

## SECTION VIII.

## AGRICULTURAL PRODUCTION.

## § 1. Introductory.

1. **Early Attempts at Agriculture.**—The instructions issued to Captain Phillip on the 25th April, 1787, directed him, amongst other things, to proceed as soon as possible to the cultivation of the soil “under such regulations as may appear to be necessary and best calculated for securing supplies of grain and provisions.” When the settlers landed at Botany Bay, however, it was found that the glowing accounts published in England by members of Captain Cook’s expedition of the fertility of the soil in the vicinity of the existing settlement were considerably overdrawn. Even when Phillip and his company moved round to Port Jackson on the 26th January, 1788, matters were for a time in no better case. The ground in the immediate neighbourhood of the settlement was not suitable for the cultivation of cereal crops, and when the time came to cultivate the soil it was found that there were very few who possessed the slightest acquaintance with the art of husbandry.

2. **The First Sowing.**—In his despatch of the 15th May, 1788, Captain Phillip states that it was proposed to sow eight acres with wheat and barley, although, owing to the depredations of field mice and ants, he was doubtful of the success of the crops.

3. **Discovery of Suitable Agricultural Land.**—A branch settlement was formed at Rosehill, on the Parramatta River, towards the close of 1788, and here corn crops were successfully raised. In his despatch of 12th February, 1790, Phillip refers to the harvest at Rosehill at the end of December, 1789, as consisting of 200 bushels of wheat and sixty of barley, in addition to small quantities of oats, Indian corn, and flax. By the year 1791 there were 213 acres under crop in this locality. In 1792 a new settlement was formed at Toongabbie, about three miles westward of Parramatta, where Phillip states “there are several thousand acres of exceeding good ground.” The Hawkesbury Valley, which probably contains some of the richest land in the world, was first settled in 1794. For a long time agricultural operations in Australia were restricted to the narrow belt of country between the tableland and the east coast of New South Wales, as it was not until the year 1813 that a passage was discovered across the Blue Mountains to the fertile plains of the west.

## § 2. Progress of Agriculture.

1. **Early Records.**—In an “Account of Live Stock and Ground under Crop in New South Wales, 19th August, 1797,” Governor Hunter gives the acreage under crop as follows:—Wheat, 3361 acres; maize, 1527 acres; barley, 26 acres; potatoes, 11 acres; and vines, 8 acres.

At a muster taken in 1808 the following was the return of crops:—Wheat, 6877 acres; maize, 3389 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, 34 acres.

By the year 1850 the area under crop 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.

The gold discoveries of 1851 and subsequent years had at first a very disturbing effect on agricultural progress, the area under crop declining from 491,000 acres in 1850 to 458,000 acres in 1854; cultivation in New South Wales dwindled by nearly 66,000 acres, while in Tasmania the area fell off by over 41,000 acres. 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 measured over a million acres. The largest increase took place in Victoria, which returned an area of 299,000 acres, South Australia had 264,000 acres in cultivation, Tasmania 229,000 acres, and New South Wales 223,000 acres.

**2. Progress of Cultivation since 1860.**—The following table shews the area under cultivation in each of the Commonwealth States at various periods since 1860 and during each year of the period 1901-7. The area under artificially-sown grasses is excluded in all the States, except for the years 1860-79 in the case of New South Wales, where the acreage cannot be separated. During those years, however, the area laid down under permanent grasses could not have been very large:—

AREA UNDER CROP IN AUSTRALIA, 1860-1 TO 1906-7.

Season.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Commonwealth.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1860-1 ...	260,798	387,282	3,353	359,284	24,705	152,860	1,188,282
1865-6 ...	378,255	448,194	14,414	547,124	38,180	159,547	1,585,714
1870-1 ...	426,976	692,840	52,210	801,571	54,527	157,410	2,185,534
1875-6 ...	451,139	736,520	77,347	1,111,882	47,571	142,547	2,567,006
1880-1 ...	629,180	1,548,809	113,978	2,087,237	57,707	140,788	4,577,699
1885-6 ...	737,701	1,867,496	198,334	2,298,412	60,058	144,761	5,306,762
1890-1 ...	852,704	2,031,955	224,993	2,093,515	69,678	157,376	5,430,221
1895-6 ...	1,348,600	2,413,235	285,319	2,092,942	97,821	212,703	6,450,620
1900-1 ...	2,445,564	3,114,132	457,397	2,369,680	201,338	224,352	8,812,463
1901-2 ...	2,278,370	2,965,681	483,460	2,236,552	217,441	232,550	8,414,054
1902-3 ...	2,249,092	3,246,568	275,383	2,224,593	229,992	246,923	8,472,551
1903-4 ...	2,545,940	3,389,069	566,589	2,256,824	283,752	259,611	9,301,785
1904-5 ...	2,674,896	3,321,785	539,216	2,275,506	327,391	226,228	9,365,022
1905-6 ...	2,840,235	3,219,962	522,748	2,255,569	364,704	230,237	9,433,455
1906-7 ...	2,826,657	3,303,586	559,753	2,150,291	460,825	244,744	9,545,856

**3. Artificially-Sown Grasses.**—Complete statistics regarding the area sown down in grasses are available for the whole of the States only since the year 1896, and are as shewn hereunder:—

AREA UNDER SOWN GRASSES, 1896-7 TO 1906-7.

Season.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Commonwealth.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1896-7	384,016	172,582	11,960	20,027	4,044	253,306	845,935
1901-2	467,839	162,954	34,679	23,510	3,711	314,422	1,007,115
1902-3	477,629	565,635	24,286	23,636	3,228	319,090	1,413,504
1903-4	552,501	962,665	15,639	24,118	2,952	343,284	1,901,159
1904-5	607,997	953,543	35,589	24,912	3,964	378,346	2,004,351
1905-6	627,530	1,040,335	40,802	26,082	5,456	404,653	2,144,858
1906-7	679,631	1,095,642	45,990	23,679	6,787	432,128	2,301,857

The considerable increase in the area of the grass lands of the Commonwealth is due to the great development of the dairying industry which has taken place during the last ten years, and which is referred to at length in the succeeding section.



As the table shews, considerably more than half the total cultivated area of the Commonwealth is under wheat.

**3. Acreage of principal Crops, Commonwealth.**—The acreage devoted to each of the principal crops in the whole Commonwealth during the last sexennium is shewn below :—

ACREAGE OF CHIEF COMMONWEALTH CROPS, 1901-2 TO 1906-7.

Crops.	1901-2.	1902-3.	1903-4.	1904-5.	1905-6.	1906-7.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Wheat ...	5,115,965	5,156,049	5,566,340	6,269,778	6,122,746	5,977,794
Hay ...	1,688,402	1,590,488	1,853,864	1,367,321	1,574,412	1,654,899
Oats ...	461,430	592,247	620,856	493,317	466,567	581,843
Maize ...	294,849	303,375	371,906	324,265	314,901	325,581
Green Forage ...	204,988	210,641	159,884	179,603	225,879	236,484
Orchards and Fruit Gardens ...	145,281	146,675	154,254	158,604	159,724	162,274
Sugar Cane ...	132,840	105,498	131,698	141,842	155,912	153,885
Potatoes ...	109,685	116,521	116,112	116,707	118,533	146,681
Barley ...	74,511	76,260	121,088	113,207	90,945	106,436
Vineyards ...	63,677	63,943	65,463	65,673	64,344	62,546
All other Crops ...	122,426	110,854	140,320	134,705	139,492	137,933
Total ...	8,414,054	8,472,551	9,301,785	9,365,022	9,433,455	9,545,856

Wheat, of course, is the chief Australian crop, and, despite the drawbacks incidental to unfavourable seasons, the cultivation has considerably increased during the period covered by the above table. Oats shews an increase of 120,000 acres, barley of 32,000, and maize of nearly 31,000 acres. Separate sections will be devoted to a consideration of the more important crops.

#### § 4. Wheat.

**1. Progress of Wheat-Growing.**—(i.) *Acreage.* The area under wheat for grain is given below for each State at various periods since 1860, and is shewn diagrammatically in the graph hereinafter :—

AREA UNDER WHEAT, 1860-1 TO 1906-7.

Season.	N.S.W.	Victoria.	Q'sland.	Sth. Aust.	West Aust.	Tasmania.	C'wealth.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1860-1	128,829	161,252	196	273,672	13,584	66,450	643,983
1865-6	131,653	178,628	2,068	410,608	22,249	73,270	818,476
1870-1	147,997	284,167	2,892	604,761	26,640	57,382	1,123,839
1875-6	133,609	321,401	4,478	898,820	21,561	42,745	1,422,614
1880-1	253,138	977,285	12,632	1,733,542	27,686	50,022	3,054,305
1885-6	264,867	1,020,082	10,093	1,922,555	29,511	30,266	3,277,374
1890-1	333,233	1,145,163	10,390	1,673,573	33,820	32,452	3,228,631
1895-6	596,684	1,412,736	27,090	1,649,929	23,241	64,652	3,774,332
1900-1	1,530,609	2,017,321	79,304	1,913,247	74,308	51,825	5,666,614
1901-2	1,392,070	1,754,417	87,232	1,743,452	94,710	44,084	5,115,965
1902-3	1,279,760	1,994,271	1,880	1,746,842	92,398	40,898	5,156,049
1903-4	1,561,111	1,968,599	138,096	1,711,174	137,946	49,414	5,566,340
1904-5	1,775,955	2,277,537	150,958	1,840,157	182,080	43,091	6,269,778
1905-6	1,939,447	2,070,517	119,356	1,757,036	195,071	41,319	6,122,746
1906-7	1,866,253	2,031,893	114,575	1,681,982	250,283	32,808	5,977,794

(ii.) *Yield.* The production during the same period for each State and for the Commonwealth as a whole is given below :—

PRODUCTION OF WHEAT, 1860-1 TO 1906-7.

Season.	N.S.W.	Victoria.	Q'nsland.	Sth. Aust.	W. Aust.	Tasmania.	C'wealth.
	Bushels. <sup>1</sup>	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1860-1	1,581,598	3,459,914	3,136	3,576,593	208,332	1,415,896	10,245,469
1865-6	1,013,863	3,514,227	33,088	3,587,800	231,594	1,273,766	9,654,338
1870-1	999,595	2,870,409	39,787	6,961,164	316,769	896,881	12,084,605
1875-6	1,958,640	4,978,914	97,400	10,739,834	237,171	700,092	18,712,051
1880-1	3,717,355	9,727,869	223,243	8,606,510	332,232	750,040	23,356,749
1885-6	2,733,133	9,170,538	51,598	14,612,876	339,376	524,348	27,431,869
1890-1	3,649,216	12,751,295	207,990	9,399,389	467,389	642,980	27,118,259
1895-6	5,195,312	5,669,174	123,630	5,929,300	188,077	1,164,855	18,270,348
1900-1	16,173,771	17,847,321	1,194,088	11,253,148	774,653	1,110,421	48,353,402
1901-2	14,808,705	12,127,382	1,692,222	8,012,762	956,886	963,662	38,561,619
1902-3	1,585,097	2,569,364	6,165	6,354,912	985,559	876,971	12,378,068
1903-4	27,334,141	28,525,579	2,436,799	13,209,465	1,876,252	767,398	74,149,634
1904-5	16,464,415	21,092,189	2,149,663	12,023,172	2,013,237	792,956	54,535,582
1905-6	20,737,200	23,417,670	1,137,321	20,143,798	2,308,305	776,478	68,520,772
1906-7	21,817,938	22,618,043	1,108,902	17,145,796	2,758,567	651,408	66,100,654

1. Following the usual practice, the unit "bushel" has been used.

(iii.) *Average Yields.* In the next table will be found the average yield of wheat per acre in each of the last six seasons :—

YIELD OF WHEAT PER ACRE, 1901-2 TO 1906-7.

Season.	N.S.W.	Victoria.	Q'nsland.	Sth. Aust.	W. Aust.	Tasmania.	C'wealth.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1901-2	10.64	6.91	19.40	4.60	10.10	21.86	7.54
1902-3	1.24	1.29	3.28	3.64	10.67	21.44	2.40
1903-4	17.51	14.49	17.65	7.72	13.60	15.53	13.32
1904-5	9.27	9.26	14.24	6.53	11.06	18.40	8.70
1905-6	10.69	11.31	9.53	11.46	11.83	18.79	11.19
1906-7	11.69	11.13	9.68	10.19	11.02	19.86	11.06

As the above figures shew, there were remarkable variations in the average yields, chiefly of course due to the vagaries of the season. The year 1902 was an especially lean one in all the States except Western Australia and Tasmania. A large proportion of the area sown with wheat had to be ploughed in or else fed off by stock, but the comparatively heavy yields in the succeeding year shew that this additional cultivation was very beneficial.

**2. Australian and Foreign Wheat Yields.**—In the next table will be found a statement of the average return per acre in the principal wheat-growing countries of the world. The figures are, wherever possible, based on the average of the latest available quinquennial or triennial periods.

The average for New Zealand over a period of years was 32.42 bushels per acre, but the acreage sown is comparatively small, amounting in 1906 to only 206,000 acres.

In order to draw any useful comparisons from the figures quoted above several important factors have to be taken into account, such as relative rent or purchase-money for agricultural areas in the various countries, cost of cultivation generally, and expenses of marketing the product.

## AVERAGE YIELDS OF WHEAT IN VARIOUS COUNTRIES.

Country.	Average yield in bushels per acre.	Country.	Average yield in bushels per acre.
United Kingdom ...	30.85	Spain ...	12.98
Germany ...	28.24	Italy ...	12.75
Ontario (Canada) ...	20.42	India ...	11.45
France ...	19.22	Argentina... ..	10.65
Saskatchewan (Canada) ...	19.09	Caucasia (Russia) ...	10.53
Manitoba (Canada) ...	18.90	Siberia " ...	9.83
Hungary ...	17.54	Russia in Europe ...	9.68
Austria ...	17.34	<b>Australia</b> ...	<b>9.19</b>
Rumania ...	16.24	Algeria ...	9.07
United States ...	13.07		

3. **Wheat Crop of the World.**—According to "Beerbohm's," the wheat crop of the world during the last four years was as follows:—

THE WHEAT CROP OF THE WORLD<sup>1</sup>.

Country.	1903.	1904.	1905.	1906.	Country.	1903.	1904.	1905.	1906.
	1,000 Qrs.	1,000 Qrs.	1,000 Qrs.	1,000 Qrs.		1,000 Qrs.	1,000 Qrs.	1,000 Qrs.	1,000 Qrs.
Austria ...	5,750	5,000	5,750	7,000	Algeria ...	4,250	3,550	2,700	4,350
Hungary ...	21,700	18,300	21,500	25,900	Tunis ...	1,200	1,200	750	1,250
Belgium ...	1,500	1,750	1,500	1,750	Argentine Republic	15,500	19,500	17,500	19,500
Bulgaria ...	4,500	5,250	3,750	5,150	Australasia ...	10,100	7,900	9,500	10,000
Denmark ...	500	510	500	500	Asia Minor ...	4,250	4,500	5,000	5,000
France ...	45,600	37,400	42,000	41,000	Canada ...	9,750	8,500	13,000	14,000
Germany ...	16,500	17,500	17,000	18,000	Cape Colony ...	500	550	500	500
Greece ...	750	750	750	750	Chile ...	1,700	2,000	1,550	1,750
Holland ...	750	750	750	750	Egypt ...	1,500	1,500	1,500	1,000
Italy ...	22,000	21,000	20,000	20,000	India ...	36,750	44,700	35,000	40,000
Portugal ...	650	350	500	500	Persia ...	3,000	3,000	3,500	3,500
Rumania ...	9,400	6,750	12,750	13,600	Syria ...	3,000	2,500	2,500	3,000
Russia ...	76,500	82,000	79,000	63,000	U. S. America ...	77,000	66,000	85,000	91,000
Servia ...	1,500	1,500	1,400	1,850	Uruguay ...	1,000	950	750	1,000
Spain ...	12,500	12,000	10,000	15,000	Mexico ...	1,550	1,100	750	1,000
Sweden ...	670	700	620	800	Japan ...	8,125	11,600	10,000	12,000
Switzerland ...	500	450	500	500					
Turkey (Europe) ...	5,000	4,500	5,000	5,000	Total out of Europe	179,175	179,050	180,500	208,850
United Kingdom	6,000	4,750	7,550	7,580					
<b>Total for Europe...</b>	<b>232,270</b>	<b>221,210</b>	<b>230,820</b>	<b>228,630</b>	<b>Grand total</b>	<b>411,445</b>	<b>400,260</b>	<b>420,320</b>	<b>437,480</b>

1. In quarters of 480lb. Add 000 to the figures in columns for number of quarters.

The figures given for Australasia in the above total are considerably overstated for the year 1906, the actual return being about 8,964,000 quarters as against 10,000,000 quoted in the table. Taking the average of the four years the yield of wheat in the Commonwealth constitutes about 2 per cent. of the world's production.

4. **Prices of Wheat.**—(i.) *British.* As the United Kingdom is the largest importer of wheat, the price of the cereal in the British markets naturally has a considerable influence on the price in the local markets, especially since the position of Australia as an exporting country became assured. The table below gives the average price per Imperial quarter of British wheat at various intervals since 1861, together with the highest and lowest weekly average:—

## PRICES OF BRITISH WHEAT, 1861-1906.

Year.	Average for Year.	Highest Weekly Average.	Lowest Weekly Average.	Year.	Average for Year.	Highest Weekly Average.	Lowest Weekly Average.
	s. d.	s. d.	s. d.		s. d.	s. d.	s. d.
1861 ...	55 4	61 6	50 0	1902 ...	28 1	31 8	24 10
1871 ...	56 8	60 0	52 6	1903 ...	26 9	30 3	24 11
1881 ...	45 4	55 2	40 9	1904 ...	28 4	30 6	26 3
1891 ...	37 0	41 8	32 3	1905 ...	29 8	32 3	26 8
1901 ...	26 9	27 8	25 8	1906 ...	28 3	30 9	25 9

(ii.) *Australian.* Generally speaking, Australian wheat shews a grain of bright clear texture, rich in gluten, and of fine milling quality. Its excellence is attested by the high price which it realises in the Home markets. The statement below shews, for the last three years, the average value per Imperial quarter of the wheat imported into the United Kingdom from the chief producing countries:—

## AVERAGE PRICE OF FOREIGN WHEAT IMPORTED INTO THE UNITED KINGDOM, 1904-6.

Country.	Average Price per Imperial Quarter.			Country.	Average Price per Imperial Quarter.		
	1904.	1905.	1906.		1904.	1905.	1906.
	s. d.	s. d.	s. d.		s. d.	s. d.	s. d.
Argentina ...	30 1	30 7	29 10	Turkey ...	25 4	28 1	28 11
Bulgaria ...	28 7	29 4	27 5	United States—			
Chile ...	30 8	30 4	...	Atlantic Coast	30 7	31 9	30 7
Germany ...	31 2	31 11	27 7	Pacific Coast ...	30 9	31 7	30 11
Rumania ...	29 5	31 0	28 11	Canada ...	30 10	31 8	30 8
Russia—				British India ...	28 7	29 8	29 4
Northern Ports	30 9	31 2	28 6	New Zealand ...	29 7	30 1	32 2
Southern Ports	30 9	31 9	29 10	<b>Australia</b> ...	<b>31 4</b>	<b>32 4</b>	<b>31 2</b>

In the next table will be found a statement of the export price of Australian wheat during each of the last six years:—

## EXPORT PRICE OF AUSTRALIAN WHEAT, 1901-6.

Year.	1901.	1902.	1903.	1904.	1905.	1906.
Price per bushel ...	2s. 9d.	3s. 1d.	3s. 1d.	3s. 2d.	3s. 5d.	3s. 3d.

Export price is defined in the Customs' returns as value in the principal markets of the Commonwealth.

5. **Exports of Wheat and Flour.**—(i.) *Quantities.* The table hereunder shews the imports, exports, and net exports of wheat and flour during each year of the period 1901-6. For the sake of convenience flour has been expressed at its equivalent in wheat, one ton of flour being taken as equal to 50 bushels of grain:—

IMPORTS AND EXPORTS OF WHEAT AND FLOUR, COMMONWEALTH,  
1901-6.

Year.	Imports.			Exports.			Net Exports.
	Wheat.	Flour.	Total.	Wheat.	Flour.	Total.	
	Bushels.	Eq. Bshl.	Bushels.	Bushels.	Eq. Bshl.	Bushels.	Bushels.
1901	22,992	302,550	325,542	20,260,058	4,840,700	25,100,758	24,775,216
1902	176,133	553,650	729,783	8,999,282	1,659,150	10,658,432	9,928,649
1903	9,144,490	3,493,450	12,607,940	1,530,143	402,500	1,932,643	10,675,297 <sup>2</sup>
1904	618	58,200	58,818	33,346,066	5,247,500	38,593,566	38,534,748
1905	258	55,550	55,808	24,648,182	7,715,850	32,364,032	32,308,224
1906	745	43,800	44,545	30,262,335	8,344,050	38,606,385	38,561,840

1. Equivalent bushels. 2. — Denotes net imports.

As shewn above, the Commonwealth had to import over 12,500,000 bushels of wheat and flour during 1903, this being necessitated by the failure of the crop in the preceding season. The principal sources of supply were the United States, which contributed 5,000,000 bushels of wheat and 56,000 tons of flour, the Argentine which sent 3,000,000 bushels of wheat and 2000 tons of flour, and Canada which sent 57,000 bushels of wheat in addition to 11,000 tons of flour. Wheat to the extent of 134,000 bushels was obtained from India, while Brazil furnished 122,000 bushels.

