.89) a bushel compared with 18s. 9d. ($1.88) in 1963–64. The estimated gross value of the crop in each State for the 1964–65 season and the value per acre were as follows.

MAIZE FOR GRAIN: VALUE OF CROP, STATES, 1964–65

—		N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	Aust.
Aggregate value	$'000	2,949	213	6,837	..	..	..	9,999
Value per acre	$	70.79	90.52	40.62	..	..	..	47.09

Exports of maize and maize products

Exports of Australian-produced maize for the years 1960–61 to 1964–65 are shown hereunder.

MAIZE: EXPORTS, AUSTRALIA, 1960–61 TO 1964–65

		1960–61	1961–62	1962–63	1963–64	1964–65
Quantity	'000 bus.	3	2	552	14	20
Value	$A'000 f.o.b.	8	6	480	27	42

The increase in exports of maize in 1962–63 was due principally to the shipment of 474,000 bushels to Japan, a country to which there had been no previous exports. Imports of maize into Australia are not recorded separately, but are considered to be negligible.

World production of maize

According to figures issued by the United States Department of Agriculture, world production of maize in the year 1964 amounted to 7,735 million bushels, harvested from 244 million acres, giving an average yield per acre of 31.7 bushels. This compared with production in the previous year of 8,030 million bushels from 245 million acres, and an average yield of 32.7 bushels per acre.

The United States of America is the most important maize-producing country in the world, and during the three years ended 1964 the area sown to maize in that country averaged 58 million acres or 24 per cent. of the world total. During the same period production averaged 3,759 million bushels or 49 per cent. of the world total.

Rice

The principal rice-growing areas of the world are confined almost entirely to Asia, although limited quantities are grown in other countries. In Australia rice was first cultivated at the Yanco Experimental Farm in New South Wales, but it was not grown commercially until 1924–25, when 16,240 bushels were produced from 153 acres. Favoured by high average yields and protected by tariff, rice culture made rapid progress in the Murrumbidgee Irrigation Area until local requirements were met and a surplus became available for export. The acreage sown in this area is controlled, as the quantity of water available is limited.

Until recent years rice-growing in Australia was practically confined to the Murrumbidgee Irrigation Area in New South Wales. However, there is now some experimental rice-growing in Western Australia and the Northern Territory, but particulars are not available for publication. Small quantities have also been produced in Queensland in some years. The bulk of Australia's exports of rice in 1964–65 was shipped to Papua and New Guinea, the Pacific Islands and the United Kingdom. Details relating to area, production, and Australian-produced exports for the years 1960–61 to 1964–65 are shown in the following table.

RICE: AREA, PRODUCTION AND EXPORTS, AUSTRALIA(*a*)
1960–61 TO 1964–65

Year	No. of holdings growing rice(*b*)	Area	Production (paddy rice)		Average yield (paddy) per acre	Exports(*c*)	
			Quantity	Gross value(*d*)		Uncleaned	Cleaned
		acres	'000 bushels (*e*)	$'000	bushels (*e*)	cwt.	cwt.
1960–61	787	46,117	6,001	8,250	130.1	359,440	876,175
1961–62	878	50,185	7,045	7,664	140.4	280,540	748,920
1962–63	956	54,929	7,129	7,676	129.8	239,820	905,580
1963–64	1,033	59,398	7,455	7,912	125.5	198,820	918,340
1964–65	1,074	61,617	8,030	8,529	130.3	216,240	1,058,080

(*a*) Particulars of area and production for Western Australia and the Northern Territory are not available for publication, and are excluded. (*b*) Twenty acres or more in area. (*c*) Imports into Australia are not recorded separately, but are considered to be negligible. (*d*) Excludes the value of straw. (*e*) 42 lb. per bushel.

Fodder crops

Hay

Because of the comparatively unreliable nature of rainfall in Australian agricultural and pastoral areas, hay as a fodder crop occupies a position of importance. In 1964–65 hay represented 8 per cent of the total area of crops. Up to 1946-47 hay, in terms of area, was second only to wheat for grain, but in more recent years it has been supplanted by green fodder (for feeding-off) and oats for grain. Hay is generally considered to include cereal hay, meadow hay and lucerne hay. Cereal crops cut early for hay contain a higher level of protein than those cut late.

In most European countries hay is made almost entirely from meadow pastures, but in Australia a very large proportion is made from cereals and lucerne, the hay being stored loose, in sheaves or baled. Because of its bulk, hay is usually produced for individual or local use, except in times of drought, when large inter-regional transfers may take place. Meadow hay requires greater care in preparation than cereal hay. Baling must be spaced carefully behind mowing to ensure that the bales are dry enough to prevent moulding, but not so dry as to result in excessive leaf loss. The leaves contain the bulk of the protein. Lucerne hay requires similar attention.

The area, production and yield per acre of hay of all kinds in the several States during the years 1960–61 to 1964–65 and the averages for the three-year periods ended 1938–39, 1948–49 and 1958–59 are shown below.

HAY: AREA, PRODUCTION AND YIELD PER ACRE, STATES AND TERRITORIES 1936-37 TO 1964-65

Season	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
AREA ('000 ACRES)									
Average for three years ended—									
1938–39	859	1,122	67	540	439	81	..	3	3,111
1948–49	516	642	66	287	245	93	..	3	1,852
1958–59	556	978	64	336	305	129	..	4	2,372
Year—									
1960–61	750	1,286	84	393	284	171	1	4	2,973
1961–62	594	922	95	209	294	157	1	2	2,274
1962–63	587	1,251	87	287	340	165	1	2	2,720
1963–64	584	1,138	80	358	289	150	1	2	2,602
1964–65	600	1,306	82	314	305	180	1	3	2,793
PRODUCTION ('000 TONS)									
Average for three years ended—									
1938–39	975	1,181	94	591	434	120	..	3	3,398
1948–49	618	987	119	396	275	153	..	4	2,552
1958–59	752	1,712	129	476	377	248	..	7	3,701
Year—									
1960–61	1,243	2,338	167	616	380	326	1	8	5,079
1961–62	923	1,585	212	286	396	286	..	5	3,693
1962–63	965	2,376	197	406	453	313	1	6	4,717
1963–64	1,006	1,947	184	488	389	249	1	5	4,269
1964–65	1,040	2,506	167	487	390	365	1	7	4,963
YIELD PER ACRE (TONS)									
Average for three years ended—									
1938–39	1.14	1.05	1.40	1.09	0.99	1.48	..	1.00	1.09
1948–49	1.20	1.54	1.80	1.38	1.12	1.65	..	1.33	1.38
1958–59	1.35	1.75	2.02	1.42	1.24	1.92	0.54	1.75	1.56
Year—									
1960–61	1.66	1.82	1.98	1.57	1.34	1.91	0.78	2.12	1.71
1961–62	1.55	1.72	2.22	1.37	1.35	1.82	0.76	2.18	1.62
1962–63	1.64	1.90	2.27	1.41	1.33	1.89	1.21	2.38	1.73
1963–64	1.72	1.71	2.30	1.37	1.35	1.67	1.02	1.71	1.64
1964–65	1.73	1.92	2.19	1.55	1.28	2.02	1.11	1.99	1.78

Plate 52 shows the area under hay since 1900–01.

Information regarding areas cut for hay and varieties grown in 1964–65 is given in the following table.

HAY: AREA OF VARIOUS KINDS GROWN, STATES AND TERRITORIES
1964–65
(Acres)

State or Territory	Oaten	Lucerne	Wheaten	Other	Total
New South Wales	65,832	179,877	61,529	292,583	599,821
Victoria	163,101	80,391	23,221	1,039,653	1,306,366
Queensland	5,896	57,759	3,410	15,354	82,419
South Australia	110,128	43,631	39,777	120,782	314,318
Western Australia	120,993	1,570	38,869	143,178	304,610
Tasmania	13,575	1,151	233	165,297	180,256
Northern Territory	..	..	..	1,280	1,280
Australian Capital Territory	461	1,390	114	1,504	3,469
Australia	**479,986**	**365,769**	**167,153**	**1,779,631**	**2,792,539**

For all States and the Territories combined, the proportions of the areas sown to the principal kinds of hay in 1964–65 were 17.2 per cent for oaten, 13.1 per cent for lucerne, 6.0 per cent for wheaten, and 63.7 per cent for other hay.

The following table shows the estimated gross value, and the value per acre, of the hay crop of the several States for the 1964–65 season.

HAY: VALUE OF CROP, STATES AND A.C.T., 1964–65

——		N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	A.C.T.	Aust.
Aggregate value	$'000	25,400	44,063	7,265	8,336	9,287	4,654	154	(a)99,209
Value per acre	$	42.35	33.73	88.15	26.52	30.49	25.82	44.39	35.53

(a) Includes $50,000 in the Northern Territory.

Farm stocks of hay

Particulars of stocks of hay held on farms at 31 March for the years 1961 to 1965 are given in the table below.

STOCKS OF HAY HELD ON FARMS, STATES AND A.C.T.
1961 TO 1965
(Tons)

At 31 March—	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	A.C.T.	Aust.(a)
1961	1,704,486	2,640,249	155,209	648,267	258,859	327,696	12,338	5,747,104
1962	1,775,977	1,847,725	231,335	496,564	254,377	305,108	12,241	4,923,327
1963	1,609,639	2,197,725	194,948	470,202	273,500	333,650	6,896	5,086,560
1964	1,610,063	1,911,475	179,422	547,354	274,812	276,650	5,085	4,804,861
1965	1,586,969	2,402,299	145,737	614,451	275,948	414,415	7,606	5,447,425

(a) Excludes the Northern Territory, for which particulars are not available.

Under normal conditions, hay, whether whole or in the form of chaff, is somewhat bulky for oversea trade, and consequently does not figure largely among Australian exports. During 1964–65 exports amounting to 4,174 tons, valued at $171,434, were made, principally to Malaysia, Kuwait and Hong Kong. There were no imports of hay in 1964–65.

Green fodder

Considerable areas are devoted to the growing of green fodder, usually as an adjunct to cereal operations or as a minor crop in irrigation areas. The areas recorded in respect of green fodder include areas of crops cut for feeding to live stock as green fodder or ensilage, together

with areas fed off to stock as green forage. Statistics of green fodder exclude areas which may have been sown with the intention of harvesting for grain, but which, owing to adverse conditions, showed no promise of producing grain or even hay and were fed off to livestock. The principal crops cut for green fodder are oats, wheat and lucerne, while small quantities of barley, sorghum, maize, rye, and sugar cane are also used in this way. In 1964–65 the area under green fodder (5,613,527 acres) consisted of lucerne (2,424,815 acres), oats (2,321,730 acres), wheat (173,348 acres), barley (139,345 acres), sorghum (120,853 acres), maize (28,779 acres), rye (21,471 acres), sugar cane (2,404 acres), and other crops (380,782 acres). Particulars concerning the area of green fodder in the several States during each of the years 1960–61 to 1964–65 are given in the following table.

GREEN FODDER: AREA, STATES AND TERRITORIES, 1960–61 TO 1964–65

('000 acres)

Year	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
1960–61	1,691	431	875	744	606	60	..	1	4,408
1961–62	1,830	539	865	787	622	57	1	1	4,702
1962–63	1,900	478	912	928	668	65	..	1	4,952
1963–64	1,974	431	1,011	972	417	71	..	1	4,877
1964–65	2,397	454	1,111	1,135	446	67	1	1	5,614

In the 1964–65 season green fodder ranked second to wheat in area of crops throughout Australia. A graph showing the area sown to green fodder appears on plate 52. The value of these crops is variously estimated in the several States, but the Australian total, excluding Western Australia, may be taken as approximately $21,000,000 for the 1963–64 season and $25,000,000 for the 1964–65 season.

Ensilage

Ensilage is produced from herbage compacted tightly to exclude air and kept from contact with air and extraneous moisture to avoid moulding. Fermentation results in a dark mass of high protein and lactic acid content. Molasses may be added to hasten fermentation. Ensilage may be stored in pits or stacks or in constructed silos.

The several State Governments devote a considerable amount of attention to the education of the farming community with regard to the value of ensilage. Monetary aid is afforded in the erection of silos, and expert advice is supplied in connection with the design of the silos and the cutting and packing of the ensilage. Information regarding production and farm stocks of ensilage for the years ended 31 March 1961 to 1965 is given in the following table.

ENSILAGE: PRODUCTION AND FARM STOCKS, STATES AND A.C.T. 1960–61 TO 1964–65

(Tons)

Period	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	A.C.T.	Aust.
Production during—								
1960–61 season	256,459	303,198	51,198	100,727	50,911	72,344	80	834,917
1961–62 ,,	196,625	261,884	73,838	52,451	51,364	77,781	700	714,643
1962–63 ,,	210,653	295,914	63,489	64,206	48,806	68,117	290	751,475
1963–64 ,,	222,126	252,837	53,160	88,183	37,238	43,760	270	697,574
1964–65 ,,	182,063	250,997	34,440	78,709	26,798	54,438	400	627,845
Farm stocks at—								
31 March 1961	499,244	231,315	117,749	79,269	43,518	46,570	80	1,017,745
,, ,, 1962	567,801	181,383	139,788	68,614	37,224	60,157	1,305	1,056,272
,, ,, 1963	602,585	263,440	146,286	63,315	37,415	61,110	1,768	1,175,919
,, ,, 1964	565,457	185,115	139,691	78,997	29,709	43,554	1,108	1,043,631
,, ,, 1965	534,730	206,304	112,596	86,093	24,160	49,668	892	1,014,443

Sugar cane

The growing of sugar cane is restricted to those coastal areas in Queensland and northern New South Wales which have suitable climatic and soil conditions. Considerable areas in more southern coastal districts of New South Wales previously devoted to this crop are now used for dairying owing to the uncertainty of rainfall.

The Bureau of Sugar Experiment Stations in Queensland and the Colonial Sugar Refining Company Limited render useful service to the sugar industry by advocating and demonstrating better methods of cultivation and the more scientific use of fertilizers, lime, etc. and by producing and distributing improved varieties of cane. In common with these two organizations, Sugar Research Ltd., of Mackay, undertakes technological research in raw sugar milling practices.

Sugar agreements and marketing arrangements in Australia

In Year Book No. 37, pages 940–1, a summary is given of the agreement operating between the Commonwealth and Queensland Governments in respect of the sugar industry in Australia. Briefly, the agreement places an embargo on sugar importations and fixes the price of sugar consumed in Australia. The current agreement is for the period from 1 September 1961 to 31 August 1967. The Commonwealth Government appointed a Committee of Enquiry in 1960 to investigate all facets of the sugar and canned fruits industries. The Committee presented its report, publication of which was restricted to a summary of conclusions and recommendations, in 1961. There was no variation of the consequent agreement.

Production of sugar is regulated under the terms of the agreement. At the mill level control is exerted by means of seasonal ' mill peaks ' in respect of Queensland mills and a proportionate allowance for New South Wales mills. The combined total equals the estimated requirements of the domestic and export markets. Farm production is regulated according to the limit on the mill which the farm supplies. Up to the end of 1961 exports were limited by the export quota provisions of the International Sugar Agreement, but these provisions have not been operative since then (*see* below).

The Queensland Government acquires the whole of the sugar production of that State and of New South Wales by legislation and private agreement respectively. The net proceeds of all sugar sold are pooled and a uniform price paid to mills. In 1963 a Queensland Government Committee of Enquiry recommended that the industry should expand production to 2.26 million tons (of 94 net titre sugar) by 1965–66, of which New South Wales might produce 132,000 tons. This recommendation has been implemented, although seasonal conditions have so far prevented the attainment of the target.

International Sugar Agreement

The International Sugar Agreement of 1937 was superseded by the International Sugar Agreements of 1953 and 1958. Details of the 1937 and 1953 Agreements were given in Year Books No. 40, pages 881–2, and No. 48, page 936, respectively. The 1958 Agreement, which came into operation on 1 January 1959, established basic export quotas for exporting countries. The British Commonwealth was allocated a total quota, the distribution of which remained a matter for internal arrangement by the countries and territories concerned (*see* below). The Australian quota for 1960 and 1961 was approximately 651,000 tons per annum.

The quota and price provisions of the International Sugar Agreement were subject to review before 31 December 1961. A conference in Geneva in 1961 failed to reach agreement on quota provisions for 1962 and 1963. The conference adjourned with a resolution that it be reconvened if circumstances became favourable for an agreement on quotas. The principal practical effect of the adjournment of the 1961 conference was that former export limitations on participating exporting countries, including Australia, did not apply until such time as agreement on this question was again reached at a resumed session of that conference or at a newly convened conference.

The question of convening a United Nations conference to consider re-introduction of an agreement with quota provisions was deferred at a meeting of the International Sugar Council in April 1963. The 1958 Agreement, in its restricted form, was extended by protocol until 31 December 1965.

A United Nations conference was convened at Geneva in September 1965. The conference did not negotiate a new Agreement but extended the 1958 Agreement, in its currently restricted form, until 31 December 1966. Arrangements for a second session of the conference are being negotiated.

British Commonwealth Sugar Agreement

On 1 January 1953 the British Commonwealth Sugar Agreement became effective. This agreement, which has been extended to 1973, provides for Australia to export to preferential markets a maximum of 600,000 tons per annum. Of the 600,000 tons, 335,000 tons are purchased by the United Kingdom Government at a regularly negotiated price and the balance is sold at world market prices plus tariff preferences where applicable. The negotiated price of £Stg.42 a ton bulk f.o.b. and stowed payable for Australian raws in 1965 has been increased to £Stg.43 10s. a ton for 1966, 1967 and 1968.

Fruit Industry Sugar Concession Committee and sugar rebates

The Fruit Industry Sugar Concession Committee was established by agreement between the Commonwealth and Queensland Governments and administers a fund contributed by the Queensland Government on behalf of the sugar industry.

Until 15 May 1960 a rebate of £2 4s. ($4.40) a ton of refined sugar used in processing approved fruit products was paid to Australian manufacturers, provided they bought the fresh fruit at prices not lower than those declared by the Committee as reasonable. This was increased to £5 ($10) a ton from 16 May 1960.

An export sugar rebate is also paid by the Committee to exporters of approved fruit products to ensure that manufacturers do not pay higher prices for the Australian sugar content than the price for which the cheapest imported sugar could be landed duty free in Australia. The Queensland Government is responsible for payment of a similar rebate to exporters of other approved products. Payment of the export sugar rebate in respect of approved fruit products has been made conditional upon such fruit having been purchased at not less than the prices (if any) which the Committee has declared to be reasonable at the time of purchase.

Under the Sugar Agreement for 1961–67 the Queensland Government contributes to the fund $528,000 annually, reimburses the Committee for the actual expenditure on export sugar rebates, and, by a supplementary agreement operating from 1 September 1962, pays the Committee an additional sum equal to the amount payable by way of domestic sugar rebate in respect of the products exported. Any money remaining in the fund after the payment of rebates and administrative expenses may be used by the Committee for the promotion of the use and sale of fruit products, or for research for the purpose of increasing the yield per acre of Australian fruit, or of obtaining information regarding Australian fresh marketable fruits.

Bulk handling of sugar

The total conversion of the Australian sugar industry to bulk handling and mechanized loading and unloading of raw sugar has now been accomplished, except for the operation of a bagging station specially provided at Townsville to meet the needs of a few oversea customers. Terminals for the bulk loading of sugar were opened at Mackay in 1957, at Lucinda and Bundaberg in 1958, at Townsville in 1959, at Mourilyan in 1960, and at Cairns in 1964. A second storage shed at Bundaberg, a third shed at Mackay and second sheds at Lucinda and Townsville have been opened subsequently. The comparatively small New South Wales sugar industry was converted to bulk handling in 1954. Bulk receiving facilities are in operation at all Australian refineries.

Area of sugar cane

A brief outline of the development of the industry was included in earlier issues of the Year Book (*see* No. 38, page 985). The area of sugar cane in Australia for the seasons 1960–61 to 1964–65 and the averages for the three-year periods ended 1938–39, 1948–49 and 1958–59 are shown in the following table. The areas shown in the table do not include the small acreage cut for green fodder, which in 1964–65 amounted to 2,404 acres. The whole area planted is not cut for crushing during any one season, there being always a considerable amount of young and 'stand-over' cane as well as a small quantity required for plants.

SUGAR CANE: AREA(*a*), STATES, 1936-37 TO 1964-65

(Acres)

Period	New South Wales			Queensland			Australia			
	Area crushed	Area of stand-over and newly-planted cane	Area cut for plants	Area crushed	Area of stand-over and newly-planted cane	Area cut for plants	Area crushed	Area of stand-over and newly-planted cane	Area cut for plants	Total
Average for three years ended—										
1938–39	10,468	10,366	n.a.	247,632	89,690	n.a.	258,100	100,056	n.a.	n.a.
1948–49	7,687	8,666	338	230,905	90,448	12,891	238,592	99,114	13,229	350,935
1958–59	11,094	9,462	619	360,709	110,786	12,596	371,803	120,248	13,215	505,266
Year—										
1960–61	13,657	11,385	568	327,246	110,704	11,574	340,903	122,089	12,142	475,134
1961–62	14,655	11,299	482	372,223	87,831	12,339	386,878	99,130	12,821	498,829
1962–63	14,109	12,656	495	387,477	80,438	11,313	401,586	93,094	11,808	506,488
1963–64	15,508	14,204	594	402,060	93,149	13,205	417,568	107,353	13,799	538,720
1964–65	19,429	17,043	728	450,956	126,906	12,896	470,385	143,949	13,624	627,958

(*a*) Excludes areas cut for green fodder.

Production of cane and sugar

The production of sugar cane in 1964–65 was at the record level of 15.1 million tons, which was 18.3 per cent above the previous record production in 1962–63. A graph showing the production of sugar appears on page 995 of Year Book No. 49.

In the following table production data relating to cane and raw sugar are shown for the seasons 1960–61 to 1964–65 together with averages for the three-year periods ended 1938–39, 1948–49 and 1958–59.

SUGAR CANE: PRODUCTION OF CANE AND RAW SUGAR, STATES 1936-37 TO 1964-65

(Tons)

Period	New South Wales		Queensland		Australia	
	Cane	Sugar(*a*)	Cane	Sugar(*a*)	Cane	Sugar(*a*)
Average for three years ended—						
1938–39	324,531	43,419	5,215,217	760,994	5,539,748	804,413
1948–49	283,613	35,444	4,767,291	700,053	5,050,904	735,497
1958–59	356,324	43,881	9,221,497	1,260,564	9,577,821	1,304,445
Year—						
1960–61	480,147	62,978	8,685,426	1,319,633	9,165,573	1,382,611
1961–62	555,858	67,448	9,020,734	1,315,393	9,576,592	1,382,841
1962–63	637,310	79,733	12,098,582	1,770,084	12,735,892	1,849,817
1963–64	617,402	75,980	11,500,672	1,648,273	12,118,074	1,724,253
1964–65	784,126	95,195	14,286,350	1,854,883	15,070,476	1,950,078

(*a*) Raw sugar at 94 net titre.

Owing to climatic variations the crop in New South Wales matures in from twenty to twenty-four months, whereas in Queensland a period of from twelve to sixteen months is sufficient. The average yields of cane and sugar per acre for the years 1960–61 to 1964–65 and for the three-year periods ended 1938–39, 1948–49 and 1958–59 are shown below. Allowance should be made in interpreting these figures for the disparity in maturing periods noted above.

SUGAR CANE AND SUGAR: YIELD PER ACRE, STATES, 1936–37 TO 1964–65

(Tons)

Period	New South Wales			Queensland			Australia		
	Cane per acre crushed	Sugar per acre crushed	Cane to each ton of sugar	Cane per acre crushed	Sugar per acre crushed	Cane to each ton of sugar	Cane per acre crushed	Sugar per acre crushed	Cane to each ton of sugar
Average for three years ended—									
1938–39	31.00	4.15	7.47	21.06	3.07	6.85	21.46	3.12	6.89
1948–49	36.90	4.61	8.00	20.65	3.03	6.81	21.17	3.08	6.87
1958–59	32.12	3.96	8.12	25.57	3.49	7.32	25.76	3.52	7.34
Year—									
1960–61	35.16	4.61	7.62	26.54	4.03	6.58	26.89	4.06	6.63
1961–62	37.93	4.60	8.24	24.23	3.53	6.86	24.75	3.57	6.93
1962–63	45.17	5.65	7.99	31.22	4.57	6.84	31.71	4.61	6.88
1963–64	39.81	4.90	8.13	28.60	4.10	6.98	29.02	4.13	7.03
1964–65	40.36	4.90	8.24	31.68	4.11	7.70	32.04	4.15	7.73

Production and utilization of sugar

Details of the production and utilization of sugar for the years 1960–61 to 1964–65 are shown below. Consumption is shown in terms of refined sugar, including that consumed in manufactured products.

SUGAR: PRODUCTION AND UTILIZATION, AUSTRALIA 1960-61 TO 1964-65

Year	Changes in stocks(*a*)	Production (raw)	Exports (*b*)	Miscellaneous uses(*c*)	Consumption in Australia(*d*)	
					Total	Per head
	'000 tons	'000 tons	'000 tons	'000 tons	'000 tons	lb.
1960-61	− 10.3	1,324.8	815.6	21.0	498.5	107.4
1961-62	− 4.8	1,404.2	862.5	18.0	528.5	111.6
1962-63	+111.9	1,831.6	1,175.8	17.8	526.1	109.0
1963-64	− 65.3	1,648.7	1,156.0	21.3	536.7	109.0
1964-65	− 6.6	1,880.0	1,308.1	24.2	554.3	110.4

(*a*) Includes allowance for estimated sugar content of imported foodstuffs. (*b*) Includes sugar content of manufactured products exported. (*c*) Includes refining losses and quantities used in golden syrup and treacle. (*d*) Includes sugar content of manufactured products consumed.

The quantity of refined sugar used in factories in 1964-65 amounted to 359,690 tons compared with 339,507 tons in 1963-64 and 351,973 tons in 1962-63. Particulars of sugar used in establishments not classified as factories are not available, and consequently these quantities are deficient to that extent. In 1964-65 consumption by factories engaged in the production of jams, jellies and preserved and dried fruit amounted to 72,809 tons, by those producing confectionery, ice cream, etc. to 69,632 tons, by breweries to 49,415 tons, and by factories producing aerated waters, cordials, etc. to 56,226 tons.

Sugar by-products

Industrial chemicals, together with large quantities of molasses, are produced as by-products in sugar mills. Further, during the period 1939 to 1960 building boards were made from the residue of crushed fibre after removal of the sugar content from sugar cane. These boards possessed high insulating and sound absorbing properties which made them particularly suitable for use in walls and ceilings. Early in the period referred to the boards were manufactured almost entirely from crushed fibre residue, the remaining component being non-millable pine, but gradually the pine content was increased until by 1960 fibre residue was no longer being used. The main purpose for which crushed cane fibre residue is now used is furnace fuel in sugar mills.

Sugar prices and returns

The prices of sugar in Australia from 1960 to 1964 (as determined under the Sugar Agreement in Australia—*see* page 914) and details of net returns for raw sugar from 1960-61 to 1964-65, are shown in the following tables.

SUGAR: PRICES IN AUSTRALIA, 1960 TO 1964

Year	Raw sugar, 94 net titre			Refined sugar		
	Average return per ton received by millers and growers for—			Date of determination	Wholesale price to retailer per ton	Retail price, capital cities per lb.
	Home consumption	Exports(*a*)	Whole crop (*a*)			
	$	$	$		$	$
1960	125.05	79.95	98.21	14.5.56 to 15.5.60	164.10	0.08
1961	124.95	75.50	96.43	16.5.60	180.52	0.09
1962	125.10	82.18	95.98			
1963	122.00	131.22	127.97			
1964	120.75	83.89	95.78			

(*a*) Includes 'excess' sugar.

RAW SUGAR(*a*): NET RETURNS, AUSTRALIA, 1960–61 TO 1964–65

(*Source:* The Queensland Sugar Board)

Year	Proportion exported	Net value of exports per ton	Average price per ton for whole crop	Estimated value of crop
	per cent	$	$	$'000
1960–61	59.53	79.95	98.21	135,738
1961–62	57.66	75.50	96.43	133,306
1962–63	67.85	82.18	95.98	177,496
1963–64	64.70	131.22	127.97	220,520
1964–65	67.76	83.89	95.78	186,728

(*a*) 94 net titre.

The estimated value of the raw sugar produced has been based upon details taken from the audited accounts of the Queensland Sugar Board. The values stated comprise the gross receipts from sales in Australia and overseas, less refining costs, freight, administrative charges, etc., and export charges, but including concessions to the fruit industry and other rebates which in 1964–65 amounted to $2,652,000. The value thus obtained represents the net market value of all raw sugar sold, which, less the rebates, is divided between the growers and millers in the approximate proportions of 70 per cent and 30 per cent respectively.