(ii.) *Destination of Exported Breadstuffs.* In the next two tables will be found the principal countries to which the Commonwealth exported wheat and flour during each year of the period 1901-6. The countries are as shewn in the Australian Customs returns, but owing to the fact that wheat ships are frequently instructed to call for orders at various African ports, some of these African countries cannot be properly considered as the ultimate destination of the whole of the wheat said to be exported to them. Wheat and flour are shewn separately for reasons that will be alluded to later on.

## EXPORTS OF WHEAT FROM THE COMMONWEALTH, 1901-6.

Country to which Exported.	1901.	1902.	1903.	1904.	1905.	1906.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
United Kingdom	10,821,975	7,343,019	1,134,496	27,176,293	16,910,892	20,138,149
Cape Colony ...	2,983,215	1,329,352	254,232	4,587,759	3,783,657	4,017,233
India ...	297,159	245	...	...	233	437,317
Natal ...	232,456	32,553	43,486	381,602	238,797	145,995
Other Brit. Pos.	2,515	2,412	264	42,208	28,281	168,079
Canary Islands...	...	...	...	...	323,882	327,255
Chile ...	1,102,395	...	...	138,567	382,377	2,212,410
Egypt ...	258,521	...	...	16,972	...	161,470
Italy ...	43,821	...	...	...	11,040	208,528
New Caledonia...	115,088	58,774	952	69,555	128,893	60,563
Peru ...	162,796	...	71,743	446,616	1,213,877	1,244,112
Spain ...	...	...	...	...	809,635	864,367
Total Exports	20,260,058	8,999,282	1,530,143	33,346,066	24,647,998	30,262,335

The exports of flour during the same period, and the principal countries of destination, were as follows:—



## EXPORTS OF FLOUR FROM THE COMMONWEALTH, 1901-6.

Country to which Exported.	1901.	1902.	1903.	1904.	1905.	1906.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
United Kingdom ...	27,625	822	105	52,114	54,019	26,796
Cape Colony ...	13,919	9,465	7	9,031	17,212	13,722
Hong Kong ...	725	191	23	419	10,269	20,456
Natal ...	21,338	7,704	1,306	19,642	23,910	24,358
Straits Settlements ...	2,050	520	104	842	7,680	17,608
Java ...	1,117	10	270	730	1,555	4,793
Java ...	13,170	6,501	2,323	8,360	11,890	15,021
New Caledonia ...	2,994	2,784	1,979	2,974	3,030	3,613
Philippine Islands ...	620	400	32	1,163	6,442	12,126
Portuguese East Africa ...	524	155	...	3,193	4,410	11,139
Total Exports ...	96,814	33,183	8,050	104,948	154,317	166,881

(iii.) *Disadvantages of Wheat Export.* From the above returns it will be seen that the export of flour from Australia is, in comparison with wheat, quite insignificant. This overwhelming preponderance of wheat export calls for comment. A recent calculation places the value of the phosphoric acid sent away from Australia in the form of wheat grain as exceeding £100,000 annually. Of course the obvious way to prevent this loss would be to substitute the export of the wheaten flour for the export of the wheat grain itself. While Australian wheat commands the highest price in the home markets, however, there does not appear to be any striking predilection in favour of the Australian-made flour, this of course being chiefly due to the fact that the importing countries find it advantageous to have the disposal of the wheat offal.

More exactly the proportions of milled product from a bushel (60 lbs.) of wheat are, approximately, as follows:—Flour, 42 lbs.; bran, 9 lbs.; pollard, 9 lbs. The average percentage of phosphoric acid in these products is as follows:—

Flour ...	...	0.32 per cent., or 0.13 lbs. per bushel.
Bran ...	...	3.00 „ 0.27 „
Pollard ...	...	0.90 „ 0.08 „

The total amount of phosphoric acid contained in a bushel of wheat is, therefore, 0.48 lbs., of which 0.13 lbs. is in the flour and 0.35 lbs. in the offal.

The market value of phosphoric acid as a fertiliser is about three halfpence per lb. In an export of 30,262,335 bushels of wheat the value of the phosphoric acid will, therefore, be £90,787, of which £24,588 is in the flour and £66,199 in the bran and pollard. The price for which the offal can be sold locally will probably be the determining factor with the millers in deciding whether to export wheat or flour.<sup>1</sup>

6. **Value of the Wheat Crop.**—The estimated value of the wheat crop in each State and in the Commonwealth during the season 1906-7 is shewn below:—

## VALUE OF THE WHEAT CROP, 1906-7.

State.	N.S.W.	Vic.	Q'land.	S. Aust.	W. Aust.	Tas.	C'w'lth.
	£	£	£	£	£	£	£
Value of wheat crop ...	3,522,680	3,109,980	194,058	2,357,547	471,225	122,139	9,777,629
Average value per acre under cultivation ...	£1/17/9	£1/10/7	£1/13/10	£1/8/0	£1/17/8	£3/14/5	£1/12/9

1. The above estimates are furnished on the authority of F. B. Guthrie, Esquire, F.C.S., etc., Chemist to the Department of Agriculture, New South Wales.

## § 5. Oats.

1. **Progress of Cultivation.**—Oats come next in importance to wheat amongst the cereal crops cultivated last season, but while wheat accounted for nearly 63 per cent., oats represented only 6 per cent. of the area under crop in the Commonwealth. The progress of cultivation since 1860 is shewn in the table hereunder, and more fully in the graphs hereinafter:—

CULTIVATION OF OATS, 1860-1 TO 1906-7.

Season.	N.S.W.	Victoria.	Q'nsland.	S. Aust.	W. Aust.	Tas.	C'wealth.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1860-1...	6,535	86,337	7	2,273	507	30,303	125,962
1865-6...	10,939	102,817	348	2,872	1,232	28,538	146,746
1870-1...	10,683	149,309	122	6,188	2,095	30,946	199,343
1875-6...	18,856	124,100	114	3,640	1,256	32,556	180,522
1880-1...	17,923	134,089	116	4,355	1,319	19,853	177,655
1885-6...	14,117	215,994	208	7,871	1,596	29,247	269,033
1890-1...	14,102	221,048	411	12,475	1,934	20,740	270,710
1895-6...	23,750	255,503	922	34,098	1,880	32,699	348,852
1900-1...	29,383	362,689	385	27,988	4,790	45,073	470,308
1901-2...	32,245	329,150	1,535	34,660	9,751	54,089	461,430
1902-3...	42,992	433,489	78	50,296	10,334	55,058	592,247
1903-4...	51,621	433,638	2,808	57,558	14,568	60,663	620,856
1904-5...	40,471	344,019	643	50,630	13,864	43,690	493,317
1905-6...	38,543	312,052	533	56,950	15,713	42,776	466,567
1906-7...	56,431	380,493	1,236	57,000	28,363	58,320	581,843

2. **Total Yield.**—The total oat crop of the several States for the same period is furnished in the following table:—

COMMONWEALTH OAT CROP.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	C'wealth.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1860-1 ...	98,814	2,633,693	91	52,989	11,925	926,418	3,723,930
1865-6 ...	116,005	2,279,468	4,524	42,642	19,005	688,740	3,150,384
1870-1 ...	119,365	2,237,010	1,586	88,383	39,974	691,250	3,177,568
1875-6 ...	352,966	2,719,795	1,482	60,749	18,840	827,043	3,980,835
1880-1 ...	356,121	2,362,425	2,081	50,070	21,104	439,446	3,231,247
1885-6 ...	279,107	4,692,303	1,006	97,201	23,142	784,325	5,877,084
1890-1 ...	256,659	4,919,325	8,967	116,229	38,791	519,395	5,859,366
1895-6 ...	374,196	2,880,045	10,887	184,012	19,326	906,934	4,375,400
1900-1 ...	593,548	9,582,332	7,855	366,229	86,433	1,406,913	12,043,310
1901-2 ...	687,179	6,724,900	42,208	469,254	163,654	1,702,659	9,789,854
1902-3 ...	351,758	4,402,982	520	620,823	167,882	1,752,745	7,296,710
1903-4 ...	1,252,156	13,434,952	70,713	902,936	258,503	1,621,950	17,541,210
1904-5 ...	652,646	6,203,429	15,137	555,696	226,318	1,178,819	8,832,045
1905-6 ...	883,081	7,232,425	5,858	869,146	283,987	1,200,024	10,474,521
1906-7 ...	1,404,554	8,845,654	28,884	896,166	457,155	1,979,574	13,611,987

The principal oat-growing State of the Commonwealth is Victoria. During the past seven seasons it has produced more than 70 per cent. of the total quantity of oats grown in the Commonwealth; Tasmania, New South Wales, and South Australia come next in order of importance. In Tasmania, New South Wales, and Western Australia, the highest production of oats for any season was that of 1906-7, while Victoria, South Australia, and Queensland experienced a maximum yield in 1903-4. For the Commonwealth as a whole the yield of 13,611,987 bushels of oats in 1906-7 has only once been exceeded, viz., in the record year 1903-4 when the total reached was 17,541,210 bushels.

3. **Average Yield.**—The average yield per acre of the oat crop of the Commonwealth varies considerably in the different States, being highest in Tasmania and lowest in South Australia. Particulars as to average yield for the past six seasons are given in the succeeding table :—

AVERAGE YIELD OF OATS PER ACRE.

Season.	N.S.W.	Victoria.	Q'nsland.	S. Aust.	W. Aust.	Tasmania.	C'wealth.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1901-2 ...	21.31	20.43	27.50	13.54	16.78	31.48	21.22
1902-3 ...	8.18	10.16	6.67	12.34	16.25	31.83	12.32
1903-4 ...	24.26	30.98	25.18	15.69	17.74	26.74	28.25
1904-5 ...	16.13	18.03	23.54	10.98	16.32	26.98	17.90
1905-6 ...	22.91	23.18	10.99	15.26	18.07	28.05	22.45
1906-7 ...	24.89	23.25	23.37	15.72	16.12	33.94	23.39

It will be seen that as in the case of the wheat crop, the smallest average yield per acre for the Commonwealth for the period was that experienced in the season 1902-3, while the largest was that of the succeeding season.

4. **Value of Oat Crop.**—The estimated value of the oat crop of the several States of the Commonwealth for the season 1906-7 is as follows :—

VALUE OF OAT CROP, 1906-7.

State.	N.S.W.	Victoria.	Q'sland.	Sth Aust.	West Aus.	Tas.	C'wealth.
Aggregate Value ...	£169,720	£810,851	£4,573	£82,148	£68,573	£230,950	£1,366,815
Value per Acre ...	£3/0/2	£2/2/7	£3/14/0	£1/8/10	£2/8/4	£3/19/2	£2/7/0

5. **Imports and Exports.**—The production of oats in the Commonwealth has not yet reached such a stage as to admit of a regular export trade in this cereal; in fact in certain years the imports have exceeded the exports, notably in 1903 and 1906. The quantities and values of oats imported into and exported from the Commonwealth during the six years 1901 to 1906 are given hereunder :—

COMMONWEALTH IMPORTS AND EXPORTS OF OATS, 1901 TO 1906.

Year.	Imports.		Exports.		Net Exports.*	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Bushels.	£	Bushels.	£	Bushels.	£
1901	1,526,599	153,674	2,874,334	285,347	1,347,735	131,673
1902	1,037,596	157,981	1,427,620	181,450	390,024	23,469
1903	2,066,365	229,395	184,823	23,305	1,881,542	206,090
1904	185,652	15,921	1,713,578	115,659	1,527,926	99,738
1905	392,400	45,460	882,740	83,479	490,340	38,019
1906	215,330	27,445	154,063	18,559	61,267	8,886

\* — Signifies net imports.

The principal country from which the Commonwealth imports of oats are obtained is the Dominion of New Zealand, while the principal country to which oats were exported during the period under review were the South African colonies in the earlier, and the United Kingdom in the later years.

6. **Oatmeal, &c.**—In addition to the locally manufactured oatmeal, importations take place principally from the United Kingdom, the United States and Canada. The

total importations of groats, oatmeal, wheatmeal, and rolled oats during 1906 amounted to 1,246,657 lbs., and represented a value of £18,226.

7. **Comparisons with other Countries.**—A comparison of the Australian production of oats with that of the leading oat-producing countries of the world, is furnished in the following table :—

PRODUCTION OF OATS IN VARIOUS COUNTRIES, 1905.

Country.	Quantity of Oats produced	Country.	Quantity of Oats produced	Country.	Quantity of Oats produced.
	Bushels.		Bushels.		Bushels.
United States ...	923,428,192	Austria ...	107,850,696	Rumania ...	18,387,320
Russian Empire ...	766,139,080	Ontario ...	105,563,568	Spain ...	18,251,240
Germany ...	369,961,288	Sweden ...	59,466,824	New Zealand	12,707,982
France ...	273,907,032	Manitoba ...	45,484,024	<b>Australia ...</b>	<b>10,474,521</b>
United Kingdom	166,286,492	Saskatchewan	19,213,056		

8. **Comparison of Yields.**—The average yield per acre of oats in Australia is a somewhat lower one compared with the results obtained in other countries, where the cultivation of this cereal is more extensively carried on. Arranging the countries contained in the foregoing table according to the magnitude of the average yield of oats for a period of five years, the results are as follows :—

AVERAGE YIELD PER ACRE.

Country.	Average per Acre.	Country.	Average per Acre.	Country.	Average per Acre.
	Bshl.		Bshl.		Bshl.
United Kingdom...	41.09	Saskatchewan ...	32.73	Rumania...	21.11
New Zealand ...	39.56	United States ...	29.14	<b>Australia...</b>	<b>20.47</b>
Germany ...	39.39	Sweden ...	28.73	Spain ...	16.37
Ontario ...	38.61	France ...	26.60	Russia ...	16.19
Manitoba ...	38.54	Austria ...	22.41		

9. **Interstate Trade.**—Particulars concerning the interstate trade in oats are contained in the following table. These shew that Victoria and Tasmania are the largest exporters, while New South Wales and Western Australia are the largest importers of oats :—

INTERSTATE TRADE IN OATS, 1906.

State.	Imports from Other States of the Commonwealth.		Exports to Other States of the Commonwealth.		Net Interstate Exports.*	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Bushels.	£	Bushels.	£	Bushels.	£
New South Wales ...	633,178	77,051	30,250	3,940	—602,928	—73,111
Victoria ...	43,102	5,142	912,682	107,256	869,580	102,114
Queensland ...	70,785	8,954	148	19	—70,637	—8,935
South Australia ...	18,835	2,134	135,795	15,865	116,960	13,731
Western Australia ...	627,573	71,699	...	...	—627,573	—71,699
Tasmania ...	76,590	8,904	391,188	46,804	314,598	37,900

\* — Signifies net imports.

10. **Price of Oats.**—The average wholesale prices of oats in the Melbourne market for each of the years 1903 to 1906 are given in the following table :—

## AVERAGE WHOLESALE PRICE PER BUSHEL.

Year ...	...	...	1903.	1904.	1905.	1906.
			s. d.	s. d.	s. d.	s. d.
Algerian oats ...	...	...	2 5	1 3	1 10	2 4
White oats ...	...	...	2 8	1 11	2 7	2 8

## § 6. Maize.

1. **States Growing Maize.**—The only States in which maize is at all extensively grown for grain are those of New South Wales and Queensland, the area so cropped in these two States during the season 1906-7 being 313,921 acres, or more than 96 per cent. of the total for the Commonwealth. Of the balance, Victoria contributed 11,559 acres and Western Australia 101 acres. The climate of Tasmania prevents the growing of maize for grain in that State, while in South Australia the area is so small that the particulars are not specially asked for on the form used in the collection of agricultural statistics. In all the States maize is grown to a greater or less extent as green forage, particularly in connection with the dairying industry.

2. **Area under Maize.**—The area devoted to the growing of maize for grain in each State, with the total for the Commonwealth, from 1875 onwards is as follows:—

## AREA UNDER MAIZE, STATES AND COMMONWEALTH, 1875-6 TO 1906-7.

Season.	N.S.W.	Victoria.	Queensland.	West Aust.	C'wealth.
	Acres.	Acres.	Acres.	Acres.	Acres.
1875-6 ...	117,582	2,346	38,711	60	158,699
1880-1 ...	127,196	1,769	44,109	32	173,106
1885-6 ...	132,709	4,530	71,741	120	209,100
1890-1 ...	191,152	10,357	99,400	81	300,990
1895-6 ...	211,104	7,186	100,481	23	318,794
1900-1 ...	206,051	9,389	127,974	91	343,505
1901-2 ...	167,333	10,020	116,983	513	294,849
1902-3 ...	202,437	10,906	89,923	109	303,375
1903-4 ...	226,834	11,810	133,099	163	371,906
1904-5 ...	193,614	11,394	119,171	86	324,265
1905-6 ...	189,353	11,785	113,720	43	314,901
1906-7 ...	174,115	11,559	139,806	101	325,581

The actual fluctuations from year to year are shewn more fully on the graph hereinafter.

The total area under maize in the Commonwealth exceeded 300,000 acres for the first time in the season 1890-1, and although it has fluctuated somewhat since then, it may be considered to have remained practically stationary at about that figure. The greatest divergence occurred in 1903-4, when a record total of 371,906 acres was harvested. The area cropped with maize appears to be on the decline in New South Wales, the maximum cropping being that of 1903-4, while each subsequent season furnished a smaller area than the preceding. In Queensland, on the other hand, the area is on the increase, and that for 1906-7 is the highest yet attained. The area under maize in New South Wales in 1906-7 represents a little more than 6 per cent. of that State's total area under crop, while in the case of Queensland the maize crop amounts to almost 25 per cent. of the total.

3. **Total Yield.**—Notwithstanding the fact that the area under maize in the Commonwealth for 1906-7 fell considerably short of that for some of the previous seasons the

1906-7 production established a record, the total attained being 10,172,154 bushels. Only once previously had a total exceeding ten millions been reached, viz., in the season 1897-8, when 10,036,083 bushels were harvested. Particulars concerning the yield from 1875 onwards are as hereunder:—

MAIZE CROP, STATES AND COMMONWEALTH, 1875-6 to 1906-7.

Season.	N.S.W.	Victoria.	Queensland.	W. Aust.	C'wealth.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1875-6 ... ..	3,410,517	37,177	1,006,486	1,200	4,455,380
1880-1 ... ..	4,518,897	49,299	1,409,607	896	5,978,699
1885-6 ... ..	4,336,163	181,240	1,574,294	1,417	6,093,114
1890-1 ... ..	5,713,205	574,083	2,373,803	1,526	8,662,617
1895-6 ... ..	5,687,030	351,891	2,391,378	600	8,430,899
1900-1 ... ..	6,292,745	604,180	2,456,647	1,399	9,354,971
1901-2 ... ..	3,844,993	615,472	2,569,118	5,203	7,034,786
1902-3 ... ..	3,049,269	750,524	1,033,929	2,110	4,835,232
1903-4 ... ..	6,836,740	904,239	1,923,623	2,487	9,667,089
1904-5 ... ..	4,951,132	623,736	2,542,766	896	8,118,530
1905-6 ... ..	5,539,750	641,216	2,164,674	428	8,346,068
1906-7 ... ..	5,763,000	704,961	3,703,274	919	10,172,154

4. **Average Yield.**—In the following table particulars are given of the average yield per acre of the maize crops of the several States for the six seasons, 1901-2 to 1906-7:—

AVERAGE YIELD OF MAIZE PER ACRE, COMMONWEALTH AND STATES, 1901-2 to 1906-7.

Season.	N.S.W.	Victoria.	Queensland.	W. Aust.	C'wealth.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1901-2 ... ..	22.98	61.42	21.96	10.16	23.86
1902-3 ... ..	15.06	68.82	11.49	19.36	15.94
1903-4 ... ..	30.14	76.57	14.45	15.26	25.99
1904-5 ... ..	25.57	54.74	21.34	10.42	25.04
1905-6 ... ..	29.26	54.41	19.04	9.95	26.50
1906-7 ... ..	33.10	60.99	26.49	9.10	31.24

The extraordinarily high average yield obtained in Victoria is due, in large measure, to the fact that the area under maize in that State is comparatively small and is situated in districts that are peculiarly suited to the production of this grain. The yield in New South Wales is appreciably higher than that obtained in Queensland.

5. **Value of Maize Crop.**—The value of the Commonwealth maize crop for the season 1906-7 has been estimated at £1,326,071, made up as follows:—

VALUE OF MAIZE CROP, 1906-7.

State ... ..	New South Wales.	Victoria.	Queensland.	Western Australia.	Commonwealth.
Aggregate value ... ..	£792,400	£70,496	£462,922	£253	£1,326,071
Value per acre ... ..	£4 11/0	£6 2/0	£3 6/3	£2 10/1	£4 1/6

6. **Imports and Exports.**—Except in the years 1902 and 1903, when, owing to the severe drought experienced in Australia, many of the maize crops failed, the Commonwealth trade in maize has been practically insignificant. In the former of the years mentioned nearly two million, and in the latter considerably more than a million bushels were imported. Details of the imports and exports for the past six years are as follows:—

## COMMONWEALTH IMPORTS AND EXPORTS OF MAIZE, 1901-6.

Year.	Imports.		Exports.		Net Exports.*	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Bushels.	£	Bushels.	£	Bushels.	£
1901 ...	188,423	24,764	543	75	187,890	24,689
1902 ...	1,910,587	319,859	1,450	351	1,909,137	319,508
1903 ...	1,346,702	204,484	17,296	2,749	1,329,406	201,735
1904 ...	35,096	3,018	48,109	5,421	13,013	2,403
1905 ...	9,785	1,922	7,033	985	2,752	937
1906 ...	24,727	3,243	63,168	9,256	38,441	6,013

\* — Signifies net imports.

The principal countries to which maize has been exported from the Commonwealth are South Africa and New Zealand, while the principal countries from which importations have taken place are the Argentine Republic, New Zealand, the United States, and the New Hebrides.

7. **Prepared Maize.**—A fairly large quantity of maizena and corn-flour is imported annually into the Commonwealth, the principal countries of supply being the United Kingdom and the United States. During the year 1906 these importations amounted to 1,857,937 lbs., and represented a value of £20,092.

8. **Maize-growing in Other Countries.**—The world's production of maize for the year 1906 has been estimated at 3,520,000,000 bushels, and of this amount the United States of America was responsible for 2,840,000,000, or slightly more than 80 per cent. The other leading maize-producing countries of the world are Mexico, the Argentine Republic, India, Italy, and Austria-Hungary.

9. **Interstate Trade in Maize.**—In addition to being the largest producer of maize in the Commonwealth, New South Wales is also the largest importer from the other States. Particulars of the Interstate imports and exports are contained in the table given hereunder:—

## INTERSTATE TRADE IN MAIZE, 1906.

State.	Imports from other States of the Commonwealth.		Exports to other States of the Commonwealth.		Net Interstate Exports.*	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Bushels.	£	Bushels.	£	Bushels.	£
New South Wales ...	488,406	117,194	24,962	8,086	463,444	109,108
Victoria ...	36,704	8,270	64,850	21,890	28,146	13,620
Queensland ...	23,787	8,766	475,491	108,584	451,704	99,818
South Australia ...	5,889	1,551	929	286	4,960	1,265
Western Australia ...	8,432	2,213	...	...	8,432	2,213
Tasmania ...	3,014	852	...	...	3,014	852

\* — Signifies net Imports.

10. **Price of Maize.**—The average wholesale price of maize in the Sydney market is given in the following table for each of the years 1901 to 1906:—

## AVERAGE PRICE OF MAIZE PER BUSHEL.

Year	1901.	1902.	1903.	1904.	1905.	1906.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Average price per bushel	2 9	4 10	4 1	2 4	3 3	3 0

### § 7. Barley.

1. **Area under Barley.**—The barley crop of the Commonwealth is one which has fluctuated very considerably as regards area, but the net result of these fluctuations has left it in practically the same position as that which it occupied twenty-six years ago. Thus in the season 1880-1, the area of barley harvested totalled 105,919 acres, while in 1906-7 no more than 106,436 acres were reaped. The principal barley-growing State of the Commonwealth is Victoria, which, for the season 1906-7, accounted for nearly 50 per cent. of the Commonwealth area devoted to this crop. The figures here given relate to the areas harvested for grain; only small areas are cropped for hay, while more considerable quantities are cut for green forage. These, however, are not included in this section. The area under barley for grain in the several States from 1875 onwards is shewn in the following table :—

COMMONWEALTH AREA UNDER BARLEY, 1875-6 TO 1906-7.

Season.	N.S.W.	Victoria.	Q'nsland.	Sth. Aust.	W. Aust.	Tasmania.	C'wealth.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1875-6	4,817	31,568	613	13,969	5,014	5,939	61,920
1880-1	8,056	68,630	1,499	13,074	6,363	8,297	105,919
1885-6	5,298	74,112	406	16,493	6,178	6,833	109,320
1890-1	4,937	87,751	584	14,472	5,322	4,376	117,442
1895-6	7,590	78,438	721	14,184	1,932	6,178	109,043
1900-1	9,435	58,853	7,533	15,352	2,536	4,502	98,211
1901-2	6,023	32,423	11,775	15,517	2,669	6,104	74,511
1902-3	4,557	37,716	430	21,493	3,783	8,281	76,260
1903-4	10,057	47,760	22,881	28,697	3,609	8,084	121,088
1904-5	14,930	46,089	17,387	23,904	3,251	7,646	113,207
1905-6	9,519	40,938	5,201	26,250	3,665	5,372	90,945
1906-7	7,979	52,816	8,601	28,122	3,590	5,328	106,436

The only State in which a marked increase in the area devoted to this crop is in evidence is that of South Australia.

2. **Malting and other Barley.**—In recent years the statistics of all the States, except South Australia, have distinguished between "malting" and "other" barley. Particulars for the Commonwealth are as follows, the figures for South Australia being estimated:—

AREA UNDER MALTING AND OTHER BARLEY, COMMONWEALTH, 1906-7.

State	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	C'wealth.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Malting Barley	5,528	30,052	6,696	16,001*	1,138	4,046	63,461
Other Barley...	2,451	22,764	1,905	12,121*	2,452	1,282	42,975
Total ....	7,979	52,816	8,601	28,122*	3,590	5,328	106,436

\* Estimated.

It will be seen that taking the Commonwealth as a whole, about 60 per cent. of the area devoted to this grain is cropped with malting barley. The proportion varies considerably in the several States.

3. **Total Yield.**—The total production of barley in the Commonwealth for the season 1906-7, viz., 2,248,432 bushels, was greater than for any previous year except 1903, when a record of 2,656,313 bushels was established, and 1889 when a total of 2,416,163 was reached. Particulars concerning the yields of the several States from 1875 onwards are as follows :—



## COMMONWEALTH BARLEY CROP, 1875-6 TO 1906-7.

Season.	N.S.W.	Victoria.	Q'sland.	Sth. Aust.	West Aust.	Tasmania.	C'wealth.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1875-6	98,576	700,665	12,260	197,315	70,196	165,357	1,244,369
1880-1	163,395	1,068,880	31,433	151,886	89,082	169,156	1,673,782
1885-6	85,606	1,302,854	9,826	218,334	89,581	176,466	1,882,667
1890-1	81,383	1,571,599	12,673	175,583	85,451	99,842	2,026,531
1895-6	96,119	715,592	7,756	140,391	18,691	138,833	1,117,382
1900-1	114,228	1,215,478	127,144	211,102	29,189	116,911	1,814,052
1901-2	103,361	693,851	277,037	243,362	34,723	167,485	1,519,819
1902-3	18,233	561,144	3,595	317,155	46,255	201,133	1,147,515
1903-4	174,147	1,218,003	510,557	487,920	53,227	212,459	2,656,313
1904-5	266,781	874,099	331,772	346,718	37,332	163,194	2,019,896
1905-6	111,266	1,062,139	61,816	505,916	49,497	92,664	1,883,298
1906-7	152,739	1,255,442	158,283	491,246	48,827	141,895	2,248,432

4. **Value of Barley Crop.**—The estimated value of the total barley crop of the Commonwealth is £343,535, the extent to which the several States have contributed to this total being shewn in the following table:—

## VALUE OF BARLEY CROP.

State ...	N.S.W.	Victoria.	Q'sland.	Sth. Aus.	Wst. Aus.	Tas.	C'wealth.
Total Value ...	£25,460	£205,832	£17,807	£61,406	£8,198	£24,832	£343,535
Value per acre	£3/4/8	£3/17/11	£2/1/5	£2/3/8	£2/5/8	£4/18/3	£3/4/7

5. **Imports and Exports Oversea.**—The Commonwealth oversea trade in barley is not extensive, and in most years the imports exceed the exports. In 1902 and 1903, somewhat extensive importations of barley from the United States and New Zealand took place, owing to the shortage in local supply resulting from the severe drought of that period. In 1904, the record crop of the season 1903-4 furnished the material for a heavy exportation to Japan, the total exported thither during that year being 551,825 bushels. Particulars of the Commonwealth oversea imports and exports of barley for the six years 1901 to 1906 are contained in the following table:—

## OVERSEA IMPORTS AND EXPORTS OF BARLEY, 1901-1906.

Year.	Imports.		Exports.		Net Exports.*	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Bushels.	£	Bushels.	£	Bushels.	£
1901 ...	55,508	7,208	17,474	1,942	— 38,034	— 5,266
1902 ...	686,478	123,194	8,267	1,465	—678,211	—121,729
1903 ...	731,494	136,997	14,286	5,561	—717,208	—131,436
1904 ...	246,908	39,012	568,640	65,950	321,732	26,938
1905 ...	124,850	19,672	244,456	28,618	119,606	8,946
1906 ...	210,586	34,468	3,150	562	—207,436	— 33,906

\* — Signifies net imports.

In addition to the above, which relates to the unprepared grain, there is a small importation into the Commonwealth of pearl and Scotch barley mainly from the United Kingdom and Germany. The total imported during 1906 amounted to only 17,869 lbs. in weight, with a value of £159.

6. **Oversea Imports and Exports of Malt.**—The importations of malt into the Commonwealth are fairly extensive, the bulk of the supply being obtained from the United Kingdom and Germany, principally from the former. Details of imports and exports for the past six years are given hereunder :—

## OVERSEA IMPORTS AND EXPORTS OF MALT, 1901-1906.

Year.	Imports.		Exports.		Net Imports.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Bushels.	£	Bushels.	£	Bushels.	£
1901 ...	516,135	140,615	...	...	516,135	140,615
1902 ...	293,637	91,410	...	...	293,637	91,410
1903 ...	175,212	54,532	198	76	175,014	54,456
1904 ...	189,500	57,571	787	313	188,713	57,258
1905 ...	170,712	53,247	41	14	170,671	53,233
1906 ...	172,433	55,714	539	85	171,894	55,629

7. **Interstate Trade in Barley and Malt.**—Victoria, as well as being the largest grower of barley in the Commonwealth, is also the largest importer from the other States. The largest exporter to the other States during 1906 was South Australia. In the cases of both pearl barley and malt New South Wales was the largest importer from the other States and Victoria the largest exporter.

## INTERSTATE TRADE IN BARLEY AND MALT, 1906.

## BARLEY (UNPREPARED).

State.	Imports from Other States of the Commonwealth.		Exports to Other States of the Commonwealth.		Net Interstate Exports.*	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Bushels.	£	Bushels.	£	Bushels.	£
New South Wales	24,899	7,681	10,988	4,161	— 13,911	— 3,520
Victoria	64,602	23,877	21,055	6,643	— 43,547	— 17,234
Queensland	10,651	3,532	1,024	342	— 9,627	— 3,190
South Australia	81	39	76,087	26,782	76,006	26,743
Western Australia	11,232	3,595	...	...	— 11,232	— 3,595
Tasmania	1,058	351	3,369	1,147	2,311	796

## BARLEY (PEARL AND SCOTCH).

	Lbs.	£	Lbs.	£	Lbs.	£
New South Wales	602,396	2,632	1,581	14	— 600,815	— 2,618
Victoria	...	...	831,619	4,225	831,619	4,225
Queensland	87,739	518	139,156	605	51,417	87
South Australia	152,504	884	81,960	371	— 70,544	— 513
Western Australia	186,006	1,015	...	...	— 186,006	— 1,015
Tasmania	25,671	166	...	...	— 25,671	— 166

## MALT.

	Bushels.	£	Bushels.	£	Bushels.	£
New South Wales	112,954	76,296	2,304	1,572	— 110,650	— 74,724
Victoria	1,635	977	149,813	103,642	148,178	102,665
Queensland	17,560	12,616	1,753	1,160	— 15,807	— 11,456
South Australia	829	616	15,244	10,976	14,415	10,360
Western Australia	35,908	26,577	...	...	— 35,908	— 26,577
Tasmania	228	268	...	...	— 228	— 268

\* — Signifies net imports.

**8. Comparison with Other Countries.**—In comparison with the barley production of other countries of the world that of Australia appears very small indeed. Particulars for some of the leading countries for the year 1905 are as follows, the Australian figure being added for the sake of comparison :—

PRODUCTION OF BARLEY IN VARIOUS COUNTRIES, 1905.

Country.	Production of Barley.	Country.	Production of Barley.
	Bushels.		Bushels.
Russian Empire ...	332,045,280	France ...	41,548,104
United States ...	132,380,672	Rumania ...	25,567,360
Germany ...	128,799,688	Ontario ...	24,265,392
United Kingdom ...	65,003,560	Manitoba ...	14,064,176
Austria ...	64,359,408	Sweden ...	13,141,976
Spain ...	44,067,768	<b>Australia</b> ...	<b>1,884,298</b>

**9. Average Yield.**—The average yield per acre of barley varies considerably in the different States, being highest in Tasmania and Victoria, and lowest in Western Australia and Queensland. Details for each State for the six seasons 1901-2 to 1906-7 are given in the following table :—

AVERAGE YIELD PER ACRE OF BARLEY, 1901-2 TO 1906-7.

Season.	N.S.W.	Victoria.	Q'sland.	Sth. Aust.	West Aust.	Tas.	C'wealth.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1901-2 ...	17.16	21.40	23.53	15.68	13.01	27.44	20.40
1902-3 ...	4.00	14.88	8.36	14.76	12.23	24.29	15.05
1903-4 ...	17.32	25.50	22.31	17.00	14.75	26.28	21.94
1904-5 ...	17.87	18.97	19.08	14.50	11.48	21.34	17.84
1905-6 ...	11.69	25.95	11.89	19.27	13.51	17.44	20.72
1906-7 ...	19.14	23.77	18.40	17.47	13.60	26.63	21.12

**10. Price of Barley.**—The average prices of barley in the Melbourne market during each of the years 1903 to 1906 are given in the following table :—

AVERAGE PRICE OF BARLEY PER BUSHEL, 1903 TO 1906.

Particulars.	1903.	1904.	1905.	1906.
	s. d.	s. d.	s. d.	s. d.
Malting Barley ...	3 11	3 6	4 0	4 5
Cape Barley...	3 1	1 9	2 7	2 4

### § 8. Other Grain and Pulse Crops.

In addition to the grain crops already specified, the only grain and pulse crops at all extensively grown in the Commonwealth are beans, peas and rye. The total area under the two former for the season 1906-7 was 30,824 acres, giving a total yield of 655,167 bushels, or an average of 21.26 bushels per acre. The States in which the greatest area is devoted to beans and peas are Victoria, Tasmania and South Australia. The total area under rye in the Commonwealth during the season 1906-7 was 9738 acres, yielding 137,471 bushels, and giving an average of 14.12 bushels per acre. More than two-thirds of the rye grown during the season was produced in New South Wales. In addition to these grain crops a small area of rice has for some years past been cultivated in Queensland. The results obtained, however, have not offered sufficient inducement

to growers to continue this crop, and the total area devoted to it has declined from 863 acres in 1898-9 to 24 in 1906-7. Should rice-growing ever be seriously taken up in Australia, it is probable that large tracts of country in the northern parts of Western Australia and in the Northern Territory will be found well suited to its cultivation.

### § 9. Potatoes.

1. **Area.**—The principal potato-growing State of the Commonwealth, as regards area, is Victoria, New South Wales ranking second and Tasmania third. The area devoted to this crop in the Commonwealth, which has fluctuated somewhat, reached its highest point in the season 1906-7, with a total of 146,681 acres. The largest areas planted in any previous season were 139,397 acres in 1899-1900, and 127,592 acres in 1894-5. The area under potatoes in each State from 1890 onwards is given hereunder :—

COMMONWEALTH AREA UNDER POTATOES, 1890-1 TO 1906-7.

Season.	N.S.W.	Victoria.	Q'nsland.	Sth. Aust.	W. Aust.	Tasmania.	Com'wealth
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1890-1	19,406	53,818	6,270	6,626	511	20,133	106,764
1895-6	24,722	43,895	9,240	6,448	668	19,247	104,220
1900-1	29,408	38,477	11,060	6,628	1,794	23,068	110,435
1901-2	26,158	40,058	9,948	6,248	1,829	25,444	109,685
1902-3	19,444	49,706	2,899	7,763	2,084	34,625	116,521
1903-4	20,851	48,930	6,732	8,616	1,823	29,160	116,112
1904-5	23,855	46,912	9,771	8,315	1,906	25,948	116,707
1905-6	26,374	44,670	7,170	9,540	2,145	28,634	118,533
1906-7	36,815	55,372	8,031	9,894	2,264	34,305	146,681

2. **Total Yield.**—Although only third amongst the States in respect of area under potatoes, Tasmania has, in several recent years, occupied the leading position in point of production. For the season 1906-7, Tasmania's production represented 36 per cent. of the total for the Commonwealth, Victoria and New South Wales coming next in order. The total Commonwealth production for the season 1906-7, viz., 507,153 tons, was the highest ever attained, the yield which most nearly approached it being 449,383 tons in 1903-4. Details as to production in the several States during the period from 1890 onwards are as follows :—

COMMONWEALTH PRODUCTION OF POTATOES, 1890-1 TO 1906-7.

Season.	N.S.W.	Victoria.	Q'nsland.	Sth. Aust.	W. Aust.	Tasmania.	Com'wealth.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1890-1	52,791	204,155	13,112	23,963	1,900	73,158	369,079
1895-6	56,179	117,238	19,027	18,412	2,290	81,423	294,569
1900-1	63,253	123,126	20,014	14,566	4,836	93,862	319,657
1901-2	39,146	125,474	22,402	15,059	5,739	114,704	322,524
1902-3	30,732	168,759	3,257	28,312	6,488	163,518	401,066
1903-4	56,743	167,736	17,649	31,415	4,542	171,298	449,383
1904-5	48,754	92,872	19,231	19,521	5,614	110,547	296,539
1905-6	49,889	115,352	11,308	20,238	6,297	64,606	267,780
1906-7	114,856	166,839	15,830	22,277	5,028	182,323	507,153

3. **Average Yield.**—The suitability of the soil, climate, and general conditions of Tasmania for potato growing are evidenced by the high yields per acre which are almost invariably obtained in the island State. The lowest average yield is that obtained in Queensland. Particulars for each State for the six seasons 1901-2 to 1906-7 are given hereunder :—

## AVERAGE YIELD OF POTATOES, COMMONWEALTH AND STATES.

1901-2 to 1906-7.

Season.	N.S.W.	Victoria.	Queensl'd.	S. Aust.	W. Aust.	Tasmania.	C'wealth.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1901-2	1.50	3.13	2.25	2.41	3.14	4.51	2.94
1902-3	1.58	3.40	1.12	3.65	3.11	4.72	3.44
1903-4	2.72	3.43	2.62	3.65	2.49	5.87	3.87
1904-5	2.04	1.98.	1.97	2.35	2.95	4.26	2.54
1905-6	1.89	2.58	1.58	2.13	2.94	2.26	2.26
1906-7	3.12	3.01	1.97	2.25	2.22	5.31	3.46

4. **Value of Potato Crop.**—The estimated value of the potato crop of each State for the season 1906-7 is furnished in the following table together with the value per acre :—

## VALUE OF POTATO CROP, 1906-7.

State.	N.S.W.	Victoria.	Queensl'd.	S. Aust.	W. Aust.	Tasmania.	C'wealth.
Total value	£548,470	£333,678	£142,470	£55,693	£57,822	£364,646	£1502,779
Value per acre	£14/18/0	£6/0/6	£17/14/10	£5/12/7	£25/10/10	£10/12/7	£10/4/11

5. **Oversea Imports and Exports.**—Under normal conditions there is usually a fairly large export trade in potatoes carried on by the Commonwealth, principally with New Zealand and New Caledonia. Thus, during 1906, out of a total export of 12,908 tons, 10,818 tons went to New Zealand and 1217 tons to New Caledonia. On the other hand when in 1902 and 1903 the drought of that period had brought about a shortage in the Australian supplies importations from New Zealand took place to the extent of 11,471 tons in the former and 2279 tons in the latter year. The quantities and values of the Commonwealth oversea imports and exports of potatoes for the six years 1901 to 1906 are contained in the following table :—

## COMMONWEALTH OVERSEA IMPORTS AND EXPORTS OF POTATOES,

1901 TO 1906.

Year.	Imports.		Exports.		Net Exports.*	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Tons.	£	Tons.	£	Tons.	£
1901 ...	17,655	86,067	6,028	45,485	11,627	40,582
1902 ...	11,608	53,919	3,383	20,192	8,225	33,727
1903 ...	2,367	7,752	3,407	12,336	1,040	4,584
1904 ...	2,602	8,186	5,464	14,462	2,862	6,276
1905 ...	428	3,181	4,058	29,730	3,630	26,549
1906 ...	295	2,205	12,908	86,248	12,613	84,043

\* — Signifies net imports.

6. **Interstate Trade in Potatoes.**—A large trade in potatoes is carried on between the States of the Commonwealth, the principal exporters being Tasmania and Victoria, and the chief importers New South Wales, Western Australia and Queensland. Particulars for each State for the year 1906 are given hereunder :—

## INTERSTATE TRADE IN POTATOES, 1906.

State.	Imports to Other States of the Commonwealth.		Exports from Other States of the Commonwealth.		Net Interstate Exports.*	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Tons.	£	Tons.	£	Tons.	£
New South Wales	44,671	298,926	4,562	34,650	— 40,109	— 264,276
Victoria	1,146	7,943	24,962	174,284	— 23,816	— 166,341
Queensland	13,346	96,542	473	3,305	— 12,873	— 93,237
South Australia	4,676	33,789	2,695	19,281	— 1,981	— 14,508
Western Australia	13,287	98,109	...	...	— 13,287	— 98,109
Tasmania	294	1,844	44,728	305,633	— 44,434	— 303,789

\* — Signifies net imports.