Exports of sugar

Particulars of the exports of Australian-produced cane sugar (raw and refined) for each year from 1960–61 to 1964–65 are as follows.

RAW AND REFINED SUGAR: EXPORTS, AUSTRALIA, 1960–61 TO 1964–65

——	1960–61	1961–62	1962–63	1963–64	1964–65
Quantity . . . . tons	796,499	843,537	1,145,966	1,116,190	1,269,163
Value . . $A'000 f.o.b.	70,144	67,790	91,042	156,512	112,685

Tobacco

This summer-growing annual requires a temperate to tropical climate, adequate soil moisture and a frost-free period of approximately five months. These requirements necessarily restrict its growth to particular areas. These include the Mareeba area (northern Queensland), the neighbourhood of Texas (Queensland and New South Wales border) and near Myrtleford (Victoria). The best quality Australian tobaccos are grown in Queensland. In Australia flue-curing is the main method of drying used.

Marketing

Between 9 May 1941 and 24 September 1948 all leaf was under the direct control of the Australian Tobacco Board, and prices were paid on leaf appraisal. Subsequently the Board was disbanded, and sales have been by open auction through the Tobacco Leaf Marketing Board (Queensland and northern New South Wales) and the Victorian Tobacco Growers Association Ltd. (southern New South Wales and Victoria). In 1964 the Victorian Tobacco Leaf Marketing Board was set up to market the portion of the crop that was formerly sold by the Victorian Tobacco Growers Association Ltd., and in 1965 a Board was established in New South Wales. However, the actual physical handling of New South Wales leaf at auction will continue to be carried out by the Queensland and Victorian authorities.

A stabilization plan for the tobacco growing industry has been agreed between Commonwealth and State Governments. The plan, which will operate initially for four years, commenced with the 1965 selling season. It provides broadly for the establishment of an annual marketing quota of 26 million pounds (green weight) of leaf to be sold under an agreed grade and price schedule providing for an average minimum price, based on a normal crop fall-out, of 104 cents a pound. The overall marketing quota is divided among tobacco producing States, and the State quotas are in turn divided among individual growers.

The plan is administered by the Australian Tobacco Board, constituted under the *Tobacco Marketing Act* 1965 and representative of the Commonwealth, tobacco producing States, growers, and manufacturers.

Central Tobacco Advisory Committee

The Australian Agricultural Council formed the Standing Advisory Committee on Tobacco during 1950. This Committee consisted of representatives of tobacco growers, tobacco manufacturers and the Commonwealth and State Governments. Its main functions were to review the industry and make recommendations on its problems. The Committee was reconstituted by the Agricultural Council during 1952–53. The terms of reference of this committee are given in Year Book No. 47, page 935.

In 1955 the Committee formulated a programme for increased research and advisory activities. The capital costs of establishing this programme were estimated at £168,000 ($336,000), of which the Commonwealth Government and tobacco manufacturers each agreed to contribute half. Annual contributions are made to a fund by the Commonwealth and State Governments and tobacco growers and manufacturers. A Tobacco Industry Trust Account was established under the *Tobacco Industry Act* 1955 to receive these contributions. The contributions from growers and manufacturers are obtained under the Tobacco Charges Assessment Act and the Tobacco Charges Acts, whose purpose is to provide funds to be used in research and otherwise with a view to fostering and expanding the Australian tobacco industry. This programme commenced in 1956, and since then £1,448,286 ($2,896,572) has been paid to State and Commonwealth departments for expenditure on tobacco research and extension. The allocation for 1964–65 was £288,738 ($577,476). As from 1 July 1964 the annual Commonwealth contribution has been increased to one half of approved expenditure from the Tobacco Industry Trust Account; it now incorporates the Tobacco Extension Grant of $48,000 per annum. In 1961 a Research Sub-Committee was established to review annually scientific programmes and finance in relation to the Tobacco Industry Trust Account and make recommendations to the Central Tobacco Advisory Committee.

Other assistance and research

Details of the recommendations by the Tobacco Inquiry Committee and grants periodically approved by the Commonwealth Government up to 30 June 1953 are given in Year Book No. 40, pages 895–6, and in previous issues.

The Commonwealth Scientific and Industrial Research Organization and the State Departments of Agriculture in the tobacco growing States are carrying out investigations into a wide range of problems involving fundamental research, plant breeding, variety trials, irrigation, disease and pest control, fertilizers, crop rotation, and cultural practices.

Tobacco factories

Manufacturers of Australian cigarettes and tobacco are granted a lower rate of duty on imported tobacco leaf, provided it is blended with a prescribed minimum percentage of Australian leaf. These percentages were increased from 3 per cent for cigarettes and 5 per cent for tobacco in November 1946 to 43 per cent and 40 per cent respectively from 1 July 1962. The percentage applicable to both cigarettes and tobacco from 1 July 1963 was 40 per cent and from 1 July 1964, 41.5 per cent. The rate was increased quarterly from 1 April 1965 to 1 January 1966, from which date onwards it has been set at 50 per cent for both cigarettes and tobacco.

In 1964–65 the quantity of cured leaf used in tobacco factories in Australia amounted to 52 million lb., of which 22 million lb. was of local origin. The balance was imported, chiefly from the United States of America and Rhodesia.

Tobacco area and production

The area of tobacco in 1964–65 was 10.5 per cent below the record area established in 1962–63. Production at 25,839,000 lb. was 24.8 per cent below the record established in 1963–64.

In the following table particulars of the area and production of tobacco are given by States for each of the seasons 1960–61 to 1964–65, together with averages for the three-year periods ended 1938–39, 1948–49 and 1958–59.

TOBACCO: AREA AND PRODUCTION, STATES AND N.T., 1936–37 TO 1964–65

Period	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	Aust.
AREA (ACRES)								
Average for three years ended—								
1938–39	697	4,262	3,842	77	1,055	134	..	10,067
1948–49	415	1,046	1,948	..	609	..	..	4,018
1958–59	1,257	3,478	7,479	..	1,295	..	..	13,509
Year—								
1960–61	3,408	9,932	14,395	..	1,478	..	..	29,213
1961–62	3,078	9,286	14,069	..	194	..	..	26,627
1962–63	3,163	9,844	16,346	..	28	..	..	29,381
1963–64	2,927	10,519	15,579	..	..	..	..	29,025
1964–65	2,546	9,720	14,042	..	..	..	..	26,308
PRODUCTION OF DRIED LEAF ('000 lb.)								
Average for three years ended—								
1938–39	471	1,603	2,173	17	741	104	..	5,109
1948–49	380	670	1,725	..	523	..	..	3,298
1958–59	1,066	3,770	5,563	..	1,016	..	..	11,415
Year—								
1960–61	3,538	9,728	15,308	..	1,288	..	..	29,862
1961–62	3,116	6,515	12,751	..	196	..	..	22,578
1962–63	2,885	9,447	14,787	..	29	..	..	27,148
1963–64	2,652	14,459	17,231	..	..	..	..	34,342
1964–65	2,356	12,080	10,675	..	..	..	..	25,111

Imports and exports of tobacco

Imports of tobacco and tobacco manufactures into Australia during 1964–65 were valued at $24.9 million. This included 28.3 million lb. of unmanufactured tobacco valued at $18.6 million. Exports of tobacco and tobacco manufactures during 1964–65 were valued at $1,924,616, including Australian produce, $1,624,294.

Cotton

This annual shrub requires a hot climate and inter-row weed control. Lint (long fibres) is extracted from the seed cotton in the ginneries and is used for yarn. The residue, consisting of linters (short fibres), kernels and hulls (outer seed coat), is treated in oil mills. From linters and kernels are produced such items as short-fibred cotton, cotton seed oil for human consumption and industrial purposes, and meal cakes for stock feed. The hulls may be used as fuel.

The production of cotton in Australia was formerly restricted mainly to the coastal river valleys of Queensland. In recent years, however, the Namoi River area of New South Wales has emerged as the predominant growing area, while smaller quantities are grown in the Murrumbidgee Irrigation Area. The Ord River district in Western Australia is also becoming an increasingly important cotton producer. The extension of areas of cotton under irrigation in these regions has resulted in greatly increased yields.

Cotton bounty

For particulars of the *Cotton Bounty Act* 1951 and amendments of 1952, 1955 and 1957, *see* page 1044 of Year Book No. 49. Under the *Raw Cotton Bounty Act* 1963 the Commonwealth pays a bounty on raw cotton produced and sold for use in Australia at the rate of 13.4375 cents per lb. for Middling 1" White, with premiums and discounts on grades and staples above and below, up to a maximum of $4 million in any one year. The bounty is for a period of five years from 1 January 1964.

Cotton area and production

The area under cultivation and the production in Australia for the years 1960–61 to 1964–65 are shown on page 921.

COTTON: AREA AND PRODUCTION, AUSTRALIA(*a*), 1960–61 TO 1964–65

Year	Area sown	Production of cotton(*b*)			Average yield per acre sown	
		Unginned		Ginned	Unginned	Ginned
		Quantity	Gross value			
	acres	'000 lb.	$'000	'000 lb.	lb.	lb.
1960–61	37,048	15,544	1,834	5,540	420	150
1961–62	28,844	10,948	1,294	3,830	380	133
1962–63	37,689	15,762	1,876	5,403	418	143
1963–64	40,938	18,223	2,212	6,570	445	160
1964–65	37,922	63,009	7,685	17,286	1,662	455

(*a*) Incomplete; excludes small quantities produced in Victoria, for which particulars are not available for publication. (*b*) Harvested from crop sown in the previous year.

Consumption of raw cotton

The following table shows details of the availability and actual consumption of raw cotton in Australian factories during each of the five years ended 1964–65. Additional information about the cotton spinning and weaving industries is to be found in the chapter Manufacturing Industry.

RAW COTTON: PRODUCTION, IMPORTS AND CONSUMPTION AUSTRALIA, 1960–61 TO 1964–65

('000 lb.)

Year	Production	Imports	Total	Consumption of raw cotton
1960–61	5,540	41,842	47,382	43,359
1961–62	3,830	37,735	41,565	46,517
1962–63	5,403	42,543	47,946	51,870
1963–64	6,570	56,663	63,233	62,588
1964–65	17,286	55,474	72,760	73,404

Peanuts

Peanuts, or groundnuts, are a sub-tropical legume (and hence summer growers), the pods of which mature beneath the surface of the soil. They thus require well drained, light textured soils. At harvest the plant is pulled, wind-rowed, field-cured for two to four weeks, and then threshed to recover the pods. The main products of the industry are nuts, peanut oil, oil cake, and synthetic protein fibre.

The production of peanuts in Australia is confined mainly to Queensland, although small quantities are grown in New South Wales, the Northern Territory and, in some years, Western Australia. Details of the area and production of peanuts are given in the table on page 922 for the years 1960–61 to 1964–65.

PEANUTS: AREA AND PRODUCTION, STATES AND N.T., 1960-61 TO 1964-65

Year	Area (acres)				Production (cwt.)			
	N.S.W.	Qld	N.T.	Aust.(a)	N.S.W.	Qld	N.T.	Aust.(a)
1960–61 . .	788	41,659	335	42,782	9,578	446,215	1,215	457,008
1961–62 . .	573	33,131	307	34,011	6,003	292,267	1,343	299,613
1962–63 . .	395	35,552	(b)	c 35,947	4,258	315,144	(b)	c 319,402
1963–64 . .	478	44,482	(b)	c 44,960	4,744	455,982	(b)	c 460,726
1964–65 . .	400	45,554	(b)	c 45,954	4,746	202,369	(b)	c 207,115

(a) Excludes Western Australia, for which details are not available for publication. (b) Not available for publication. (c) Incomplete; excludes Northern Territory.

The gross value of the 1964–65 crop was $2,204,000 which was approximately $2,314,000 less than in 1963–64. All production is consumed in Australia. In recent years considerable quantities of peanut kernels have been imported. Total supplies available for consumption in Australia in 1964–65 were 21,400 tons (in shell equivalent), after allowing for a decrease of 800 tons in stock held by the Peanut Marketing Board and exports of 100 tons of peanut products. Supplies were made up of 18,400 tons from Australian production received into store by the Board and 2,300 tons imported.

Flax

Flax for fibre

This crop has a winter-growing season in Australia. The whole plant, after harvesting, is retted and scutched at local mills to recover the linen fibre and tow. The seeds may be sold to oil mills and the refuse used for stock feed.

FLAX FOR FIBRE: AREA AND PRODUCTION STATES, 1960-61 TO 1964-65

Year	Victoria	W.A.	Australia
Area (acres)—			
1960–61 . . .	430	736	1,166
1961–62 . . .	323	91	414
1962–63 . . .	419	871	1,290
1963–64 . . .	..	171	171
1964–65 . . .	..	729	729
Production (tons of fibre)—			
1960–61 . . .	592	1,176	1,768
1961–62 . . .	514	183	697
1962–63 . . .	648	2,152	2,800
1963–64 . . .	..	318	318
1964–65 . . .	..	1,388	1,388

Flax for linseed

Fibre varieties are uneconomic for seed production, and prior to 1948–49 the growing of flax for linseed oil had not been developed extensively in Australia. Since then, however, action has been taken to develop this industry, the ultimate objective being the production of sufficient linseed to meet Australia's total oil requirements. The main producing areas are the Darling Downs in Queensland, the wheat belt of New South Wales and the western and north-eastern districts of Victoria.

The question of assistance to the industry was investigated by the Commonwealth Tariff Board in 1953, and its conclusions are contained in its Report on *Linseed and Linseed Products* dated 23 October 1953.

FLAX FOR LINSEED: AREA AND PRODUCTION, STATES, 1960-61 TO 1964-65

Year	N.S.W.	Vic.	Qld	S.A.	W.A.	Aust.
Area (acres)—						
1960–61	11,823	6,179	75,088	2,115	483	95,688
1961–62	7,266	17,711	34,390	1,513	1,253	62,133
1962–63	11,493	25,232	58,493	1,220	626	97,064
1963–64	15,335	16,240	83,336	1,002	1,588	117,501
1964–65	23,769	9,953	97,092	898	2,135	133,847
Production (tons of linseed)—						
1960–61	1,870	1,013	10,394	218	70	13,565
1961–62	856	6,093	5,187	275	178	12,589
1962–63	2,634	8,180	14,477	290	136	25,717
1963–64	3,722	4,758	20,342	283	411	29,516
1964–65	8,761	2,671	34,175	426	567	46,600

Hops

Hops are grown from perennial rootstocks over deep, well-drained soils in localities sheltered from the wind. The hop-bearing vine shoots are carried upon wire and coir trellises, from which they are later harvested, principally by hand. The green hops are kiln-dried and bleached with sulphur dioxide fumes, following which the cured hops are pressed into bales.

Hop growing in Australia is confined to the Derwent, Huon and Channel areas of Tasmania and the Ovens and King Valleys in Victoria. A small area is also under hops in Western Australia, near Manjimup, but the details are not available for publication.

Production and imports of hops

The production of hops in Australia is insufficient to meet local requirements, and additional supplies are imported to meet the needs of the brewing industry. In the following table details of the production and imports of hops and the quantity of hops used in breweries are shown for each of the years 1960–61 to 1964–65. Exports of hops are negligible and are not recorded separately.

HOPS: PRODUCTION AND DISPOSAL, AUSTRALIA
1960-61 TO 1964-65

Year	Production(*a*)		Imports	Net available supplies (*b*)	Quantity used in breweries
	Quantity	Gross value			
	cwt.	$'000	cwt.	cwt.	cwt.
1960–61	33,099	2,358	991	34,090	40,015
1961–62	32,936	2,484	5,569	38,505	39,064
1962–63	33,629	2,570	1,337	34,966	38,202
1963–64	19,858	1,534	536	20,394	37,033
1964–65	27,893	2,372	9,521	37,414	39,517

(*a*) Excludes production in Western Australia, for which details are not available for publication. (*b*) Disregards movements in stocks.

Vegetables for human consumption

Area, production and trade

Vegetables were initially grown on a large scale near the main cities, where there was ready access to reliable water supplies and to markets. Later, the expansion of irrigation areas and improvement in transport services resulted in their production being extended into many other areas. At present, because of the wide diversity of climatic conditions across Australia, supplies for main city markets are drawn from widely different areas, depending upon the times of maturity of the various crops. Apart from potatoes and onions, which are sold in some States through marketing boards, the bulk of vegetable trading takes place at the metropolitan markets of the cities concerned.

Details of the areas planted and production of individual kinds of vegetables are shown hereunder for the seasons 1962–63 to 1964–65. Certain particulars shown are incomplete in that details for specific vegetables in some States are either not available or are not available for publication. For further information *see* the bulletin *Rural Industries*. Details of the estimated consumption of vegetables for a series of years ending 1964–65 are given in the chapter Miscellaneous.

FRESH VEGETABLES FOR HUMAN CONSUMPTION: AUSTRALIA
1962–63 TO 1964–65

Vegetable	1962–63		1963–64		1964–65	
	Area sown	Production	Area sown	Production	Area sown	Production
	acres	tons	acres	tons	acres	tons
Asparagus	3,523	5,503	3,994	6,197	4,067	5,390
Beans, French and runner	18,429	32,373	17,969	33,065	16,707	30,371
Beans, navy	2,488	876	5,423	1,026	3,430	710
Beetroot	1,992	15,882	1,859	14,432	1,893	16,519
Cabbages and brussel sprouts	5,867	62,748	6,190	66,147	5,959	65,914
Carrots	5,204	55,380	5,446	58,478	5,591	62,629
Cauliflowers	6,659	76,811	6,631	72,677	6,941	74,262
Celery	735	10,849	740	12,288	756	13,025
Cucumbers	1,725	7,428	1,679	7,790	1,588	8,115
Lettuces	4,799	21,390	4,823	21,991	4,710	22,386
Onions	10,765	68,219	9,222	59,278	9,707	69,701
Parsnips	1,354	12,682	1,316	12,698	1,314	13,311
Peas, blue	5,710	3,407	5,165	2,656	3,973	2,718
Peas, green	52,926	79,046	50,971	74,229	57,948	100,603
Potatoes	113,742	666,596	101,987	562,032	87,919	508,019
Tomatoes	16,506	129,044	16,356	135,815	16,315	147,194
Turnips, swede and white	1,268	9,116	1,418	9,380	1,255	8,179
All other	34,804	..	35,651	..	35,505	..
Total	**288,496**	..	**276,840**	..	**265,578**	..

Processed vegetables

Total production of canned vegetables in 1964–65 amounted to 152,115,000 lb., the principal types produced being green peas (including mint-pro peas), 39,179,000 lb.; green beans, 5,482,000 lb.; baked beans (including pork and beans), 37,123,000 lb.; asparagus, 9,126,000 lb.; beetroot, 24,313,000 lb.; and mushrooms, 6,996,000 lb.

The production of dehydrated vegetables, including split peas, during 1964–65 amounted to 15,091,000 lb., while the production of potato crisps, chips and flakes was 14,818,000 lb.

There has been rapid development in the quick-frozen vegetable industry. Data were collected for the first time in 1957–58, when 13,846,000 lb. of frozen vegetables were produced, made up principally of 10,131,000 lb. of peas and 2,540,000 lb. of beans. In 1964–65 production had risen to 67,254,000 lb., of which 57,040,000 lb. were peas and 9,638,000 lb. were beans.

Exports and imports of vegetables

The quantity and value of oversea exports of pulse and fresh vegetables during 1964–65 were respectively: pulse, 7,310 tons, $728,034; fresh onions, 2,247 tons, $177,270; potatoes, 4,715 tons, $426,924; other vegetables, 5,604 tons, $842,520. Imports of pulse amounted to 6,197 tons, valued at $1,035,894, while imports of fresh vegetables in total were 9,959 tons, valued at $1,946,716.

In 1964–65 exports of vegetables preserved in liquid consisted of: asparagus, 1,007,196 lb., $261,666; beans (including baked), 390,301 lb., $58,450; peas, 412,369 lb., $57,004; tomatoes, 327,873 lb., $49,854; other vegetables, 512,133 lb., $101,302.

Potatoes

This crop requires deep friable soils, which in Australia are usually basaltic, alluvial or swampy in origin. Fertilizer requirements, which are generally high, vary with the type of soil. Potatoes are killed by heavy frost, but require only moderate temperatures for growth. Mechanical

planters and diggers are used to a variable extent depending upon a variety of factors including terrain, state of the soil and scale of operations. Seed certification schemes, which operate in all States except Queensland, provide a supply of seed which is free from viral, fungal and bacterial diseases. In Australia potatoes are used almost entirely for human consumption and not for the production of starch or alcohol. They are rarely used as stock feed.

Potatoes

Area, production, and yield per acre. Victoria possesses particular advantages for the growing of potatoes, as the rainfall is generally satisfactory and the climate is unfavourable to the spread of Irish blight; consequently, the crop is widely grown. The principal areas of that State are the central highlands and the south-western and Gippsland districts. Until 1958–59 Tasmania (where production is mainly in the north-west) came next in order of acreage sown, although production exceeded that of Victoria in some of the war years. Since then, however, acreage in New South Wales and Queensland has increased considerably, and there is now a greater area of potatoes in both of these States than in Tasmania. In New South Wales production is chiefly in the tablelands districts.

The area sown, production and yield per acre of potatoes in each State during the years 1960–61 to 1964–65 and the averages for the three-year periods ended 1938–39, 1948–49 and 1958–59 are shown hereunder. A graph showing production since 1935–36 appears on page 996 of Year Book No. 49.

POTATOES: AREA, PRODUCTION AND YIELD PER ACRE, STATES AND TERRITORIES, 1936–37 TO 1964–65

Period	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
AREA (ACRES)									
Average for three years ended—									
1938–39	21,049	40,376	11,551	4,445	4,627	32,044	..	59	114,151
1948–49	20,440	53,862	10,795	6,084	6,753	38,643	..	103	136,680
1958–59	16,589	45,225	12,980	6,035	7,977	19,002	4	94	107,906
Year—									
1960–61	18,365	38,672	11,992	5,209	6,656	10,875	(a)	36	(b) 91,805
1961–62	20,209	36,469	14,466	5,316	6,824	11,129	(a)	30	(b) 94,443
1962–63	27,420	43,024	16,994	5,918	6,499	13,839	6	42	113,742
1963–64	24,352	39,626	15,886	5,459	5,835	10,806	(a)	23	(b) 101,987
1964–65	20,530	32,931	14,005	5,247	5,797	9,393	(a)	16	(b) 87,919
PRODUCTION (TONS)									
Average for three years ended—									
1938–39	52,158	137,583	17,191	20,342	23,678	109,285	..	143	360,380
1948–49	62,701	191,590	26,470	32,149	38,722	148,389	..	598	500,619
1958–59	68,533	245,937	50,989	48,072	50,024	92,367	5	391	556,318
Year—									
1960–61	85,182	180,819	59,311	40,797	45,500	39,050	(a)	134	(b) 450,793
1961–62	83,301	196,032	70,675	48,479	55,700	71,560	(a)	234	(b) 525,981
1962–63	132,969	254,473	86,239	53,253	56,900	82,545	5	212	666,596
1963–64	98,308	200,384	90,201	51,195	55,402	66,420	(a)	122	(b) 562,032
1964–65	75,659	183,665	82,389	48,400	60,739	57,062	(a)	105	(b) 508,019
YIELD PER ACRE (TONS)									
Average for three years ended—									
1938–39	2.48	3.41	1.49	4.58	5.12	3.41	..	2.42	3.16
1948–49	3.07	3.56	2.45	5.28	5.73	3.84	..	5.81	3.66
1958–59	4.13	5.44	3.93	7.97	6.27	4.86	1.25	4.16	5.16
Year—									
1960–61	4.64	4.68	4.95	7.83	6.84	3.59	(a)	3.72	(b) 4.91
1961–62	4.12	5.38	4.89	9.12	8.16	6.43	(a)	7.80	(b) 5.57
1962–63	4.85	5.91	5.07	9.00	8.76	5.96	0.83	5.05	5.86
1963–64	4.04	5.06	5.68	9.38	9.49	6.15	(a)	5.30	(b) 5.51
1964–65	3.69	5.58	5.88	9.22	10.48	6.07	(a)	6.28	(b) 5.78

(a) Not available for publication. (b) Incomplete; excludes Northern Territory.

Potato marketing boards were established in all States except Tasmania under separate State legislation after Commonwealth control of potato marketing under war-time legislation ceased at the end of 1948. The life of the Queensland Board was not extended when its term ended in 1954. The New South Wales Board was voted out by growers in 1956, and the Victorian Board also ceased functioning in that year. The boards in South Australia and Western Australia are the only statutory boards still in operation.

Value of potato crop. The estimated gross value of the potato crop of each State for the 1964–65 season and the value per acre are shown in the following table.

POTATOES: VALUE OF CROP, STATES AND A.C.T., 1964–65

		N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	A.C.T.	Aust.
Aggregate value	$'000	9,578	24,820	8,153	6,048	5,372	6,732	10	60,713
Value per acre	$	467	754	582	1,153	927	717	625	691

Consumption and exports of potatoes. The annual consumption of potatoes in Australia during each of the three years 1962–63 to 1964–65 amounted to 594,300 tons, 507,700 tons and 469,000 tons respectively or 123.1 lb., 103.1 lb. and 93.4 lb. respectively per head of population. These figures exclude the quantities used for seed, which averaged about 46,000 tons annually over this period. Details showing exports for the years 1960–61 to 1964–65 are given in the following table.

POTATOES: EXPORTS, AUSTRALIA, 1960–61 TO 1964–65

		1960–61	1961–62	1962–63	1963–64	1964–65
Quantity	tons	5,219	4,121	15,819	12,722	4,715
Value	$A'000 f.o.b.	390	320	850	643	427

The increased exports in 1962–63 and 1963–64 were due principally to increased shipments to Singapore, Ceylon, French Possessions, Pacific Islands, and Hong Kong. Imports of potatoes into Australia are usually negligible, but in 1964–65 they amounted to 5,404 tons valued at $343,066.

Onions

Area, production and yield per acre. Until recently Australia's onion supply came chiefly from Victoria. However, during the last five years Victorian production has not been as great as formerly, and in 1960–61, and again in 1963–64, it was exceeded by Queensland. The Victorian crop consists almost entirely of brown onions, and the bulk of the crop is grown in a small section of the Western Division of the State, where the volcanic ash soils have been found to be particularly suitable for onion growing on a commercial scale. Most of Queensland's onion production is grown in the Lockyer Valley and also consists mainly of brown varieties. Details of the area, production and yield per acre are given in the following table for the years 1960–61 to 1964–65 together with averages for the three-year periods ended 1938–39, 1948–49 and 1958–59. A graph showing production since 1935–36 appears on page 996 of Year Book No. 49.

ONIONS: AREA, PRODUCTION AND YIELD PER ACRE, STATES AND A.C.T., 1936–37 TO 1964–65

Period	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	A.C.T.	Aust.
				AREA (ACRES)				
Average for three years ended—								
1938–39	126	5,634	1,187	521	122	8	6	7,604
1948–49	433	6,245	2,234	534	468	26	4	9,944
1958–59	491	4,614	3,655	635	413	29	9	9,846
Year—								
1960–61	624	3,532	3,763	657	465	59	10	9,110
1961–62	490	4,456	3,173	753	479	60	(a)	(b) 9,412
1962–63	800	4,634	3,796	944	509	79	(a)	(b)10,765
1963–64	682	3,756	3,317	930	446	91	(a)	(b) 9,222
1964–65	803	3,825	3,422	1,146	428	83	(a)	(b) 9,707

(a) Not available for publication. (b) Includes a small area in Northern Territory but excludes Australian Capital Territory.

ONIONS: AREA, PRODUCTION AND YIELD PER ACRE, STATES AND A.C.T., 1936–37 TO 1964–65—*continued*

Period	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	A.C.T.	Aust.
PRODUCTION (TONS)								
Average for three years ended—								
1938–39	324	34,039	3,040	3,904	915	42	21	42,285
1948–49	1,703	41,156	10,489	5,032	3,831	153	24	62,388
1958–59	2,496	31,982	15,505	5,625	4,599	132	71	60,410
Year—								
1960–61	3,935	16,286	21,156	5,947	5,826	285	80	53,515
1961–62	3,082	23,784	17,921	6,915	6,290	327	(*a*)	(*b*)58,323
1962–63	5,185	26,175	21,184	8,531	6,622	515	(*a*)	(*b*)68,219
1963–64	4,998	17,946	20,412	8,736	6,814	372	(*a*)	(*b*)59,278
1964–65	6,378	22,963	22,853	11,061	5,981	465	(*a*)	(*b*)69,701
YIELD PER ACRE (TONS)								
Average for three years ended—								
1938–39	2.57	6.04	2.56	7.49	7.50	5.25	3.50	5.56
1948–49	3.93	6.59	4.70	9.42	8.19	5.88	6.00	6.27
1958–59	5.08	6.93	4.24	8.86	11.14	4.55	7.89	6.14
Year—								
1960–61	6.31	4.61	5.62	9.05	12.52	4.83	8.00	5.87
1961–62	6.29	5.34	5.65	9.18	13.13	5.45	(*a*)	(*b*) 6.20
1962–63	6.48	5.65	5.58	9.04	13.01	6.52	(*a*)	(*b*) 6.34
1963–64	7.33	4.78	6.15	9.39	15.28	4.09	(*a*)	(*b*) 6.43
1964–65	7.94	6.00	6.68	9.65	13.97	5.60	(*a*)	(*b*) 7.18

(*a*) Not available for publication. (*b*) Includes a small production in Northern Territory but excludes Australian Capital Territory.

Value of onion crop. The estimated gross value of the onion crop and the value per acre are shown in the following table for the 1964–65 season.

ONIONS: VALUE OF CROP, STATES AND TERRITORIES, 1964-65

——	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
Aggregate value $'000	568	1,440	2,014	917	376	25	(*a*)	(*a*)	(*b*)5,340
Value per acre $	707	376	589	800	879	301	(*a*)	(*a*)	(*b*) 550

(*a*) Not available for publication. (*b*) Incomplete; excludes Northern Territory and Australian Capital Territory.

Consumption and exports of onions. The consumption of onions in Australia during 1964–65 was 68,700 tons or 13.7 lb. per head of population. Onions are the only root crop, other than potatoes, in which any considerable oversea trade is carried on by Australia. In 1964–65 exports amounted to 2,247 tons, valued at $177,270, and were shipped mainly to Malaysia, Papua and New Guinea, and New Caledonia. The quantity of exports in 1963–64 was 3,547 tons, valued at $250,026. Imports of onions amounted to 815 tons, valued at $74,112 in 1964–65, and 3,035 tons, valued at $244,020 in 1963–64. The principal country from which onions were imported was New Zealand.

Fruit

The varieties of fruit grown differ in various parts of the States, ranging from pineapples, papaws and mangoes in the tropics to strawberries, raspberries and currants in the colder parts of the temperate zone. In New South Wales citrus fruit (oranges, lemons, etc.) and bananas are the principal crops, although apples, peaches, plums, pears, and cherries are grown extensively. The principal varieties grown in Victoria are apples, pears, peaches, oranges, and apricots. In Queensland apples, pineapples, bananas, oranges, mandarins, peaches, and plums are the varieties

most largely cultivated. In South Australia, in addition to oranges, apples, peaches, apricots, and pears, almonds and olives are grown extensively. In Western Australia apples, oranges plums, and pears are the chief varieties. In Tasmania apples occupy over three-quarters of the fruit-growing area, but small fruit, such as currants, raspberries and gooseberries, are grown extensively, the balance of the area being mainly taken up with pears and apricots.

Oversea marketing of fruits

The *Apple and Pear Organization Act* 1938–1964 provides for the establishment of an Australian Apple and Pear Board comprising representatives of growers, exporters, employees, and the Commonwealth Government. A representative in London has also been appointed by the Board. An export levy to meet the expenses of the Board is provided for in the *Apple and Pear Export Charges Act* 1938–1960. The function of the Board is the organization and control of exports of fresh apples and pears, and it has the power to regulate shipments, determine export quotas, allocate consignments from each State, and recommend the licensing of exporters. The Board contributes to apple and pear publicity activities overseas.

The *Canned Fruits Marketing Act* 1963, which was introduced in January 1964, replaced the *Canned Fruits Export Control Act* 1926–1959 under which the oversea marketing of canned fruit was initially organized (*see* Year Book No. 49, page 1050). The Australian Canned Fruits Board, which is constituted under the Act, determines the terms and conditions for oversea sales. The Board exercises this control through a system of export licences. The Board, whose membership was increased from five to eleven members and which was granted greater powers under the 1963 Act, comprises representatives of the Commonwealth Government (one), canners of deciduous fruit (six), growers of deciduous fruit (three), and pineapple interests (one). The Board maintains a London office. The *Canned Fruits Export Charges Act* 1926–1963 provides for a levy on exports to meet the Board's expenses, which include contributions to oversea publicity connected with the canned fruit industry. In 1963 an excise duty was imposed by the *Canned Fruits Excise Act* 1963 on canned deciduous fruit entered for domestic consumption, and the proceeds of the duty are made available to the Board to assist in the promotion of oversea sales of canned deciduous fruit.

In 1959 the Australian Canned Fruits Sales Promotion Committee was established to promote the sale of canned deciduous fruit on the home market and overseas. The operations of the Committee are financed by a levy on fruit accepted by the canneries for the production of canned fruit. The Committee comprises representatives of growers and processers of canning fruit and a representative of the Commonwealth Government.

Area and production of fruit

The area under fruit in Australia has been increasing steadily in recent years, and new record levels have been reached each year since 1961–62. The following tables set out the area under fruit in the several States.

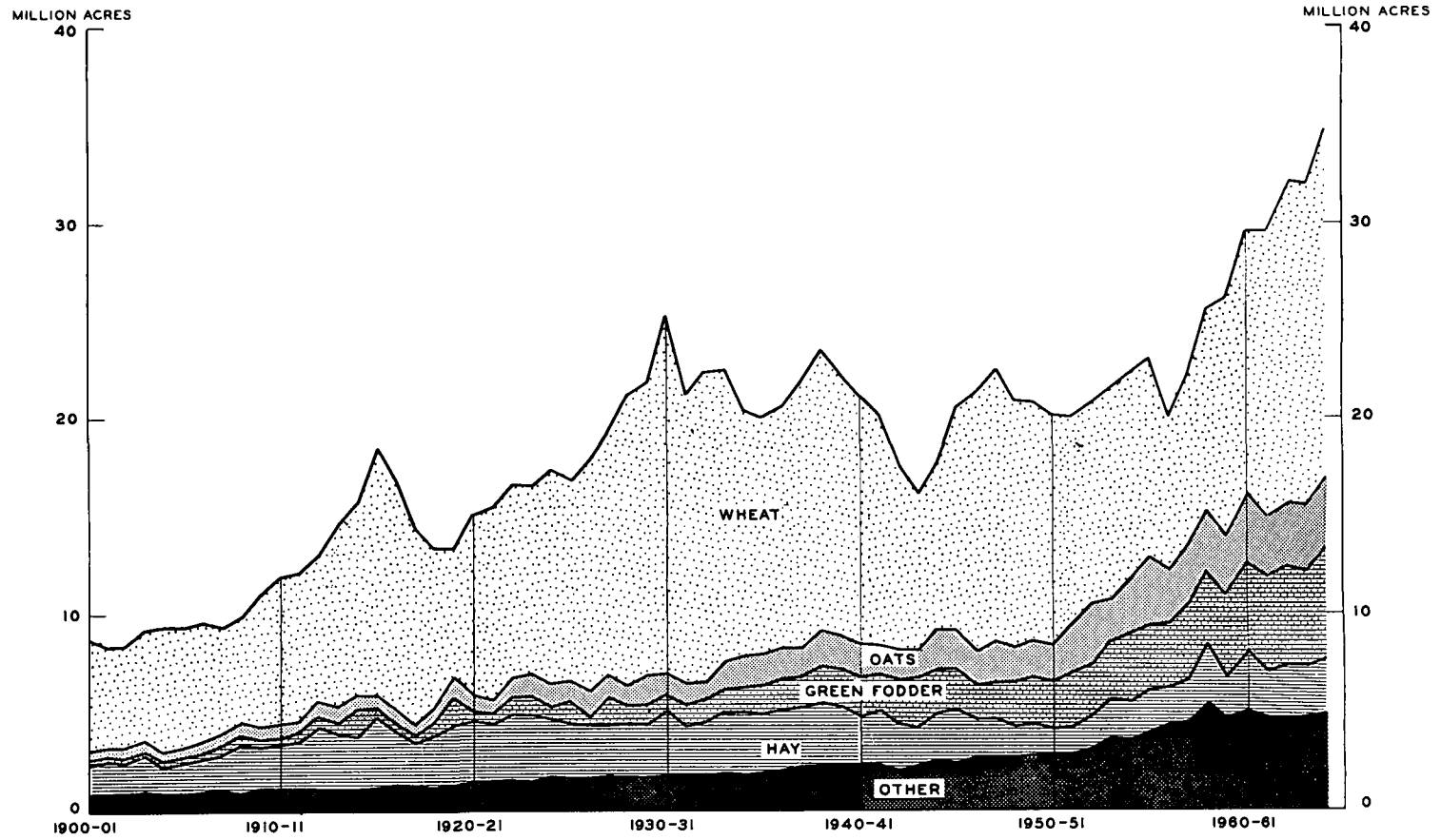
FRUIT: AREA, STATES AND TERRITORIES, 1960-61 TO 1964-65

(Acres)

Year	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
1960–61	92,962	71,415	41,067	37,711	23,913	22,194	120	55	289,437
1961–62	94,246	72,712	41,872	38,548	24,487	21,859	136	65	293,925
1962–63	98,032	75,855	43,242	40,444	25,204	21,943	136	55	304,911
1963–64	98,670	76,796	44,681	41,686	25,670	22,134	149	54	309,840
1964–65	97,221	75,509	45,918	43,012	26,425	22,375	130	56	310,646

AREA OF CROPS: AUSTRALIA, 1900-01 TO 1964-65

PLATE 52



WHEAT FOR GRAIN

AUSTRALIA, 1935-36 TO 1964-65

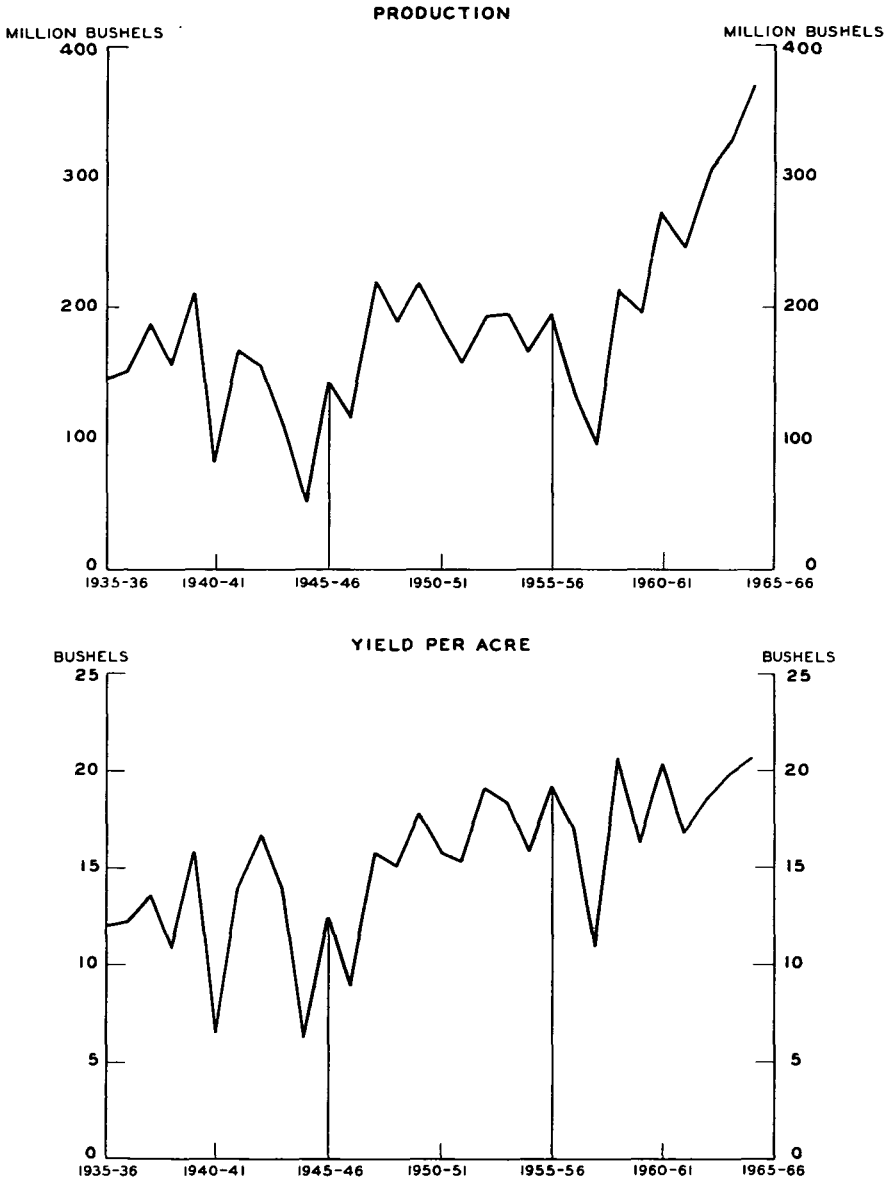


PLATE 53

FRUIT: AREA AND PRODUCTION, STATES AND TERRITORIES, 1964-65

Fruit	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
AREA, BEARING AND NOT BEARING (ACRES)									
Apples	19,031	22,678	13,255	6,038	15,742	18,075	..	51	94,870
Apricots	2,043	3,277	479	4,684	309	482	..	..	11,274
Bananas	20,912	..	5,353	..	469	..	28	..	26,762
Cherries	2,816	2,102	20	553	38	55	..	..	5,584
Citrus—									
Oranges	28,501	6,702	3,815	16,689	4,734	..	56	..	60,497
Mandarins	2,520	576	2,326	695	499	..	3	..	6,619
Lemons and limes	2,475	1,051	482	540	631	..	9	..	5,188
Other	676	281	91	538	141	..	5	..	1,732
Nuts	221	290	573	3,514	110	..	..	..	4,708
Peaches	8,137	14,700	1,870	4,707	924	49	..	..	30,387
Pears	3,025	17,214	994	2,034	1,148	1,664	..	(*a*)	(*b*)26,079
Pineapples	159	..	11,404	..	..	..	19	..	11,582
Plums	1,865	1,602	1,439	384	1,039	78	..	..	6,407
Prunes	3,099	267	..	728	12	2	..	..	4,108
Small fruit	39	962	224	154	10	1,940	..	..	3,329
Other fruit	1,702	3,807	3,593	1,754	619	30	10	5	11,520
Total	**97,221**	**75,509**	**45,918**	**43,012**	**26,425**	**22,375**	**130**	**56**	**310,646**
PRODUCTION ('000 BUSHELS)									
Apples	2,988	4,394	1,324	1,625	2,355	6,207	..	4	18,897
Apricots	391	293	36	1,170	24	54	..	..	1,968
Bananas	4,113	..	767	..	145	..	3	..	5,028
Cherries	188	118	1	42	1	4	..	..	354
Citrus—									
Oranges	5,213	1,244	709	3,188	480	..	2	..	10,836
Mandarins	179	47	330	62	27	..	..	..	645
Lemons and limes	453	148	112	42	98	..	1	..	845
Peaches	1,307	2,363	145	1,173	87	3	..	..	5,078
Pears	557	4,026	82	574	191	490	..	(*c*)	(*b*) 5,920
Pineapples	35	..	4,327	..	..	..	1	..	4,363
Plums	156	144	115	38	101	12	..	..	502
Prunes	400	28	..	72	1	1	..	..	566

(*a*) Not available for publication; included with Other fruit. (*b*) Incomplete; excludes the Australian Capital Territory. (*c*) Not available for publication.

Principal fruit crops

The area and production of the principal fruit crops and the gross value of production during the seasons 1960–61 to 1964–65 are shown hereunder.

PRINCIPAL FRUIT CROPS: AREA, PRODUCTION AND GROSS VALUE OF PRODUCTION, AUSTRALIA, 1960-61 TO 1964-65

Year	Apples	Apricots	Bananas	Oranges	Peaches	Pears	Plums and prunes
AREA, BEARING AND NOT BEARING (ACRES)							
1960–61	86,882	11,945	29,870	50,626	26,883	23,935	10,665
1961–62	87,571	11,461	29,180	53,623	29,627	25,338	10,839
1962–63	91,380	11,847	30,392	57,301	30,226	25,945	10,828
1963–64	92,859	11,890	29,709	59,211	30,237	25,870	10,963
1964–65	94,870	11,274	26,762	60,497	30,387	26,079	10,515

PRINCIPAL FRUIT CROPS: AREA, PRODUCTION AND GROSS VALUE OF PRODUCTION, AUSTRALIA, 1960–61 TO 1964–65—*continued*

Year	Apples	Apricots	Bananas	Oranges	Peaches	Pears	Plums and Prunes
			PRODUCTION ('000 BUSHELS)				
1960–61 . .	15,487	1,323	4,830	6,244	2,471	5,360	930
1961–62 . .	17,127	1,869	4,876	8,168	3,962	6,567	961
1962–63 . .	18,349	1,913	4,832	9,307	4,003	5,667	1,043
1963–64 . .	19,285	1,610	5,324	8,735	4,366	6,916	1,039
1964–65 . .	18,897	1,968	5,028	10,836	5,078	5,920	1,068
			GROSS VALUE OF PRODUCTION ($'000)				
1960–61 . .	41,286	3,870	15,430	18,940	6,940	13,184	3,656
1961–62 . .	40,006	5,754	17,262	19,194	9,534	14,408	3,322
1962–63 . .	42,006	5,296	18,354	19,752	9,548	12,760	3,226
1963–64 . .	44,862	4,802	16,442	20,834	10,084	14,900	4,036
1964–65 . .	46,577	5,508	18,585	23,547	12,676	14,753	4,544

Production and consumption of jams and jellies and preserved fruit

In Australia considerable quantities of fruit are used in the production of jams and jellies and for preserving. During 1964–65 output of jams, conserves, fruit spreads, etc. amounted to 90,078,000 lb., while output of preserved fruit amounted to 511,074,000 lb. Of the latter figure, pears accounted for 119,726,000 lb., peaches 203,012,000 lb., and pineapples 54,354,000 lb.

In 1964–65, 7,190,080 cwt of fruit was used in factories classified to the sub-classes Oils, vegetable; Jam, fruit and vegetable canning; Condiments, coffee, spices; Aerated waters and cordials; and Dehydrated fruit and vegetables. Details of the estimated consumption of fruit and fruit products per head of population for a series of years ending 1964–65 are shown in the chapter Miscellaneous.

Imports and exports of fruit and fruit products

The imports of fresh fruit into Australia are negligible, while those of dried fruit consist mainly of dates. A considerable export trade in both fresh and dried fruit is carried on by Australia with oversea countries. The values of the shipments in 1964–65 amounted to $30,542,000 and $24,100,000 respectively. Apples constitute the bulk of the fresh fruit exported, although exports of pears and citrus fruit are considerable. Particulars of the Australian export trade in fresh and frozen fruit for each of the years 1960–61 to 1964–65 are shown in the following table.

FRESH AND FROZEN FRUIT: EXPORTS, AUSTRALIA, 1960-61 TO 1964-65

Year	Apples		Pears		Citrus		Total value(*a*)
	Quantity	Value	Quantity	Value	Quantity	Value	
	'000 bus.	$A'000 f.o.b.	'000 bus.	$A'000 f.o.b.	'000 bus.	$A'000 f.o.b.	$A'000 f.o.b.
1960–61 . .	5,729	14,642	1,235	4,160	419	1,328	20,738
1961–62 . .	7,083	18,792	1,639	5,150	673	2,172	26,726
1962–63 . .	7,206	23,290	1,071	3,500	862	2,566	29,968
1963–64 . .	8,212	24,036	1,666	5,294	961	2,986	33,156
1964–65 . .	7,051	20,989	1,461	5,297	1,082	3,382	30,543

(*a*) Includes exports of all other fresh and frozen fruit.

The quantity and value of oversea imports and exports of dried fruit, other than raisins and currants, for the years 1960–61 to 1964–65 are shown below. Normally the bulk of the imports consists of dates obtained almost entirely from Iraq and Iran. The export figures include particulars of some re-exported dried fruit.

DRIED TREE FRUIT(*a*): IMPORTS AND EXPORTS, AUSTRALIA 1960-61 TO 1964-65

Year	Imports(*b*)		Exports	
	Quantity	Value	Quantity	Value
	'000 lb.	$A'000 f.o.b.	'000 lb.	$A'000 f.o.b.
1960–61	9,178	606	8,199	1,864
1961–62	8,266	628	5,961	1,565
1962–63	8,939	592	6,611	1,905
1963–64	10,262	604	8,555	2,003
1964–65	8,454	601	9,420	1,810

(*a*) Excludes raisins and currants dealt with separately under Vineyards (*see* below). (*b*) Dates and figs only.

Exports of jam and jellies in 1964–65 were 11,006,000 lb., valued at $1,676,000 f.o.b., compared with 11,774,000 lb., valued at $1,622,000 f.o.b. in 1963–64. Imports of jams and jellies in 1964–65 were 1,234,000 lb., valued at $251,000, compared with 1,432,000 lb., valued at $271,000 in 1963–64.

The total value of fruit preserved in tins or other airtight containers, or pulped, imported into Australia during 1964–65 was $508,430. Large quantities of fruit preserved in tins or other airtight containers are normally exported from Australia, the quantity recorded in 1964–65 being 102,003 tons valued at $27,583,558. Exports in 1964–65 were made up principally of peaches (41,489 tons), pears (39,517 tons), fruit salad (6,697 tons), pineapples (4,657 tons), and apricots (4,078 tons). In addition, the exports of pulped fruits during 1964–65 amounted to 1,458 tons valued at $534,346.

Vineyards

Grapes require a warm to hot climate and a predominantly winter rainfall. Freedom from late spring frosts is essential. They are grown for wine-making, drying and, to a minor extent, for table use. In Australia wine is produced very largely from irrigated crops, as are dried fruits. Some of the better known wine producing areas are the Murray Valley (South Australia and Victoria), Barossa Valley and Southern Vales Areas (South Australia), the Murrumbidgee Irrigation Area and the Hunter Valley (New South Wales), the Mildura, Rutherglen and Stawell districts of Victoria, and the Swan Valley (Western Australia). Nearly all the dried fruit is produced along the River Murray and its tributaries, with small localized areas in the other States.

Area of vineyards

The area under vineyards in the 1964–65 season in Victoria and South Australia constituted 77 per cent of the total area of vineyards. The total area of vines in the several States during each of the years 1960–61 to 1964–65 and the averages for the three-year periods ended 1938–39, 1948–49 and 1958–59 are shown in the following table.

VINEYARDS: AREA, STATES, 1936-37 TO 1964-65

(Acres)

Period	N.S.W.	Vic.	Qld	S.A.	W.A.	Aust.(a)
Average for three years ended—						
1938–39	16,824	42,071	2,670	57,185	6,197	124,947
1948–49	16,482	44,114	3,099	58,971	9,965	132,631
1958–59	17,210	44,823	2,926	57,199	8,967	131,125
Year—						
1960–61	16,988	44,649	3,110	56,897	8,864	130,508
1961–62	17,607	45,105	3,203	57,836	9,017	132,768
1962–63	17,704	45,662	3,237	58,266	8,685	133,554
1963–64	18,715	46,501	3,276	58,679	8,629	135,800
1964–65—						
Drying	8,033	39,589	..	13,411	3,345	64,378
Table	2,965	3,160	3,012	244	1,376	10,757
Wine	9,466	5,247	287	45,202	3,589	63,791
Total	**20,464**	**47,996**	**3,299**	**58,857**	**8,310**	**138,926**

(a) Excludes for some years particulars for Northern Territory and Australian Capital Territory, which are not available for publication. There are no vineyards in Tasmania.

Wine industry

Australia produces wine of every type and also brandy. In recent years there has been a distinct trend toward greater consumption and production of unfortified or table wines. Until 1957–58 production of these wines (which include burgundy, claret, riesling, sauterne, and sparkling wines) was less than half that of the fortified varieties (sherries, ports, etc.). By 1964–65 production of table wines reached a volume only 24 per cent smaller than that of fortified varieties.

The Wine Overseas Marketing Act 1929–1963 was introduced to place the oversea marketing of wine on an orderly basis. The Australian Wine Board, consisting of representatives from wineries and distilleries, grape-growers and the Commonwealth Government, supervises the sale and distribution of Australian wine exported and recommends conditions under which export licences should be issued. The Board also engages in wine publicity and trade promotion activities both in Australia and overseas. In London the Board maintains an Australian Wine Centre, which is a medium for promoting interest in Australian wines and brandy. It is also a retail shop for the sale of these products. *The Wine Grapes Charges Act* 1929–1957 provides for the imposition of a levy on all grapes used in Australia for the manufacture of wine, brandy and spirit used for fortifying wine. The proceeds of the levy are used to meet the Board's projects in Australia and overseas and to defray the administrative expenses of the Board, which has no other source of income.

Production and consumption of wine

In 1964–65 the total production of wine (beverage and distillation) in Australia was 38.6 million gallons, while total consumption of beverage wine was 13.8 million gallons (1.22 gallons per head of population). Similar particulars for 1963–64 are 37.5 million gallons and 13.4 million gallons (1.22 gallons per head of population) respectively.

The quantities of wine and brandy produced in the several States during the 1960–61 to 1964–65 seasons, together with the averages for the three-year periods ended 1938–39, 1948–49 and 1958–59, are shown in the following table.

WINE: PRODUCTION(*a*), STATES, 1936-37 TO 1964-65
('000 gallons)

Period	N.S.W.	Vic.	Qld	S.A.	W.A.	Aust.
Average for three years ended—						
1938–39	2,712	1,359	31	14,021	396	18,519
1948–49	4,178	3,040	31	25,906	689	33,844
1958–59	3,974	2,435	36	25,190	743	32,378
Year—						
1960–61	4,904	3,021	32	25,061	744	33,762
1961–62	6,442	3,605	36	30,831	822	41,736
1962–63	5,858	2,433	28	20,785	789	29,893
1963–64	6,030	3,705	33	27,102	666	37,536
1964–65	6,404	3,458	24	28,112	612	38,610

(*a*) Net factory and farm production of beverage and distillation wine excluding the liquid gallonage of spirits added in wine fortifying.

BRANDY: PRODUCTION, SOUTH AUSTRALIA AND AUSTRALIA 1936–37 TO 1964–65
(Proof gallons)

Period	South Australia	Australia(*a*)
Average for three years ended—		
1938–39	446,251	505,474
1948–49	648,641	714,688
1958–59	1,009,040	1,149,032
Year—		
1960–61	1,044,285	1,166,978
1961–62	1,042,580	1,177,943
1962–63	994,420	1,128,997
1963–64	1,052,850	1,219,968
1964–65	1,183,351	1,400,100

(*a*) Includes New South Wales and Victoria, for which separate details are not available for publication.

Exports and imports of wine and brandy

Exports of wine and brandy in 1964–65 totalled 2,109,139 gallons, of which the United Kingdom received 1,418,837 gallons, Canada 361,789 gallons, New Zealand 79,928 gallons, Hong Kong 26,563 gallons, and other countries 222,022 gallons. Exports of Australian-produced wine for the five years ended 1964–65 are shown in the following table.

WINE: EXPORTS, AUSTRALIA, 1960–61 TO 1964–65

Year	Quantity (gallons)			Value ($A f.o.b.)		
	Sparkling	Other	Total	Sparkling	Other	Total
1960–61	11,441	1,884,978	1,896,419	59,572	2,546,158	2,605,730
1961–62	5,145	1,664,984	1,670,129	34,200	2,737,860	2,772,060
1962–63	17,245	1,596,887	1,614,132	92,444	2,657,052	2,749,496
1963–64	10,373	1,527,666	1,538,037	62,118	2,682,108	2,744,226
1964–65	16,035	1,977,329	1,993,364	96,056	3,427,426	3,523,482

Imports for 1964–65 amounted to 149,818 gallons valued at $618,342, compared with 117,537 gallons valued at $466,456 in the previous year. During 1964–65 Italy supplied 65,128 gallons valued at $190,792, France 33,810 gallons valued at $231,922 and the Federal Republic of Germany 13,067 gallons valued at $73,232.

Exports of Australian-produced brandy in 1964–65 amounted to 115,775 proof gallons, valued at $467,630. Imports of brandy, mainly from France, amounted to 84,383 proof gallons, valued at $465,130.

Dried vine fruit industries

The dry period from November to March in the lower Murray valley makes this an ideal area for dried vine fruit. Harvesting for drying takes place at the end of summer. The sun-drying process is often accelerated by using a dip of cold potash.