7. **Comparison with Other Countries.**—The following table will furnish means for comparing the potato crop of Australia for 1906-7 with those of some of the leading potato-producing countries of the world. The figures given for these countries are the latest available, and relate in the majority of cases to the years 1904 and 1905:—

## POTATO CROPS OF VARIOUS COUNTRIES.

Country.	Yield.	Country.	Yield.
	Tons.		Tons.
Germany	47,546,728	United States	6,518,532
Russian Empire	28,083,985	Belgium	2,453,730
Austria-Hungary	13,871,336	Netherlands	2,287,588
France	12,078,003	Sweden	1,812,676
United Kingdom	7,185,745	Australia	507,153

## § 10. Other Root and Tuber Crops.

1. **Nature and Extent.**—Root crops, other than potatoes, are not extensively grown in Australia, the total area devoted to them for the season 1906-7 being only 17,524 acres. The principal ones are onions, mangolds, beet, turnips, and "sweet potatoes" (*Batatas edulis*). Of these onions are most largely grown in Victoria, mangolds in Tasmania and Victoria, beet in Victoria, turnips in Tasmania, and sweet potatoes almost solely in Queensland. The total area under onions in the Commonwealth during the season 1906-7 was 5378 acres, giving a total yield of 31,756 tons, and averaging 5.90 tons per acre. The area devoted in 1906-7 to root crops other than potatoes and onions, viz., 12,146 acres, yielded 122,659 tons, and gave an average of 10.10 tons per acre. The areas and yields here given are exclusive of the production of "market gardens," a reference to which will be made later.

2. **Oversea Imports and Exports.**—The only root crop, other than potatoes, in which any considerable oversea trade is carried on by the Commonwealth is that of onions. During the year 1906 oversea imports of onions amounted to 658 tons, the principal countries from which they were imported being Japan, the United States of America, and the Straits Settlements. For the same year the exports of onions totalled 2683 tons, the principal countries to which they were exported being New Zealand, the United States of America, the Philippine Islands, and New Caledonia.

3. **Interstate Trade.**—A fairly extensive trade in onions is carried on between the several States of the Commonwealth. Victoria, the largest producer of onions, is naturally the largest exporter, while New South Wales, Queensland, and Western Australia are the principal importers. During the year 1906 the interstate onion trade was as follows:—

INTERSTATE TRADE IN ONIONS, 1906.

State.	Imports from Other States of the Commonwealth.		Exports to Other States of the Commonwealth.		Net Interstate Exports.*	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Tons.	£	Tons.	£	Tons.	£
New South Wales ...	7,292	42,223	578	3,437	— 6,714	— 38,786
Victoria ...	68	300	13,826	78,630	13,758	78,330
Queensland ...	3,949	22,090	14	94	— 3,935	— 21,996
South Australia ...	250	1,654	314	1,768	64	114
Western Australia ...	2,659	14,765	...	...	— 2,659	— 14,765
Tasmania ...	522	2,945	8	48	— 514	— 2,897

\* — Signifies net imports.

## § 11. Hay.

1. **Nature and Extent.**—As already stated, the most important crop of the Commonwealth is that of wheat grown for grain. Next to this in importance is the hay crop, which for the season 1906-7 represented rather more than 17 per cent. of the area under crops in the Commonwealth. In most European countries the hay crop consists almost entirely of meadow and other grasses, whilst in Australia a very large proportion of the area under hay comprises cereal crops, mainly wheat and oats. A considerable quantity of lucerne hay is also made, particularly in New South Wales and Queensland. The area under hay of all kinds in the several States from 1860 onwards is given hereunder:—

AREA UNDER HAY, 1860-1 TO 1906-7.

Season.	N.S.W.	Victoria.	Q'land.	Sth. Aust.	W. Aust.	Tas.	Com'wealth.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1860-1	46,584	90,921	276	55,818	6,626	31,837	232,062
1865-6	61,909	97,902	1,449	101,996	8,824	30,244	302,324
1870-1	65,404	163,181	3,671	140,316	17,173	33,612	423,357
1875-6	77,125	155,274	8,531	161,429	17,319	34,758	454,436
1880-1	131,153	249,656	12,022	272,567	19,563	31,615	716,576
1885-6	219,886	421,036	28,881	312,672	19,677	41,693	1,043,845
1890-1	175,242	413,052	31,106	345,150	23,183	45,381	1,033,114
1895-6	319,296	464,482	28,609	362,972	63,804	54,748	1,293,911
1900-1	466,236	502,105	42,497	341,330	104,254	61,541	1,517,963
1901-2	442,163	659,239	63,055	369,796	92,654	61,495	1,688,402
1902-3	491,918	580,884	20,068	325,789	105,791	66,038	1,590,488
1903-4	496,017	733,353	78,393	370,152	109,002	66,947	1,853,864
1904-5	435,704	452,459	48,740	269,626	105,247	55,545	1,867,321
1905-6	438,036	591,771	37,425	317,924	124,906	64,350	1,574,412
1906-7	458,072	621,139	64,498	295,895	149,830	64,965	1,654,399

It will be seen from this table that in all the States marked fluctuations occur in the area devoted to the hay crop from year to year. These fluctuations are due to various causes, the principal being the variations in the relative prices of grain and hay, and the favourableness or otherwise of the season for a grain crop. Thus crops originally

sown for grain are frequently cut for hay owing to the improved price of that commodity, or owing to the fact that the outlook for the due development of the grain is not a satisfactory one. On the other hand, improved grain prices or the prospect of a heavy yield will frequently cause crops originally intended for hay to be left for grain. In the season 1903-4, when 1,853,864 acres were devoted to this crop, the maximum area under hay for the Commonwealth was reached, the reason being the shortage and consequent high prices resulting from the poor yield of the previous season, 1902-3.

2. **Kinds of Hay.**—Particulars concerning the kind of crop cut for hay are furnished in the returns prepared by four of the States, totals only being shewn in the cases of South Australia and Tasmania. Details of the past six seasons are given in the following table:—

KINDS OF HAY GROWN, 1901-2 to 1906-7.

Kind of Hay Crop.	1901-2.	1902-3.	1903-4.	1904-5.	1905-6.	1906-7.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
<b>NEW SOUTH WALES—</b>						
Wheaten ...	312,858	320,588	286,702	284,367	313,582	316,845
Oaten ...	96,833	131,891	159,828	107,805	88,495	94,420
Barley ...	981	1,782	1,242	1,285	2,397	843
Lucerne ...	31,491	37,657	48,245	42,247	33,562	45,964
Total ...	442,163	491,918	496,017	435,704	438,036	458,072
<b>VICTORIA—</b>						
Wheaten ...	284,582	161,657	200,673	132,265	203,726	231,408
Oaten ...	368,258	412,485	523,155	309,143	377,885	377,887
Other ...	6,399	6,742	9,525	11,051	10,160	11,844
Total ...	659,239	580,884	733,353	452,459	591,771	621,139
<b>QUEENSLAND—</b>						
Wheaten ...	9,719	867	6,189	3,137	2,856	8,664
Oaten ...	17,167	2,619	19,523	9,076	4,446	9,260
Lucerne ...	34,177	15,213	49,501	35,009	28,564	44,178
Other ...	1,992	1,369	3,180	1,518	1,559	2,396
Total ...	63,055	20,068	78,393	48,740	37,425	64,498
<b>WESTERN AUSTRALIA—</b>						
Wheaten ...	92,654	79,708	78,210	79,913	99,629	116,164
Oaten ...		24,543	29,100	23,914	23,910	32,521
Other ...		1,540	1,692	1,420	1,367	1,145
Total ...	92,654	105,791	109,002	105,247	124,906	149,830

It will be seen that for the four States for which particulars are available, wheat is the principal hay crop in New South Wales and Western Australia, oats in Victoria, and lucerne in Queensland.

3. **Total Yield.**—The Commonwealth hay crop for the season 1906-7 amounted to 2,256,140 tons, a total which has only once been exceeded, viz., by the record yield of the season 1903-4, when the hay harvest resulted in a production of 2,903,160 tons. For many years past the State of Victoria has been the largest hay producer in the Commonwealth, and in the season 1906-7 accounted for nearly 40 per cent. of the total production. The total yields of the several States from 1860 onwards is given hereunder:—



## COMMONWEALTH HAY CROP, 1860-1 TO 1906-7.

Season.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Commonwealth.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1860-1 ...	50,927	144,211	414	71,241	8,099	62,318	337,210
1865-6 ...	54,230	96,101	2,173	88,731	7,901	34,751	283,887
1870-1 ...	69,602	183,708	5,506	197,149	20,833	40,763	517,561
1875-6 ...	88,968	206,613	12,796	194,794	17,319	49,217	569,707
1880-1 ...	174,194	300,581	23,441	261,371	19,563	35,883	815,033
1885-6 ...	191,371	442,118	30,670	307,855	19,677	51,872	1,043,563
1890-1 ...	213,034	567,779	50,116	310,125	25,014	52,021	1,218,089
1895-6 ...	229,671	390,861	50,881	225,462	53,758	62,345	1,012,978
1900-1 ...	526,260	677,757	78,758	353,662	103,813	94,198	1,834,448
1901-2 ...	472,621	884,369	122,039	346,467	89,729	109,383	2,024,608
1902-3 ...	243,379	601,272	23,181	308,825	94,007	89,210	1,359,874
1903-4 ...	816,810	1,233,063	136,117	479,723	121,934	115,513	2,903,160
1904-5 ...	366,293	514,316	80,662	294,252	113,794	73,457	1,442,774
1905-6 ...	459,182	864,177	56,829	435,546	139,380	90,077	2,045,191
1906-7 ...	621,846	881,276	94,343	395,766	158,112	104,797	2,256,140

4. **Value of Hay Crop.**—The following table furnishes particulars concerning the total value and the value per acre of the hay crop of the several States of the Commonwealth for the season 1906-7:—

## VALUE OF HAY CROP, 1906-7.

Particulars.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Commonwealth.
Total value ...	£2,195,950	£1,681,768	£287,792	£791,532	£632,448	£327,490	£5,916,980
Value per acre	£4 15/10	£2 14/2	£4 9/3	£2 13/6	£4 4/5	£5 0/10	£3 11/6

5. **Average Yield per Acre.**—The States of the Commonwealth in which the highest average yields per acre have been obtained are those of Queensland and Tasmania, these being also the States in which the smallest areas are devoted to this crop. For the past six seasons the lowest yield for the Commonwealth as a whole was that of 17 cwt. per acre in 1902-3, and the highest that of 31 cwt. in 1903-4. Particulars for the several States for the seasons 1901-2 to 1906-7 are given hereunder:—

## AVERAGE YIELD OF HAY PER ACRE, 1901-2 TO 1906-7.

Season.	N.S.W.	Victoria.	Qld.	S. Aust.	W. Aust.	Tas.	C'wealth.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1901-2 ...	1.07	1.34	1.94	0.94	0.97	1.78	1.20
1902-3 ...	0.49	1.04	1.16	0.95	0.89	1.35	0.86
1903-4 ...	1.65	1.68	1.74	1.30	1.12	1.73	1.57
1904-5 ...	0.84	1.14	1.65	1.09	1.08	1.32	1.06
1905-6 ...	1.05	1.46	1.52	1.37	1.12	1.40	1.30
1906-7 ...	1.36	1.42	1.46	1.34	1.06	1.61	1.36

6. **Oversea Imports and Exports.**—Under normal conditions hay, whether whole or in the form of chaff, is somewhat bulky for oversea trade, and consequently does not in such circumstances figure largely amongst the imports and exports of the Commonwealth. In 1901 and 1902, however, the exceptional demand which was created by the South African war brought about a fairly large export of hay and chaff to Natal and Cape Colony.

These colonies also took and are still taking a considerable quantity of Australian compressed fodder. During the year 1904, when the war between Japan and Russia was being carried on, the exports of compressed fodder to Hong Kong were valued at £42,759 and those to Japan at £23,608. The total value of the hay and chaff exported during 1901 was £406,455, as compared with £9924 only in 1906, while the exports of fodder, which amounted in value to £142,472 in 1904, had shrunk to £29,872 in 1906.

**7. Interstate Trade in Hay and Chaff.**—A considerable trade in hay and chaff is carried on between the several States of the Commonwealth, the exporting States during the year 1906 being South Australia and Victoria, and the importing States New South Wales, Queensland, Tasmania and Western Australia. Western Australia, however, has during 1907 entered the ranks of the exporting States, some large shipments of chaff having been consigned thence to New South Wales. Particulars of interstate imports and exports for 1906 are given in the following table :—

INTERSTATE TRADE IN HAY AND CHAFF, 1906.

State.	Imports from Other States of the Commonwealth.		Exports to Other States of the Commonwealth.		Net Interstate Exports.*.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Tons.	£	Tons.	£	Tons.	£
New South Wales	71,080	226,608	2,232	7,609	—68,848	—218,999
Victoria	276	756	45,787	133,240	45,511	132,484
Queensland	14,200	35,627	910	3,026	—13,290	—32,601
South Australia	76	169	50,017	160,376	49,941	160,207
Western Australia	5,939	20,243	...	...	—5,939	—20,243
Tasmania	7,419	20,983	44	135	—7,375	—20,848

\* — Signifies net imports.

**8. Hay Production in other Countries.**—As already noted, the hay crops of most European countries consist of grasses of various kinds, amongst which clover, lucerne, sainfoin and rye grass occupy a prominent place. The statistics of hay production in these countries are not prepared on a uniform basis, and consequently any attempt to furnish an extensive comparison of the production of hay in the various countries would probably be misleading. It may be noted, however, that in the United Kingdom the production of hay from clover, sainfoin, etc., was for the year 1905 represented by 4,542,552 tons from 2,818,012 acres, while from permanent grasses a yield of 9,011,398 tons of hay was obtained from 6,353,492 acres, giving a total of 13,553,950 tons from 9,171,504 acres, or about 28 cwt. per acre.

## § 12. Green Forage.

**1. Nature and Extent.**—In all the States of the Commonwealth a considerable area is devoted to the production of green forage, mainly in connection with the dairying industry. The total area so cropped during the season 1906-7 was no less than 236,484 acres. Of this total the New South Wales area represented rather more than 50 per cent., while that in Queensland fell little short of 20 per cent. of the total. The principal crops cut for green forage are maize, sorghum, oats, barley, rye, rape, and lucerne, while small quantities of sugar-cane also are so used. Particulars concerning the area under green forage in the several States from 1890 onwards are furnished in the following table :—

## AREA UNDER GREEN FORAGE, 1890-1 TO 1906-7.

Season.	N.S.W.	Vic.	Qld.	S. Aust.	W. Aust.	Tas.	C'wealth.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1890-1 ...	37,473	10,091	9,546	7,349	161	1,497	66,117
1895-6 ...	66,833	25,939	19,552	7,309	430	1,883	121,946
1900-1 ...	78,144	18,975	41,445	13,136	1,024	3,749	156,473
1901-2 ...	113,060	32,795	39,793	13,695	1,563	4,082	204,988
1902-3 ...	109,287	31,145	51,279	14,937	636	3,355	210,639
1903-4 ...	77,130	33,165	26,576	19,241	672	3,100	159,884
1904-5 ...	87,718	29,902	35,861	20,362	1,643	4,117	179,603
1905-6 ...	95,058	34,041	66,183	23,842	1,873	4,882	225,879
1906-7 ...	122,893	36,502	50,513	17,985	3,265	5,326	236,484

2. **Value of Green Forage Crops.**—The value of these crops is variously estimated in the several States. Taking the Commonwealth as a whole, it may be set down approximately at £2 15s. per acre for the season 1906-7, giving a total value of about £650,000.

## § 13. Sugar-Cane.

1. **Area.**—Sugar-cane is grown in only two of the States of the Commonwealth, viz., Queensland and New South Wales, and much more extensively in the former than the latter. Thus of the total area of 153,885 acres under sugar cane in the Commonwealth for the season 1906-7 there were 133,284 acres or about 87 per cent. in Queensland. Sugar cane growing appears to have been started in the Commonwealth in or about 1862, as the earliest statistical record of sugar-cane as a crop is that which credits Queensland with an area of twenty acres for the season 1862-3. In the following season the New South Wales records shew that an area of two acres was devoted to the crop in the mother State. The area under cane in New South Wales reached its maximum in 1895-6 with a total of 32,927 acres. It then fell continuously to 1902-3, when it was lower than for any previous season since 1889-90. Since 1902-3 it has remained practically stationary. In Queensland, on the other hand, although fluctuations in area are in evidence throughout, the general trend has been one of satisfactory and somewhat rapid increase, the area under cane for 1905 being the highest on record, and that for 1906 only a little short of it. The area under sugar-cane in the Commonwealth from 1865 onwards is given in the following table:—

## AREA UNDER SUGAR-CANE, 1865-6 TO 1906-7.

Season.	N.S.W.	Queensland.	C'wealth.	Season.	N.S.W.	Queensland.	C'wealth.
	Acres.	Acres.	Acres.		Acres.	Acres.	Acres.
1865-6	141	450	591	1900-1	22,114	108,535	130,649
1870-1	4,082	6,342	10,424	1901-2	20,809	112,031	132,840
1875-6	6,454	13,459	19,913	1902-3	20,160	85,338	105,498
1880-1	10,971	20,224	31,195	1903-4	20,182	111,516	131,698
1885-6	16,419	59,186	75,605	1904-5	21,525	120,317	141,842
1890-1	20,446	50,922	71,368	1905-6	21,805	134,107	155,912
1895-6	32,927	77,247	110,174	1906-7	20,601	133,284	153,885

2. **Productive and Unproductive Cane.**—The areas given in the preceding table represent the total area on which sugar-cane was grown during the seasons specified for purposes other than green forage. The whole area, however, was not in any case cut for crushing during that season, there being always a considerable amount of "stand over" cane, as well as a small amount required for plants. In the season 1906-7 the New South Wales total comprised 10,378 acres of productive and 10,223 acres of unproductive cane, while in the case of Queensland the productive cane amounted to 98,194 acres and the unproductive to 35,090 acres, the latter including 1057 acres for plants.

3. **Yield of Cane.**—Queensland statistics of the production of sugar-cane are not available for dates prior to the season 1897-8. In that season the total for the Commonwealth was 1,073,883 tons as against 1,950,340 tons for 1906-7. The average yield per acre of productive cane is much higher in New South Wales than in Queensland, and during the past six years has in the case of the former State remained practically constant at about twenty-one tons per acre. Particulars relative to the total and average yields of the Commonwealth sugar crops for the six seasons 1901-2 to 1906-7 are as follows:—

YIELD OF SUGAR-CANE, 1901-2 TO 1906-7.

Season.	Total Yield of Cane.			Average Yield per Acre of Productive Cane.		
	N.S.W.	Queensland.	C'wealth.	N.S.W.	Queensland.	C'wealth.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1901-2 ...	187,711	1,180,091	1,367,802	21.36	15.10	15.73
1902-3 ...	183,105	641,927	825,032	20.90	10.86	12.16
1903-4 ...	227,511	823,875	1,051,386	21.94	13.65	14.86
1904-5 ...	199,640	1,326,989	1,526,629	20.43	16.04	16.50
1905-6 ...	201,998	1,415,745	1,617,743	19.59	14.73	15.20
1906-7 ...	221,560	1,728,780	1,950,340	21.35	17.61	17.96

4. **Quality of Cane.**—The quantity of cane required to produce a ton of sugar varies considerably not only with the district in which the cane is grown but also with the season. In Queensland, for instance, during the past five seasons the sugar content of the cane crushed has continuously diminished, so that whilst in 1902-3 the quantity of cane used in producing a ton of sugar was 8.38 tons, in the season 1906-7 the quantity required was 9.38 tons, the production in the former case being approximately 12 per cent. and in the latter 11 per cent. of the weight of cane crushed. It should be noted however, that in 1901-2 no less than 9.76 tons of cane were needed to produce a ton of sugar. It may be remarked in this connection that the systematic study of the beet in Germany shewed that by suitable culture its sugar content might be greatly increased, and this is by no means impossible in the case of sugar-cane.

5. **Sugar Bounties.**—The provision of bounties or similar aids to the sugar-growers of the Commonwealth early occupied the attention of the Commonwealth Parliament, the object in view being that of assisting the industry whilst at the same time diminishing the employment of coloured labour in connection therewith. The earliest legislative provision made with this object in view was that contained in the Excise Tariff 1902, under which an excise duty of three shillings per cwt. of manufactured sugar was charged, and a rebate of four shillings per ton allowed on all sugar-cane delivered for manufacture in the production of which white labour only had been employed after 28th February, 1902. This rebate was calculated on the basis of cane giving 10 per cent. of sugar, and was increased or reduced proportionately according to any variation from this standard, that is to say, the rebate amounted to two shillings per cwt. of the sugar content of the cane treated. In actual practice it was found that this system of rebates was producing effects that had not been anticipated at the time the legislation was passed, and that the greater part of the cost of substituting white for black labour in the sugar-growing industry was thereby being imposed upon the States engaged in the industry, viz., Queensland and New South Wales, instead of being a charge upon the whole Commonwealth. To remedy this state of affairs the Sugar Rebate Abolition Act of 1903 was passed on 30th July, 1903, and the Sugar Bounty Act 1903 received assent on the same day. The rate of bounty provided by this latter Act was, as in the case of the rebate mentioned above, four shillings per ton of cane grown by white labour giving 10 per cent. of sugar, the bounty to be increased or reduced proportionately according to any variation from this standard. This Act remained in force until 31st December, 1906, when it was superseded by the provisions of the Sugar Bounty Act 1905, which extended the principle of bounties to the end of the year 1912, but stipulated that during the years 1911 and 1912 the rates payable on

cane delivered should be respectively two-thirds and one-third of the rates prevailing during the earlier years of the period. The rate of bonus allowed under this Act is six shillings per ton of cane of 10 per cent. quality grown by white labour, while under the Excise Tariff 1905, assented to on 21st December, 1905, the excise duty on sugar was, from 1st January, 1907, increased to four shillings per cwt. of manufactured sugar in place of three shillings formerly imposed.

6. **Cost of Bounties.**—The amounts paid by the Commonwealth Government in sugar bounties and the expenses in connection therewith during the five years 1902-3 to 1906-7, as well as the manner in which this expenditure was allocated to the several States, is shewn in the following table:—

EXPENDITURE ON SUGAR BOUNTIES AND EXPENSES, 1902-3 TO 1906-7.

Year.	N.S.W.	Victoria.	Qld.	S. Aust.	W. Aust.	Tas.	C'wealth.
	£	£	£	£	£	£	£
1902-3 ...	21,999	18,923	8,003	5,743	3,378	2,781	60,827
1903-4 ...	35,273	29,873	12,740	9,115	5,608	4,436	97,045
1904-5 ...	46,880	38,935	16,781	11,990	7,794	5,798	128,178
1905-6 ...	56,950	46,520	20,159	14,439	9,727	6,914	154,709
1906-7 ...	124,492	100,456	43,635	31,299	21,344	14,690	335,916

7. **Collection of Sugar Excise.**—The table hereunder contains particulars concerning the net amount of excise duty on sugar collected in respect of the several States for the five years 1902-3 to 1906-7. In this table refunds and drawbacks have been deducted, and the requisite adjustment has been made between the States.

SUGAR EXCISE, 1902-3 TO 1906-7.

Year.	N.S.W.	Victoria.	Qld.	S. Aust.	W. Aust.	Tas.	C'wealth.
	£	£	£	£	£	£	£
1902-3 ...	166,952	10,715	61,523	1,332	7,294	13,701	261,517
1903-4 ...	166,646	Dr. 2,307	73,634	1,413	18,464	14,267	272,117
1904-5 ...	183,335	163,247	70,576	34,626	30,980	20,863	503,627
1905-6 ...	183,457	149,120	98,015	45,921	35,339	24,227	536,079
1906-7 ...	211,625	138,982	83,889	50,564	37,109	24,484	546,653

8. **Imports and Exports of Sugar.**—Notwithstanding the increase in the production of sugar in evidence in the Commonwealth during recent years, Australia's over-sea import trade in cane sugar is still very extensive, the principal countries engaged in supplying this commodity being Java, Mauritius, and Fiji. For the year 1906 the total importation was valued at £439,916, and of this more than 80 per cent. came from Java. Particulars concerning the imports and exports of cane sugar for the six years 1901 to 1906 are as follows:—

IMPORTS AND EXPORTS OF CANE SUGAR, 1901 TO 1906.

Year.	Oversea Imports.		Oversea Exports.		Net Imports.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	cwt.	£	cwt.	£	cwt.	£
1901 ...	1,970,883	1,239,550	94,764	68,876	1,876,119	1,170,674
1902 ...	1,862,063	1,120,554	66,736	48,751	1,795,327	1,071,803
1903 ...	1,830,595	1,054,338	47,295	33,242	1,783,300	1,021,096
1904 ...	760,702	415,120	58,882	42,699	701,820	372,421
1905 ...	498,670	276,157	223,161	155,514	275,509	120,643
1906 ...	839,519	439,916	185,072	140,466	654,447	299,450

The principal over-sea countries to which cane sugar from Australia has been exported are New Zealand, South Africa, and New Caledonia.

9. **Interstate Trade in Sugar.**—The Interstate trade in sugar is an extensive one, the exports from Queensland to the other States of the Commonwealth representing a value of £1,615,338 for the year 1906. The manner in which this trade is distributed amongst the several States is furnished in the table given hereunder:—

INTERSTATE SUGAR TRADE, 1906.

State.	Imports from Other States of the Commonwealth.		Exports to Other States of the Commonwealth.		Net Interstate Imports.*	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	cwt.	£	cwt.	£	cwt.	£
New South Wales	1,438,863	871,653	258,341	227,863	1,180,522	643,790
Victoria	981,312	528,836	115,949	93,171	865,363	435,665
Queensland	1,768	1,565	2,832,118	1,615,338	2,830,350	1,613,773
South Australia	466,583	259,936	75,412	61,693	391,171	198,243
Western Australia	216,438	184,612	287	267	216,151	184,345
Tasmania	177,251	151,822	108	92	177,143	151,730

\* — Signifies net exports.

#### § 14. Vineyards.

1. **Nature and Extent.**—The introduction of the grape vine into Australia is said to have taken place in 1828, some forty years after the first settlement. The locality claiming to be the cradle of the vine-growing industry of Australia is the Hunter River district of New South Wales, where, in the year mentioned, cuttings from celebrated vineyards of France, Spain, and Germany were planted. From New South Wales the vine spread to Victoria and South Australia, and these States have now far outstripped the mother State in the area which they have devoted to its cultivation. In Queensland and Western Australia also, vine-growing has been carried on for many years, but in neither State has the industry progressed with the rapidity attained in Victoria and South Australia. In Tasmania the climate is not favourable to the growth of grapes. The purposes for which grapes are grown in Australia are three in number, viz.—(i.) for wine-making, (ii.) for table use, (iii.) for drying. The total area under vines in the several States from 1860 onwards is given in the following table:—

COMMONWEALTH VINEYARDS, 1860-1 TO 1906-7.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	C'wealth.
	Acres.	Acres.	Acres.	Acres.	Acres.	There are no vineyards in Tasmania.	Acres.
1860-1	1,584	1,138	—	3,180	335		6,237
1865-6	2,126	4,078	110	6,629	634		13,577
1870-1	4,504	5,466	416	6,131	710		17,227
1875-6	4,459	5,081	376	4,972	675		15,563
1880-1	4,800	4,980	739	4,337	659		15,515
1885-6	5,247	9,775	1,483	5,142	624		22,271
1890-1	8,044	20,686	1,981	9,535	1,024		41,270
1895-6	7,519	30,275	2,021	17,604	2,217		59,636
1900-1	8,441	30,634	2,019	20,158	3,325		64,577
1901-2	8,606	28,592	1,990	20,860	3,629		63,677
1902-3	8,790	28,374	1,559	21,692	3,528		63,943
1903-4	8,940	28,513	2,069	22,617	3,324		65,463
1904-5	8,840	28,016	2,194	23,210	3,413		65,673
1905-6	8,754	26,402	2,044	23,603	3,541		64,344
1906-7	8,521	25,855	2,070	22,575	3,525		62,546

The area devoted to vines in the Commonwealth attained its highest point in the season 1904-5, when a total of 65,673 acres was reached. In the course of the two following seasons this area diminished by over 3000 acres, the decline being in evidence in all the States except Western Australia, in which there was a slight increase in 1905-6 and decrease in 1906-7.

The wine-growing industry in Australia, more particularly in Victoria and New South Wales, received a severe check on account of various outbreaks of phylloxera which took place in different parts of these States. With a view to its eradication extensive uprooting of vineyards in the infested areas was undertaken, while further planting within such areas, except with phylloxera-resisting vines, was prohibited.

**2. Wine Production.**—The production of wine in Australia has not increased as rapidly as the suitability of soil and general favourableness of conditions would appear to warrant. The cause of this is probably twofold, being in the first place due to the fact that the Australians are not a wine-drinking people and consequently do not provide a local market for this product, and in the second to the fact that the new and comparatively unknown wines of Australia find it difficult to establish a footing in the markets of the old world, owing to the competition of well-known brands. Active steps are being taken in various ways to bring the Australian wines under notice, and it may be confidently asserted that when their qualities are duly recognised the wine production of Australia will exhibit much more rapid development than has taken place within recent years. Particulars concerning the quantity of wine produced in the several States during the past six years are contained in the table given hereunder:—

AUSTRALIAN WINE PRODUCTION, 1901-2 TO 1906-7.

Season.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Commonwealth.
	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.	No production of wine in Tasmania.	Gallons.
1901-2 ...	868,479	1,981,475	148,835	2,077,923	185,735		5,262,447
1902-3 ...	806,140	1,547,188	100,852	2,145,525	158,853		4,758,558
1903-4 ...	1,086,820	2,551,150	38,558	2,345,270	138,371		6,160,169
1904-5 ...	928,160	1,832,386	60,433	2,625,430	185,070		5,631,479
1905-6 ...	831,700	1,726,444	66,926	2,845,853	208,911		5,679,834
1906-7 ...	1,140,000	2,044,833	65,016	2,441,504	195,660		5,887,013

**3. Imports and Exports.**—During recent years the importations of wine into the Commonwealth have fallen off considerably, the total value of the wine imported during 1906 being £106,133, as against a value of £161,945 in 1901. The principal countries of origin of wine imported into Australia are France and Spain, the greater portion of the sparkling wines coming from the former and of still wines from the latter country. Particulars relative to the importations of wine into the Commonwealth during the past six years are given hereunder:—

COMMONWEALTH IMPORTS OF WINE, 1901 TO 1906.

Year.	Quantity.		Value.		
	Sparkling.	Other.	Sparkling.	Other.	Total.
	Gallons.	Gallons.	£	£	£
1901	55,341	165,472	104,700	57,245	161,945
1902	46,824	134,513	80,941	46,828	127,769
1903	41,211	81,222	78,869	29,014	107,883
1904	38,738	70,982	69,643	27,227	96,870
1905	38,933	74,358	71,753	28,231	99,984
1906	43,324	71,980	81,448	24,685	106,133

The principal countries to which wine is exported from Australia are the United Kingdom and New Zealand; a small but fairly regular export trade being also carried on with India, Ceylon, Fiji, and the South Sea Islands. Details concerning the exports of wine from Australia during the six years (1901 to 1906) are given in the following table:—

## COMMONWEALTH EXPORTS OF WINE. 1901 TO 1906.

Year.	Quantity.		Value.		
	Sparkling.	Other.	Sparkling.	Other.	Total.
	Gallons.	Gallons.	£	£	£
1901	2,936	863,147	6,972	122,751	129,723
1902	3,201	1,075,713	5,989	142,994	148,983
1903	2,194	718,284	4,161	101,016	105,177
1904	2,525	789,032	4,440	103,272	107,712
1905	2,749	937,932	4,990	107,988	112,978
1906	2,439	717,821	4,637	93,046	97,683

The sparkling wine included in the foregoing table consists mainly of foreign wine re-exported.

4. **Interstate Trade.**—A fairly extensive trade in wine is carried on between the States, South Australia being the principal exporting State. Particulars for the year 1906 are furnished hereunder:—

## INTERSTATE TRADE IN WINE. 1906.

State.	Imports from other States of the Commonwealth.		Exports to other States of the Commonwealth.		Net Interstate Exports.*	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Gallons.	£	Gallons.	£	Gallons.	£
New South Wales	223,098	45,360	44,824	12,614	—178,274	—32,746
Victoria	89,534	20,138	114,508	30,274	24,974	10,136
Queensland	66,049	20,420	1,462	867	—64,587	—19,553
South Australia	24,508	3,771	330,190	74,457	305,682	70,686
Western Australia	66,846	22,066	285	266	—66,561	—21,800
Tasmania	22,054	6,956	820	233	—21,234	—6,723

\* — Signifies net imports.

5. **Other Viticultural Products.**—In addition to grapes for wine-making purposes, large quantities are grown in all the States for table use, whilst, particularly in Victoria and South Australia, the drying of raisins and currants is also carried on. The quantities of table grapes grown in the several States during the past six seasons are as follows:—

## TABLE GRAPES, 1901-2 TO 1906-7.

Season.	N.S.W.	Victoria.	Q'sland.*	Sth. Aust.†	W'st Aus.*	Tasmania.	C'wealth.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1901-2	3,475	5,110	750	12,608	1,100	...	23,043
1902-3	3,561	4,327	300	11,797	1,200	...	21,185
1903-4	4,213	3,862	780	13,027	1,200	...	23,082
1904-5	2,933	3,186	950	13,477	1,500	...	22,046
1905-6	2,749	3,008	870	14,698	1,700	...	23,025
1906-7	5,470	5,184	1,130	13,368	1,700	...	26,852

\* Estimated. † Inclusive of grapes sold for wine-making.



Statistics of the quantities of raisins and currants dried are available for Victoria and South Australia, and are as follows for the past six years :—

RAISINS AND CURRANTS DRIED, 1901-2 TO 1906-7.

Season.	Raisins.		Currants.	
	Victoria.	Sth. Australia.	Victoria.	Sth. Australia.
	lbs.	lbs.	lbs.	lbs.
1901-2 ... ..	3,088,665	822,080	285,157	382,256
1902-3 ... ..	3,979,798	1,294,944	416,890	547,232
1903-4 ... ..	5,986,060	1,463,056	838,955	1,165,472
1904-5 ... ..	3,393,117	974,064	669,108	1,871,968
1905-6 ... ..	4,813,240	1,334,928	717,156	2,225,440
1906-7 ... ..	10,990,224	1,805,776	1,313,760	2,607,472

§ 15. Orchards and Fruit Gardens.

1. **Nature and Extent.**—Fruit-growing has made rapid progress in the Commonwealth during recent years, the area devoted thereto having increased in the past five years by no less than 16,993 acres. The States in which the increase was most marked were:—Tasmania, 6565 acres; Western Australia, 6441 acres; and Victoria, 3966 acres. During the same period the South Australian fruit-growing area increased slightly, that in Queensland was practically the same at the end as at the beginning of the period, while that in New South Wales exhibited a decline of nearly 2000 acres. The increased areas in Tasmania and Western Australia are mainly due to extensive plantings of apple trees with a view to the possibilities of the London market for fresh fruit. The total area devoted to orchards and fruit gardens in the several States is given hereunder :—

COMMONWEALTH ORCHARDS AND FRUIT GARDENS, 1901-2 TO 1906-7.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	C'wealth.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1901-2 ... ..	48,107	50,055	13,243	16,315	6,076	11,485	145,281
1902-3 ... ..	47,584	50,478	11,690	17,376	6,872	12,675	146,675
1903-4 ... ..	48,316	51,357	13,784	18,725	7,938	14,134	154,254
1904-5 ... ..	47,340	52,751	14,424	18,872	9,756	15,461	158,604
1905-6 ... ..	46,615	52,274	13,970	19,320	11,026	16,519	159,724
1906-7 ... ..	46,177	54,021	13,310	18,199	12,517	18,050	162,274

The varieties of fruit grown differ materially in various parts of the several States, and range between such fruits as the pineapple, paw-paw, mango, and guava of the tropics, and the strawberry, the raspberry, and the currant of the colder parts of the temperate zone. The principal varieties grown in Victoria are the apple, plum, peach, apricot, cherry, and pear. In New South Wales citrus fruits (orange, lemon, etc.) occupy the leading position, although apples, pears, peaches, plums, and apricots are also extensively grown. In Queensland the banana, the orange, the pineapple, the apple, the peach, the mango, and the plum are the varieties most largely grown. In South Australia, in addition to the apple, pear, peach, apricot, plum, orange, and lemon, the almond and the olive are also largely grown. In Western Australia the apple, orange, peach, pear, plum, fig, and apricot are the sorts chiefly grown, while in Tasmania, although the apple represents more than two-thirds of the area in that State devoted to fruit-growing, small fruits, such as the currant, raspberry, and gooseberry, are very extensively grown. The balance of the area is mainly occupied with the pear, plum, apricot, peach, and cherry.

**2. Oversea Imports and Exports.**—A very considerable fruit trade, both import and export, is carried on by the Commonwealth with overseas countries, the major portion of the importations consisting of dried fruits, while the bulk of the exports is made up of fresh fruits. Amongst the imports the principal dried fruits are currants, dates, sultanas, and raisins, and the principal fresh fruits bananas, oranges, lemons, and apples. The currants imported are mainly of Greek origin, the dates of Persian and Arabian, the sultanas of Turkish, and the raisins from the United States. Of the fresh fruit imported during 1906 the bananas were chiefly from Fiji, the oranges and lemons from Italy, and the apples from the United States and Canada. The dried fruit imported during the year was valued at £137,732, and the fresh at £82,655. The Commonwealth exports of dried fruits for 1906, representing in all a value of only £2752, consisted mainly of re-exports of currants, dates, etc. The fresh fruit exported during the year was valued at £173,190, and consisted mainly of apples. The principal countries to which these were sent were the United Kingdom, Germany, New Zealand, and Natal. Particulars concerning the overseas imports and exports of dried fruits for the six years 1901 to 1906 are as follows:—

COMMONWEALTH OVERSEA IMPORTS AND EXPORTS OF DRIED FRUITS,  
1901 TO 1906.

Year.	Oversea Imports.		Oversea Exports.		Net Imports.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	lbs.	£	lbs.	£	lbs.	£
1901	14,265,731	179,305	831,996	14,206	13,433,735	165,099
1902	15,312,229	165,926	942,342	14,024	14,369,887	151,902
1903	13,479,256	106,439	913,008	11,775	12,566,248	94,664
1904	14,267,310	107,117	1,729,725	18,497	12,537,585	88,620
1905	17,285,240	134,178	344,174	5,579	16,941,066	128,599
1906	15,659,620	137,732	187,710	2,752	15,471,910	134,980

Similar information with regard to the Commonwealth overseas trade in fresh fruit for the same period is contained in the table given hereunder:—

COMMONWEALTH OVERSEA IMPORTS AND EXPORTS OF FRESH FRUIT,  
1901 TO 1906.

Year.	Oversea Imports.		Oversea Exports.		Net Exports.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Centals.	£	Centals.	£	Centals.	£
1901	*	45,955	*	167,926	*	121,971
1902	*	57,744	*	142,613	*	84,869
1903	91,976	47,303	371,158	216,992	279,182	169,689
1904	50,397	31,137	467,343	263,767	416,946	232,630
1905	49,659	32,654	393,982	207,418	344,323	174,764
1906	204,561	82,655	265,743	173,190	61,182	90,535

\* Not available.

**3. Jams and Jellies.**—A small overseas trade in jams and jellies is carried on by the Commonwealth, the value of the imports for the year 1906 amounting to £8277, and of the exports to £24,009. The country of origin of the bulk of the importations is the United Kingdom, while the destinations of the exports are principally South Africa, Ceylon, and Fiji. Particulars relative to imports and exports for the six years 1901 to 1906 are as follows:—

## COMMONWEALTH OVERSEA TRADE IN JAMS AND JELLIES, 1901 TO 1906.

Year.	Oversea Imports.		Oversea Exports.		Net Exports.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	lbs.	£	lbs.	£	lbs.	£
1901 ...	1,312,377	23,358	4,140,072	64,389	2,827,695	41,031
1902 ...	837,746	13,207	5,159,688	77,833	4,321,942	64,626
1903 ...	379,300	7,410	2,097,371	40,386	1,718,071	32,976
1904 ...	384,159	7,270	1,526,747	21,962	1,142,588	14,692
1905 ...	317,182	7,010	1,772,524	25,385	1,455,342	18,375
1906 ...	379,129	8,277	1,580,228	24,009	1,201,099	15,732

The trade carried on in jams and jellies between the States of the Commonwealth is a much more extensive one, the principal exporting States being Victoria and Tasmania, and the principal importing States Queensland and Western Australia. Details for the year 1906 are furnished in the table hereunder:—

## INTERSTATE TRADE IN JAMS AND JELLIES, 1906.

State.	Imports from Other States of the Commonwealth.		Exports to Other States of the Commonwealth.		Net Interstate Exports.*	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	lbs.	£	lbs.	£	lbs.	£
New South Wales ...	3,832,064	54,953	4,423,755	57,983	591,691	3,030
Victoria ...	2,372,653	32,936	5,985,940	79,628	3,613,287	46,692
Queensland ...	5,640,051	73,534	326,196	5,210	5,313,855	68,324
South Australia ...	812,870	11,372	1,792,536	22,307	979,666	10,935
Western Australia ...	4,880,776	59,491	2,518	36	4,878,258	59,455
Tasmania ...	812,449	11,021	5,819,918	78,143	5,007,469	67,122

\* — Signifies net imports.

4. **Preserved Fruit.**—Details concerning the quantities and values of preserved fruit imported and exported into and from the Commonwealth cannot readily be obtained, owing to the fact that in the Customs returns particulars concerning fruit and vegetables are in certain cases combined. The total value of fruit and vegetables, other than fresh and dried fruits, imported into Australia during 1906 was £35,660, and the corresponding value of exports was £23,282.

## § 16. Minor Crops.

1. **Nature and Extent.**—In addition to the leading crops which in the foregoing pages have been dealt with in some detail, there are many others which, owing either to their nature or to the fact that their cultivation has advanced but little beyond the experimental stage, do not occupy so prominent a position. Some of the more important of these are those which may be classed under the heads of Market Gardens, Nurseries, Grass Seed, Tobacco, Hops, and Millet, while the possibilities of cotton-growing in the tropical portions of the Commonwealth have in recent years received considerable attention, although the industry cannot yet be said to have assumed definite shape. The total area in the Commonwealth during the season 1906-7 devoted to crops of this nature was 79,689 acres, of which market gardens accounted for 33,787 acres.