The *Dried Fruits Export Control Act* 1924–1964 was passed to organize oversea marketing of Australian dried vine fruit. The Australian Dried Fruits Control Board, consisting of growers' representatives, members with commercial experience in marketing dried fruits and a Government representative, controls the sale and distribution of dried fruit exports, recommends the licensing of exporters and contributes to dried vine fruit publicity activity overseas. In conjunction with its London office, the Board has improved dried fruit marketing overseas by its system of appraisement, regulation of shipments and advertising. The *Dried Fruits Export Charges Act* 1924–1964 provides for a levy on exports of dried fruit to defray costs and expenses incurred by the Board.

For details of the bulk purchase agreements between the Governments of the United Kingdom and Australia which operated during the period 1946–53 *see* Year Book No. 40, page 888. From 1 December 1953 exports to the United Kingdom have been on a trader to trader basis.

In June 1963 Australian, Greek and Turkish dried vine fruit interests concluded an agreement to maintain minimum prices for sultanas on world markets. The agreement, which aims at international price stability, is periodically reviewed. A permanent committee of the contracting parties was established in London for the purpose of supervising the working of the agreement, and a sub-committee of the permanent committee was established in Hamburg in 1964.

The Dried Vine Fruits Stabilization Scheme was introduced under the *Dried Vine Fruits Stabilization Act* 1964 to stabilize seasonal returns to growers of currants, sultanas and raisins. Its main features are:

Growers are guaranteed an average return from seasonal sales of currants, sultanas and raisins equal to the average cost of production of each variety less $10.00 per ton.

The maximum quantities for which returns are guaranteed each season are 13,500 tons of currants, 75,000 tons of sultanas and 11,000 tons of raisins.

Growers are required to contribute to separate varietal stabilization funds when the average return to the industry from seasonal sales of a variety exceeds cost of production by more than $10.00 a ton, with a limit on such contributions of $20.00 a ton.

When the quantity received for packing in any season does not reach 8,000 tons of currants, 50,000 tons of sultanas or 6,000 tons of raisins, growers are not required to contribute to the stabilization fund for the variety concerned.

Contributions are to be made by the Commonwealth to raise average returns to the guaranteed price when there is insufficient industry money in a stabilization fund for this purpose.

Limits are set to accumulation of money in the stabilization funds. These are $1,000,000 in the case of both the currant and raisin stabilization funds, and $4,000,000 in the case of the sultana stabilization fund.

Where these limits are exceeded during the operation of the scheme, the excess will be used first to reimburse the Government for any contribution it may have made to a fund; any balance will be repaid to growers on a first-in first-out basis.

The scheme is to operate for five years. At the end of the fifth year any credit balance in the stabilization funds will be used, in the first instance, to reimburse the Government for unrepaid contributions (if any). If the scheme is not renewed any remaining money will be returned to growers.

Growers' contributions for the scheme are collected under the *Dried Vine Fruits Contributory Charges Act* 1964 and the *Dried Vine Fruits Contributory Charges (Collection) Act* 1964.

Production and disposal of dried vine fruit

As the production of dried vine fruit is far in excess of Australia's requirements, considerable quantities are available for export. Total production during the 1964–65 season amounted to 107,911 tons, while exports for the year ended December 1965 were 77,828 tons, leaving an estimated 30,083 tons available for Australian consumption from that season's production. Australian consumption includes amounts delivered to biscuit manufacturers, bakeries, etc., as well as retail sales for household consumption..

The production of dried vine fruit during each of the seasons 1960–61 to 1964–65 and the averages for the three-year periods ended 1938–39, 1948–49 and 1958–59 are shown in the following table.

DRIED VINE FRUIT: PRODUCTION, STATES, 1936–37 TO 1964–65

(Tons)

Period	N.S.W.		Vic.		S.A.		W.A.		Australia	
	Raisins (a)	Currants	Raisins (a)	Currants	Raisins (a)	Currants	Raisins (a)	Currants	Raisins (a)	Currants
Average for three years ended—										
1938–39	5,464	1,163	39,810	8,953	13,215	9,009	723	2,179	59,212	21,304
1948–49	5,429	994	40,027	7,380	8,811	5,243	580	3,179	54,847	16,796
1958–59	10,300	705	53,178	4,294	11,115	4,432	118	1,746	74,711	11,177
Year—										
1960–61	10,777	981	51,002	5,583	6,751	4,543	51	1,984	68,581	13,091
1961–62	13,089	410	64,862	2,714	10,674	2,742	66	1,941	88,691	7,807
1962–63	8,560	463	44,059	2,536	11,007	2,607	51	1,225	63,677	6,831
1963–64	13,563	709	66,138	3,934	13,159	4,533	121	2,166	92,981	11,342
1964–65	12,841	632	66,153	4,477	16,325	5,044	75	2,364	95,394	12,517

(a) Includes sultanas and lexias.

The following table shows the exports of dried vine fruit during each of the years 1960–61 to 1964–65.

DRIED VINE FRUIT(a): EXPORTS, AUSTRALIA, 1960–61 TO 1964–65

Year	Raisins, sultanas and lexias		Currants		Total	
	Quantity	Value	Quantity	Value	Quantity	Value
	tons	$A'000 f.o.b.	tons	$A'000 f.o.b.	tons	$A'000 f.o.b.
1960–61	48,805	14,266	7,838	2,065	56,643	16,331
1961–62	60,169	17,910	4,564	1,240	64,733	19,150
1962–63	56,696	16,058	4,208	1,141	60,904	17,199
1963–64	57,451	17,442	5,512	1,601	62,963	19,043
1964–65	63,197	20,322	6,532	1,968	69,729	22,290

(a) Excludes quantities exported as mincemeat.

The chief countries importing Australian dried vine fruit are the United Kingdom, Canada, the Federal Republic of Germany, New Zealand and Ireland. The quantities exported to these countries in 1964–65 were 27,029 tons, 17,559 tons, 9,389 tons, 6,701 tons, and 1,962 tons respectively.

Table grapes

Grapes for table use are grown in all States except Tasmania, but the area of this type was only about 8 per cent of the productive area of vines in 1964–65. The quantities of table grapes produced during the season 1964–65 in each State are shown on page 887.

PASTORAL PRODUCTION

Livestock numbers

A detailed account of the various enumerations of livestock in Australia made prior to 1860 was given on page 748 of Year Book No. 35. Since 1860 annual enumerations have been made, based, with few exceptions, on actual collections made through the agency of the State police or by post. Particulars concerning the numbers of each of the principal kinds of livestock in Australia, at decennial intervals from 1860 to 1960, and from 1961 onwards in single years, are given in the following table, and are shown continuously since 1870 on the graph on plate 54 of this Year Book.

LIVESTOCK: AUSTRALIA, 1860 TO 1965

('000)

Year	Horses	Cattle	Sheep	Pigs	Year	Horses	Cattle	Sheep	Pigs
1860 .	432	3,958	20,135	351	1940 .	1,699	13,080	119,305	1,455
1870 .	717	4,276	41,594	543	1950 .	1,057	14,640	112,891	1,123
1880 .	1,069	7,527	62,184	816	1960 .	640	16,503	155,174	1,424
1890 .	1,522	10,300	97,881	891	1961 .	598	17,332	152,679	1,615
1900 .	1,610	8,640	70,603	950	1962 .	562	18,033	157,712	1,652
1910 .	2,166	11,745	98,066	1,026	1963 .	547	18,549	158,626	1,440
1920 .	2,416	13,500	81,796	764	1964 .	536	19,055	164,981	1,468
1930 .	1,793	11,721	110,568	1,072	1965 .	520	18,816	170,622	1,660

While livestock numbers (particularly sheep) have increased substantially since 1860, marked fluctuations have taken place during the period, mainly on account of widespread droughts which have from time to time left their impressions on the pastoral history of Australia. These occurred in 1868, 1877, 1883–84, 1892, 1893, 1895, 1901–02, 1912, 1914, 1918, 1919, 1922–23, 1925–26, 1927–28, 1929–30, 1940–41, 1944–45 to 1946–47, and 1964–65. The years in which the numbers of livestock attained their peaks are as follows: horses, 1919 (2,527,000); cattle, 1964 (19,055,000); sheep, 1965 (170,622,000); and pigs, 1941 (1,797,000).

The distribution throughout Australia of sheep, beef cattle, dairy cattle, and pigs at 31 March 1963 is shown in the maps on pages 1049 and 1050 and facing pages 1082 and 1083 of Year Book No. 50.

The numbers of horses, cattle, sheep, and pigs in each State and Territory are shown later in this chapter. As explained on page 940, since 1964 farmers are no longer asked to classify their herds as either 'beef cattle' or 'dairy cattle'; consequently detailed statistics of cattle from 1964 onwards are not comparable with those for earlier years.

Value of pastoral production

Values of pastoral production are shown for 1964–65 and earlier years in the following tables. Further details of the source of the information and an explanation of the terms used in this compilation will be found in the chapter Miscellaneous. Maintenance costs and depreciation have not been deducted; consequently the net values are inflated to the extent of these amounts.

GROSS, LOCAL AND NET VALUES OF PASTORAL PRODUCTION, STATES AND TERRITORIES, 1964-65

($'000)

State or Territory	Gross production valued at principal markets	Marketing costs	Local value of production	Value of materials used in process of production	Net value of production(*a*)
New South Wales . . .	535,114	42,433	492,681	(*b*) 41,313	451,368
Victoria	373,501	41,017	332,484	22,816	309,668
Queensland	270,939	22,619	248,320	27,332	220,988
South Australia . . .	135,916	8,313	127,603	17,549	110,054
Western Australia . . .	125,837	8,960	116,877	15,808	101,069
Tasmania	33,233	2,119	31,114	10,074	21,040
Northern Territory . . .	6,450	1,078	5,372	n.a.	5,372
Australian Capital Territory .	2,059	164	1,895	154	1,741
Australia	**1,483,049**	**126,703**	**1,356,346**	**135,046**	**1,221,300**

(*a*) No deduction has been made for depreciation and maintenance. (*b*) No allowance has been made for costs of power, power kerosene, petrol and other oils.

NET VALUE OF PASTORAL PRODUCTION(a): STATES AND TERRITORIES 1960-61 TO 1964-65

Year	N.S.W. (b)	Vic.	Qld	S.A.	W.A.	Tas.	Aust.(c)
			NET VALUE ($'000)				
1960–61	319,920	232,362	188,692	72,238	79,956	12,806	916,338
1961–62	366,004	231,056	172,898	91,256	82,656	11,708	962,676
1962–63	403,660	265,126	200,522	103,990	82,580	15,084	1,078,698
1963–64	503,090	323,696	235,774	125,978	123,544	19,566	1,340,578
1964–65	451,368	309,668	220,988	110,054	101,069	21,040	1,221,300
			NET VALUE PER HEAD OF POPULATION ($)				
1960–61	82.5	80.3	125.5	75.5	109.6	36.6	88.2
1961–62	92.7	78.1	113.2	93.1	110.8	32.8	90.8
1962–63	100.5	87.7	129.3	104.1	108.0	41.7	99.8
1963–64	123.1	104.7	149.9	123.5	157.9	53.4	121.6
1964–65	108.6	97.7	138.4	105.5	126.7	57.2	108.6

(a) No deduction has been made for depreciation and maintenance. (b) No allowance has been made for costs of power, power kerosene, petrol and other oils. (c) Includes Northern Territory and Australian Capital Territory.

Indexes of quantum and price of pastoral production, 1960-61 to 1964-65

The quantum indexes shown in the following table relate to gross output of farm products valued at constant prices. The quantities of each farm product produced each year have been re-valued at the unit gross value for the period 1936–37 to 1938–39. The price indexes relate to average 'prices' of farm products realized in the principal markets of Australia. Average quantities of each product marketed in the period 1946–47 to 1950–51 have been used as fixed weights. For further details of the methods of calculating these indexes and of the weights used *see* the chapter Miscellaneous.

INDEXES OF QUANTUM(a) AND PRICE OF PASTORAL PRODUCTION AUSTRALIA, 1960-61 TO 1964-65

(*Base: Average 3 years ended June,* 1939 = 100)

—	1960–61	1961–62	1962–63	1963–64	1964–65
Quantum(a) produced—					
Wool	165	174	170	183	183
Other products	136	144	154	158	158
Total, pastoral	*152*	*160*	*163*	*172*	*172*
Per head of population	100	104	104	107	105
Price—					
Wool	397	412	449	531	437
Other products	513	433	451	480	496
Total, pastoral	*443*	*421*	*450*	*511*	*460*

(a) Index of value at constant prices, i.e. quantities revalued at average unit values of base years 1936–37 to 1938–39.

Sheep

Distribution throughout Australia

With the exception of a short period in the early eighteen-sixties, when the flocks of Victoria outnumbered those of New South Wales, the latter State has occupied the premier position in sheep-raising, depasturing nearly one-half of the sheep of Australia.

A map showing the distribution of sheep in Australia at 31 March 1963 appears on page 1049 of Year Book No. 50. Graphs showing the number of sheep in Australia from 1870 onwards appear on plates 54 and 55 of this Year Book.

SHEEP: NUMBERS IN STATES AND TERRITORIES, 1937 TO 1965

('000)

Period	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
Average for three years ended—									
1939	51,202	17,845	21,889	8,916	8,972	2,460	23	251	111,558
1949	46,525	17,900	16,442	8,793	10,368	2,060	24	227	102,339
1959	67,006	26,615	22,537	15,285	15,609	3,259	25	265	150,601
At 31 March—									
1961	68,087	26,620	22,135	14,952	17,152	3,439	16	278	152,679
1962	69,498	27,533	22,125	16,415	18,314	3,531	10	286	157,712
1963	70,021	27,472	22,811	15,737	18,727	3,570	9	279	158,626
1964	71,764	28,413	24,337	16,403	20,165	3,600	10	289	164,981
1965	72,396	30,437	24,016	17,289	22,392	3,793	9	290	170,622

Except when affected by drought, the relative numbers of sheep in the different States have remained fairly constant in recent years. The percentage distribution in 1965 was: New South Wales, 43; Victoria, 18; Queensland, 14; South Australia, 10; Western Australia, 13; and Tasmania, 2.

Movement in sheep numbers

The following table shows the approximate movement in sheep numbers in Australia in each year from 1960-61 to 1964-65.

SHEEP AND LAMBS: ANALYSIS OF MOVEMENT IN NUMBERS, AUSTRALIA 1960-61 TO 1964-65

('000)

Year ended 31 March	Numbers at beginning of season	Lambs marked	Net exports	Sheep and lambs slaughtered (*a*)	Estimated deaths on farms (*b*)	Numbers at close of season
1961	155,174	39,792	171	32,582	9,534	152,679
1962	152,679	45,596	181	33,317	7,065	157,712
1963	157,712	45,146	247	33,944	10,041	158,626
1964	158,626	47,818	312	33,240	7,911	164,981
1965	164,981	47,608	307	33,549	8,111	170,622

(*a*) Includes an estimate for numbers boiled down. (*b*) Balance figure; excludes lambs which died before marking.

Comparisons of Australian flock numbers with those of certain other principal sheep producing countries are given on page 952.

Classification of sheep according to age, sex and breed

In the following table numbers of sheep in Australia are classified according to age and sex at 31 March.

SHEEP, BY AGE AND SEX: AUSTRALIA, 1961 TO 1965
('000)

Description	1961	1962	1963	1964	1965
Rams, 1 year and over	1,934	1,956	1,979	1,986	2,047
Breeding ewes (including ewes intended for mating)	69,662	70,693	70,936	72,862	75,580
Other ewes, 1 year and over	8,951	8,729	8,878	8,631	8,952
Wethers, 1 year and over	42,912	43,021	44,267	46,203	49,284
Lambs and hoggets, under 1 year	29,220	33,313	32,566	35,299	34,759
Total, sheep and lambs	**152,679**	**157,712**	**158,626**	**164,981**	**170,622**

Particulars of the principal breeds of sheep at 31 March 1965 (details are collected on a triennial basis) are shown in the following table.

SHEEP, BY PRINCIPAL BREED: STATES AND TERRITORIES, 31 MARCH 1965
('000)

Breed	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
Merino	56,232	14,148	23,655	14,581	20,533	351	9	245	129,754
Other recognized breeds	7,601	7,486	129	1,218	788	2,352	..	13	19,587
Merino comebacks (*a*)	1,163	2,160	47	284	287	419	..	1	4,361
Crossbreds(*b*)	7,400	6,643	185	1,206	784	671	..	31	16,920
Total	**72,396**	**30,437**	**24,016**	**17,289**	**22,392**	**3,793**	**9**	**290**	**170,622**

(*a*) Merino comeback is the progeny of a crossbred Merino ewe and a Merino ram, i.e. finer than half-bred.
(*b*) Half-bred and coarser.

Imports and exports of sheep

The oversea exports of live sheep from Australia are of comparatively minor importance. On 27 November 1929 the export of stud Merino sheep was prohibited, except with the approval of the Minister for Primary Industry. Exports of sheep are now principally for slaughter overseas. Consignments for this purpose in recent years were made chiefly from Western Australia to Singapore. In 1964–65 the number of sheep exported was 286,205, valued at $2,411,000 (1963–64, 327,607, valued at $2,837,000). Since June 1958 an embargo has been imposed on the import of sheep in order to prevent the introduction of the disease blue-tongue.

Cattle

Objects of cattle-raising in Australia

Cattle-raising is carried out in all the States, the main object in certain districts being the production of stock suitable for slaughtering purposes and in others the raising of profitable dairy herds. While dairy cattle are restricted mainly to coastal districts, beef cattle are more widely distributed, particularly in the eastern States, and are raised in areas unsuitable for dairy cattle, such as the tropical area of northern Queensland, the Northern Territory and the Kimberley district in the north of Western Australia.

Distribution throughout Australia

Although cattle numbers declined after 1957 because of drought conditions and heavy slaughterings, they began to rise again in 1960 and in 1964 reached a record level of 19,055,000. Again because of drought in the eastern States, this figure declined to 18,816,000 in 1965.

A graph showing the number of cattle in Australia from 1870 onwards appears on plate 54.

CATTLE: NUMBERS IN STATES AND TERRITORIES, 1937 TO 1965
('000)

Period	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
Average for three years ended—									
1939	3,040	1,861	6,002	324	767	260	882	8	13,144
1949	3,122	2,153	5,971	443	830	244	1,006	9	13,778
1959	3,770	2,722	7,177	598	985	367	1,173	10	16,802
At 31 March—									
1961	4,242	2,864	7,004	561	1,100	394	1,154	13	17,332
1962	4,399	3,156	7,098	659	1,218	425	1,064	14	18,033
1963	4.569	3,225	7,233	679	1,298	444	1,087	14	18,549
1964	4,789	3,301	7,402	694	1,299	450	1,105	15	19,055
1965	4,619	3,316	7,393	697	1,258	451	1,068	14	18,816

Although the proportion was not as high as it has been in some previous years, Queensland was carrying 39 per cent of the cattle in Australia in 1965. The percentage in each State and Territory during that year was: New South Wales, 25; Victoria, 18; Queensland, 39; South Australia, 4; Western Australia, 7; Tasmania, 2; and Northern Territory, 5.

Maps showing the distribution of beef and dairy cattle in Australia appear on pages 1050 and 1082 of Year Book No. 50, and maps showing the distribution in earlier years were published in previous issues of the Year Book.

Classification of cattle

Following an investigation into the adequacy of the wording and arrangement of the cattle sections of the statistical forms used for recent Agricultural, Dairying and Pastoral Censuses, certain changes were made to the forms used for the Census conducted at 31 March 1964. Prior to 1964 farmers were asked to classify their herds as either 'beef cattle' or 'dairy cattle'. These two terms tended to cause confusion between breed and purpose, and in those instances where vealer production was carried on in association with dairying, farmers were in doubt how to classify part or all of their herds. From 1964 onwards farmers have been asked to classify their cattle according to the two main purposes of (i) milk production and (ii) meat production, irrespective of breed, and to report separately the number of cows and heifers kept for their own domestic milk supply. Consequently detailed statistics of cattle from 1964 are not comparable with earlier figures. However, four broad groupings of cattle are generally comparable with earlier years, and particulars for each year from 1961 to 1965 are shown below.

CATTLE: NUMBERS, AUSTRALIA, 1961 TO 1965
('000)

At 31 March—	Bulls one year and over	Cows and heifers one year and over	Calves under one year	Other	Total
1961	347	10,124	3,561	3,300	17,332
1962	366	10,543	3,872	3,252	18,033
1963	379	10,936	4,079	3,155	18,549
1964	377	11,138	4,254	3,286	19,055
1965	370	11,130	4,068	3,248	18,816

CATTLE, BY PURPOSE(*a*), AGE AND SEX, 31 MARCH 1964 AND 1965
('000)

Classification	1965									1964
	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T. (*b*)	A.C.T.	Aust.	Aust.
Bulls (1 year and over) used or intended for service—										
Dairy breeds	20	41	19	6	5	4	..	..	95	99
Beef breeds	67	32	109	10	20	4	33	..	275	278
Total bulls	*87*	*73*	*128*	*16*	*25*	*8*	*33*	..	*370*	*377*
Cattle used or intended for production of—										
Milk or cream for sale—										
Cows—In milk	532	873	478	97	44	143	1	1	3,012	3,078
Dry	186	314	211	61	70			1		
Heifers—Springing (within 3 months of calving)	191	322	181	24	26	43	..	..	843	821
Other (1 year and over)				26	30					
Calves (under 1 year)	146	309	121	38	33	43	..	..	690	718
Milk or cream for use on rural holdings—										
House cows and heifers	105	29	44	7	11	6	..	..	202	218
Total cattle, production of milk, etc.	*1,160*	*1,847*	*1,035*	*253*	*214*	*235*	*1*	*2*	*4,747*	*4,835*
Cattle for other purposes(*c*)—										
Cows and heifers (1 year and over)	1,793	675	3,125	223	531	91	629	6	7,073	7,021
Calves (under 1 year)(*d*)	1,029	458	1,294	132	223	77	161	4	3,378	3,536
Other (1 year and over), i.e. steers, bullocks, speyed cows, etc.	550	263	1,811	73	265	40	244	2	3,248	3,286
Total cattle, other purposes	*3,372*	*1,396*	*6,230*	*428*	*1,019*	*208*	*1,034*	*12*	*13,699*	*13,843*
Total cattle and calves for all purposes	4,619	3,316	7,393	697	1,258	451	1,068	14	18,816	19,055

(*a*) Collected according to this classification for the first time in 1964. *See* text on p. 940. (*b*) As at 30 June 1965. (*c*) Mainly for meat production. (*d*) Includes vealers, and bull calves intended for service.

For beef cattle and dairy cattle numbers up to 1963 *see* pages 1056 and 1078 respectively of Year Book No. 50.

Meat research schemes

In November 1965 the Commonwealth Parliament passed legislation providing for the extension of the cattle and beef research scheme to cover beef, mutton and lamb research. Details of the beef research scheme were set out on page 1,050 of Year Book No. 51. Under the new legislation the Cattle and Beef Research Committee will be re-constituted as the Meat Research Committee and its powers and functions will be the same as the former Committee as widened to include mutton and lamb research. The Meat Research Committee will consist of twelve members—seven meat producer representatives, the Chairman of of the Australian Meat Board, one representative from the Universities engaged in meat research, the Commonwealth Scientific and Industrial Research Organization, the Australian Agricultural Council, and the Department of Primary Industry. The new Committee will come into being on a date to be proclaimed and the Cattle and Beef Research Committee will cease to exist from that date.

The scheme will be financed from the Livestock Slaughter Levy (*see* below). The Commonwealth will make a matching contribution on a $1 for $1 basis to meet expenditure on research. The research will be conducted by existing bodies such as the Universities, C.S.I.R.O. and State Departments of Agriculture.

The Minister for Primary Industry has approved a beef research programme of just over $2,000,000 for 1965–66. This is approximately the same amount as in the previous year.

The Livestock Slaughter Levy

The *Livestock Slaughter Act* 1964–1965 imposed a levy on all cattle (over 200 lb. dressed weight), sheep and lambs slaughtered within Australia for human consumption. These levies operated from 1 August 1964 and replaced the charge imposed on meat exports and also included

the cattle slaughter levy for beef research purposes imposed in 1960. (*See* page 909 of Year Book No. 51 for details.) The proceeds of the levies under the Livestock Slaughter Levy Act are for the purposes of meat market development (including the financing of the operations of the Australian Meat Board) and for research into the technical, scientific and economic problems of the meat industry. The rates of levy are not to exceed 75 cents for cattle, of which a maximum of 20 cents is for beef research, and 7.5 cents for sheep or lambs, of which a maximum of 3.75 cents is for sheep or lamb research.

Imports and exports of cattle

In 1964–65 the number of cattle exported was 9,425, valued at $835,000 (1963–64, 7,634 valued at $613,000). The bulk of the animals at present being exported are sent to the Philippines for slaughtering, the number exported thereto in 1964–65 being 4,685 head valued at $332,000. Prior to June 1958 small numbers of cattle were imported, consisting mainly of valuable animals for stud purposes. Since that date an embargo has been imposed on the import of cattle in order to prevent the introduction of the disease 'blue-tongue'.

Comparison with other countries

The following table shows the number of cattle in Australia and in some of the principal cattle-raising countries of the world at the latest available date.

CATTLE: NUMBERS IN VARIOUS COUNTRIES

Source (for countries other than Australia): *World Agricultural Production and Trade*, United States Department of Agriculture

('000)

Country	Year and month	Number p
India(*a*)	1962 (May)	236,000
United States of America	1965 (January)	107,152
U.S.S.R.	1965 (January)	87,100
Brazil(*a*)	1964 (December)	81,515
China (Mainland)(*a*)	1960 (December)	65,400
Argentina	1965 (June)	43,000
Pakistan(*a*)	1961 (Estimate)	30,300
Mexico	1965 (Spring)	28,400
Ethiopia	1963 (Estimate)	22,000
France	1964 (October)	20,155
Australia	**1965 (March)**	**18,816**
Colombia	1964 (October)	16,000
Turkey(*a*)	1964 (December)	13,760
Germany, Federal Republic of	1964 (December)	13,044
South Africa	1965 (August)	12,500

(*a*) Includes buffaloes.

Horses

Distribution throughout Australia

About eighty per cent of the horses in Australia are in the States of New South Wales, Victoria and Queensland.

HORSES: NUMBERS IN STATES AND TERRITORIES, 1961 TO 1965

('000)

At 31 March—	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
1961	192	65	224	27	40	9	40	1	598
1962	168	61	217	25	40	9	41	1	562
1963	166	58	212	25	39	8	38	1	547
1964	163	56	206	(*a*) 25	39	8	38	1	(*b*) 536
1965	158	56	201	(*a*) 24	37	7	36	1	(*b*) 520

(*a*) Estimated. (*b*) *See* South Australia.

The number of horses in Australia reached a peak of 2,527,000 in 1919. Since then it has declined, because of mechanization of transport and farming, at an average rate of 44,000 a year. A graph showing the number of horses in Australia since 1870 appears on plate 54.

The percentage distribution of the number of horses in each State and Territory for 1965 was: New South Wales, 30; Victoria, 11; Queensland, 39; South Australia, 5; Western Australia, 7; Tasmania, 1; and Northern Territory, 7.

Oversea trade in horses

Exports of horses in 1964–65 numbered 467, valued at $658,000 (Australian produce 412 for $408,000, re-exports 55 for $250,000), made up of horses for breeding (177 valued at $176,000), horses for racing (226 valued at $452,000, shipped principally to Hong Kong, Malaysia and New Zealand), and horses for other purposes (64 valued at $30,000). Horses imported into Australia in 1964–65 (715 valued at $2,352,000) were mainly from the United Kingdom and New Zealand.

Pastoral products: wool

With about one-sixth of the world's woolled sheep, Australia produces almost one-third of the world's wool and more than half the world's fine-quality Merino wool. The bulk of the production is exported, mainly as greasy wool, although substantial amounts of scoured and carbonized wool, wool on sheep skins and small quantities of semi-manufactured wool are also shipped. The important position held by Australia among the principal sheep and wool producing countries of the world is shown in the table on page 952.

Wool marketing

Details of past wool marketing schemes and agreements, including the 1914–18 War Imperial Purchase Scheme, the British Australian Wool Realization Association Ltd., the 1939–45 War Acquisition Scheme, Joint Organization, and Minimum Reserve Price Plan, are given in previous issues of the Year Book.

More than ninety per cent of the Australian wool clip is disposed of at auction. (During both world wars, however, auction selling was suspended and replaced by bulk purchase schemes.) There are fourteen recognized wool-selling centres, namely Sydney, Goulburn, Newcastle, Albury, Melbourne, Geelong, Ballarat, Portland, Brisbane, Adelaide, Perth, Albany, Hobart, and Launceston. At these centres wool-selling brokers operate large stores where wool received from growers is held awaiting sale.