2. **Market Gardens.**—Under this head are included all areas on which are grown mixed vegetables for sale. Where considerable areas are devoted to the production of

one vegetable, such for instance as the potato, the onion, the melon, the tomato, etc., these crops are usually not included with market gardens, but are shewn either under some specific head, or under some such general head as "Other Root Crops," or "All Other Crops." The area under market gardens in the several States of the Commonwealth during each of the six seasons 1901-2 to 1906-7 are given in the table hereunder:—

COMMONWEALTH MARKET GARDENS, 1901-2 TO 1906-7.

Season.	N.S.W.	Victoria.	Q'sland.	Sth. Aust.	Wst. Aust.	Tasmania.	C'wealth.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1901-2 ...	7,834	8,752	2,328	9,005	2,142	1,746	31,807
1902-3 ...	8,263	7,937	2,171	9,489	2,262	1,893	32,015
1903-4 ...	8,754	8,455	2,563	9,964	2,463	1,685	33,884
1904-5 ...	8,827	7,904	2,099	10,160	3,538	1,759	34,287
1905-6 ...	9,119	7,333	2,089	10,688	3,550	1,778	34,557
1906-7 ...	9,550	7,906	1,953	8,379	3,789	2,210	33,787

The decline in the Commonwealth total for the season 1906-7 is due to the marked decrease in the area devoted to market gardens in South Australia, and to the smaller falling-off in the case of Queensland. In all the other States the area for 1906-7 was in excess of that for 1905-6.

3. **Grass Seed.**—In only three of the States is the growing of grass seed considered of sufficient importance to be specially shewn in the statistical returns. These States are Tasmania, Victoria, and Queensland, and the areas so cropped during 1906 were respectively 3720 acres, 1859 acres, and 1131 acres.

4. **Tobacco.**—The tobacco-growing industry is one which has experienced marked fluctuations in Australia, and one which at one time promised to occupy an important place amongst the agricultural industries of the Commonwealth. Thus, as early as the season 1888-9 the area under this crop amounted to as much as 6641 acres, of which 4833 were in New South Wales, 1685 in Victoria, and 123 in Queensland. This promise of prosperity was, however, not fulfilled, and after numerous fluctuations, in the course of which the Victorian area rose in 1895 to over 2000 acres, and that in Queensland to over 1000 acres, the total area under tobacco for the season 1906-7 was only 1400 acres, distributed as follows:—New South Wales, 601 acres; Victoria, 183 acres; and Queensland, 666 acres. This decline in production appears to have been due to the comparatively small demand which existed in Australia for the locally-produced leaf, and to the fact that the cost of production and preparation in the Commonwealth prevented the Australian leaf from obtaining a footing in the outside markets. Probably under more favourable circumstances, and with greater attention given to the production of leaf of the best quality only, the industry is one which will eventually, in Australia, assume considerable proportions. In all the States in which its cultivation has been tried the soil and climate appear to be very suitable for the growth of the plant, and the enormous importations of tobacco in its various forms into the Commonwealth furnish an indication of the extensive local market which exists for an article grown and prepared in such a manner as to meet with public requirements. The value of the net importations of tobacco into the Commonwealth during the year 1906 amounted to £545,782, comprising manufactured tobacco (£78,726), unmanufactured tobacco (£283,103), cigars (£129,105), cigarettes (£53,743), and snuff (£1105).

5. **Hops.**—Hop-growing in the Commonwealth is confined to Tasmania and some of the cooler districts of Victoria, the total area for the season 1906-7 being 1244 acres, of which 921 acres were in Tasmania and 323 acres in Victoria. The Tasmanian area, though still small, has increased rapidly during the past five years, the total for the season 1901-2 being only 599 acres. On the other hand, the Victorian area, which in 1901-2 was 307 acres, has reached only 323 acres in 1906-7. The cultivation of hops was

more extensive in Victoria twenty years ago than at present, the area devoted to this crop in 1883-4 being no less than 1758 acres. During the year 1906 the net importations of hops into the Commonwealth represented a weight of 1,385,624 lbs. and a value of £59,336. The total value of the net importations of hops into Australia during the past six years amounted to £316,260, thus indicating the existence of a regular and extensive local demand.

6. **Millet.**—Millet appears in the statistical records of three of the Commonwealth States, viz., New South Wales, Victoria, and Queensland. The total area devoted thereto in 1905-6 was 4323 acres, by far the greater portion, viz., 3765 acres, being in New South Wales. The particulars here given relate to millet grown for grain and fibre. That grown for green forage is dealt with in the section relating thereto.

7. **Nurseries.**—In all the States somewhat extensive areas are devoted to nurseries for raising plants, trees, etc., but statistics concerning the area so occupied are not available, and so far as they relate to forestry are given elsewhere.

8. **Cotton.**—Cotton-growing on a small scale has been tried in Queensland, but so far without marked success. The area under cotton during the season 1905-6, viz., 171 acres, had fallen by 1906-7 to 138 acres. Hopes are entertained that with the invention of a mechanical device for the picking of the cotton the industry will become firmly established, since the soil and conditions appear eminently suitable for the growth of this crop. Small areas in the Northern Territory have also been planted with cotton, while the tropical portions of Western Australia have long been regarded as suitable for its cultivation.

9. **Coffee.**—Queensland is the only State of the Commonwealth in which coffee-growing has been at all extensively tried, and here the results have up to the present time been far from satisfactory. The total area devoted to this crop reached its highest point in the season 1901-2, when 547 acres were recorded. Since then the area has continuously declined, and for 1906-7 amounted to only 256 acres.

10. **Other Crops.**—Miscellaneous small crops are grown in the several States, amongst which may be mentioned pumpkins, melons, tomatoes, rhubarb, artichokes, arrowroot, chicory, and flowers.

## § 17. Agricultural Colleges and Experimental Farms.

1. **Introduction.**—It has been thought preferable to refer to what may be called the effort in the direction of agricultural education, in this section rather than under the heading of education.

The virgin soil of a new country rendered attention to scientific methods of farming less necessary in the earlier days of Australian colonisation than at the present time, and it may also be said that the knowledge of scientific farming was then but little developed. In many parts of Australia, moreover, the regular rotation of crops, of vast importance to all agricultural countries, would appear hardly possible owing to the peculiar climatic conditions. These conditions may, however, be utilised, or made less adverse by a more skilful tillage of the soil, and the restoring to it or adding to it such chemical constituents as may be necessary for particular crops. The fostering of industries, other than those pertaining merely to the production of cereals, is also becoming a matter of consequence, and considerable extensions of knowledge have been made in the past few years in respect to the co-ordination of other industries with agricultural industry. In most of the States agricultural colleges and experimental farms have been established with a view to promoting agriculture and of establishing improved and more scientific systems of stock-breeding and dairying. In these colleges and in some of the farms provision is made for the accommodation of pupils, to whom both practical and theoretical instruction is given by experts in various branches of

agriculture. Analyses of soils and fertilisers are made, manures are tested, and elementary veterinary science, etc., is taught, while general experimental work is carried on with cereal and other crops, not merely for the purpose of shewing that it is practicable to produce certain crops in a given place, but also to shew how it is possible to make farming pay best in that locality. Opportunities are afforded for practice in general agricultural work, and instruction is given in the conservation of fodder, in cheese and butter making, in the management, breeding, and preparation for the market of live stock, in the eradication of pests and weeds, and in the carpenters,' blacksmiths', and other trades.

Travelling expert lecturers are sent to the various agricultural and dairying centres, and there is a wide distribution of periodical agricultural gazettes and bulletins on matters of importance at special seasons. In some of the States agricultural instruction is given at technical schools, while experimental elementary agriculture—practically a form of nature study—is taught at many of the primary schools. Courses for the instruction of school-teachers have been established during the holiday recesses at some of the agricultural colleges.

2. **New South Wales.**—In order to meet the demand for agricultural training, and for the purpose of conducting experiments in various branches of agriculture and of disseminating agricultural knowledge, an agricultural college and farm and twelve experimental farms have been established by the New South Wales Government. Theoretical instruction in agriculture, with practical illustrations, forms part of the curriculum of the Sydney Technical College. At the Hurlstone Continuation College there is a special course in both theoretical and practical agriculture for teachers. Instruction in "nature knowledge" is given in the State primary schools, many of which have their own experimental plots. As a means of further encouraging the study of agriculture the Department of Public Instruction has a travelling inspector in agriculture, whose duty it is to visit the country and metropolitan schools, giving lectures on the value, necessity, and advantages of agricultural knowledge, and giving practical demonstrations wherever practicable.

(i.) *The Hawkesbury Agricultural College*; situated near the town of Richmond, on the Hawkesbury River, about thirty-eight miles from Sydney, is under the control of the Agricultural Department and provides accommodation for about 200 students. Attached to the college is a farm of 3546 acres, of which 1166 acres were under cultivation in the year 1906.

(a) *The course of instruction* comprises the principles of agriculture; the breeding, rearing, feeding, and management of live stock; agricultural chemistry, botany, vegetable pathology, and entomology; veterinary science and practice; bacteriology; meteorology; agricultural mechanics; elements of surveying and farm book-keeping; all kinds of practical farm work, including the use of farm implements and machinery; dairying, carpentry, saddlery, blacksmithing, and elementary agricultural engineering; the management of poultry and bees and all branches of orchard and garden work. The course extends over two years, and is divided into four sessions. At the end of the course students may undergo examination for the purpose of obtaining the college diploma.

(b) *Experimental Work.* In addition to the education of the students extensive experimental operations are carried on at the farm for the general benefit of agriculturists. Large numbers of farmers visit the institution in quest of information. During the winter vacation arrangements are made for a winter school for farmers. This school has been in operation for two years and about eighty farmers have attended each year. The course extends over one month.

(ii.) *Experimental Farms, Orchards, and Vineyards.* Experimental farms have been established at Wagga, Bathurst, Coolabah, Grafton, Glen Innes, Cowra, Wollong-

bar, and Pera. There is an irrigation farm at Moree and a dairy stud farm at Berry, while viticultural stations have been established at Howlong and Lake Macquarie. At the farms at Wagga, Bathurst, Wollongbar, and Berry, accommodation is provided for students. The educational work undertaken at the four farms where students are received partakes more of a practical nature and less of the academic character. Scientific lectures are given as far as possible, and the students, at the end of the full course, undergo an examination for the purpose of obtaining the farm certificate. The fees payable by students are not large, amounting, as a rule, to about £25 inclusive. With regard to the farm operations, the objects of each farm are to demonstrate the most economic and effective systems of producing and harvesting crops; to carry out experiments to determine the suitability or otherwise of crops, not only for the district where the farm is situated but for other districts having similar climate and soils; and to carry out scientific agricultural experiments generally.

(iii.) *Particulars of Agricultural College and Experimental Farms.* The following table shows the number of students at the Hawkesbury College and at the four experimental farms at which students are received for each year from 1901 to 1906 inclusive:—

NEW SOUTH WALES.—NUMBER OF STUDENTS AT GOVERNMENT  
AGRICULTURAL COLLEGE AND EXPERIMENTAL FARMS.

Name.	1901.	1902.	1903.	1904.	1905.	1906.
Hawkesbury Agricultural College ...	102	116	120	153	144	201
Wagga Farm ... ..	7	18	29	40	41	40
Bathurst Farm ... ..	6	15	15	23	18	25
Wollongbar Farm ... ..	...	2	3	11	14	9
Berry Dairy Stud Farm ...	...	5	5	3	11	7
Total ... ..	115	156	172	230	228	282

The following table gives particulars of the Hawkesbury College and of the twelve experimental farms for the year ended the 31st March, 1906;—

NEW SOUTH WALES.—PARTICULARS OF GOVERNMENT AGRICULTURAL  
COLLEGE AND EXPERIMENTAL FARMS AT THE 31ST MARCH, 1906.

Name of Farm.	Total Area of Farm.	Total Area Cultivated.	Area under Cereals and Hay.	Area under Fruit-trees and Vines.	Number of Students.	Number of Hands Employed.	Value of Plant and Machinery.	Value of Produce for the Year.
	Acres.	Acres.	Acres.	Acres.			£	£
Hawkesbury ...	3,546	1,166	517	41	201	32	2,215	5,000
Wagga ...	3,300	818	408	95	40	19	1,435	4,828
Bathurst ...	695	403	243	37	25	31	1,130	1,500
Coolabah <sup>1</sup> ...	2,200	178	65	3	...	2	480	50
Moree <sup>2</sup> ...	79	40	27	6	...	3	160	70
Wollongbar ...	263	248	10	2	9	18	950	820
Berry <sup>3</sup> ...	323	60	14	...	7	4	330	400
Howlong <sup>4</sup> ...	250	84	26	56	...	5	500	60
Grafton ...	2,064	35	33	...	...	8	64	135
Glen Innes ...	1,250	141	99	20	...	5	160	486
Cowra ...	936	85	83	1	...	2	350	150
Pera ...	67	43	10	25	...	1	100	28
Lake Macquarie <sup>5</sup> ...	...	...	...	...	...	...	...	...

1. The total area of this farm is 15,000 acres, but 12,800 acres have been let for grazing purposes.

2. Irrigation farm.

3. Dairy Stud farm.

4. Viticultural station.

5. Viticultural station; particulars not available.

At the Wagga farm a specialty is made of growing seed wheats and fruits for drying, and of breeding dairy stock and swine. The Bathurst farm is devoted to the cross-breeding of sheep, fruit-growing, cereal culture, and general mixed farming. At Coolabah experiments in the dry districts have been carried on, while at Wollongbar experiments have been made on a large scale with grasses for the grazing of dairy cattle, and steps have been taken to assist the dairying industry in the surrounding districts.

(iii.) *Other Forms of Agricultural Instruction.* Agricultural education at the Technical College at Sydney includes the following studies:—The character and prospects of Australian agriculture; climate and rainfall; selection of land, clearing, fencing, building and draining; irrigation and water storage; the cultivation of crops; manures; live stock; dairying; sheep and wool; farm and dairy chemistry; the treatment of fungus and insect pests; orcharding and fruit preserving; vine growing and wine making; pigs, poultry and bee-keeping; and horticulture and home-gardening. Elementary agriculture forms the first year's course, and advanced agriculture is dealt with during the second year. With the object of giving lectures and demonstrations on various subjects, the scientific and expert staff of the agricultural laboratories in Sydney as well as those attached to the college and farm staffs are from time to time placed at the disposal of the agrarian community, and are constantly in demand by agricultural societies, farmers' and settlers' associations, and other similar bodies. The publication of the *Agricultural Gazette* is a valuable means of imparting knowledge on agricultural matters. Seeds grown at the experimental farms are distributed from a central dépôt in Sydney for trial purposes among the farmers, and are also available to State school teachers for use in connection with the experimental plots, which are now attached to many of the primary schools throughout the State. The only condition in the granting of such samples is that the recipients shall in due course forward a report of their experiments to the Agricultural Department.

3. **Victoria.**—In 1884, the Agricultural Colleges Act, passed to make provision for the establishment of agricultural colleges and experimental farms in Victoria, provided for the permanent reservation from sale of 150,000 acres of Crown lands by way of endowment of agricultural colleges and experimental farms, which, together with other lands reserved as sites for such institutions prior to the passing of the Act, are vested in three trustees appointed by the Governor. Provision was made for the appointment of a Council of Agricultural Education, consisting of eleven members, five of whom are elected by the members of the Agricultural Societies of the State, five are nominated by the Governor, whilst the Secretary for Agriculture is also a member of the Council and its Treasurer. Two agricultural colleges and five experimental farms, orchards and vineyards have now been established in different parts of the State under this Act. There are two Agricultural High Schools under the control of the Education Department, while elementary experimental agriculture is taught at many of the State primary schools. Instruction in agriculture is also given at the technical schools at Melbourne and Bairnsdale.

(i.) *Agricultural Colleges.* The two colleges are situated respectively (a) at Dookie, in the Goulbourn Valley district, and (b) at Longerenong, in the Wimmera district.

(a) *The Dookie Agricultural College.* with its farm of 4846 acres, is situated in a rich agricultural country, eminently suited for farming, grazing, viticulture, and horticulture. The college buildings were erected during 1886, and since then numerous additions have been made, so that at the present time accommodation is provided for seventy students, and provision will shortly be made to accommodate thirty more. The farm is equipped with modern dairy and cowbyres, piggeries, poultry plant, cellars, etc., also large stables and stallion boxes, shearing shed, slaughterhouse, mechanics' and carpenters' shops, silos, barn, sheds, cattle and sheep yards, steam and oil engines, and numerous modern implements of agriculture. Half the students' time is devoted to practical work on the farm, and half to scientific, theoretical,



and other work. On the farm the student is taught to manage live stock, handle implements and machinery, work the separator, drive engines, prune vines and trees, break-in horses, shoe horses, mend a break, and erect buildings. At the college instruction is given in determining the fertility of soils, the effects of manuring, the importance of drainage, the improvement of stock and crops, irrigation, and the treatment and eradication of diseases in plants and animals. Considerable attention is paid to experimental work in connection with cereals. The rearing of new varieties of wheat, suitable for the different parts of the State of Victoria, has special attention paid to it. Manurial tests are carried out each year and the results published for the benefit of the farmers. The stock comprise over fifty horses, good herds and flocks of pedigreed cattle, sheep, pigs, and poultry. The annual charge made to students is £28 per head inclusive.

- (b) *The Longerenong Agricultural College*, reopened in 1905, can accommodate forty students. The farm contains an area of 2386 acres, and is particularly adapted for demonstrating what can be done in farming with irrigation, water being supplied by one of the channels of the Western Wimmera Irrigation Trust. Including fallow land, about 1000 acres are under cultivation each season; the orchard and vineyard cover an area of thirty acres. In addition to a number of well-bred horses and cattle, there is a small flock of pedigree sheep. Lamb-raising is one of the principal industries. The course may be taken by either resident or non-resident students, the former doing both class and farm work, while the latter attend for class work only on alternate days. The syllabus of instruction includes the principles and practice of agriculture, agricultural chemistry, agricultural physics and mechanics, botany, entomology, geology, surveying, book-keeping, mathematics, and English. The fees for resident students amount to £18 5s. per annum, and for non-resident students to £5 per annum.

(ii.) *Agricultural High Schools and Technical Colleges.* During the year 1907 the Education Department opened two agricultural high schools—one at Warrnambool and the other at Sale—each having accommodation for about fifty pupils. Similar institutions are to be established in the near future at Wangaratta, Ballarat, and Shepparton, the sites having already been acquired, the direct aims being to give to boys such an education as will direct their attention specially towards the land as a means of gaining a livelihood; to promote agriculture as an occupation and a profession; to provide a central institution for the dissemination of agricultural information by evening lectures, conferences, and literature; to superintend the Government experimental plots, to record and interpret their results; and to provide a summer school in agriculture for primary school teachers. The course of instruction comprises agricultural science, climatology, physics, chemistry, geography, drawing, English, mathematics, and farm practice. At the Working Men's College at Melbourne lectures are given on agricultural chemistry, wool-classing, poultry-breeding, etc., and at the School of Mines at Bairnsdale a complete course in theoretical and practical agriculture is given, extending over a period of two years. Agricultural courses are also held at the Ballarat School of Mines and at the Gordon College, Geelong.

(iii.) *Experimental Farms.* Experimental farms, orchards, and vineyards have been established at Rutherglen, Wyuna, Whitfield, Heytesbury, and Burnley, demonstrating different methods of cultivation, manuring, stock-breeding, the cultivation of economic plants, the improvement of varieties of cereals by selection and cross fertilisation, and the testing of fodder plants. Six demonstration orchards have been established to shew the effect of proper cultivation and pruning of fruit trees in various districts and the suitability of the trees for the district. At Burnley Horticultural Gardens students are trained in horticulture. Areas have been planted at Rutherglen and Wahgunyah

with phylloxera-resistant vines for distribution to vignerons to enable them to reconstitute their vineyards. 150,000 vines were distributed last season.

(iv.) *Other Forms of Agricultural Instruction.* Since the establishment of butter factories throughout Victoria a travelling dairy formerly utilised has been discontinued. Demonstrations in cheese-making are, however, still given by an expert, while other experts also visit the factories and supply information and instruction. Practical lessons are also given by experts in fruit-preserving, drying, candying, also in flax manufacture, cider-making, poultry-dressing, and the preparation of poultry for export. In addition to these lectures a system of short course classes in agriculture has been established. These classes are held at various centres and lectures are given on the principles of agriculture, the care of farm stock, sheep-breeding and management, dairy-farming, agricultural engineering, and orchard and garden work. At the end of the year 1907 these classes had been established at twenty-seven centres, and the total number of students attending the lectures was 1236. In about 130 of the State-schools of Victoria elementary agriculture is taught. In connection with these schools there are experimental plots varying in area from half an acre to rather less than a quarter of an acre. Experiments are conducted to shew the benefits of cultivation, drainage, and rotation of crops, to ascertain fodder and other crops suitable for the locality, and to test manures. In some of the schools milk-testing is taught, and the economic native woods, common weeds, and insects are dealt with.