Each year a wool-selling programme is drawn up jointly by the selling brokers and wool-buyers on the basis of the expected clip. Selling dates and the quantities to be offered are then determined for each centre. Before each sale the selling brokers, who act as agents for the wool-growers, display a representative portion of the wool to be sold on show floors for buyers' inspection and valuation. Auction sales are attended by buyers purchasing on behalf of wool users in more than fifty countries.

Wool Marketing Committee of Inquiry

In 1961 the Commonwealth Government appointed an independent committee to inquire into the marketing and promotion of Australian wool and related matters (*see* Year Book No. 48, page 977, for further details). The Committee presented its report to the Government in 1962. Its most important recommendation was that wool promotion, research and testing should be brought under the control of a single body, which should also act as an advisory authority on wool marketing. This recommendation was implemented under the *Wool Industry Act* 1962, which set up the Australian Wool Board.

Australian Wool Board

This Board consists of a chairman, six woolgrower representatives, three members with special qualifications, and a representative of the Commonwealth Government. The first chairman of the Board was appointed by the Minister for Primary Industry after consultation with the Australian Wool Industry Conference (*see* page 944), but subsequent chairmen are to be appointed on the nomination of the Board. The six woolgrower representatives are appointed by the Minister on the nomination of the Wool Industry Conference, and the three members with special qualifications are appointed from a panel of names submitted by the Conference. The Act provides that the latter members must be experienced in one of the following fields: wool marketing and manufacturing, research, finance, and commerce.

When the Board came into being on 1 May 1963 it took over the functions of the Australian Wool Bureau. On 1 July 1963 the Australian Wool Testing Authority became part of the Board, and on 1 January 1964 the Board took over the functions of the Wool Research Committee. Information on these three former instrumentalities appears in Year Book No. 48, pages 977–81.

Following the organizational changes carried out under the Wool Industry Act, the functions of the Board embrace the following activities.

Wool promotion in Australia and overseas by publicity and other means. Promotion overseas is carried out through the International Wool Secretariat, which is maintained jointly by the Wool Boards of Australia, New Zealand and South Africa.

Provision of a testing service for wool and wool products. This service is administered by a subsidiary board retaining the name Australian Wool Testing Authority.

Administration of wool research. The Board is responsible for preparing annual programmes of research expenditure which are subject to the approval of the Minister for Primary Industry. Two committees established by the Board, the Wool Production Research Advisory Committee and the Wool Textile Research Advisory Committee, assist in this task.

Investigation into all aspects of wool marketing on a continuing basis. The Wool Marketing Committee, an ancillary body appointed by the Board, assists in carrying out this function. The Board is required to report to the Australian Wool Industry Conference on its findings and advise it on measures which should be adopted to meet changing marketing conditions. However, the Board has no executive powers over marketing.

In July 1964 the Board, after an investigation by the Wool Marketing Committee, made recommendations to the Australian Wool Industry Conference for the introduction of a Reserve Price Plan for wool, which were put to woolgrowers in a referendum in December 1965. For details *see* page 945.

Maintenance and administration of the wool stores which were entrusted to the Board by the Commonwealth Government. Further details concerning these stores appear in Year Book No. 48, page 978.

Other activities approved by the Minister for the benefit of the wool industry, including the operation of the Wool Statistical Service and the registration of wool classers. The Wool Statistical Service (described in more detail in Year Book No. 48, pages 977–8) provides comprehensive statistics on the Australian wool clip, while the registration of wool classers is designed to improve the standards of wool classing in Australia.

At present the main sources of finance for the various activities of the Board are a levy paid by woolgrowers and contributions by the Commonwealth Government.

The Australian Wool Industry Conference

This body was formed by woolgrowers in October 1962 to meet the need for an organization with sufficient authority to speak on behalf of the woolgrowing industry as a whole. It is not a statutory body and consists of twenty-five members each from the Australian Woolgrowers' and Graziers' Council and the Australian Wool and Meat Producers' Federation, and, from October 1965, five members from the Australian Primary Producers' Union. The fifty-five member conference is presided over by an independent chairman.

The Conference makes recommendations to the Commonwealth Government on policy matters concerning the wool industry. Under the Wool Industry Act it is the responsibility of the Conference to nominate woolgrower representatives for appointment to the Australian Wool Board and to prepare panels of names from which the three Board members with special qualifications are selected. Under the Wool Tax Acts (*see* below) the Conference is also responsible for recommending to the Commonwealth Government what rates of levy should be paid by woolgrowers to finance the activities of the Wool Board.

Wool Levy

Since 1936 a statutory levy has been collected from woolgrowers to finance wool promotion activities. The initial rate of 6d. (5c) a bale was increased at the request of woolgrowers to 2s. (20c) a bale in 1945 and 4s. (40c) a bale in 1952, the latter rate continuing until 1960. Further details regarding the operation of this levy prior to 1957 appear in Year Book No. 48, page 978.

Under legislation passed in 1957 provision was also made for the payment by woolgrowers of a contribution for wool research which was fixed at 2s. (20c) a bale. In 1960 the wool promotion levy was raised to 5s. (50c) a bale, and the following year it was increased further to 10s. ($1) a bale. The operation of this rate was subsequently extended for 1962–63 and 1963–64.

On 1 July 1964 the basis of collecting the woolgrowers' combined levy for wool promotion and research was changed from the existing unit charge per bale to a percentage of the gross sale value of the wool. The maximum rate was set at 2 per cent and provision was made for annual adjustments to the operative rate, not greater than that maximum, to yield the required amounts. At the same time the levy for wool promotion was increased from 10s. ($1) a bale to the equivalent of 27s. ($2.70) a bale, but the levy for research remained unchanged at the equivalent of 2s. (20c) a bale. For 1964–65 the rate for the combined levy for wool promotion and research was set at $1\frac{1}{8}$ per cent and for 1965–66 it was at the full rate of 2 per cent.

The imposition and collection of the combined levy from woolgrowers is governed by six complementary Acts, the Wool Tax Acts (Nos. 1 to 5) 1964 and the *Wool Tax Administration Act* 1964.

Commonwealth Government's contributions to wool research and promotion

Since 1945 the Commonwealth Government has contributed to wool research on a statutory basis. Originally the contribution was equivalent to 2s. (20c) a bale. This was increased to 4s. (40c) a bale in 1957 and has remained unchanged since then.

Until 1964–65 the Commonwealth Government had not contributed to wool promotion, but in that year began contributing at the rate of about $8,500,000 a year. This was the result of a request in July 1963 from the Australian Wool Industry Conference to the Government for assistance to the Australian Wool Board to finance its vastly increased commitments to the International Wool Secretariat (*see* page 944) for wool promotion overseas. The Secretariat had announced a five-year plan of expanded wool promotion activities that envisaged an increase in the Australian Wool Board's share of contributions to the Secretariat from its then $5,000,000 to about $20,000,000 a year.

The Government agreed in October 1963 to match $1 for $1 any increase in the growers' levy for promotion in excess of their current levy of 10s. ($1) a bale for that purpose. In January 1964 the Conference agreed to increase the growers' levy to the equivalent of 27s. ($2.70) a bale, which resulted in a Government commitment of 17s. ($1.70) a bale. In terms of aggregate quantities this commitment required a Commonwealth Government contribution of about $8,500,000 a year, commencing in 1964–65. This will be reviewed after three years.

Wool Reserve Prices Plan Referendum

On 9 December 1965 a compulsory referendum was held among Australian woolgrowers to decide whether or not they approved a plan of reserve prices for Australian shorn wool sold at auction. The plan originated from recommendations made by the Australian Wool Board to the Australian Wool Industry Conference. The chief object of the plan was to set a limit to extreme short-term falls in wool prices and so protect growers against exceptionally low returns.

The plan envisaged a scheme conducted as an integral part of the existing auction system and administered by a statutory marketing authority with the following financial resources for the buying-in of wool:

(*a*) a fund of $60 million to be provided by woolgrowers over a period of about seven years;
(*b*) ready access to $100 million credit to be provided by trading banks as and when required;
(*c*) a Government guarantee to provide such further finance as might be required in excess of the total of $160 million to be raised by (*a*) and (*b*) above, and special funds to be available to finance the administrative costs of the proposed scheme.

The plan provided for reserve prices to be set at conservative levels in accordance with certain criteria. If the commercial bidding on a lot being auctioned did not reach the reserve price, that lot would be bought-in by the marketing authority, with the grower thus receiving a minimum return. The authority would hold the wool until market conditions favoured its re-offer at auction. However, wool would not have been sold below the reserve prices operating at the time.

The Australian Government stated that it was prepared to legislate to implement the scheme, provided it received the approval of the majority of woolgrowers. However, the plan was rejected by 53.4 per cent of the enfranchised woolgrowers who voted at the referendum.

Wool production

Wool as shorn from the sheep contains an appreciable amount of grease, dirt and other extraneous matter, and is termed 'greasy wool'. The quantity of grease and other matter in a fleece differs not only between countries, but between districts in the same country. It fluctuates with the vagaries of the season, and with the breed and the condition of the sheep. To allow for this factor, the weight of greasy wool is sometimes given on a 'clean' basis, i.e. minus the estimated amount of impurities. The net wool fibre content of greasy wool, expressed as a percentage, is termed 'clean yield'.

From 1946–47 to 1952–53 the Australian Wool Realization Commission, and from 1953–54, the Wool Statistical Service, have assessed annually the clean yield of the Australian wool clip. During the period of assessment the clean yield showed a continuous rise up to 1951–52, when it reached 57.5 per cent. It has since fluctuated between 55.8 per cent and 57.7 per cent.

Wool scoured, washed and carbonized in Australia before export, however, has a clean yield somewhat lower than for the whole clip, because the grade of greasy wool treated locally for export as scoured, washed or carbonized includes a large proportion of dirty and low-grade wool. In recent years it has been slightly over 50 per cent. The quantity of this wool exported during 1964–65 was about 10 per cent of the total raw wool exports (excluding wool exported on skins) in terms of greasy. For the clean yield of Australian scoured wools exported a standard factor of 93 per cent is taken.

The production of wool in the States and Territories varies broadly in accordance with the number of sheep depastured and with seasonal conditions which affect clip per head (*see* page 947). In general, however, South Australia obtains from its large-framed Merinos a much heavier fleece per sheep than the Australian average, while Tasmania generally obtains from its predominantly non-Merino flocks a lighter fleece per sheep. In addition, as a result of better management (improved pastures, fodder conservation, better breeding, control of diseases, etc.), the long-term trend has been towards higher fleece weights.

The following table shows details of total wool (i.e. shorn, dead and fellmongered, and exported on skins) produced by each of the States and Territories during the years 1960–61 to 1964–65 compared with averages for the three-year periods ended 1938–39, 1948–49 and 1958–59. A graph showing the production of wool in relation to sheep numbers from 1870 onwards appears on plate 55 of this Year Book.

PRODUCTION OF WOOL (GREASY BASIS): STATES AND TERRITORIES, 1936–37 TO 1964–65

('000 lb.)

Period	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
Average for three years ended—									
1938–39	478,595	169,256	169,325	88,699	73,141	15,728	35	1,822	996,601
1948–49	439,363	200,229	151,679	108,126	95,031	16,272	305	1,927	1,012,932
1958–59	633,938	298,302	217,062	187,225	160,402	30,141	277	2,371	1,529,718
Year—									
1960–61	664,276	322,011	235,590	177,413	191,353	31,870	157	2,471	1,625,141
1961–62	701,168	330,716	230,333	206,985	192,161	34,469	98	2,645	1,698,575
1962–63	693,734	316,705	233,638	207,344	184,123	34,561	100	2,343	1,672,548
1963–64	731,316	334,288	255,386	210,500	216,574	34,007	91	2,552	1,784,714
1964–65	706,061	361,530	251,426	215,736	207,035	39,671	89	2,475	1,784,023

The bulk of the Australian wool production (about 91 per cent in recent years) is shorn from live sheep. The remainder is obtained by fellmongering (about 2 per cent) or is exported on skins (about 7 per cent). The following table shows details of total wool production according to method of obtaining wool, and also the gross value of wool produced. Gross value is based, for shorn wool, upon the average price realized for greasy wool sold at auction and, for skin wools, on prices recorded by fellmongers and skin exporters.

QUANTITY (GREASY BASIS) AND VALUE OF WOOL PRODUCED AUSTRALIA, 1936-37 TO 1964-65

Period	Shorn (incl. crutchings)	Dead and fell-mongered	Exported on skins	Total production	
				Quantity	Value
	'000 lb.	'000 lb.	'000 lb.	'000 lb.	$'000
Average for three years ended—					
1938–39	889,338	49,280	57,983	996,601	106,850
1948–49	902,007	50,660	60,265	1,012,932	305,072
1958–59	1,411,424	36,804	81,490	1,529,718	788,290
Year—					
1960–61	1,472,092	37,509	115,540	1,625,141	680,860
1961–62	1,546,318	36,192	116,065	1,698,575	745,108
1962–63	1,515,932	32,854	123,762	1,672,548	800,524
1963–64	1,631,962	28,688	124,064	1,784,714	1,023,442
1964–65	1,629,412	26,865	127,746	1,784,023	840,552

Average fleece weight

The average weights of sheep and lamb fleeces shorn in each of the States and Territories of Australia are shown in the following table for each season from 1960–61 to 1964–65.

AVERAGE WEIGHT OF FLEECES SHORN (SHEEP AND LAMBS) STATES AND TERRITORIES, 1960-61 TO 1964-65

(lb.)

State or Territory	1960–61	1961–62	1962–63	1963–64	1964–65
SHEEP					
New South Wales	9.48	10.06	9.94	10.19	9.81
Victoria	10.24	10.17	9.59	10.09	10.08
Queensland	9.93	9.89	9.83	10.41	9.65
South Australia	12.12	12.86	12.29	12.89	12.49
Western Australia	11.37	10.90	10.09	11.46	10.06
Tasmania	8.89	9.39	9.44	9.14	10.64
Northern Territory	9.00	8.50	10.94	10.36	9.26
Australian Capital Territory	9.18	9.87	8.88	9.59	9.07
Australia	**10.12**	**10.41**	**10.11**	**10.60**	**10.15**
LAMBS					
New South Wales	3.31	3.30	3.34	3.39	3.34
Victoria	2.96	2.92	2.82	2.76	2.97
Queensland	4.16	3.89	3.85	3.99	3.78
South Australia	3.55	3.81	3.63	3.71	3.79
Western Australia	2.84	2.84	2.55	2.91	2.69
Tasmania	2.30	2.23	2.35	2.12	2.31
Northern Territory	..	2.33	5.00	4.34	3.88
Australian Capital Territory	1.56	1.66	1.80	1.61	1.93
Australia	**3.27**	**3.25**	**3.20**	**3.26**	**3.24**

Classification of wool according to quality

The following table provides a detailed analysis of wool sold at auction, according to quality, for the years 1960–61 to 1964–65. These data are compiled by the Wool Statistical Service on the basis of catalogues of auction sales. 'Quality' ('64's, 60's, 58's,' etc.) is a measure of the fineness and texture of wool for spinning purposes. Broadly, it means the maximum number of hanks of yarn, each of 560 yards length, which can be spun from 1 lb. of combed wool. For instance, wool of 64's quality is of a fineness and texture which will produce 64 hanks, each of 560 yards, from 1 lb. of tops (combed wool) of that particular wool.

CLASSIFICATION OF GREASY WOOL SOLD AT AUCTION(*a*): AUSTRALIA 1960-61 TO 1964-65

(Bales of approximately 300 lb.)

Predominating quality	1960–61		1961–62		1962–63		1963–64		1964–65	
	Quantity	Per cent	Quantity	Per cent	Quantity	Per cent	Quantity	Per cent	Quantity	Per cent
70's and finer	122,534	2.7	115,434	2.4	138,238	3.0	132,620	2.7	145,267	2.9
64/70's	462,764	10.0	381,683	8.0	413,195	8.9	373,658	7.6	409,279	8.2
64's	633,919	13.8	572,549	12.1	582,315	12.5	567,559	11.6	620,453	12.5
64/60's	451,905	9.8	475,487	10.0	469,010	10.1	482,770	9.9	486,575	9.7
60/64's	947,627	20.5	1,048,912	22.1	1,043,674	22.4	1,149,957	23.4	1,108,668	22.2
60's and 60/58's	829,601	18.0	915,501	19.3	854,771	18.4	964,274	19.7	930,821	18.7
Total, 60's and finer	*3,448,350*	*74.8*	*3,509,566*	*73.9*	*3,501,203*	*75.3*	*3,670,838*	*74.9*	*3,701,063*	*74.2*
58's	555,237	12.0	578,588	12.2	527,493	11.3	566,904	11.6	586,708	11.8
56's	354,287	7.7	383,238	8.1	353,344	7.6	382,384	7.8	406,878	8.2
50's	140,457	3.0	146,657	3.1	135,256	2.9	141,638	2.9	153,079	3.1
Below 50's	43,552	0.9	49,875	1.1	45,631	1.0	45,675	0.9	51,534	1.0
Oddments	73,246	1.6	75,708	1.6	86,058	1.9	92,622	1.9	82,742	1.7
Grand total	**4,615,129**	**100.0**	**4,743,632**	**100.0**	**4,648,985**	**100.0**	**4,900,061**	**100.0**	**4,982,004**	**100.0**

(*a*) All greasy wool sold at auction except 'wool re-offered account buyer'.

Price and value

During 1964–65 the price of greasy wool sold in the selling centres of Australia averaged 47.8c per lb. compared with the average price of 58.1c per lb. in 1963–64 and 49.2c per lb. in 1962–63. These prices are as compiled by the National Council of Wool Selling Brokers and represent the average price realized for all greasy wool, of whatever type or quality, marketed during the years indicated.

Fluctuation in Australian wool prices has a marked effect on the nation's rural and national income. In 1945–46 the gross value of wool production was £58,597,000 ($117,194,000), representing 17.4 per cent of the gross value of production of all rural industries, while in 1950–51, when prices reached a peak, wool was valued at £651,902,000 ($1,303,804,000) or 55.6 per cent of the total value of production for all rural industries. The value of wool production fluctuated considerably in subsequent years. In 1964–65 it was £420,276,000 ($840,552,000), 24.3 per cent of the gross value of production of rural industries.

ESTIMATED GROSS VALUE OF TOTAL WOOL PRODUCTION: STATES AND TERRITORIES, 1960-61 TO 1964-65(*a*)

($'000)

Season	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
1960–61 .	277,762	138,530	101,718	70,484	76,624	14,458	56	1,228	680,860
1961–62 .	309,840	148,438	101,274	85,800	82,520	15,752	36	1,448	745,108
1962–63 .	332,340	158,012	115,462	92,514	82,988	17,772	40	1,396	800,524
1963–64 .	416,834	208,700	141,458	113,410	119,862	21,352	50	1,776	1,023,442
1964–65 .	336,675	176,041	117,218	94,328	95,804	19,051	39	1,396	840,552

(*a*) Includes shorn, dead and fellmongered wool and wool exported on skins.

Stocks of wool

Stocks of raw wool held in Australia at 30 June 1965 amounted to 310.7 million lb. (greasy basis), of which 66.3 million lb. (45.3 million lb. as greasy and 21.0 million lb. as scoured and carbonized) were held by woollen mills, wool scourers and fellmongers, and 244.4 million lb., assumed to be all greasy, were held by brokers. Of the wool held by brokers, 85.8 million lb. were unsold wool and 158.6 million lb. were sold wool held awaiting shipment. These stocks exclude wool on skins, since this wool is not recorded as production until fellmongered in Australia or exported on skins.

Consumption of wool

Statistics of raw wool consumption published in recent years for the purposes of broad international comparisons are based on the quantities of scoured or carbonized wool used on the woollen and worsted systems (mill consumption), plus quantities used in such processes as felting. Consumption estimates compiled on this basis have obvious defects, as they disregard oversea trade in semi-processed wool (e.g. tops and yarns) as well as woollen goods. Estimates of raw wool used on the woollen and worsted systems and by felt manufacturers in Australia are shown in the following table for the years 1960–61 to 1964–65.

ESTIMATED CONSUMPTION OF RAW WOOL IN AUSTRALIA, 1960-61 TO 1964-65

('000 lb.)

Year	Greasy basis			Clean equivalent		
	Used on woollen and worsted systems	Used for felt manufacture (including hats)	Total	Used on woollen and worsted systems	Used for felt manufacture (including hats)	Total
1960–61 . . .	104,801	3,896	108,697	63,414	1,851	65,265
1961–62 . . .	117,555	4,328	121,883	70,682	2,056	72,738
1962–63 . . .	120,238	3,868	124,106	72,295	1,837	74,132
1963–64 . . .	126,678	3,568	130,246	75,688	1,695	77,383
1964–65 . . .	120,676	2,392	123,068	72,102	1,136	73,238

As considerable quantities of tops, noils and yarn are exported from Australia, the series on raw wool consumption shown above is over-stated to this extent. The series entitled 'Estimated consumption of processed wool in Australia' provides a more reliable indication of wool consumption in Australia, as allowance has been made for exports of wool in semi-processed form. This series is shown in the following table for the years 1960–61 to 1964–65. Briefly, the series measures consumption of wool in terms of yarn used in Australian mills and other factories to produce woollen cloth and other woollen goods, yarn used for hand knitting purposes, and scoured wool used for felt manufacture. No allowance has been made for oversea trade in woollen piece goods, clothing, etc., because of the obvious difficulties of estimating accurately the wool content of these products.

ESTIMATED CONSUMPTION OF PROCESSED WOOL IN AUSTRALIA 1960-61 TO 1964-65

('000 lb.)

Year	Greasy basis				Clean equivalent			
	Worsted yarn used (*a*)(*b*)	Woollen yarn used (*b*)	Scoured wool used for felt manufacture (including hats)	Total	Worsted yarn used (*a*)(*b*)	Woollen yarn used (*b*)	Scoured wool used for felt manufacture (including hats)	Total
1960–61	41,384	32,239	3,896	77,519	24,516	20,016	1,851	46,383
1961–62	45,173	29,316	4,328	78,817	26,543	18,143	2,056	46,742
1962–63	45,967	32,337	3,868	82,172	27,335	20,064	1,837	49,236
1963–64	46,684	30,777	3,568	81,029	27,155	18,966	1,695	47,816
1964–65	44,137	35,926	2,392	82,455	25,674	22,154	1,136	48,964

(*a*) Includes hand knitting yarns used. (*b*) Includes wool content of yarns containing a mixture of wool and other fibres.

Quantities of wool exported

Of the total shipments of greasy and slipe wool in 1964–65, 32 per cent went to Japan, 14 per cent to the United Kingdom, 9 per cent to France, 8 per cent to Belgium-Luxembourg and 7 per cent to Italy.

EXPORTS OF GREASY AND SLIPE WOOL: AUSTRALIA, 1960-61 TO 1964-65

('000 lb. actual weight)

Country of consignment	1960–61	1961–62	1962–63	1963–64	1964–65
Japan	411,782	416,970	386,956	433,944	424,175
United Kingdom	217,318	207,660	204,412	229,308	192,961
France	155,378	138,483	131,769	138,798	122,283
Belgium-Luxembourg	105,023	108,699	98,572	101,699	106,391
Italy	105,790	146,369	119,409	127,556	95,175
Germany, Federal Republic of	60,931	66,773	74,474	86,350	85,944
United States of America	17,234	35,024	46,314	27,590	67,093
U.S.S.R.	30,289	40,753	49,445	45,595	50,681
Mexico	14,865	15,225	15,126	19,085	28,065
Other	140,530	154,179	152,491	172,876	163,631
Total	**1,259,140**	**1,330,135**	**1,278,968**	**1,382,801**	**1,336,399**

EXPORTS OF SCOURED AND WASHED, AND CARBONIZED WOOL
AUSTRALIA, 1960-61 TO 1964-65
('000 lb. actual weight)

Country of consignment	1960–61	1961–62	1962–63	1963–64	1964–65
United States of America	19,345	20,564	25,469	23,063	27,834
United Kingdom	20,234	15,344	17,497	17,566	12,812
Germany, Federal Republic of	8,470	8,267	7,314	7,517	8,997
Italy	7,691	9,636	8,582	8,340	6,292
Canada	5,339	5,470	2,981	3,398	4,966
Japan	6,105	7,055	5,796	4,891	4,122
Iran	1,853	2,322	3,173	2,428	3,513
France	4,659	5,089	4,251	3,205	3,268
Belgium-Luxembourg	1,504	1,566	1,541	1,413	2,466
China, Republic of (Formosa)	538	753	1,010	2,011	1,853
Other	21,624	23,238	24,299	14,385	11,330
Total	**97,362**	**99,304**	**101,913**	**88,217**	**87,453**

EXPORTS OF CARDED OR COMBED WOOL, NOILS AND WOOLWASTE
AUSTRALIA, 1960-61 TO 1964-65
('000 lb. actual weight)

—	1960–61	1961–62	1962–63	1963–64	1964–65
Carded or combed—Tops	16,694	21,438	21,631	25,932	19,232
Other			10	177	17
Noils	4,372	3,957	4,794	5,006	4,066
Waste—Soft wool	2,322	2,580	3,121	2,661	2,393
Hard wool	3,088	2,154	3,181	3,448	2,595

The following table shows the estimated greasy and clean weights of exports of raw and semi-processed wool for the years 1960–61 to 1964–65. As the figures in the following table are in terms of 'greasy' or 'clean' basis, they differ from those in the preceding tables which represent actual weight shipped.

EXPORTS OF WOOL—GREASY AND CLEAN BASES: AUSTRALIA(*a*)
1960-61 TO 1964-65
('000 lb.)

—	1960–61	1961–62	1962–63	1963–64	1964–65
GREASY BASIS					
Raw wool—					
Greasy and slipe	1,259,448	1,328,343	1,279,334	1,383,271	1,337,474
Scoured and washed and carbonized	182,668	184,249	191,208	162,871	161,384
Exported on skins	115,540	116,065	123,762	124,064	127,746
Total, raw wool	*1,557,656*	*1,628,657*	*1,594,304*	*1,670,206*	*1,626,604*
Semi-processed wool—					
Tops	30,049	40,089	39,368	47,483	35,024
Yarn	340	425	436	707	354
Grand total	**1,588,045**	**1,669,171**	**1,634,108**	**1,718,396**	**1,661,982**

(*a*) Includes re-exports.

EXPORTS OF WOOL—GREASY AND CLEAN BASES: AUSTRALIA(*a*)
1960–61 TO 1964–65—*continued*

('000 lb.)

—	1960–61	1961–62	1962–63	1963–64	1964–65
CLEAN EQUIVALENT					
Raw wool	892,824	936,749	912,148	969,007	936,084
Semi-processed wool	17,890	24,039	23,394	28,167	20,681
Total	**910,714**	**960,788**	**935,542**	**997,174**	**956,765**

(*a*) Includes re-exports.

Value of wool exported

The value of wool (other than wool on sheepskins) exported from Australia during 1964–65 was 31 per cent of the total value of exports of merchandise of Australian origin, while the proportion for the five years ended 1964–65 averaged 34 per cent. The value for the five years ended 1964–65, together with the principal countries to which wool was exported, is shown in the following table.

VALUE OF WOOL EXPORTS: AUSTRALIA(*a*), 1960–61 TO 1964–65

($'000)

Country of consignment	1960–61	1961–62	1962–63	1963–64	1964–65
Japan	211,836	229,132	222,234	282,172	242,549
United Kingdom	111,118	106,582	114,004	153,528	110,015
United States of America	21,416	33,732	45,904	41,240	62,233
France	70,250	64,902	66,538	83,134	61,799
Italy	54,194	77,054	65,260	84,014	54,515
Germany, Federal Republic of	31,832	34,916	40,940	55,830	50,179
Belgium-Luxembourg	36,686	40,600	37,906	48,268	42,664
U.S.S.R.	15,486	22,898	29,142	33,990	31,681
Other	116,066	135,238	136,784	178,704	150,215
Total	**668,884**	**745,054**	**758,712**	**960,880**	**805,850**

(*a*) Excludes re-exports and wool exported on sheepskins.

World sheep numbers and wool production

The following table shows particulars of the woolled sheep numbers and total production of wool, in terms of greasy, in the principal wool-producing countries of the world, together with estimates of world production of merino, crossbred, and carpet type wool for the latest available years.

In 1964–65 Australia produced 31 per cent of the world total of all types of wool, the share of all British Commonwealth countries combined representing approximately 47 per cent. The principal wool producers, other than Australia, were New Zealand with 11 per cent of the world total, Argentina, 7 per cent, South Africa, 5 per cent, and United States of America, 5 per cent. Production in the U.S.S.R., China and eastern European countries together amounted to 19 per cent. World production of wool (all types) in 1964–65 exceeded the average for the years 1934 to 1938 by approximately 1,872 million lb. or 49 per cent.