4. *Queensland.*—Organised experimental agriculture in Queensland dates from the establishment of the Department of Agriculture and Stock, but such work as has been done in connection with stock-breeding, other than that carried on by private individuals, has been of later birth, and has been confined to dairy stock and draught horses. Agriculture in Queensland in the early nineties was upon the well-defined lines of the other States, so that the knowledge to be gained as to what could be profitably adapted to Queensland, with its varied climate and rainfall, covered a wide field. Instructors were appointed conversant with the different lines of agriculture, of which grain cultivation, dairying, fruit growing, tobacco cultivation, and tropical agriculture, such as sugar, rubber, and spices, are the most important. This has been followed by the establishment of an agricultural college, of farms in the temperate parts of the State, and of nurseries in the tropical parts. With wheaten grain a system of experiments has been carried out through years with the distinctive object of evolving a type of wheat adapted for Queensland, and as far as possible resistant to the attacks of rust. In dairying, a commencement was made by despatching to the different farming centres properly equipped travelling dairies with the latest appliances. The export of Queensland dairy produce has arisen through this effort. No travelling dairies are, however, now employed. A fruit farm has been established, at which fruits suitable for or likely to adapt themselves to the Queensland climate and conditions have been experimented with during a series of years. To cope with the insect and fungus pests to which such fruits are peculiarly susceptible, careful inspection is made of fruits in the markets and for export, and every effort is put forth to prevent the introduction of fresh diseases and to exterminate those which are already within the State.

(i.) *Gatton Agricultural College.* In 1897 the Queensland Government established an agricultural college at Gatton, about fifty-eight miles west of Brisbane, with an associated farm of 1692 acres. Accommodation is provided for sixty residential students. Instruction is afforded in various branches of practical farming and theoretical agriculture, the practical feature being regarded as the more important. Elementary science and physics, dairying, gardening, elementary chemistry, veterinary science, horticulture, stock-breeding, elementary bacteriology, and agricultural chemistry are also taught. A dairy herd of the best known and favoured breeds has been established at the college, whence the young stock of pure breed have been distributed throughout the State. A course for the instruction of school-teachers during the summer recess has been established at the college by the Education Department, and the knowledge thus acquired is imparted by the teachers, not only to the school children, but also to the farmers and

dairymen. On the 30th June, 1907, there were fifty-seven students on the books of the college.

(ii.) *Experimental Farms and Technical Colleges.*

(a) *Experimental Farms* are carried on by the Government at Westbrook (near Toowoomba), Gindie, Biggenden, Hermitage (near Warwick), Bungeworgorai, and Stanwell. At the Hermitage farm arrangements were made during the year 1906, whereby instruction in general farm work is given to a number of boys who, from circumstances, are unable to receive the advantages of the college course, and this system has now been applied to the farm at Biggenden. The pupils are apprenticed for a term of three years and are instructed in experimental and acclimatisation work, stock-breeding, hybridising, orchard work, etc. These youths are paid nothing for the first twelve months, £12 for the second, and £24 for the third. A State nursery has been established at Kamerunga, near Cairns, and a sugar experimental station at Mackay, but the State tobacco farm at Texas was relinquished during 1906.

(b) *Technical Colleges.* At the technical colleges established in various parts of the State instruction is given in certain agricultural subjects. Thus, at Brisbane, Ipswich, and Maryborough botany, milk and cream testing, fruit preserving and pickling are considered, and at Brisbane wool-classing also. At Bundaberg, Gympie, Rockhampton, South Brisbane, and Toowoomba milk and cream testing are taught, whilst instruction is given in dairy-farming at Warwick.

(iii.) *Other Forms of Agricultural Instruction.* Free lectures are from time to time given at different centres by the Agricultural Department's technical instructors on all agricultural, horticultural, and pastoral subjects. A monthly *Agricultural Journal* is issued, in addition to pamphlets on special subjects. Seeds which are new to the country, and which have not been cultivated there before, are distributed free. In the primary schools instruction is given in nature study and in economic gardening, prizes being awarded both for practical and theoretical work.

5. **South Australia.**—To this State belongs the honour of starting the first experimental farm in the Commonwealth. As far back as the year 1879 a resolution was passed by the local Parliament in favour of the establishment of a School of Agriculture, with an experimental farm, under the charge of a professor of agriculture. Active operations in this connection were commenced in 1882, when the first series of plots of wheat were sown at Roseworthy. Experimental work, chiefly directed towards improving the wheat yield, has been developed along three main lines, viz.: (a) The improvement of varieties of wheat, (b) the improvement of methods of cultivation, and (c) the use of manures. The central agricultural bureau, established at Adelaide under the control of an Advisory Board, had on the 30th June, 1906, a membership of nearly 1900 persons distributed amongst 115 branches. It assists farmers by the dissemination of knowledge; by helping to introduce new economic plants; by improving the breed of stock; and it acts as a means of keeping the Agricultural Department in touch with the producers. The branches of the bureau hold meetings at regular intervals in their several districts, ideas and methods as regards practical subjects are interchanged, and discussions are held on matters of general interest to agriculturists. The Agricultural Department issues a monthly journal, and from time to time special bulletins and pamphlets regarding cultivation, manuring, diseases of stock, etc.

(i.) *The Roseworthy Agricultural College.* The Roseworthy College, situated seven miles from Gawler, and affording accommodation for 50 resident pupils—who must be at least 16 years of age on admission—has two main objects, viz.: (a) To train young men for the practice of agriculture, horticulture, and viticulture, and (b) to conduct experiments with a view to the advancement of the rural industries in South Australia.

The attached plot is 1550 acres in extent. The course extends over a period of three years, the fees being £30 per annum. The curriculum includes both scientific and technical subjects, viz., chemistry, physics, anatomy, physiology, botany, and entomology; agriculture, viticulture, oenology, fruit culture, veterinary science, dairying, book-keeping, surveying, wool-classing, and general rural economy.

(ii.) *Experimental Farms.* During the year 1905-6 three experimental farms were handed over to the Agricultural Department, namely, the homestead block at Kybybolite of 1060 acres, 40 acres of reclaimed swamp at Murray Bridge, and 80 acres at Parafield. On these, experiments are carried on with regard to the growing of different varieties of wheat, oats, and barley, both for grain and for hay crops, and also with regard to the growing of root and fodder crops. Investigations cover the manuring of crops, different methods of cultivation, rotation of crops, irrigation, the hybridisation and selection of cereals, feeding of animals, fruit-growing, and wine-making.

(iii.) *Other Forms of Agricultural Instruction.* Lectures are given by the experts of the Agricultural Department under arrangement with the School of Mines at Adelaide and at country branches of that institution, while practical demonstrations are also given by the horticultural instructor. No instruction is given by travelling dairies, but the dairy instructor visits districts as arranged and gives instruction and advice on all matters pertaining to dairying. Lectures and practical demonstrations are given by experts all over the State, principally under the auspices of the agricultural bureau or local committees. Though no systematic scheme for agricultural teaching in the primary schools exists, numbers of individual teachers have taken up experimental elementary agriculture—practically a form of nature study—with satisfactory results. Seed of special varieties of wheat is from time to time distributed gratis to applicants; also seed of barley and oats, and of fodder plants of a special character, likely to suit prevailing conditions.

6. *Western Australia.*—A considerable amount of developmental work has been done of late years towards the promulgation of agricultural knowledge on the three State farms at Chapman, Narrogin, and Hamel.

(i.) *The Chapman Farm* stands in the centre of a vast stretch of country lying twenty-five miles north of Geraldton and fifteen miles east of Northampton. Until five or six years ago, the expanse of land referred to was almost exclusively devoted to grazing, and it was mainly to prove its capabilities and thus promote settlement, that the farm was established. The whole of the available land has since been selected, and settlement has outrun the extent of the area in question. Collaterally the object of the farm has been extended; it has become the medium whereby practical instruction in farming is provided for intending settlers in quest of a training which will fit them for their work, and on the 30th June, 1906, seventeen students, by whom all the farm work was done, were resident thereat. The farm is well watered by the Chapman River and by wells served by windmills; it is securely fenced and subdivided. Stud stock are kept and bred, the young stock being sold annually. The stock consists of a stud of Suffolk Punch horses, a herd of Dexter Kerries, a flock of pure-bred Shropshire ewes and rams, Angora goats, and various kinds of poultry.

(ii.) *The Narrogin Farm.* The initial object of this farm was to practically demonstrate the larger return consequent upon improved cultivation of the land; to raise stud-stock for the benefit of the farmers, to raise clean seeds for sowing their land, and to offer a field for training farmers' sons and others wishing to settle on the land. Students are admitted at an annual fee of £10, they are taught the practical farm work, such as handling live stock, and the use of various farm implements. Lectures are given at intervals by the scientific staff attached to the Agricultural Department. Experimental work is a merely subsidiary feature. The total area is 2826 acres. On the 30th June, 1906, there were fifteen students, a number which has increased since that date.

(iii.) *The Hamel State Farm.* Hitherto only experimental work has been carried out on the Hamel State farm, consisting chiefly of testing new varieties of grasses

and fodder plants, cereals, fruits, and tubers. Students are not taken on at the farm, the work having been carried out chiefly by a gang of good conduct prisoners.

(iv.) *Other forms of Agricultural Instruction.* The Government dairy expert is continually travelling and lecturing on dairying, and lectures are also given by the field-officer, the horticultural and viticultural experts, and others. Demonstrations are also given in the cultivation of vines and fruit trees, including budding, grafting, and pruning. A regular monthly journal and bulletins at frequent intervals on matters of importance are issued by the Agricultural Department. The distribution of seeds and plants is now practically confined to seeds of fodder plants. While there are no specific regulations, recipients are asked, with a view to collating information as to the most suitable varieties in different localities, to report results. Experimental plots are conducted at some of the State schools under the direction of the teachers. A special feature of the entomological work carried out by the Department of Agriculture is the collection, breeding, and distribution of parasites on insect pests. This work has been carried out with excellent results, several pests which were formerly a great source of trouble and expense being now practically non-existent. Experimental farms have been established at Brunswick and Nangeenan.

7. *Tasmania.*—In Tasmania there is a Council of Agriculture consisting of eleven members, whose duties are to collect and publish information of every kind calculated to prove beneficial to colonists engaged in agriculture, such as suitability of various districts for growth or production of animal and vegetable products, information respecting plants, methods of cultivation, of breeding and feeding animals, and how to best improve the same; to prevent as far as possible the introduction and spread of diseases and pests, and to publish bulletins, abstracts, and reports containing all such information as may be desirable. Other matters embrace the employment of experts in any branch of agricultural science, distribution of plants and seeds for experiment, and the establishment of local boards of agriculture in different parts of the State. Lectures are given by the experts from time to time, and useful information and knowledge is diffused by means of the monthly gazette published by the Council, and also by means of special bulletins. There are no agricultural colleges nor experimental farms, and practically no agricultural teaching is given in the elementary schools.

8. *Organisation of Agricultural Departments and of their Work.*—The extended table on pages 344 to 347 gives an aperçu of the entire organisation of agricultural departments and of the effort in the direction of agricultural education in Australia.

## § 18. Government Loans to Farmers.

1. *Introduction.*—All the Australian States, excepting Tasmania, have established systems under which financial aid is rendered to agriculturists by the Government. The principle upon which such aid is founded was probably first practically applied in Germany, viz., in the year 1770, when the *Landschaften Bank* was created. The establishment of the *Crédit Foncier* somewhat later in France was a creation of a similar character. This latter is an institution designed to enable house and land owners to raise money on mortgage at a low rate of interest, with facility for repayment by an annuity including redemption of the capital. It dates from 1852, but the mortgage bank known as the *Caisse Hypothécaire*, which, after a struggling existence, was finally liquidated in 1846, was based essentially on the same principle. Over the operations of the *Crédit Foncier*, created under governmental patronage and invested with such special privileges as to virtually constitute it a monopoly, the Government exercised a direct control, viz., by appointing its governor and its two deputy-governors. The *Crédit Foncier* could lend money only on a first mortgage, and to the amount of one-half of the estimated value of houses and farms, and one-third of that of vineyards, woods, and other plantations, and the commission charged could not exceed six-tenths per cent.

The system developed and adopted in the Commonwealth, with the object of assisting farmers to make improvements or to develop or utilise the agricultural or pastoral resources of the land, is analogous. Though not yet adopted in Tasmania the Government of that State has its introduction in contemplation, on somewhat similar lines to those followed in Victoria.

2. **Particulars of Transactions in Each State, 1904-7.**—The subjoined table gives particulars of transactions in each State in which advances to farmers are made, for the years 1904 to 1907, inclusive :—

STATE GOVERNMENT ADVANCES DEPARTMENTS. PARTICULARS OF  
LOANS TO FARMERS, 1904-7.<sup>1</sup>

State.	TOTAL ADVANCED.				BALANCE DUE.			
	1904.	1905.	1906.	1907.	1904.	1905.	1906.	1907.
	£	£	£	£	£	£	£	£
New South Wales...	502,828	563,596	647,623	702,099	392,745	406,405	411,208	420,531
Victoria ...	1,749,409	1,890,299	2,021,333	2,111,308	1,321,510 <sup>2</sup>	1,350,515 <sup>2</sup>	1,328,547 <sup>2</sup>	1,225,805 <sup>2</sup>
Queensland ...	21,020	39,378	98,484	129,361	20,370	38,417	94,268	112,216
South Australia ...	889,976	925,071	1,011,110	1,109,362	602,641	582,214	602,365	613,730
West Australia ...	215,000	297,600	394,164	525,177	189,626	250,503	323,464	420,534
Commonwealth ...	3,378,233	3,715,944	4,172,704	5,377,307	2,526,892	2,628,054	2,759,852	2,792,816
	ANNUAL PROFITS.				ACCUMULATED PROFITS.			
	£	£	£	£	£	£	£	£
New South Wales <sup>2</sup>	...	...	...	...	...	...	...	...
Victoria ...	6,901	7,330	7,260	6,430	41,177	48,507	55,768	62,198
Queensland ...	84	53	444	...	...	...	246	...
South Australia ...	3,050	3,116	3,314	3,598	15,552	18,669	21,984	25,582
West Australia ...	2,036	2,409	3,754	3,988	3,024	5,433	9,187	13,557
Commonwealth <sup>4</sup>	12,071	12,908	14,772	...	...	...	...	...

1. Compiled from figures furnished by the Government Savings Banks of Victoria. 2. Returns not available. 3. Balance after deduction of special principal payments in advances (see subsection 7, section 41, of the Savings Banks Act, 1896). 4. Exclusive of New South Wales.

3. **New South Wales.**—New South Wales adopted the principle of advances to settlers later than most of the other States. It was not until 1899 that the Advances to Settlers Act was passed, having for its object the rendering of financial assistance to settlers in necessitous circumstances. Under this Act loans to farmers were authorised but the amount advanced to any one person was not to exceed £200, and was to be repaid in ten years, together with interest at 4 per cent. per annum. A Board, called the Advances to Settlers Board, was appointed to deal with applications for advances and to decide whether they should be granted. In the year 1902 an Amending Act increased the advance limit to £500, and extended the time limit to thirty-one years. The Government Savings Bank Act of 1906 repealed previous Acts on the subject, and provided that all property held by the Advances to Settlers Board should be vested in the three Commissioners appointed under the Act. An Advances Department of the Savings Bank was constituted and authority given to issue debentures to the amount of £305,000, viz., the amount of stock issued under the Advances to Settlers Acts and held by the Savings Bank. This Bank was made liable to the Treasury for the amount of £12,050, being the amount issued to the public under these Acts.

(i.) *Security on which and Objects for which Advances are made.* The Commissioners are authorised to issue debentures to the amount of £2,000,000, bearing interest at a rate not exceeding 4 per cent., and to lend moneys upon mortgage (a) of a fee simple estate in any land in the State, or (b) of conditional purchases, homestead grants or selections, settlement leases or purchases, and conditional purchase leases. Loans may be made for any of the following purposes :—

(For continuation see page 348.)

MAIN FEATURES OF ORGANISATION.	NEW SOUTH WALES.	VICTORIA.
<b>I. Designation of Minister</b> by whom department is controlled	Minister for Agriculture	Minister of Agriculture
<b>II. Staff, on 30th June, 1907—Agricultural Branch—</b>		
Administrative ... ..	9	4
Professional ... ..	21	13
Clerical ... ..	12	12
Temporary ... ..	181	73
General ... ..	22	125
<b>Total</b> ... ..	<b>245</b>	<b>227</b>
<b>Stock and Brands Branch—</b>		
Administrative ... ..	1	2
Professional ... ..	1	...
Clerical ... ..	13	6
Temporary ... ..	25	35
General ... ..	56	5
<b>Total</b> ... ..	<b>96</b>	<b>48</b>
<b>III. Expenditure, 1906-7</b> ... ..	<b>£60,134</b>	<b>£103,594</b>
<b>IV. Facilities for Agricultural Education—Places at which are established (i.) Agricultural Colleges</b>	Hawkesbury	Dookie and Longerenong
(ii.) Technical Schools at which Agriculture is taught	Sydney Technical College Hurlstone Continuation Col.	Working Men's College, Melb. Bairnsdale School of Mines. Ballarat School of Mines. Gordon College, Geelong
(iii.) Experimental Farms, Orchards, and Vineyards	Farms: Hawkesbury, Bathurst, Wagga, Coolabah, Grafton, Cowra, Glen Innes, Wollongbar, Moree Irrigation Farm, Berry Dairy Stud Farm, Pera Bore Farm, Howlong and Lake Macquarie Viticultural Stations	Experimental Farms:— Dookie, Longerenong, Whitfield, Heytesbury, Rutherglen Viticultural Farm, Wyuna Irrigation Farm, Burnley Horticultural Gardens
Nature and Extent of— (i.) Agricultural Teaching given in Primary Schools	Elementary Principles of Agriculture taught in most of the schools. Experimental plots in many schools. Travelling instructor in agriculture visits schools, giving lessons and lectures	Agriculture is taught in about 130 State schools. Experiments conducted to show benefits of cultivation, drainage, etc., of crops, test manures, etc., and milk testing. Agricultural high schools at Sale and Bairnsdale
(ii.) Agricultural Teaching given in Technical Schools	Comprises agricultural principles, climate and rainfall, selection of land, clearing, building, etc., draining, irrigation, crops, manures, dairying, sheep, wool and wool-classing, orchards, pigs, poultry, etc.	Lectures given at Working Men's College on agricultural chemistry, wool - classing, poultry breeding, etc.
(iii.) Work undertaken in Agricultural Colleges	Same as above and chemistry, botany, entomology, veterinary science, bacteriology, meteorology, surveying, carpentry, blacksmithing, bees and poultry, etc.	Complete course in practical and theoretical agriculture, extending over two years
(iv.) Work undertaken on Experimental Farms, Orchards and Vineyards	Producing and harvesting crops, production and improvement of suitable seeds, etc.	Experiments in methods of cultivation, manuring, stock - breeding, improving cereals by selection and cross fertilisation, testing of fodder plants. Irrigation at Longerenong; horticulture at Burnley; vines at Rutherglen and Wahgunyah
(v) Instruction given by Travelling Dairies, etc.	Nil	None now employed. Demonstrations in cheese-making given by experts; also practical instruction in fruit preserving, drying, candying, flax manufacture, cider making, poultry dressing, etc.

QUEENSLAND.	SOUTH AUSTRALIA.	WESTERN AUSTRALIA.	TASMANIA.
Secretary for Agriculture	Minister of Agriculture	Minister for Agriculture	Minister of Agriculture
*23	1	1	2
147	14	...	6
...	7	15	3
...	...	...	...
97	12	24	1
†266	34	40	†12
	2	...	
	58	2	
	3	...	
	...	...	
	1	11	
	64	13	
£59,445	£19,339	£49,159	£4,950
Gatton	Roseworthy	Nil	Nil
Brisbane, Bundaberg, Ipswich, Gympie, Maryborough, Rockhampton, S. Brisbane, Toowoomba, Warwick	Adelaide School of Mines	Nil	Nil
State Farms: Toowoomba, Warwick, Emerald, Maryborough, Roma, Rockhampton. State Nursery: Cairns. Sugar Station: Mackay	Farms: Parafield, Kybybolite and Murray Bridge. Orchards: Adelaide and Roseworthy. Vineyard: Roseworthy. Experimental plots: Hammond, Eudunda, Loxton, Mt. Barker, Forest Range, Mt. Gambier, Saddleworth, and thirty-eight other centres	Narrogin, Chapman, Brunswick, Nangeenan and Hamel	Nil
Nature study and school gardens; prizes given for practical and theoretical work. Gardening pursued is economic (not flower gardening)	No systematic agricultural teaching in primary schools. Experimental elementary agriculture taken up by individual teachers—results satisfactory. Work optional but not widespread.	Experimental plots at some State schools under direction of teachers	Nil
Botany, milk and cream testing, sheep and wool training, fruit preserving and pickling, dairying	Lectures and agricultural practical work; viticulture, fruit culture, botany; lectures in conjunction with School of Mines; ditto by horticultural instructor	Nil	Nil
Practical farming and theoretical agriculture (preference given to former), botany, elementary science and physics, dairying, gardening, elementary chemistry, veterinary science, horticulture, stock-breeding, bacteriology, agricultural chemistry	Training young men for practice of agriculture, horticulture, and viticulture; conducting experiments, and dairying	Nil	Nil
Experimental and acclimatisation work, stock-breeding, hybridising, object lessons in cultivation, orchard work, etc. Pupils taken at some of the farms	Growing of various cereals and root crops; experimental work in manuring, cultivation, and rotation of crops; irrigation, etc., of cereals; feeding of animals; selection of fruits; general attention to orchards, vineyards, and wine-making	At Narrogin farm students are admitted at annual fee of £10, and are taught practical farm work. Lectures are given at intervals by scientific staff attached to department	Nil
None now employed	Nil. Dairy instructor visits as arranged and gives advice, etc., at some of the principal farms	Nil	Nil

\* Including clerical.