Australia's wool clip is predominantly merino. New Zealand and Argentina produce mainly crossbred wool, while the clip of the U.S.S.R. is largely of the carpet type. World production of merino wool in 1964–65 was 43 per cent above the average for the years 1934 to 1938, and the production of crossbred types has risen by about 72 per cent. Carpet wool production has risen by about 29 per cent.

ESTIMATED WORLD WOOLLED SHEEP NUMBERS AND PRODUCTION OF WOOL, 1962-63 TO 1964-65

(*Source* (for countries other than Australia): Reports published by Commonwealth Economic Committee, London)

Country	Sheep numbers (million)			Wool production (million lb.—greasy basis)		
	1962–63	1963–64	1964–65 (*a*)	1962–63	1963–64	1964–65
British Commonwealth—						
Australia	**159**	**165**	**171**	**1,673**	**1,785**	**1,784**
New Zealand	50	51	54	620	617	623
Other Commonwealth countries	84	85	85	278	273	275
Total, British	*293*	*301*	*309*	*2,571*	*2,675*	*2,682*
Foreign—						
U.S.S.R., China, eastern Europe(*b*)	243	238	229	1,148	1,152	1,100
Argentina	48	48	48	408	395	419
South Africa	34	34	34	300	303	296
United States of America	30	28	27	300	287	264
Uruguay	22	22	22	190	192	187
Other foreign countries	255	257	257	758	760	753
Total, foreign	*631*	*627*	*616*	*3,104*	*3,089*	*3,019*
Grand total	**924**	**928**	**925**	**5,675**	**5,764**	**5,701**
Type of Wool—						
Apparel type—						
Merino				2,277	2,353	2,318
Crossbred				2,177	2,195	2,166
Carpet type				1,221	1,216	1,217

(*a*) Provisional. (*b*) This group comprises Albania, Bulgaria, China and Dependencies, Czechoslovakia, East Germany, Hungary, Outer Mongolia, Poland, Romania, Tibet and U.S.S.R.

Principal importing countries and sources of supply

The following table, prepared from information published by the Commonwealth Economic Committee, furnishes, in respect of the principal importing countries, details of their production and imports of wool for 1964 together with the chief sources of supply. The quantities imported refer to the actual weight of wool, without distinguishing between greasy and scoured, except in the case of the United States of America, where estimated clean content of raw wool is quoted.

PRINCIPAL WOOL IMPORTING COUNTRIES AND SOURCES OF SUPPLY, 1964

(*Source:* Information published by Commonwealth Economic Committee, London)

(Million lb.)

Importing country	Production of importing country (*a*)	Quantity imported from— (*b*)					Total imports
		Australia	New Zealand	Argentina	South Africa	Other countries	
United Kingdom	127	218.1	139.4	31.9	45.1	136.3	570.8
Japan	n.a.	418.0	28.5	17.0	29.3	4.8	497.6
France	54	121.9	94.6	26.5	42.2	19.0	304.2
Italy	28	128.4	33.3	14.7	36.4	45.5	258.3
Belgium	n.a.	116.2	49.2	12.0	9.9	45.5	232.8
Germany, Federal Republic of	13	87.7	32.4	15.8	36.8	53.4	226.1
United States of America(*c*)	287	43.8	61.7	35.2	19.0	52.3	212.0

(*a*) Greasy basis, 1963–64. (*b*) Actual weight of greasy and scoured wool. (*c*) Imports are in terms of estimated clean content of greasy and scoured wool. Actual weight of total United States of America imports was 283.1 million lb.

As a considerable transit trade exists between European countries, it must not be assumed that the whole of the imports recorded by these countries is retained for their own consumption. The countries chiefly concerned with the transit trade are the United Kingdom and Belgium.

Pastoral products: meat

Australian Meat Board

The Australian Meat Board, which was re-constituted under the *Meat Industry Act* 1964, is the body responsible for controlling the external marketing of Australian beef, mutton and lamb. Powers and membership of the Board prior to its re-constitution in 1964 are set out on page 801 of Year Book No. 40. The Board's primary function is to ensure that Australian meat exports are marketed in a manner which will safeguard the long-term interests of the Australian meat industry. It consists of representatives of producers, exporters and the Commonwealth Government, and an independent Chairman.

The Board regulates oversea marketing of Australian meat by means of an export licensing system. It has power of control over the kinds of meat that may be exported by licensed exporters to particular places, or to particular agents and representatives. The Board also has power to undertake measures to promote the sale and consumption of meat both in Australia and overseas, and it may purchase and sell meat in its own right for the purpose of market development. However, the exercise of this power is limited to activities aimed at meeting special marketing problems or circumstances which preclude the effective participation of private traders. The Board may also purchase and sell meat, with the approval of the Minister for Primary Industry, for the purpose of administering any international arrangements to which Australia may be a party. *See also* Livestock Slaughter Levy, pages 941–2.

United Kingdom long-term purchase arrangements

Details of the long-term meat contracts with the United Kingdom from 1939 to 1952 and of the Fifteen Year Meat Agreement (1952–67) are given on page 710 of Year Book No. 41 and in earlier issues. In September 1953 the trade in meat between the United Kingdom and Australia reverted to private traders. The main features of the arrangements were given in Year Book No. 47, page 960. Details of minimum prices operating and deficiency payments received in recent years under private trading appear in Year Book No. 48 (page 973) and No. 50 (page 1068).

Lamb Guarantee Scheme

Since the 1962–63 lamb export season the Australian Meat Board has guaranteed exporters a minimum price on all lambs 36 lb. and under shipped to the United Kingdom. For the 1962–63 and 1963–64 seasons these prices were set at 15c a lb. f.o.b. for the period September to November and 13.8c a lb. for the following three months, December to February. For the 1964–65 and

1965–66 lamb export seasons the corresponding prices were 15.8c a lb. and 14.6c a lb. The higher guaranteed price for the initial period was aimed at stimulating early shipments of lamb, because normally the most opportune time for selling Australian lamb in the United Kingdom market is early in the export season. Any commitment by the Board is payable from moneys accrued in the Lamb Deficiency Payments Account under the Fifteen Year Meat Agreement.

United States-Australia Meat Agreement

In February 1964 the Governments of Australia and the United States concluded an agreement for the regulation of beef, veal and mutton exports from Australia to the United States with the object of promoting the orderly development of the trade in these classes of meat between the two countries. The agreement sought to preserve approximately the current pattern of trade in beef and mutton and to permit Australia to obtain a reasonable share of the expected market growth. Under the agreement Australia undertook to limit its exports of beef, veal and mutton to the United States to 242,000 tons in 1964, 251,000 tons in 1965, and 260,000 tons in 1966. There is provision for this figure to be increased in succeeding years in accordance with the estimated rate of increase in the total United States meat market. The agreement is subject to review every three years and, as appropriate, the established annual rate of increase will be adjusted to apply to the succeeding three years.

In August 1964 the United States Congress passed a Bill providing for the imposition of quotas on imports of beef and veal, mutton, and goatmeat, from all sources, in 1965 and subsequent years, if imports of these items are estimated by the United States Department of Agriculture to equal or exceed 110 per cent of a basic quantity. The basic quantity, 323,840 tons, is approximately the average of imports from 1959 to 1963. This quantity may be increased or decreased in any future calendar year by a percentage equal to that by which the United States average annual commercial production of beef and veal, mutton and goatmeat has changed since the base period 1959-1963. For this purpose the level of domestic production is the average of estimated commercial production for the year in which quotas may be applied and the two preceding years. An increase of 22.7 per cent in the basic quantity was set for 1966, providing for allowable imports of approximately 397,300 tons and an import ceiling, at which quotas would be established, of about 437,000 tons. On the basis of the first official estimate of United States meat imports during 1966, the United States Secretary for Agriculture announced on 30 December 1965 that it would not be necessary to invoke meat import quotas for 1966. However, if a later quarterly estimate in 1966 indicated that the import ceiling would be equalled or exceeded then quotas could be imposed.

Cattle slaughtered

The numbers of cattle slaughtered during each of the years ended June 1961 to 1965 compared with averages for the three-year periods ended June 1939, 1949 and 1959, are shown in the following table.

CATTLE (INCLUDING CALVES) SLAUGHTERED
STATES AND TERRITORIES, 1936-37 TO 1964-65
('000)

Period	Slaughterings passed for human consumption									Total slaughterings including boiled down
	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.	
Average for three years ended—										
1938–39	1,169	881	1,178	163	131	49	5	3	3,579	3,628
1948–49	1,094	759	1,119	168	146	42	14	4	3,346	3,378
1958–59	1,745	1,313	1,689	274	216	116	24	11	5,388	5,463
Year—										
1960–61	1,267	1,010	1,469	174	209	115	28	6	4,278	4,327
1961–62	1,609	1,311	1,584	201	241	136	25	8	5,115	5,167
1962–63	1,809	1,562	1,804	254	308	158	24	12	5,931	5,995
1963–64	1,930	1,760	1,857	279	373	176	50	12	6,437	6,484
1964–65	2,157	1,879	1,960	275	327	174	43	13	6,828	6,886

Production of beef and veal

Details of the production of beef and veal during each of the years ended June 1961 to 1965, compared with averages for the three-year periods ended June 1939, 1949 and 1959, are shown in the following table.

PRODUCTION OF BEEF AND VEAL (CARCASS WEIGHT)
STATES AND TERRITORIES, 1936-37 TO 1964-65
('000 tons)

Period	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
Average for three years ended—									
1938–39	181	123	199	26	28	10	1	1	569
1948–49	160	106	206	27	30	9	3	1	542
1958–59	248	176	305	41	41	19	5	2	837
Year—									
1960–61	168	125	247	27	42	17	6	1	633
1961–62	234	176	278	30	47	20	4	2	791
1962–63	263	214	314	36	56	24	5	2	914
1963–64	286	228	327	40	66	26	10	2	985
1964–65	303	246	326	37	57	26	9	2	1,007

Consumption of beef and veal

The highest post-war consumption of beef and veal (including canned beef and veal) was 132.7 lb. per head in 1956–57. With the buoyant oversea market for beef and the high prices ruling in Australia during the following four years, consumption per head fell substantially, and in 1960–61 amounted to only 88.3 lb. In 1964–65 consumption per head was 102.5 lb., consisting of 99.3 lb. carcass weight and 3.2 lb. (carcass equivalent) of canned meat.

PRODUCTION AND DISPOSAL OF BEEF AND VEAL (CARCASS WEIGHT)
AUSTRALIA, 1936-37 TO 1964-65

Period	Net change in stocks	Production	Exports (*a*)	For canning	Apparent consumption in Australia	
					Total	Per head per year
	'000 tons	'000 tons	'000 tons	'000 tons	'000 tons	lb.
Average for three years ended—						
1938–39	n.a.	569	121	18	430	140.3
1948–49	+ 1	542	101	67	373	109.1
1958–59	+ 5	837	209	85	538	123.8
Year—						
1960–61	+ 4	633	190	43	396	85.4
1961–62	+ 6	791	299	44	442	93.3
1962–63	(*b*)	914	384	45	485	100.4
1963–64	+ 4	985	423	43	515	104.6
1964–65	+ 3	1,007	457	48	499	99.3

(*a*) Includes carcass equivalent of boneless beef exported and all fresh and frozen meat shipped as ships' stores. (*b*) Less than 500 tons.

Exports of beef and veal

In 1964–65 chilled beef exports were 116,000 lb. valued at $35,000, while frozen beef exports amounted to 679,873,000 lb. valued at $192,369,000.

While beef and veal were previously shipped largely in carcass form, there has been in recent years a substantial increase in the amount of boneless beef exported. From 1958–59 to 1964–65 the quantity of boneless beef shipped exceeded that exported in carcass form. The trade in boneless beef has been developed principally with the United States of America. Since 1958–59 the United States has surpassed the United Kingdom as the principal market for Australian beef exports, the United Kingdom now occupying second place. The total value of beef and veal shipped to these two countries during 1964–65 was $93,342,000 and $64,847,000 respectively.

EXPORTS OF FROZEN AND CHILLED BEEF AND VEAL(*a*): AUSTRALIA
1960-61 TO 1964-65

Year	Exports of frozen and chilled beef		Exports of frozen veal		Exports of frozen and chilled beef and frozen veal	
	Quantity	Value	Quantity	Value	Quantity	Value
	'000 lb.	$A'000 f.o.b.	'000 lb.	$A'000 f.o.b.	'000 lb.	$A'000 f.o.b.
1960–61 . .	295,686	78,894	4,506	1,326	300,192	80,220
1961–62 . .	444,762	116,172	5,834	1,508	450,596	117,680
1962–63 . .	576,504	155,962	7,624	2,074	584,128	158,036
1963–64 . .	620,614	173,724	9,489	2,798	630,103	176,522
1964–65 . .	679,989	192,405	27,919	7,958	707,908	200,363

(*a*) Actual weight shipped, not carcass equivalent.

Sheep slaughtered

The following table shows the numbers of sheep slaughtered during each of the years ended June 1961 to 1965, compared with averages for the three-year periods ended June 1939, 1949 and 1959.

SHEEP (INCLUDING LAMBS) SLAUGHTERED: STATES AND TERRITORIES
1936-37 TO 1964-65
('000)

Period	Slaughterings passed for human consumption									Total slaughterings including boiled down
	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.	
Average for three years ended—										
1938–39 . .	6,520	7,891	1,088	1,762	1,216	364	..	25	18,866	18,925
1948–49 . .	6,367	6,413	1,066	1,863	1,458	396	3	47	17,613	17,650
1958–59 . .	7,857	9,058	1,429	2,917	2,059	775	3	71	24,169	24,278
Year—										
1960–61 . .	11,718	11,363	2,924	2,784	2,658	1,076	4	77	32,604	32,697
1961–62 . .	11,526	12,467	2,417	3,140	2,489	1,160	3	86	33,288	33,373
1962–63 . .	11,719	12,830	2,125	3,466	2,467	1,095	3	108	33,813	33,910
1963–64 . .	11,934	12,628	2,407	2,996	2,137	1,127	3	117	33,349	33,440
1964–65 . .	11,739	12,543	2,933	3,100	2,055	987	4	111	33,472	33,587

Production of mutton and lamb

Details of the production of mutton and lamb in each State and Territory in the years 1960–61 to 1964–65, compared with averages for the three-year periods ended June 1939, 1949 and 1959, are shown in the following table.

PRODUCTION OF MUTTON AND LAMB (CARCASS WEIGHT) STATES AND TERRITORIES, 1936-37 TO 1964-65

(Tons)

Period	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
Average for three years ended—									
1938–39	103 [illegible]	136,927	20,121	30,574	20,928	6,129	2	413	318,978
1948–49	109 [illegible]	111,677	18,587	34,772	23,846	7,214	64	839	306,083
1958–59	135,256	164,580	25,845	50,415	35,373	14,077	77	1,240	426,863
Year—									
1960–61	196,417	210,245	48,529	52,242	46,560	18,925	98	1,292	574,308
1961–62	196,844	229,722	40,339	55,390	42,697	20,229	65	1,427	586,713
1962–63	198,873	237,645	35,483	58,919	41,236	19,386	68	1,849	593,459
1963–64	202,057	231,769	40,209	52,864	36,690	20,079	72	1,986	585,726
1964–65	195,236	230,318	47,984	55,392	35,839	18,123	88	1,856	584,836

Consumption of mutton and lamb

In 1959–60 consumption of mutton and lamb, at 103 lb. per head of population, showed a rise of approximately 15 lb. per head over the previous year and exceeded that of beef and veal for the first time on record. Subsequently, consumption of mutton and lamb combined has declined each year; since 1962–63 it has been below the consumption of beef and veal. The consumption in 1964–65 was 85.6 lb. per head.

PRODUCTION AND DISPOSAL OF MUTTON AND LAMB (CARCASS WEIGHT): AUSTRALIA, 1936-37 TO 1964-65

Period	Net change in stocks	Production	Exports (a)	For canning	Apparent consumption in Australia	
					Total	Per head per year
	('000 tons)	('000 tons)	('000 tons)	('000 tons)	('000 tons)	(lb.)
MUTTON						
Average for three years ended—						
1938–39	..	201	17	..	184	60.0
1948–49	..	177	15	8	154	45.1
1958–59	..	268	27	19	222	51.0
Year—						
1960–61	+1	368	60	14	293	63.2
1961–62	+1	368	83	23	261	55.3
1962–63	−2	363	107	8	250	51.6
1963–64	+1	361	112	10	238	48.3
1964–65	+4	361	116	10	232	46.2
LAMB						
Average for three years ended—						
1938–39	..	118	72	..	46	15.0
1948–49	−1	130	45	..	86	25.2
1958–59	..	159	31	..	128	29.3
Year—						
1960–61	+1	207	29	..	177	38.2
1961–62	−1	219	18	..	202	42.8
1962–63	+1	231	27	..	203	42.1
1963–64	−1	225	21	..	205	41.7
1964–65	+1	224	26	..	197	39.3

(a) Includes carcass equivalent of boneless mutton exported.

Exports of frozen mutton and lamb

The quantities and values of exports of Australian frozen mutton and lamb in each year from 1960–61 to 1964–65 are shown in the following table.

EXPORTS OF FROZEN MUTTON AND LAMB(*a*): AUSTRALIA
1960-61 TO 1964-65

Year	Exports of frozen mutton		Exports of frozen lamb		Exports of frozen mutton and lamb	
	Quantity	Value	Quantity	Value	Quantity	Value
	'000 lb.	$A'000 f.o.b.	'000 lb.	$A'000 f.o.b.	'000 lb.	$A'000 f.o.b.
1960–61	83,075	14,874	64,430	11,580	147,505	26,454
1961–62	109,113	16,312	37,399	5,248	146,512	21,560
1962–63	136,741	23,304	56,615	10,362	193,356	33,666
1963–64	149,918	24,752	41,606	7,718	191,524	32,470
1964–65	162,964	29,517	54,132	10,832	217,096	40,349

(*a*) Actual weight shipped, not carcass equivalent.

The principal customer for Australian frozen mutton and lamb is the United Kingdom, although Japan has become a major buyer of mutton in recent years and in 1964–65 exports of mutton to Greece increased sharply. The exports of mutton and lamb to the United Kingdom in 1964–65 represented 16 per cent and 71 per cent, respectively, of the total quantities exported. Twenty-three per cent of the mutton exported went to Japan and 21 per cent to Greece.

Consumption of meat and meat products

The apparent consumption of meat (including cured and canned meat) and edible offal per head of population in Australia is shown in the table below for the years 1960–61 to 1964–65 in comparison with the averages for the three-year periods ended 1938–39, 1948-49 and 1958–59.

MEAT (INCLUDING CURED AND CANNED) AND EDIBLE OFFAL AVAILABLE FOR CONSUMPTION: AUSTRALIA, 1936-37 TO 1964-65

(lb. per head per year)

Period	Beef and veal (*a*)	Mutton (*a*)	Lamb (*a*)	Pork (*a*)	Offal	Canned meat (*b*)	Bacon and ham (*c*)	Carcass equivalent of meat and meat products (*d*)
Average for three years ended—								
1938–39	140.3	60.0	15.0	8.5	8.4	2.1	10.2	250.9
1948–49	109.1	45.1	25.2	7.1	8.9	2.6	11.7	215.7
1958–59	123.8	51.0	29.3	10.1	11.4	4.1	7.1	242.4
Year—								
1960–61	85.4	63.2	38.2	11.4	10.9	4.2	6.8	224.2
1961–62	93.3	55.3	42.8	13.6	11.7	3.8	7.0	232.3
1962–63	100.4	51.6	42.1	12.0	12.4	4.3	7.4	235.1
1963–64	104.6	48.3	41.7	11.5	12.9	4.3	7.3	235.3
1964–65	99.3	46.2	39.3	11.9	12.4	4.6	7.5	224.8

(*a*) Carcass weight. (*b*) Canned weight. (*c*) Cured carcass weight. (*d*) Includes offal.

Other pastoral products

Tallow

Details of tallow consumption are collected from the principal factories using tallow. Consumption of inedible tallow in these factories (soap and candle, chemical, pharmaceutical and toilet preparations, and woolscouring works) for the five years 1960–61 to 1964–65 was as follows: 1960–61, 1,158,000 cwt; 1961–62, 1,060,000 cwt; 1962–63, 1,090,000 cwt; 1963–64, 1,079,000 cwt; 1964–65, 1,159,000 cwt. These figures are, however, deficient to the extent that no allowance has been made for small unrecorded amounts used in other types of establishments. Details of edible tallow consumed in factories are not available.

Particulars of exports of edible and inedible tallow of Australian produce are shown in the following table for the five years 1960–61 to 1964–65.

TALLOW: EXPORTS, AUSTRALIA, 1960-61 TO 1964-65
(cwt)

——	1960–61	1961–62	1962–63	1963–64	1964–65
Edible . .	50,436	130,015	120,944	135,425	96,611
Inedible . .	968,540	1,853,161	2,229,230	1,976,000	1,846,543
Total .	**1,018,976**	**1,983,176**	**2,350,174**	**2,111,425**	**1,943,154**

Oversea trade in hides and skins

The value of cattle and horse hides, sheep and other skins, and skin pieces sent overseas during 1964–65 amounted to $79,534,000, compared with a total of $91,180,000 in 1963–64 and $73,420,000 in 1962–63.

Of the total exports of sheepskins with wool during 1964–65, amounting to 185,967,000 lb. valued at $59,621,000, 120,945,000 lb. valued at $37,887,000 (64 per cent of total value) were shipped to France, 22,735,000 lb. valued at $8,218,000 (14 per cent) to Italy, and 13,998,000 lb. valued at $4,112,000 (7 per cent) to the United Kingdom. In the previous year, also, France received 64 per cent (by value) of all sheepskins with wool exported, Italy 14 per cent and the United Kingdom 7 per cent. The exports of sheepskins with wool during each of the years 1960–61 to 1964–65 were as follows.

EXPORTS OF SHEEPSKINS WITH WOOL: AUSTRALIA
1960-61 TO 1964-65

——		1960–61	1961–62	1962–63	1963–64	1964–65
Number . .	'000	25,883	26,237	26,795	27,913	27,248
Value . . .	$'000	42,858	48,444	55,484	73,696	59,621

In 1964–65 sheepskins without wool to the value of $167,000 (22 per cent) were shipped to the United States of America; $164,000 (21 per cent) to France; $128,024 (17 per cent) to the United Kingdom; $85,000 (11 per cent) to Germany (Federal Republic); and $40,106 (5 per cent) to the Netherlands. In 1964–65 a total of 1,459,000 sheepskins without wool were exported, valued at $761,000. Since 1954–55 the number exported has exceeded two million once only (in 1958–59), and the value has averaged about $648,000.

The export trade in cattle hides and calfskins during 1964–65 was distributed among the main importing countries as follows: Japan, $5,598,000; Germany (Federal Republic), $2,147,000; South Africa, $1,048,000; Italy, $1,015,000; China (Mainland), $852,000; the Netherlands, $725,000. The total quantity exported was 124,423,000lb., valued at $14,423,000.

The exports of furred skins in 1964–65 were valued at $3,022,000, of which rabbit and hare skins constituted $1,321,000. The highest total value exported, $4,026,000, was recorded in 1955–56, when rabbit and hare skins accounted for $3,421,000. In 1963–64 they accounted for $1,846,000 out of a total of $3,783,000. Skins were shipped principally to the United States of America, the United Kingdom, Italy, and Germany, the values shipped to each in 1964–65 being: United States of America, $2,418,000; United Kingdom, $268,000; Italy, $135,000; and Germany (Federal Republic), $84,000.

The quantity of cattle hides, including calfskins, imported into Australia during the year 1964–65 amounted to 3,452,000 lb. valued at $451,000. The chief sources of supply are New Zealand and the Pacific Islands.

OTHER RURAL INDUSTRIES: DAIRYING, POULTRY AND BEE-FARMING

The dairying industry

The introduction of cattle into Australia and the early history of the dairying industry are treated in some detail in earlier issues of the Year Book. Australian dairy cattle have shown steady improvement in quality, as demonstrated by yield, over the years. This is attributable to improved breeding, associated with herd recording, and better feeding, resulting from the use of improved pastures. Better farming methods, arising from the development of modern farm machinery and the application of the results of research, have also played a part in the increased yields.

The Australian dairying industry is conducted under conditions ranging from tropical to temperate and Mediterranean type climates, and nowhere is it necessary to house cattle in the winter months. Most Australian dairy cattle are fed only on pasture and pasture products, and this accounts for average yields being somewhat lower than in those countries where stock are fed heavily on concentrated feed. In general, dairy farming is confined to the coastal and near coastal regions where rainfall and topography are favourable. These conditions are found in parts of the eastern, southern and south-western coasts. Inland districts include the lower north-east of Victoria, the south-western slopes of New South Wales, the fertile Darling Downs in Queensland, and the irrigated districts of the Riverina in New South Wales and northern Victoria.

The manufacturing and processing sections of the industry are highly organized and are well advanced technologically. Certain techniques and equipment developed in Australia are being adopted overseas. Dairy experts of the various State agricultural departments give instruction in approved methods of production, and inspect animals, buildings and marketable produce, with the result that a high standard of cleanliness and technology prevails in the industry.

Marketing of dairy products

The export trade is regulated by the terms of the Commonwealth *Customs Act* 1901–1954 and the Commonwealth *Commerce (Trade Descriptions) Act* 1905–1950 and regulations thereunder. This legislation requires that the true trade descriptions, etc. be marked on all produce intended for export, while official inspection ensures the maintenance of purity and quality. Upon request of the exporter the goods are given a certificate by the inspector.

Details of the *Dairy Produce Export Control Act* 1924–1965 and of the Australian Dairy Produce Board constituted under it, were given in earlier issues of the Year Book (*see* No. 48, pages 999–1000). The administrative expenses of the Australian Dairy Produce Board, and other sundry expenditure, were met from the proceeds of a levy imposed by the *Dairy Produce Export Charges Act* 1964 (*see* Year Book No. 51, page 1070). In 1965 this Act, together with the *Dairy Produce Levy Act*, 1958 was repealed by the *Butterfat Levy Act* 1965 (*see* page 961).

Equalization schemes

Reference is made to the butter and cheese equalization schemes in Year Book No. 48, pages 998–9. Particulars of the returns realized on local and oversea sales and of the average equalization rate for the years ended June 1961 to 1965 are given on page 968. Details are also given on page 966 of the wholesale prices of butter and cheese for home consumption as determined by the Commonwealth Dairy Produce Equalisation Committee Ltd.

An equalization scheme for casein similar to that for butter and cheese has been operated since 1952 by the Commonwealth Dairy Produce Equalisation Committee Ltd. Average realizations per cwt under the scheme were 174s. 10.9d. ($17.491) in 1960–61, 163s. 3.4d. ($16.328) in 1961–62, 159s. 0.9d. ($15.908) in 1962–63, 161s. 0.1d. ($16.101) in 1963–64, and 173s. 9.7d ($17.381) in 1964–65. The interim equalization value for 1965–66 has been fixed at $24.00 per cwt.

Commonwealth subsidies and stabilization plans

Butter, cheese and processed milk products. Under the provisions of the various Dairy Industry Assistance Acts, the first of which was passed in 1942, the Commonwealth Government has provided subsidies on milk supplied for the manufacture of butter and cheese. Subsidies were paid on a seasonal basis prior to 1 April 1946, but from that date have been on a flat rate basis. Subsidies are distributed by the Commonwealth Dairy Produce Equalisation Committee Ltd. through factories to milk producers by payments on butter and cheese manufactured. Subsidy on milk supplied for the manufacture of processed milk products was also payable from 1942 until 30 June 1948, and again from 1 July 1949, to 30 June 1952. The Commonwealth Government

LIVESTOCK: AUSTRALIA, 1870 to 1965

RATIO GRAPH

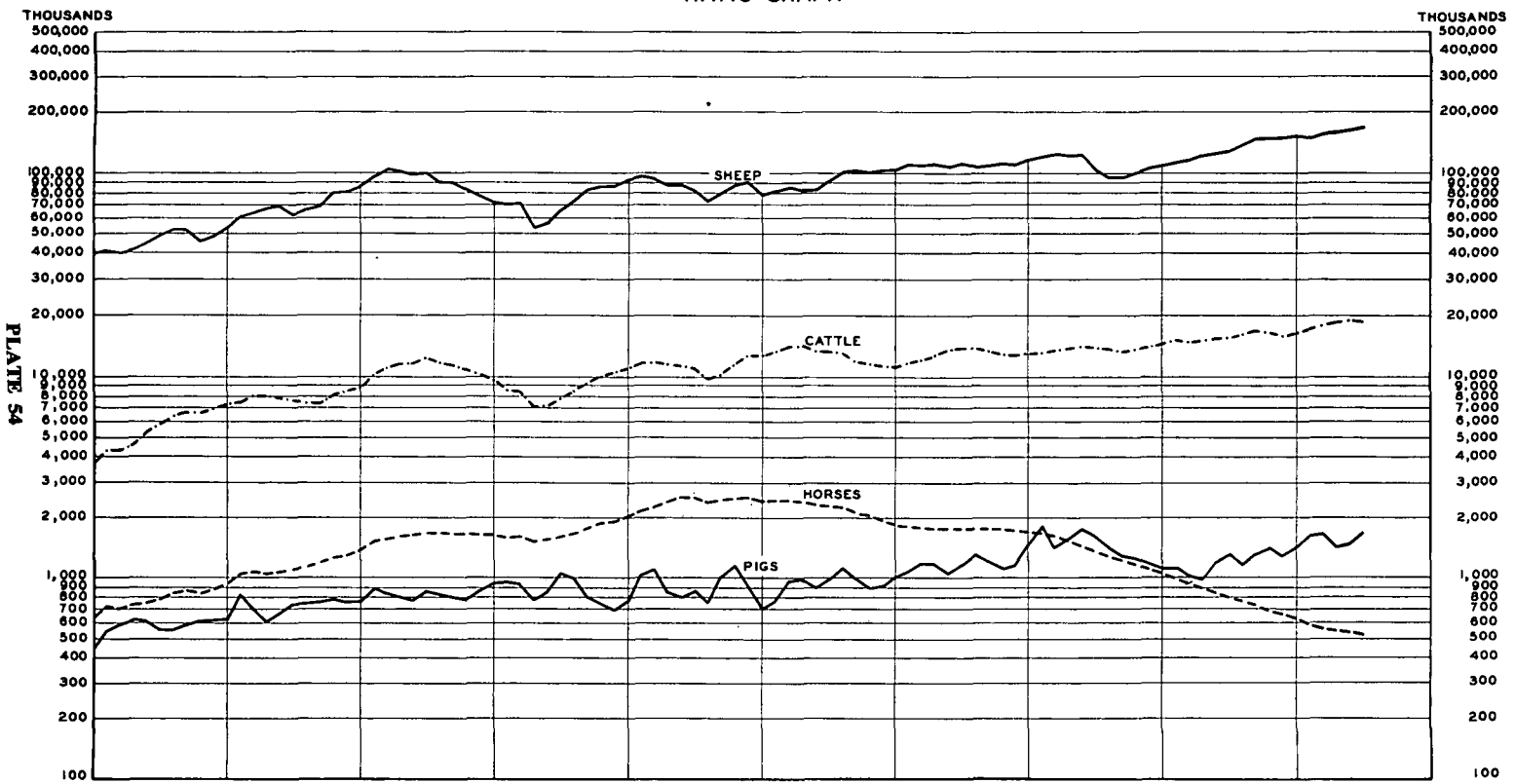


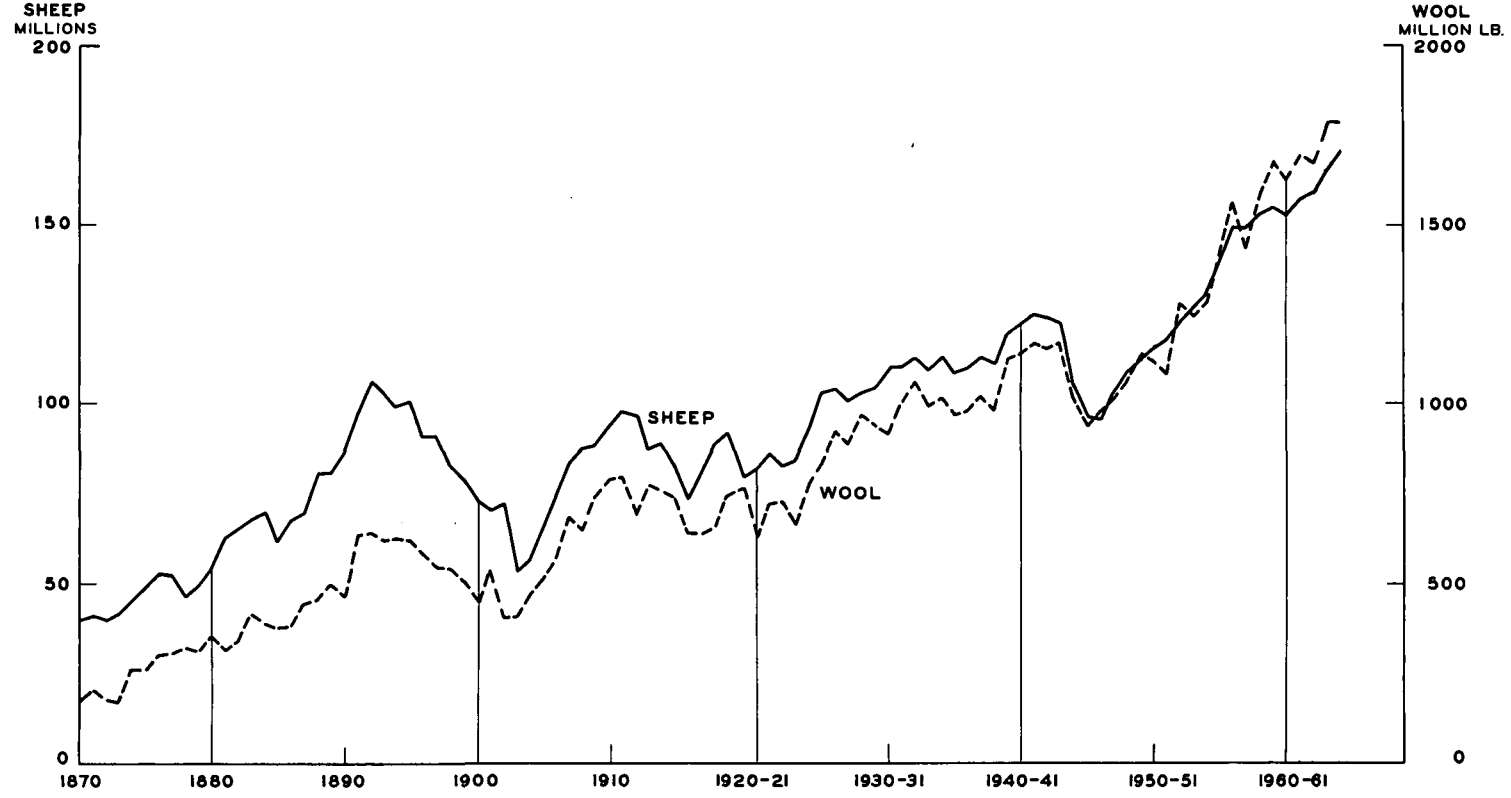
PLATE 54

NOTE:- VERTICAL SCALE IS LOGARITHMIC, AND THE CURVES RISE AND FALL ACCORDING TO RATE OF INCREASE OR DECREASE; ACTUAL NUMBERS ARE INDICATED BY SCALE.

PLATE 55

SHEEP NUMBERS AND WOOL PRODUCTION: AUSTRALIA

1870 TO 1965



provided, under the *Processed Milk Products Bounty Act* 1962, for the payment of a maximum amount of $700,000 as a bounty on exports of processed milk products in 1962–63. The bounty is to continue under present legislation until 30 June 1967, the maximum amounts made available being $1,000,000 for 1963–64 and $800,000 for each subsequent year.

Details of the three five-year stabilization plans which operated up to 30 June 1962 will be found in Year Book No. 49, page 1084.

Under the five-year stabilization plan which came into operation on 1 July 1962 a fixed bounty of $27,000,000 has been provided for each year of the plan. The bounty is payable on butter, cheese and butterfat products containing 40 per cent or more of butterfat. Bounty is payable on the production of these commodities provided they are taken into equalization.

The Commonwealth Government extended for the full period of the plan the provision whereby it underwrites the final minimum equalized return to butter and cheese factories each year. The actual level at which returns are to be underwritten is to be decided prior to the commencement of each year of the plan. Returns to producers have been underwritten at 40d. (33c) per lb. on commercial butter each year since the inception of the underwriting arrangement in 1958. The principal value underlying this guarantee is that it enables the Commonwealth Dairy Produce Equalisation Committee Ltd. to make a higher initial payment to factories than would otherwise be possible without risk of overpayment.

Under the current plan the Dairy Industry Investigation Committee has been disbanded. This Committee was responsible, during the last five-year plan, for the determination of the cost of efficient production of butterfat. However, this determination is not required for the current plan.

The Australian Dairy Industry Council assumes responsibility for determining domestic wholesale prices of butter and cheese. Under the previous plan it was the responsibility of the Minister for Primary Industry to determine local prices, after consultation with the Council.

Amounts realised on exports of butter and cheese in excess of the f.o.b. equivalent of the guaranteed return have been credited to the Dairying Industry Stabilization Fund, which was established in July 1948 for the purpose of stabilizing returns from exports. During 1951–52 the Stabilization Fund met the deficiency in respect of all exports which did not earn sufficient to meet the basic return to the factory. From 1 July 1952 to 30 June 1957 it was available to the industry to be used, in whatever manner it considered desirable, to make good any deficiency in respect of all exports other than the 20 per cent provided for under the Commonwealth Government's Five-year Stabilization Plan. The Act was amended in 1957 to enable the Board to use the fund for such other purposes as are approved by the Minister for Primary Industry. The amount standing to the credit of the Dairying Industry Stabilization Fund at 30 June 1965 totalled approximately $4,240,000. The major portion of the fund represents capital and other investments in milk recombining plants now established by the Board in Bangkok, Singapore and Manila.

Whole milk. In addition to the subsidies referred to above, the Commonwealth Government subsidized the production of whole milk consumed directly from 1943–44 to 1948–49. Details of the amounts distributed during each year will be found in Year Book No. 38, page 1031.

Extension, research and promotion of the dairying industry

Dairy Industry Extension Grant. An annual grant of $500,000, to be expended by State Governments for the purpose of promoting improved farming practices in the dairying industry, was first made by the Commonwealth Government for the five years from 1 July 1948. This assistance was continued for further periods of five years from 1 July 1953 and from 1 July 1958 at the same rate. For the five years from 1 July 1963 the amount of the annual grant has been increased to $700,000.

Dairy industry research and sales promotion. At the request of the Australian Dairy Industry Council, legislation was enacted in 1958 to provide for a sales promotion campaign for butter and cheese in Australia and also for research into industry problems. The legislation provided for a statutory levy on the manufacture of butter and cheese (the Dairy Produce Levy) which was initially set at rates of $\frac{1}{8}$d. (.104c) per lb. for butter and $\frac{1}{16}$d. (.052c) per lb. for cheese, the proceeds being divided equally between research and sales promotion. The rates of levy operative from November 1959 were $\frac{3}{16}$d. (.156c) per lb. for butter and $\frac{3}{32}$d. (.078c) per lb. for cheese, of which two-thirds was allocated to sales promotion and one-third to research.

In August 1964 the legislation was amended to include butter powder, at the same rates as for butter, and butter oil and ghee at $\frac{5}{64}$d. (.065c) per lb. for research and $\frac{5}{32}$d. (.130c) per lb. for sales promotion. In 1965 the Dairy Produce Levy Act was repealed and replaced by the *Butterfat Levy Act* 1965 which provides for the amalgamation of the three levies into one levy on butterfat used in the manufacture of butter, cheese and related products. The maximum rate of levy in the Act is 60 cents per cwt. of butterfat and the prescribed operative rate is 50 cents per cwt. (22 cents for promotion, 20 cents for administration and oversea market development, and 8 cents for research).

The Commonwealth Government agreed to contribute one half of the costs incurred on approved projects included in the programme of research, with a maximum contribution of $1 for $1 against funds raised by way of levy and allocated to research. The sales promotion programme is financed solely by the levy. The following table lists the amounts of levies collected for research and sales promotion during the five years 1960–61 to 1964–65.

DAIRY PRODUCE LEVY: AMOUNTS COLLECTED, 1960-61 TO 1964-65

($)

	1960–61	1961–62	1962–63	1963–64	1964–65
Research(*a*)	233,182	260,000	263,500	264,200	262,800
Sales promotion	466,362	520,000	527,000	528,400	543,000
Total collected(*a*)	**699,544**	**780,000**	**790,500**	**792,600**	**805,800**

(*a*) Excludes amounts contributed by the Commonwealth Government.

The scheme is administered by the Australian Dairy Produce Board, which, in respect of research, is advised by a statutory committee, the Dairy Produce Research Committee.

Dairy cattle

For the reasons indicated earlier in this chapter (*see* page 940), farmers are no longer asked to classify their herds according to breed. Commencing with the 1964 census they have been asked instead to classify their cattle according to the two main purposes of (*a*) milk production and (*b*) meat production and to report separately the number of cows and heifers kept for their own domestic milk supply. Consequently the statistics shown in the following table are not comparable with those for earlier years.

DAIRY BREED BULLS, AND COWS AND HEIFERS USED OR INTENDED FOR PRODUCTION OF MILK OR CREAM: STATES AND TERRITORIES 31 MARCH 1964 AND 1965

State or Territory	Bulls, dairy breed (*a*)	Cows and heifers used or intended for production of milk or cream for sale					House cows and heifers (*b*)
		Cows		Heifers			
				1 year and over		Under one year	
		In milk	Dry	Springing(*c*)	Other		
1964	99,270	3,078,075		821,286		717,895	218,098
1965—							
New South Wales	19,940	532,323	186,342	191,298		145,533	104,690
Victoria	40,500	873,288	313,550	321,897		309,151	29,154
Queensland	18,789	477,727	211,656	181,019		121,293	43,659
South Australia	6,720	97,627	61,182	23,685	25,922	37,846	6,735
Western Australia	4,848	43,917	69,098	25,662	30,211	33,479	11,137
Tasmania	4,179	143,257		43,311		42,648	6,212
Northern Territory	9	325		73		72	89
Australian Capital Territory	27	1,153	387	134		245	462
Australia	**95,012**	**3,011,832**		**843,212**		**690,267**	**202,138**

(*a*) Used or intended for service; excludes bull calves (under 1 year). (*b*) Kept primarily for rural holdings' own milk supply. (*c*) Within three months of calving.

For particulars relating to dairy cattle numbers up to 1963 *see* page 1078 of Year Book No. 50.

A map showing the distribution of dairy cattle in Australia at 31 March 1963, appears facing page 1082 of Year Book No. 50.

Milking machines

The following table shows particulars of the number of milking machines on rural holdings in each State and Territory for the years 1961 to 1965.

MILKING MACHINES ON RURAL HOLDINGS: NUMBER OF UNITS(*a*)
STATES AND TERRITORIES, 1961 TO 1965

At 31 March	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
1961	43,640	92,315	47,403	18,235	10,419	11,704	n.a.	99	(*b*)223,815
1962	43,369	95,661	47,486	18,831	10,562	12,220	n.a.	99	(*b*)228,228
1963	43,089	97,372	46,674	18,836	10,514	12,701	n.a.	84	(*b*)229,270
1964	42,970	98,321	45,072	19,057	10,157	13,382	n.a.	83	(*b*)229,042
1965	42,209	101,994	44,074	19,135	10,055	13,806	23	93	231,389

(*a*) The number of units indicates the number of cows that can be milked simultaneously, i.e. the cow capacity of installed milking machines. (*b*) Excludes the Northern Territory.

Production of milk

The quantity of milk produced by a dairy cow can be as high as 1,000 gallons a year, and varies greatly with breed, locality and season. For all dairy cows and for all seasons for the whole of Australia prior to 1916 production averaged considerably less than 300 gallons per annum. Largely owing to an improvement in the quality of the cattle and the increased application of scientific methods the 300-gallon average was exceeded in each year since 1924. In the last five years an average of 449 gallons per cow per annum has been obtained. In 1964–65 the average yield was 467 gallons. The annual average yields per cow shown in the following table are obtained by dividing the total production of whole milk for the year ended June by the mean of the number of cows in milk and dry and house cows at 31 March of that year and of the preceding year. They are, in effect, based on the approximate number of cows which were in milk during any part of the year. The average shown is, therefore, less than that for cows which were yielding during the greater part of the year, but it may be accepted as sufficiently reliable to show the general trend.

AVERAGE MILK PRODUCTION PER COW: STATES AND TERRITORIES
1936-37 TO 1964-65
(Gallons)

Period	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust. (*b*)
Average for three years ended—									
1938–39	315	439	298	442	353	349	n.a.	349	354
1948–49	310	506	267	565	370	419	n.a.	328	371
1958–59	322	522	267	513	406	537	n.a.	420	393
Year—									
1960–61	355	548	263	574	468	505	n.a.	447	418
1961–62	387	571	306	614	462	562	n.a.	471	452
1962–63	364	586	312	586	442	570	n.a.	479	452
1963–64(*a*)	368	587	307	587	448	577	230	557	456
1964–65(*a*)	347	613	306	614	490	589	248	547	467

(*a*) May not be comparable with earlier years: *see* page 962. (*b*) Excludes the Northern Territory before 1963–64.

In the following table particulars of the production of whole milk in the various States are shown for the years 1960–61 to 1964–65 compared with the averages for the three years ended 1938–39, 1948–49 and 1958–59. Victoria is the principal milk-producing State, and in 1964–65 the output from that State, 746 million gallons, represented 49 per cent of total production. Output from New South Wales in 1964–65 was 292 million gallons (19 per cent of the total) and that of Queensland 230 million gallons (15 per cent). Production in the remaining States accounted for 17 per cent.

TOTAL PRODUCTION OF WHOLE MILK: STATES AND TERRITORIES 1936–37 TO 1964–65

('000 gallons)

Period	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.(a)
Average for three years ended—									
1938–39	319,003	403,152	275,898	68,429	42,358	32,803	n.a.	363	1,142,006
1948–49	280,460	445,517	252,469	92,587	49,004	32,638	n.a.	573	1,153,248
1958–59	307,514	578,529	240,446	84,185	54,218	65,032	n.a.	929	1,330,853
Year—									
1960–61	319,410	596,706	212,749	87,030	58,544	63,858	n.a.	1,005	1,339,302
1961–62	344,724	630,948	239,823	95,504	58,240	73,206	n.a.	1,117	1,443,562
1962–63	324,113	667,562	245,067	95,378	56,029	78,518	n.a.	1,090	1,467,757
1963–64	322,547	694,990	239,827	97,523	57,162	83,124	76	1,146	1,496,395
1964–65	291,931	745,896	230,289	102,330	61,883	87,343	98	1,094	1,520,864

(a) Excludes the Northern Territory before 1963–64.

Utilization of whole milk

The utilization of whole milk and the production of butter and cheese in 1964–65 is given in the table below.

UTILIZATION OF WHOLE MILK: STATES AND TERRITORIES, 1964–65

('000 gallons)

——	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
Milk used for—									
Butter	135,027	520,142	149,990	33,435	35,581	64,621	..	..	938,796
Cheese	8,177	61,142	19,313	37,857	3,979	5,265	..	..	135,733
Preserved milk products	15,059	65,806	10,242	..	873	4,993	..	..	96,973
Other purposes	133,668	98,806	50,744	31,038	21,450	12,464	98	1,094	349,362
Total	**291,931**	**745,896**	**230,289**	**102,330**	**61,883**	**87,343**	**98**	**1,094**	**1,520,864**

In 1964–65, 62 per cent of the total milk supply was used for butter, 9 per cent for cheese, 6 per cent for preserved milk products, and 23 per cent for other purposes.

PRODUCTION AND UTILIZATION OF WHOLE MILK: AUSTRALIA 1936–37 TO 1964–65

('000 gallons)

Period	Total production	Quantity used for—			
		Butter (factory and farm)	Cheese (factory and farm)	Preserved milk products	Other purposes (a)
Average for three years ended—					
1938–39	1,142,006	891,742	54,934	33,226	162,104
1948–49	1,153,248	738,377	91,642	78,739	244,490
1958–59	1,330,853	865,347	90,561	79,687	295,258
Year—					
1960–61	1,339,302	839,596	104,470	76,619	318,617
1961–62	1,443,562	919,301	122,340	78,028	323,893
1962–63	1,467,757	932,041	130,503	83,167	322,046
1963–64	1,496,395	940,787	130,431	92,235	332,942
1964–65(b)	1,520,864	938,796	135,733	96,973	349,362

(a) Principally fluid milk for domestic purposes. (b) Milk used for farm production of butter and cheese is included in 'Other purposes'.

Production of butter, cheese and preserved milk products

The establishment of large central butter factories, either on a co-operative or independent basis, has resulted in a considerable reduction in the cost of manufacture. The product is also of a more uniform quality, and whereas formerly the average quantity of milk used per pound of hand-made butter was about three gallons, factory butter requires only about two gallons. In addition, subsidy payments by the Commonwealth Government are made only on factory-produced butter. As a result the production of farm-made butter has declined to negligible proportions. A similar position exists in the cheese-making industry.

In 1964–65 factories in Australia engaged in the processing of milk into butter or cheese or the various preserved milk products numbered 344 and were distributed among the States as follows: New South Wales, 70; Victoria, 120; Queensland, 69; South Australia, 43; Western Australia, 18; and Tasmania, 24. More details regarding numbers of factories, output, etc., are given in the chapter Manufacturing Industry (*see* page 137).

Factory production of butter in 1964–65 at 203,465 tons was 656 tons (0.3 per cent) more than the amount produced in 1963–64, and 2,326 tons (1 per cent) less than the record post-war production of 1955–56.

BUTTER PRODUCTION IN FACTORIES: STATES
1936-37 TO 1964-65
(Tons)

Period	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	Aust.
Average for three years ended—							
1938–39	49,665	61,566	52,637	7,977	5,803	3,934	181,582
1948–49	31,394	58,715	42,243	9,028	6,632	4,484	152,496
1958–59	33,832	87,659	38,131	7,509	6,812	10,618	184,561
Year—							
1960–61	33,997	89,356	31,081	6,858	7,661	10,256	179,209
1961–62	38,994	95,649	35,643	7,424	7,483	12,063	197,256
1962–63	35,968	101,431	36,456	7,319	6,963	13,097	201,234
1963–64	36,107	103,348	35,366	7,405	6,915	13,668	202,809
1964–65 p	29,948	111,282	32,833	7,687	7,809	13,906	203,465

Factory production of cheese was 61,389 tons in 1964–65 which was 2,850 tons (4.9 per cent) more than the previous record of 58,539 tons in 1962–63.

CHEESE PRODUCTION IN FACTORIES: STATES
1936-37 TO 1964-65
(Tons)

Period	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	Aust.
Average for three years ended—							
1938–39	3,280	7,206	5,277	6,866	427	1,424	24,480
1948–49	2,385	17,378	8,916	11,984	969	641	42,273
1958–59	4,368	17,607	6,844	11,218	1,127	335	41,499
Year—							
1960–61	5,473	19,977	7,222	12,609	1,352	348	46,981
1961–62	6,163	23,919	8,974	14,659	1,364	605	55,684
1962–63	5,524	25,569	10,201	15,164	1,438	643	58,539
1963–64	5,421	25,177	9,492	15,284	1,506	1,337	58,217
1964–65 p	4,129	27,270	8,525	17,338	1,783	2,344	61,389

Preserved milk products are manufactured mainly in Victoria, which produced 68 per cent of the total (in terms of whole milk equivalent) in 1964–65. New South Wales accounted for 15 per cent and the remaining States for 17 per cent.

PRODUCTION OF PRESERVED MILK PRODUCTS: AUSTRALIA
1936-37 TO 1964-65
('000 lb.)

	Average for three years ended—			1960–61	1961–62	1962–63	1963–64	1964–65 p
	1938–39	1948–49	1958–59					
Condensed, concentrated and evaporated milk—								
Full cream—								
Sweetened(*a*)	41,892	63,732	81,469	66,156	63,299	75,533	95,744	103,175
Unsweetened(*b*)			52,967	64,045	65,694	64,409	71,964	86,854
Skim	(*c*)	(*d*)	11,344	11,210	13,168	19,203	25,712	22,709
Ice cream mixes—								
Liquid	n.a.	12,372	7,954	7,716	8,228	8,612	11,896	12,549
Powder			1,297	1,248	1,360	1,341	973	786
Infants' and invalids' food(*e*)	2,533	22,808	31,119	36,415	38,137	38,465	44,105	45,179
Casein	n.a.	n.a.	21,695	25,178	30,356	36,236	37,360	39,612
Powdered milk—								
Full cream—								
Spray	21,199	28,524	38,300	38,353	42,211	37,829	40,069	40,437
Roller		8,772	2,856	3,211	3,115	1,874	2,110	2,104
Skim—								
Without added ingredients								
Spray	(*d*)	10,712	66,659	67,138	69,525	76,689	70,190	82,137
Roller				10,607	10,177	10,845	12,783	13,581
With added ingredients—								
Baker's powder				5,027	4,738	4,808	4,854	5,297
Other						1,834	4,303	5,124
Buttermilk or mixed skim and buttermilk—								
Spray	1,571	3,172	10,790	1,551	1,353	2,543	4,650	4,697
Roller				15,153	16,710	18,258	17,060	16,330
Total powdered milk	*22,770*	*51,180*	*118,605*	*141,040*	*147,829*	*154,680*	*156,019*	*169,707*

(*a*) Includes 'coffee and milk'. (*b*) Irrespective of butterfat content. (*c*) Not available separately—included in condensed, concentrated and evaporated full cream milk. (*d*) Not available separately—included in powdered full cream milk. (*e*) Includes malted milk and milk sugar (lactose).

Wholesale prices of butter and cheese in Australia

Details of prices operating in each of the States since 1 July 1952 are shown in the following table. The prices included are those determined by the Commonwealth Dairy Produce Equalisation Committee Ltd. for choicest grade bulk butter and cheese.

WHOLESALE PRICES OF BUTTER AND CHEESE: AUSTRALIA
1956 TO 1964
($ per cwt.)

Date from which prices became effective	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.
Butter—						
1 July 1956	46.67	46.67	46.55	46.43	46.67	46.67
1 July 1958	48.53	48.53	48.42	48.42	48.53	48.53
1 July 1960	50.17	50.17	50.05	50.17	50.17	50.17
19 June 1964	51.80	51.80	51.80	51.80	51.80	51.80
Cheese—						
1 July 1956	28.23	28.23	28.23	28.12	28.23	28.23
1 July 1958	29.17	29.17	29.17	29.17	29.17	29.17
1 July 1960	29.63	29.63	29.63	29.63	29.63	29.63
19 June 1964	30.57	30.57	30.57	30.57	30.57	30.57

Local consumption of butter and cheese

Following the cessation of butter rationing after the 1939–45 War, consumption per head rose to 31.2 lb. in 1951–52. However, in later years it gradually declined, and in 1964–65 it reached its lowest level since the war. At 22.6 lb. per head it was 3.4 per cent below the level of 1963–64. Consumption of cheese per head has been rising in recent years, reaching 7.2 lb. in 1963–64. This figure decreased slightly to 7.0 lb. in 1964–65.

PRODUCTION AND DISPOSAL OF BUTTER AND CHEESE
AUSTRALIA, 1936-37 TO 1964-65

Period	Change in stocks (a)	Production (b)	Exports (c)	Apparent consumption in Australia	
				Total	Per head per year
	('000 tons)	('000 tons)	('000 tons)	('000 tons)	(lb.)
BUTTER					
Average for three years ended—					
1938–39	n.a.	190.8	89.4	101.4	32.9
1948–49	−3.6	157.1	76.0	84.7	24.8
1958–59	−0.6	187.4	69.6	118.4	27.2
Year—					
1960–61	+2.0	181.7	63.4	116.3	25.1
1961–62	+4.7	198.6	80.1	113.8	24.0
1962–63	+7.1	202.4	80.6	114.7	23.8
1963–64	−2.3	203.8	91.0	115.1	23.4
1964–65 p	−5.8	203.5	96.4	112.9	22.5
CHEESE					
Average for three years ended—					
1938–39	n.a.	24.9	11.5	13.4	4.4
1948–49	−0.8	42.3	24.3	18.8	5.5
1958–59	+2.8	41.6	13.8	25.0	5.7
Year—					
1960–61	−0.8	47.1	18.1	29.8	6.4
1961–62	+2.2	55.7	22.4	31.1	6.6
1962–63	+0.2	58.6	26.0	32.4	6.7
1963–64	−5.0	58.2	27.9	35.3	7.2
1964–65 p	−1.1	61.4	27.2	35.3	7.0

(a) Balance figure for 1946–47 and subsequent years; includes allowance for imports. (b) Factory production only for 1964–65. (c) Includes ships' stores; figures for butter include ghee and butter concentrate expressed as butter.

Average returns from butter and cheese sold

The table below shows rates realized on local, interstate and oversea sales and the average equalization and subsidy rates in operation for the years ended June 1961 to 1965.

BUTTER AND CHEESE: RATES REALIZED ON SALES, AVERAGE EQUALIZATION RATES AND RATES OF COMMONWEALTH SUBSIDY UNDER DAIRY INDUSTRY ASSISTANCE ACTS, 1960-61 TO 1964-65

(*Source:* Commonwealth Dairy Produce Equalisation Committee Ltd.)

($ per cwt.)

Year	Rates realized on sales			Average equalization rate	Rate of subsidy	Rate of overall return to manufacturer
	Local	Interstate	Overseas			
Butter—						
1960–61	48.138	46.266	26.198	39.969	6.894	46.863
1961–62	47.941	46.667	29.098	39.843	6.256	46.099
1962–63	47.863	46.492	32.675	41.152	6.150	47.302
1963–64	48.650	47.033	33.825	41.726	6.104	47.830
1964–65	..	..	..	(*a*) 41.750	6.087	47.837
Cheese—						
1960–61	28.391		21.150	25.610	2.847	28.457
1961–62	28.390		18.950	24.123	2.438	26.561
1962–63	28.391		20.282	24.224	2.333	26.557
1963–64	28.538		21.138	25.512	2.357	27.869
1964–65	..		..	(*a*) 25.800	2.228	28.028

(*a*) Interim rates.

The distribution between factory and farm of the overall return to manufacturers for butter is shown in the following table.

COMMERCIAL BUTTER: AVERAGE OVERALL RETURNS AUSTRALIA, 1960-61 TO 1964-65

(*Source:* Commonwealth Dairy Produce Equalisation Committee Ltd.)

(Cents per lb.)

Year	Average overall returns on commercial butter		
	Rate of overall return to manufacturer	Estimated manufacturing cost	Return to dairy farmer
1960–61	41.842	4.449	37.393
1961–62	41.160	4.449	36.711
1962–63	42.233	4.449	37.784
1963–64	42.705	4.449	38.256
1964–65	(*a*) 41.811	4.449	37.362

(*a*) Interim rates.

Oversea trade in dairy products

The production of butter and cheese in Australia is considerably in excess of local requirements, and consequently a substantial surplus is available for export overseas. In normal circumstances the extent of this surplus is chiefly dependent upon seasonal conditions.

Exports of butter in 1964–65 amounted to 202.2 million lb., compared with 196.6 million lb. in 1963–64. Exports of cheese in these years were 60.9 million lb. and 62.3 million lb. respectively. As in previous years, the principal importing country for Australian butter and cheese was the United Kingdom. In 1964–65, 84 per cent of butter and 59 per cent of cheese exported was consigned to the United Kingdom.

All butter and cheese exported comes under the provisions of the Exports (Dairy Produce) Regulations and is subject to supervision, inspection and examination by officers appointed for that purpose. These commodities are graded according to quality which has been fixed by regulation as follows: flavour and aroma, 50 points; texture, 30 points; and condition, 20 points. Butter and cheese graded at 93 to 100 points is of choicest quality; at 90 to 92 points, first quality; at 86 to 89 points, second quality; and at 80 to 85 points, pastry or cooking quality or, in the case of cheese, third quality.

In the following table particulars are given of the relative proportions of butter and cheese graded for export according to quality. Further details, which include actual quantities by States, are to be found in *Rural Industries*, 1963–64, Bulletin No. 2.

BULK BUTTER AND CHEESE GRADED FOR EXPORT
AUSTRALIA, 1962-63 TO 1964-65
(Per cent)

Grade	Butter			Cheese		
	1962–63	1963–64	1964–65	1962–63	1963–64	1964–65
Choicest	70.7	67.5	73.3	6.2	5.1	6.1
First quality	21.4	25.1	21.0	81.3	87.6	87.0
Second and third quality(*a*)	7.9	7.4	5.7	12.5	7.3	6.9
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

(*a*) Includes rejected.

Exports of butter, cheese and other milk products of Australian origin are shown in the following table.

EXPORTS OF DAIRY PRODUCTS: AUSTRALIA, 1962-63 TO 1964-65

	Quantity ('000 lb.)			Value ($A'000 f.o.b.)		
	1962–63	1963–64	1964–65	1962–63	1963–64	1964–65
Butter	173,399	196,563	202,240	47,186	54,714	62,165
Cheese	58,101	62,333	60,930	12,188	13,518	14,197
Other milk products—						
Preserved, condensed, concentrated, etc.—						
Sweetened	54,432	69,554	78,070	6,852	9,174	10,362
Unsweetened	5,077	8,337	11,678	608	941	1,328
Ice cream mixes	284	215	188	80	56	47
Infants' and invalids' food (essentially of milk)(*a*)	15,047	17,925	16,523	4,678	5,142	4,752
Casein	30,327	37,582	36,624	4,429	5,388	6,145
Dried or powdered—						
Full cream	14,263	15,260	18,737	4,452	4,281	5,248
Skim	53,467	40,505	56,098	3,884	2,985	5,885

(*a*) Includes malted milk.

Pigs

At 31 March 1965, 1,660,000 pigs were recorded, representing an increase of 192,500 (13.1 per cent) on numbers a year earlier. The number of pigs in each State and Territory at 31 March for each of the years 1961 to 1965 compared with the averages for the three-year periods ended 31 March 1939, 1949 and 1959, are given in the following table.

PIGS: NUMBERS IN STATES AND TERRITORIES, 1937 TO 1965

Period	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
Average for three years ended—									
1939	374,963	285,465	299,707	74,329	74,657	42,802	404	481	1,152,808
1949	366,267	261,922	375,191	101,934	91,862	43,184	424	554	1,241,338
1959	377,510	263,363	405,702	99,632	135,404	61,389	2,543	160	1,345,703
At 31 March—									
1961	455,345	318,523	448,279	143,645	175,675	70,882	2,845	109	1,615,303
1962	471,579	325,120	432,609	170,133	174,182	75,754	2,762	184	1,652,323
1963	391,999	297,791	402,498	144,976	130,791	70,002	1,842	92	1,439,991
1964	391,300	322,051	388,144	153,415	128,140	82,534	1,806	121	1,467,511
1965	448,661	378,055	406,028	195,873	137,192	92,021	2,182	(a)	b1,660,012

(a) Not available for publication. (b) Incomplete, excludes Australian Capital Territory.

A long-term comparison of pig numbers is given in the division Pastoral Production of this chapter (*see* page 936). A map showing the distribution of pigs in Australia at 31 March 1963 faces page 1083 of Year Book No. 50 and a graph showing the number of pigs in Australia from 1870 onwards appears on plate 54 of this Year Book.

The number of pigs slaughtered during each of the years 1960–61 to 1964–65, compared with the averages for the three-year periods ended 1938–39, 1948–49 and 1958–59, is shown in the following table.

PIGS SLAUGHTERED: STATES AND TERRITORIES, 1936-37 TO 1964-65

('000)

Period	Slaughterings passed for human consumption									Total slaughterings (including boiled down)
	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.	
Average for three years ended—										
1938–39	562	503	530	155	109	65	1		1,925	1,961
1948–49	440	371	448	154	138	54	1		1,606	1,615
1958–59	594	439	474	159	191	94	5		1,956	1,968
Year—										
1960–61	655	513	554	183	194	111	9		2,219	2,229
1961–62	755	587	597	232	264	120	2	7	2,564	2,573
1962–63	688	528	604	234	237	116	2	7	2,416	2,424
1963–64	636	531	606	214	185	124	2	7	2,305	2,312
1964–65	674	599	623	241	182	135	3	5	2,461	2,468

Production of pigmeat, bacon and ham

In the following table details of the production of pigmeat in each State are shown for the years 1960–61 to 1964–65, together with the averages for the three-year periods ended 1938–39, 1948–49 and 1958–59.

PRODUCTION OF PIGMEAT (CARCASS WEIGHT) STATES AND TERRITORIES, 1936–37 TO 1964–65

(Tons)

Period	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
Average for three years ended—									
1938–39	25,558	24,569	23,522	7,538	4,322	2,893	5	43	(a)88,450
1948–49	27,182	22,308	22,856	8,993	8,500	2,916	24	36	92,815
1958–59	28,272	23,097	23,180	8,778	9,624	4,156	84	209	97,400
Year—									
1960–61	29,048	25,550	27,289	9,574	10,550	5,057	150	240	107,458
1961–62	32,677	27,406	29,802	11,558	13,180	5,428	86	326	120,463
1962–63	30,283	25,086	29,619	11,810	11,731	5,461	69	328	114,387
1963–64	28,717	25,306	29,919	11,163	9,852	5,927	73	326	111,283
1964–65	31,509	28,048	31,259	12,656	9,861	6,585	90	218	120,226

(a) Excludes trimmings from baconer carcasses.

Production of bacon and ham amounted to 43,193 tons in 1964–65. This amount was 3.9 per cent above the amount of 41,538 tons produced in 1963–64. The record output of 56,246 tons was attained in 1944–45.

PRODUCTION OF BACON AND HAM (CURED CARCASS WEIGHT)(a)
STATES, 1936–37 TO 1964–65
(Tons)

Period	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	Australia
Average for three years ended—							
1938–39	10,396	7,556	8,759	2,940	1,838	1,022	32,511
1948–49	14,436	10,787	9,846	4,580	4,209	1,196	45,054
1958–59	11,132	8,302	10,294	3,275	2,987	1,078	37,068
Year—							
1960–61	11,328	9,211	9,442	3,141	3,169	1,120	37,411
1961–62	11,145	9,102	12,221	2,757	3,512	1,131	39,868
1962–63	12,827	9,004	11,449	3,355	3,844	1,182	41,661
1963–64	13,503	8,629	10,843	3,605	3,792	1,166	41,538
1964–65	13,923	9,366	11,086	3,822	3,896	1,171	43,264

(a) Pressed and canned bacon and ham have been converted to cured carcass weight for periods subsequent to 1948–49.

Consumption of pigmeat, bacon and ham

Apparent consumption of pigmeat per head in 1964–65 was 11.9 lb., compared with 11.5 lb. per head in 1963–64. The 1961–62 level of 13.6 lb. was the highest since the war. In recent years annual consumption of pigmeat per head has not fallen below 11 lb.

PRODUCTION AND DISPOSAL OF PIGMEAT (CARCASS WEIGHT)
AUSTRALIA, 1936-37 TO 1964-65

Period	Change in stocks (a)	Production	Exports	Curing and canning	Apparent consumption (as pork or smallgoods) in Australia	
					Total	Per head per year
	'000 tons	'000 tons	'000 tons	'000 tons	'000 tons	lb.
Average for three years ended—						
1938–39	..	88.5	13.7	48.6	26.2	8.5
1948–49	−1.2	92.8	6.3	63.4	24.3	7.1
1958–59	..	97.4	0.8	53.0	43.6	10.1
Year —						
1960–61	+0.8	107.5	0.4	53.3	53.0	11.4
1961–62	−0.7	120.5	0.9	55.9	64.4	13.6
1962–63	−1.8	114.4	0.2	58.0	58.0	12.0
1963–64	−3.1	111.3	0.2	57.5	56.7	11.5
1964–65	−0.4	120.2	0.4	60.5	59.8	11.9

(a) Includes allowance for imports.

PRODUCTION AND DISPOSAL OF BACON AND HAM (CURED CARCASS WEIGHT): AUSTRALIA, 1936-37 TO 1964-65

Period	Change in stocks	Production	Exports	Canning	Apparent consumption in Australia	
					Total	Per head per year
	'000 tons	'000 tons	'000 tons	'000 tons	'000 tons	lb.
Average for three years ended—						
1938–39	..	32.5	1.0	..	31.5	10.2
1948–49	..	45.1	3.1	2.1	39.9	11.7
1958–59	+0.1	37.1	0.5	6.0	30.5	7.1
Year—						
1960–61	+0.1	37.4	0.3	5.3	31.7	6.8
1961–62	..	39.9	0.1	6.8	33.0	7.0
1962–63	−0.1	41.7	0.1	5.7	36.0	7.4
1963–64	−0.1	41.5	0.1	5.4	36.1	7.3
1964–65	+0.1	43.2	0.1	5.1	37.9	7.5

Exports of pigs and pig products

Total quantities and values of exports of pigs and pig products of Australian origin for the years 1962–63 to 1964–65 are given in the following table.

EXPORTS OF PIGS AND PIG PRODUCTS: AUSTRALIA, 1962-63 TO 1964-65

		Quantity			Value ($A'000 f.o.b.)		
		1962–63	1963–64	1964–65	1962–63	1963–64	1964–65
Bacon and ham (including canned)	'000 lb.	216	186	379	118	120	259
Lard	'000 lb.	246	95	231	48	22	32
Frozen pork	'000 lb.	482	370	818	167	133	324
Pigs, live	number	113	547	n.a.	10	80	n.a.

The poultry industry

Originally the poultry industry was conducted in conjunction with other branches of rural activity, mainly dairying, but it is now a specialized and distinct industry. It is from this source that the bulk of the commercial production is obtained. Practically all farm households keep poultry for the purpose of supplying their own domestic requirements, and some supplies from this source are also marketed. In addition, many private homes in both rural and suburban areas keep small numbers of fowls in back-yard runs to help satisfy domestic needs. Because of the incompleteness of data available on poultry throughout Australia, details of poultry numbers are not published.

Marketing of eggs

Details of the annual contracts entered into between the United Kingdom and Australian Governments up to 1952–53 and of the results of trading under free market conditions in the four years following appear in previous issues of the Year Book.

Over the period 1954–55 to 1964–65 Australian exports of shell eggs fell by 84 per cent. In 1964–65 they amounted to 3,327,000 dozen compared with 3,599,000 dozen in 1963–64. The main outlets for Australian eggs in 1964–65 were Kuwait (1,359,000 dozen), Saudi Arabia (364,000 dozen), and Qatar (257,000 dozen).

The United Kingdom provides the major export market for egg pulp. Australian exports of pulp to that country were approximately 3,554 tons in 1963–64 and 6,793 tons in 1964–65. In 1964–65 the United Kingdom absorbed the bulk of the exports of dried eggs (151,000 lb.) also.

Details of the *Egg Export Control Act* 1947 were given in earlier issues of the Year Book (*see* No. 47, page 997).

Recorded production of eggs and egg products

Available statistics of the production and disposal of eggs in Australia are restricted to those recorded by the Australian Egg Board and the Egg Marketing Board of New South Wales. Details of production as recorded by these authorities are shown in the following table.

SHELL EGGS: PRODUCTION(*a*) RECORDED BY EGG BOARDS STATES, 1960-61 TO 1964-65

('000 dozen)

State	1960–61	1961–62	1962–63	1963–64	1964–65
New South Wales(*b*)	62,157	61,657	54,609	56,713	62,918
Victoria	28,215	29,939	26,793	25,141	28,016
Queensland	10,810	10,176	11,290	12,464	14,181
South Australia	10,492	11,388	9,816	8,732	9,379
Western Australia	7,333	7,558	7,796	8,331	9,620
Tasmania	n.a.	n.a.	n.a.	n.a.	n.a.
Total(*c*)	**119,007**	**120,718**	**110,304**	**111,381**	**124,114**

(*a*) Receipts from consignors and sales by producer agents. (*b*) Includes Australian Capital Territory. (*c*) Excludes Tasmania.

Particulars of the production of whole egg pulp as recorded by the Egg Marketing Board for the State of New South Wales and by the Australian Egg Board for the other States are shown in the following table.

LIQUID WHOLE EGG PULP: PRODUCTION RECORDED BY EGG BOARDS STATES, 1960-61 TO 1964-65

('000 lb.)

State	1960–61	1961–62	1962–63	1963–64	1964–65
New South Wales	21,496	20,916	11,500	9,272	18,463
Victoria	7,948	12,000	7,684	3,216	5,512
Queensland	3,716	3,321	3,864	3,922	5,731
South Australia	3,394	3,374	2,836	3,001	2,639
Western Australia	916	620	533	835	1,450
Tasmania	n.a.	n.a.	n.a.	n.a.	n.a.
Total(*a*)	**37,470**	**40,231**	**26,417**	**20,246**	**33,795**

(*a*) Excludes Tasmania.

In addition to liquid whole egg, production was also recorded of liquid egg whites and liquid egg yolks. Output in 1964–65 amounted to 2,984,000 lb. and 2,134,000 lb., respectively, compared with 2,767,000 lb. and 1,984,000 lb., respectively, in the previous year. These figures exclude small quantities produced in Tasmania for which details are not available.

Consumption of eggs and egg products

Because of the operations of producers in areas outside the control of the Egg Boards and the extent of 'back-yard' poultry-keeping, for which no statistics are collected, figures relating to total egg production must be accepted with some reserve. The production shown in the following table, together with details of exports and consumption, is based upon the records of Egg Boards of production from areas under their control, plus estimates of production from uncontrolled areas and from 'back-yard' poultry-keepers.

ESTIMATED PRODUCTION AND DISPOSAL OF EGGS IN SHELL AUSTRALIA, 1936–37 TO 1964–65

Period	Change in stocks	Estimated total production	Exports (a)	For drying and pulping(b)	Apparent consumption in Australia	
					Total	Per head per year
Average three years ended—	mill. doz.	mill. doz.	mill. doz.	mill. doz.	mill. doz.	dozen
1938–39	−0.1	152.7	13.0	5.5	134.3	19.5
1948–49	+0.1	204.7	17.7	39.1	147.8	19.3
1958–59	..	189.9	9.6	23.0	157.3	16.1
Year—						
1960–61	−0.3	212.1	6.2	36.9	169.3	16.3
1961–62	−0.1	215.8	5.8	35.5	174.6	16.4
1962–63	−0.3	207.2	4.6	23.8	179.1	16.6
1963–64	+1.2	210.1	4.3	21.0	183.6	16.7
1964–65	+0.1	225.0	4.2	32.0	188.7	16.8

(a) Includes ships' stores. (b) Includes wastage.

Details of the annual consumption of shell eggs, liquid whole egg and total shell egg equivalent per head of population are shown in the following table.

SUPPLIES OF EGGS AND EGG PRODUCTS AVAILABLE FOR CONSUMPTION: AUSTRALIA 1936–37 TO 1964–65

(Per head per year)

Period	Eggs in shell	Liquid whole egg and egg powder (a)	Total	
			Number	Weight(b)
Average for three years ended—	number	number		lb.
1938–39	235	8	243	26.6
1948–49	232	23	255	27.9
1958–59	194	12	206	22.5
Year—				
1960–61	195	15	210	(c) 26.3
1961–62	197	14	211	(c) 26.4
1962–63	199	11	210	(c) 26.2
1963–64	200	14	214	(c) 26.7
1964–65	202	13	215	(c) 26.9

(a) In terms of number of eggs in shell. (b) The average weight of an egg in Australia was taken as 1.75 oz. for years prior to 1960–61. From 1960–61 the average weight has been taken as 2 oz. (c) Not comparable with earlier years; *see* footnote (b).

Oversea trade in poultry products

Details of the exports of poultry products in each of the years 1962–63 to 1964–65 are shown on page 975.

EXPORTS OF POULTRY PRODUCTS: AUSTRALIA
1962–63 TO 1964–65

		Quantity			Value ($A'000 f.o.b.)		
		1962–63	1963–64	1964–65	1962–63	1963–64	1964–65
Eggs in shell	'000 doz.	3,943	3,599	3,327	1,206	1,153	921
Eggs not in shell—							
In liquid form	'000 lb.	18,920	9,493	17,119	3,802	2,228	3,840
Dry	'000 lb.	3	421	158	4	168	123
Frozen poultry	'000 lb.	318	501	792	142	226	331
Poultry, live(a)	number	550,362	1,027,871	735,911	146	258	184

(a) Includes day-old chicks.

For a number of years prior to 1961–62 there were considerable imports of canned chicken from the United States of America. In 1960–61 the quantity imported was 2,016,000 lb. valued at $454,000, but the trade had declined to 150,000 lb. valued at $29,000 in 1964–65.

The bee-farming industry

Production of honey and bees-wax

Although practised as a separate industry, bee-farming is also carried on in conjunction with other branches of farming. In recent years there has been considerable growth in the number of itinerant apiarists operating on a large scale with mobile equipment. Some of these apiarists move as far afield as from Victoria to Queensland in an endeavour to provide a continuous supply of nectar from flora suitable for their bees. The returns of honey from productive hives during 1964-65 show an average of 129.0 lb. per hive, and the average quantity of wax was 1.7 lb. per productive hive.

BEEHIVES, HONEY AND BEES-WAX: STATES AND A.C.T., 1964-65

State or Territory	Beehives(a)			Honey produced		Bees-wax produced	
	Productive	Unproductive	Total	Quantity	Gross value	Quantity	Gross value
	'000	'000	'000	'000 lb.	$'000	'000 lb.	$'000
New South Wales	120	65	185	13,701	1,896	185	89
Victoria	72	27	99	9,180	1,377	105	51
Queensland	29	13	42	3,794	380	52	24
South Australia	59	14	73	6,527	561	90	37
Western Australia	39	10	49	8,066	520	106	42
Tasmania	6	2	8	715	122	10	9
Australian Capital Territory	1	..	1	97	10	1	1
Australia	**326**	**131**	**457**	**42,080**	**4,866**	**549**	**253**

(a) At 30 June 1965.

The production of honey and bees-wax fluctuates considerably and is determined mainly by the flow of nectar from flora, particularly the eucalypts, which varies greatly from year to year.

HONEY AND BEES-WAX PRODUCTION: STATES AND A.C.T. 1936-37 TO 1964-65

('000 lb.)

Period	N.S.W.	Vic.	Qld	S.A.	W.A.	Tas.	A.C.T.	Aust.
HONEY								
Average for three years ended—								
1938–39	3,005	3,107	700	2,874	1,299	200	3	11,188
1948–49	14,934	8,232	2,185	8,292	2,831	206	34	36,714
1958–59	12,853	7,239	2,071	5,924	6,548	398	44	35,077
Year—								
1960–61	15,286	8,390	1,848	4,442	5,311	441	83	35,801
1961–62	15,326	10,314	1,281	8,405	7,982	279	64	43,651
1962–63	14,087	4,818	2,941	4,147	6,099	547	40	32,679
1963–64	15,135	9,460	2,053	9,722	8,510	632	135	45,647
1964–65	13,701	9,180	3,794	6,527	8,066	715	97	42,080
BEES-WAX								
Average for three years ended—								
1938–39	49	39	11	38	23	2	..	162
1948–49	174	86	36	110	34	3	..	443
1958–59	163	81	31	94	81	5	..	455
Year—								
1960–61	197	105	32	59	71	5	1	470
1961–62	208	135	22	123	94	4	1	587
1962–63	177	64	44	56	79	6	..	426
1963–64	194	110	32	134	103	6	2	581
1964–65	185	105	52	90	106	10	1	549

Honey Levy

The *Honey Levy Act* 1962 imposed a levy on honey sold for domestic consumption in Australia at the initial operative rate of one halfpenny a pound which was reduced to four-tenths of a cent from 14 February 1966. The Act provides for a maximum rate of one penny (one cent) a pound. The proceeds of this levy may be expended on the regulation of Australian exports of honey and on associated promotional and research activities. In 1962–63, 1963–64 and 1964–65 collections amounted to $7,000, $81,000 and $104,000 respectively.

Oversea trade in bee products

The principal importers of Australian honey in 1964–65 were the United Kingdom (58 per cent of total exports), the Federal Republic of Germany (18 per cent), and Japan (12 per cent).

Bees-wax was exported mainly to the United Kingdom in 1964–65.

EXPORTS OF HONEY AND BEES-WAX: AUSTRALIA, 1962-63 TO 1964-65

	Quantity			Value ($A'000 f.o.b.)		
	1962–63	1963–64	1964–65	1962–63	1963–64	1964–65
Honey '000 lb.	26,759	18,859	13,710	1,802	2,764	1,431
Bees-wax lb.	322,922	161,347	257,828	142	71	111

Value of dairy, poultry and bee production and indexes of price and quantum of production

Value of dairy, poultry and bee production, 1960-61 to 1964-65

The following table shows the gross value of dairy, poultry and bee products recorded at the principal markets in Australia.

GROSS VALUE OF DAIRY, POULTRY AND BEE PRODUCTION: AUSTRALIA
1960-61 TO 1964-65
($'000)

—	1960–61	1961–62	1962–63	1963–64	1964–65
DAIRYING					
Whole milk used for—					
Butter(*a*)	129,202	135,824	147,076	152,750	157,989
Cheese(*a*)	21,316	22,682	25,116	27,456	30,119
Preserved milk products	18,752	19,282	19,088	21,132	23,806
Other purposes	128,196	131,946	132,010	138,522	145,310
Subsidy paid on whole milk for—					
Butter	24,550	24,494	24,500	24,500	24,500
Cheese	2,450	2,506	2,500	2,500	2,500
Total, whole milk (including subsidy)	*324,466*	*336,734*	*350,290*	*366,860*	*384,224*
Pigs slaughtered	61,318	53,906	62,606	65,998	75,408
Dairy cattle slaughtered	23,728	21,832	26,482	30,664	45,624
Total, dairying	**409,512**	**412,472**	**439,378**	**463,522**	**505,256**
POULTRY					
Total, poultry	**130,188**	**121,722**	**123,630**	**138,182**	**137,425**
BEE-FARMING					
Honey	3,544	3,754	3,296	5,778	4,866
Bees-wax	222	260	184	250	253
Total, bee-farming	**3,766**	**4,014**	**3,480**	**6,028**	**5,119**

(*a*) Excludes Commonwealth subsidy which is shown separately.

Values of dairy, poultry and bee-farming production for 1964–65 and earlier years are shown in the following tables. Further information on values, including definitions of the terms used, is given in the chapter Miscellaneous.

GROSS, LOCAL AND NET VALUE OF DAIRY, POULTRY AND BEE PRODUCTION STATES AND TERRITORIES, 1964-65

($'000)

State or Territory	Gross production valued at principal markets	Marketing costs	Local value of production	Value of materials used in process of production	Net value of production(a)
New South Wales	210,524	31,833	178,691	(b) 43,456	135,235
Victoria	242,764	13,102	229,662	68,291	161,371
Queensland	86,127	5,907	80,220	24,670	55,550
South Australia	46,459	1,917	44,542	17,462	27,080
Western Australia	30,884	2,247	28,637	13,928	14,709
Tasmania	29,575	1,573	28,002	7,242	20,760
Northern Territory	335	2	333	n.a.	333
Australian Capital Territory	1,132	113	1,019	286	733
Australia	**647,800**	**56,694**	**591,106**	**175,335**	**415,771**

(a) No deduction has been made for depreciation and maintenance. (b) No allowance has been made for costs of power, power kerosene, petrol and other oils.

NET VALUE OF DAIRY, POULTRY AND BEE PRODUCTION(a) STATES AND TERRITORIES, 1960-61 TO 1964-65

Year	N.S.W. (b)	Vic.	Qld	S.A.	W.A.	Tas.	Aust. (c)
			NET VALUE ($'000)				
1960–61	127,866	131,224	44,886	19,972	10,150	14,428	349,174
1961–62	117,804	112,752	47,126	22,320	10,444	14,708	325,964
1962–63	124,912	135,426	52,932	21,498	11,332	16,334	363,184
1963–64	131,838	152,640	57,018	23,604	12,714	18,116	396,870
1964–65	135,235	161,371	55,550	27,080	14,709	20,760	415,771
			NET VALUE PER HEAD OF POPULATION($)				
1960–61	33.0	45.4	29.9	20.9	13.9	41.2	33.6
1961–62	29.8	38.1	30.9	22.8	14.0	41.2	30.7
1962–63	31.1	44.8	34.1	21.5	14.8	45.1	33.6
1963–64	32.3	49.4	36.2	23.1	16.3	49.5	36.0
1964–65	32.5	50.9	34.8	26.0	18.4	56.4	37.0

(a) No deduction has been made for depreciation and maintenance. (b) No deduction has been made for costs of power, power kerosene, petrol and other oils. (c) Includes Northern Territory and Australian Capital Territory.

Indexes of quantum and price of dairy, poultry and bee production

For details of the methods of calculating these indexes and of the weights used *see* the chapter Miscellaneous.

INDEXES OF QUANTUM(a) AND PRICE OF DAIRY, POULTRY AND BEE PRODUCTION: AUSTRALIA, 1960-61 TO 1964-65

(Base: Average 3 years ended June, 1939 = 100)

	1960–61	1961–62	1962–63	1963–64	1964–65
Quantum(a) of production—					
Milk	116	125	129	131	132
Other products	127	135	130	133	143
Total, dairy, poultry and bee	*120*	*128*	*129*	*131*	*136*
Per head of population	79	83	82	82	83
Price—					
Milk	384	373	380	382	403
Other products	446	371	410	452	472
Total, dairy, poultry and bee	*402*	*373*	*388*	*402*	*423*

(a) Indexes of value at constant prices, i.e. quantities revalued at average unit values of base years 1936–37 to 1938–39.