† Including Stock.



Main Features of Organisation.	New South Wales.	Victoria.
(vi.) Lectures given by Experts	Dairy, fruit, viticultural and other inspectors visit societies, etc., and give suitable lectures	Lectures given on principles of agriculture, care of farm animals, sheep-breeding and management, dairy farming, poultry breeding, agricultural engineering, orchard and garden work.
(vii.) Other Forms of Agricultural Instruction	"Agricultural Gazette" and pamphlets	Demonstrations in horse-breeding, dairy cattle, pig-breeding, lamb raising, and wool-classing
<b>V. General Work of Department—</b>		
(i.) Extent to which Distribution of Plants and Seeds is carried out by Department and General Regulations governing such Distribution	Seeds are distributed for experimental purposes, on condition that reports will be furnished to department	Seeds of cereals, potatoes, etc., are imported and distributed in suitable districts
(ii.) Number of Inspectors Employed—		
(a) Fruit and Orchard Inspectors ...	27	47
(b) Stock Inspectors ...	57	47
(c) Rabbit Inspectors ...	27	43
(d) Other Inspectors ...	51	4
(iii.) Acts under which the Prevention of Diseases in Stock and Plants and the Eradication of Noxious Animals, Insects, and Weeds are carried out	Pastures Protection Act 1902 " " " Amended 1906 Stock Act of 1901 Stock (Tick) Act of 1901	The Vegetation Diseases Acts The Stock Diseases Acts The Vermin Destruction Act The Exported Products Act The Milk and Dairy Supervision Act
(iv.) Special Features of Entomological or other work of the Department		
(v.) Special steps taken by Department for Distribution of Information (a) Amongst the Agriculturists of the State	"Agricultural Gazette" and pamphlets	"Journal of Department of Agriculture," and the "Year Book," also publications on special subjects
(b) With a view to improving the market for the State's products	Commercial Agent for the East has been appointed, also one for South Africa; Agent-General in London	Agent-General is supplied with samples of produce, etc., which are exhibited at his office in London. Two agents are in the East advertising products and manufactures of State. Cool storage provided by Government to assist export trade

1 Not under Department of Agriculture.

Queensland.	South Australia.	Western Australia.	Tasmania.
Free lectures given by departmental experts on all agricultural, pastoral, and horticultural subjects. Local societies provide hall and attend to advertising	Lectures and practical demonstrations given all over State under auspices of local agricultural societies; always well attended	Lectures given by dairy expert, field officer, horticulture and viticulture expert and others; demonstrations also given in cultivation of vines and fruit trees, including budding, grafting, pruning, etc.	Lectures given by experts in butter-making, modern silo, land-surveying, etc. poultry dressing, pruning, spraying and the general principles of fruit growing & agriculture
Issue of monthly "Agricultural Journal" and pamphlets on given subjects		Issue of "Agricultural Journal" monthly, and special bulletins from time to time	Nil
Small charge made to cover expenses, except in case of seeds new to the country. Seeds for state school gardens, and plants for shade purposes for public institutions	Special varieties of wheat distributed gratis in various parts of State; also barley and oats seed, and fodder plants of special character, likely to suit prevailing conditions	Distribution of plants and seeds, practically confined to seeds and roots of fodder plants. Recipients are asked to report results with a view to collating information as to most suitable varieties for various districts	If a new plant be discovered, it is distributed gratis
36 56 24 23	74 55 1 1	15 9 \$32 ...	\$55 } 300 Police Officers
Diseases in Plants Act Marsupial Act Diseases in Stock Acts Land Acts, 1897 to 1905 (re prickly pear) Rabbit Act 1885 Rabbit Act Amend. Act 1889 Rabbit Boards Act 1896 Rabbit Boards Act Amendment Act 1903 and 1905 General work of destruction of noxious weeds is left to local authorities	Vine, Fruit and Vegetable Act of 1885 Stock Diseases Act of 1888 Amendment Act of 1903 Brands Act of 1879 and 1882 Brands Act Amendment Act of 1890 and 1905	Stock Act Insect Pests Act Contagious Disease in Bees Act Brands Act Noxious Weeds Act Fertiliser and Feeding Stuffs Act Rabbit Act	Codlin Moth Act Vegetat'n Diseases Act Rabbit Destruct'n Act Californian Thistle Act
Features are varied owing to great range of climatic conditions. No special features to be mentioned	Work confined to economic phases of entomology and vegetable pathology; aims at identifying and instructing horticulturalists how to detect different insects and fungi, and to apply best remedies for prevention; tests conducted with fungicides and insecticides, and uses demonstrated	Collection, breeding, and distribution of parasites on insect pests. Work carried out with excellent results; several pests formerly a great source of trouble and expense now practically non-existent	Lectures on the prevention of insect-pests, etc.
(i.) Distribution of Journal and pamphlets (ii.) Lectures (iii.) Object lessons at farms and agricultural college	Agricultural bureau with 120 branches established; the latter meet at intervals and matters relating to agriculture, discussed (i.) "Journal of Department of Agriculture" published monthly (ii.) Special bulletins and pamphlets on agricultural and other matters published at intervals; departmental library open to those interested.	"Agricultural Journal" issued monthly. Special bulletins written by experts	"Agricultural Gazette," published every month; bulletins written by experts
(i.) Close inspection of exports (ii.) Collection and distribution of information from markets where business is likely to be profitable	S.A. exhibits are forwarded to various shows in Great Britain; daily quotations of wheat in London, published in S.A. press. Produce of all kinds shipped to London and elsewhere; trial shipments of poultry and eggs to London have been successful	Supervision of shipment of produce to ensure its being placed on home markets in best possible state	Shipments of fruit to other countries

‡ Including 10 rabbiters and 18 boundary riders for up-keep of State rabbit-proof fences. ¶ 5 Departmental, 50 other.

*Continued from page 343.*

(a) To pay off existing encumbrances or to purchase the land; (b) to pay off money owing to the Crown in respect of the land; (c) to make improvements or to develop the agricultural or horticultural resources of the land; (d) to build homes on the land.

(ii.) *Amount and Repayment of Loans.* No loan to any one person may amount to less than £50 or more than £2000, and applications for loans not exceeding £500 have priority over those of a larger amount. Advances may be made up to two-thirds of the value of the interest of the borrower in the land, buildings and improvements, except where the land is held as a conditional lease, homestead grant, settlement lease, homestead selection, settlement purchase, or conditional purchase as to which the first five years' certificate has not issued, in which cases the amount advanced may not exceed one-half of the holder's interest in the improvements. Loans are made only in respect of first mortgages, and except in the case of loans on the security of freeholds or certificated conditional purchases, are repayable by equal half-yearly instalments within such period, not exceeding thirty-one years, as the Commissioners think fit. Loans granted on the security of freeholds and certificated conditional purchases are repayable either in the same manner as loans on other securities just mentioned, or at the expiration of a fixed term not exceeding five years, during which period interest only is payable.

(iii.) *Advances on Purchases of Farms.* To facilitate close settlement on private estates suitable for the purpose, the Commissioners are authorised to make advances in order to assist persons in purchasing land. In the case of such advances the title to the land must be either freehold or a certificated conditional purchase, and the amount advanced may not exceed 80 per cent. of the Commissioners' valuation.

(iv.) *Particulars of Advances to Farmers, 1904-6.* The following table shows particulars of the advances made up to the 30th June in each year from 1904 to 1907, inclusive:—

PARTICULARS OF GOVERNMENT ADVANCES IN NEW SOUTH WALES TO FARMERS, 1904-7.

Particulars.	1904.	1905.	1906.	1907.*
Total applications received... No.	9,572	10,431	11,188	†
Total amount applied for ... £	1,420,001	1,581,581	1,718,431	†
Total applications refused or withdrawn... No.	4,415	4,611	4,927	†
Total applications approved ... No.	5,194	5,646	6,178	6,432
Total amount advanced ... £	502,828	563,596	647,624	683,309
Average amount advanced per loan ... £	97	100	105	106
Repayments { of principal ... £	110,083	157,191	236,415	281,568
{ of interest ... £	31,620	48,043	68,646	94,798

\* To 31st December, 1906. † Figures not available.

4. **Victoria.**—The Advances Department of the Government Savings Bank of Victoria was established by the Savings Bank Act of 1896, amended in 1901 and again in 1903. The funds for the purpose of making advances are raised by the issue of mortgage bonds, the total amount of which is limited to £3,000,000.

(i.) *Security on which Advances Granted.* In order to assist farmers, graziers, market gardeners, or other persons employed in agricultural, horticultural, viticultural, or pastoral pursuits, the Savings Bank Commissioners are empowered to make advances, either by instalments or otherwise, upon the security of any lands held by such person either (a) in fee simple, or (b) under a Crown lease in which the rent received is taken by the Crown in part payment of the lands demised. A loan may be either in cash or in mortgage bonds at par face value at the option of the Commissioners.

(ii.) *Amount of Advances.* The limits of the advances are £50 and £2000, as in New South Wales, applications for advances under £500 having also similar priority. In the

LOANS TO FARMERS.—TRANSACTIONS OF ADVANCES DEPARTMENT OF  
GOVERNMENT SAVINGS BANK, VICTORIA, DURING EACH FINANCIAL  
YEAR, 1904-7.

5. **Queensland.**—The Queensland Government was authorised, under the Agricultural Bank Act of 1901, to establish a bank for the purpose of promoting the occupation

cultivation, and improvement of the agricultural lands of the State, and a body of three trustees was appointed to administer the Act. The Government was empowered to raise a sum not exceeding £250,000 by the issue of debentures, bearing interest at a rate of not more than 4 per cent. The original Act was amended in 1904 and again in 1905.

(i.) *Security on which and Purposes for which Advances are made.* Advances may be made to owners of agricultural lands or to occupiers of Crown lands held either as agricultural farms or homesteads, grazing farms or homesteads, unconditional selections, or miners' homestead leases, and may be for any of the following purposes:—(a) The payment of existing liabilities; (b) agricultural, dairying, horticultural, or viticultural pursuits on the holding; (c) making improvements or adding to improvements already made; (d) the purchase of stock, machinery, or implements. Advances are only made on the security of first mortgages.

(ii.) *Amount and Repayment of Loans.* No advance may exceed twelve shillings in the pound of the fair estimated value of the holding, including the value of improvements made and proposed, and in the case of advances for paying existing liabilities or for the purchase of stock, machinery, or implements, the amount may not exceed ten shillings in the pound of such value, nor may the advance at any time exceed £800. Applications for amounts not larger than £200 have priority over those for a larger amount. During the first five years following the date of the loan the borrower must pay interest at the rate of 5 per cent. per annum. After the expiration of that period the loan, together with the interest, must be repaid by half-yearly instalments within twenty years, the amount of such half-yearly instalment being £4 0s. 3d. for each £100 advanced. In the case of advances for the purposes of paying off existing liabilities or of buying stock, machinery, or implements, the loan must be repaid by equal half-yearly instalments of the amount of £3 11s. for every £100 advanced within twenty-five years from the date of its granting.

(iii.) *Transactions of Agricultural Bank, 1904-7.* The subjoined table shews particulars of the transactions of the Agricultural Bank for each year from 1904 to 1907, inclusive:—

PARTICULARS OF TRANSACTIONS OF THE AGRICULTURAL BANK,  
QUEENSLAND, DURING EACH FINANCIAL YEAR, 1904-7.

Particulars.		1904.	1905.	1906.	1907.
Loans raised ...	£	*	*	*	*
„ repaid ...	£	*	*	*	*
„ outstanding ...	£	*	*	*	*
Applications received ...	No.	157	699	834	503
„ „ Amount, £	£	21,069	108,667	120,256	69,472
Applications granted ...	No.	116	296	558	313
„ „ Amount, £	£	12,195	35,233	69,178	36,357
Amounts advanced ...	£	14,628	18,358	59,106	30,877
„ repaid ...	£	650	311	3,229	12,908
„ outstanding	£	20,370	38,417	94,268	112,216

\* Information not available.

6. *South Australia.*—Under the State Advances Act of 1895, amended in 1896 and 1901, a State Bank has been established in South Australia for the purpose of making advances (i.) to farmers and other producers, and (ii.) in aid of industries on the security of lands held in fee simple or under Crown leases, and (iii.) to local authorities upon the security of their rates. The bank, managed by a board consisting of five trustees appointed by the Governor, has funds raised by the issue of mortgage bonds, carrying interest at a rate not exceeding 4 per cent., to an amount not greater than the total amount due to the bank for State advances, and in any case not greater than £3,000,000.

(i.) *Amount and Repayment of Loans.* No advance to farmers or to other producers, or in aid of any industry, may exceed three-fifths of the unimproved value of the fee simple of the land and permanent improvements thereon, and if the land has acquired a special additional value by reason of cultivation as a vineyard or orchard, *plus* one-third of such special additional value. If the advance be on the security of a Crown lease, the amount of the loan may not exceed one-half the selling value of the lease, including the interest of the holder in any improvements on the land. The amount lent to any one person at any time may not exceed £5000. Advances are repayable by half-yearly instalments, the rate of interest up to the limit of 5 per cent. per annum, being a matter of arrangement between the bank and the borrower.

(ii.) *Transactions of the State Bank, 1904-7.* The following table shews particulars of the transactions of the State Bank for each year from 1904 to 1907 inclusive:—

SOUTH AUSTRALIA.—PARTICULARS OF TRANSACTIONS OF THE STATE  
BANK FOR EACH YEAR ENDED 31ST MARCH, 1904-7.

Particulars.	1904.	1905.	1906.	1907.
Loans raised ... ..	£ 58,285	23,675	46,015	57,165
„ repaid ... ..	£ 32,195	36,560	38,465	50,515
„ outstanding ... ..	£ 346,030	333,145	340,695	347,345
Applications received ... ..	No. 362	225	271	260
„ „ Amount, £ ... ..	107,159	63,340	94,794	111,609
Applications granted ... ..	No. 230	126	180	146
„ „ Amount, £ ... ..	61,530	24,865	56,181	67,420
Amounts advanced ... ..	£ 55,507	24,529	51,826	58,060
„ repaid ... ..	£ 31,940	37,200	39,531	51,265
„ outstanding ... ..	£ 349,532	336,861	349,156	355,951

7. *Western Australia.*—By the Agricultural Bank Act of 1894 the Governor of Western Australia was empowered to establish a bank for the purpose of promoting the occupation, cultivation, and improvement of the agricultural lands of the colony. This Act was amended from time to time until a consolidating Act was passed in the year 1906 repealing all previous enactments on the subject. Under this last Act the bank was placed under the control of three trustees, appointed by the Governor, in whom is vested the the whole of the bank property. The necessary funds are provided for by the issue of mortgage bonds bearing interest at a rate not exceeding 4 per cent. per annum.

(i.) *Purposes for which Advances may be made.* The bank is authorised to make advances for (a) ringbarking, clearing, fencing, draining, or water conservation; (b) for discharging any existing mortgage; or (c) for the purchase of stock for breeding purposes.

(ii.) *Amount of Loans.* Advances may be made to an amount not exceeding £300 up to the full value of the improvements proposed to be made. Further advances may be made to an amount not exceeding £200 up to half the value of additional improvements proposed to be made. No advance, however, for the purpose of discharging existing mortgages may be made to an amount exceeding three-quarters of the value of improvements already made, and the total advances to any one person may not at any time exceed £500. Not more than £100 may be advanced to any person for the purpose of purchasing stock. Advances are made only on a first mortgage, but a second mortgage may be taken as collateral security.

(iii.) *Repayment of Loans.* During the five years following the date of the loan the borrower pays interest only, at the rate of 5 per cent. per annum. After the expiration of that period the amount advanced, with interest at 5 per cent., must be repaid within twenty-five years by equal half-yearly instalments. In the case of advances for the purpose of buying stock the bank fixes the time and manner of repayment.

(iv.) *Particulars of Transactions of Agricultural Bank, 1904-6.* Under the previous Acts, now repealed, loans up to three-fourths of the estimated value of proposed improve-

ments were paid over by the bank in progress payments as the improvements were completed. The following table gives particulars of transactions under these Acts for each year from 1904 to 1906, inclusive. Particulars of transactions under the Act of 1906 are not yet available.

PARTICULARS OF TRANSACTIONS UNDER THE AGRICULTURAL BANK ACTS, WESTERN AUSTRALIA, 1894 TO 1905, FOR EACH YEAR FROM 1904 TO 1906, INCLUSIVE.

AMOUNTS ADVANCED FOR WHICH IMPROVEMENTS HAVE BEEN EFFECTED—

Year ended the 30th June.	Amounts advanced.	Clearing.	Cultivating.	Ring-barking.	Fencing.	Drain-ing.	Wells and Reser-voirs.	Build-ings.	Total.
	£	£	£	£	£	£	£	£	£
1904	215,000	243,870	60,454	10,787	17,265	1,675	9,861	33,168	377,080
1905	297,600	310,602	67,342	12,454	21,243	2,012	12,355	44,203	470,211
1906	394,164	398,376	86,837	17,044	30,805	2,596	15,482	57,005	608,145

LOANS APPROVED FOR WHICH IMPROVEMENTS WERE IN PROGRESS—

	£	£	£	£	£	£	£	£	£
1904	95,650	78,018	23,314	2,488	6,079	897	7,857	11,234	129,887
1905	91,306	75,268	22,025	3,984	8,363	741	6,771	11,996	129,148
1906	117,511	110,126	33,297	7,469	15,008	695	7,969	14,313	188,877

The following table gives particulars as to the amount of loans raised and repaid, the number and amount of applications received and granted, and the amounts lent and repaid for each year from 1904 to 1907, inclusive :—

WESTERN AUSTRALIA.—PARTICULARS OF TRANSACTIONS OF AGRICULTURAL BANK FOR EACH FINANCIAL YEAR, 1905-7.

Particulars.	1905.	1906.	1907.
Loans raised ... .. £	*	*	*
" repaid ... .. £	*	*	*
" outstanding ... .. £	*	*	*
Applications received ... .. No.	971	1,270	1,970
" .. .. Amount, £	140,275	171,750	278,625
Applications granted ... .. No.	795	1,073	1,604
" .. .. Amount, £	102,875	127,725	211,675
Amounts advanced ... .. £	83,479	95,782	131,271
" repaid ... .. £	22,586	23,917	34,201
" outstanding ... .. £	251,600	323,465	420,535

\* Information not available.

## § 19. Ensilage.

1. **Value to Stockowners.**—The use of ensilage as a substitute for green fodder during periods of drought or spells of dry weather, or for winter use, is less extensive in Australia than the circumstances would appear to warrant. There is, however, a growing disposition on the part of dairy farmers to make silos on their holdings, as they find that dairy cattle eat ensilage greedily, and that by its means the output of milk, both in regard to quantity and quality, may be kept up long after the supply of ordinary green food is exhausted. Sheepbreeders are also recognising the fact that during protracted periods of dry weather the silo enables them to keep their stock in good condition, and

lambling can take place satisfactorily. Ensilage thus obviates the expense of travelling or trucking sheep for hundreds of miles to get beyond the drought area, or the equally costly and even ruinous alternative of providing chaff for food at high prices and costly freight. By the judicious economising of the surplus growth of green food with the use of the silo farmers and squatters can carry more stock on their holdings than they otherwise would be justified in doing. Not only is the great waste of superabundant food thus avoided, but it becomes possible to change into a succulent and nutritious food much growth that in any other state would not be eaten by their stock. Thus such vegetation as marsh mallows, thistles, weeds of all sorts, and even the swamp reed, *Arundo phragmites*, which grows in great quantities in lagoons, billabongs, and swamps, are all eaten with avidity when offered to stock in the form of ensilage. The pit and stack silos are rapidly being superseded by those built of red gum and hardwood or concrete. This is found to a great extent to obviate the loss sustained by mould, at the same time reducing the risk of fire. These silos vary in capacity from forty to 130 tons.

**2. Government Assistance in the Production of Ensilage.**—The Government of Victoria, recognising the fact that defective methods of making ensilage have often been adopted, leading to partial or total failure, is making special efforts to educate the farming community in this respect, so that this community may avoid mistakes and better appreciate the conditions essential for the production of good ensilage. These vary with the climatic conditions and with locality. The Government is also undertaking the erection of silos on very liberal terms, repayment extending over three years. Experts supervise the erection of the silos and give practical lessons as to packing them, etc. With the exception of Victoria none of the other States have taken steps to assist the farmers financially, though some of them are making inquiries with the view of ultimately doing so where required.

**3. Quantity Made.**—Particulars concerning the number of silos and the quantity of ensilage made in the several States of the Commonwealth in the years 1901-2 to 1906-7 are furnished in the table given hereunder:—

COMMONWEALTH ENSILAGE-MAKING, 1901-2 TO 1906-7.

State.	1901-2.		1902-3.		1903-4.		1904-5.		1905-6.		1906-7.	
	Silos.	Ensilage Made.	Silos.	Ensilage Made.	Silos.	Ensilage Made.	Silos.	Ensilage Made.	Silos.	Ensilage Made.	Silos.	Ensilage Made.
New South Wales ...	No. 147	Tons. 7,563	No. 79	Tons. 3,212	No. 290	Tons. 21,393	No. 300	Tons. 12,609	No. 160	Tons. 9,321	No. 210	Tons. 10,581
Victoria† ...	125	5,065	111	4,703	290	10,931	300	12,779	160	7,240	210	10,581
Queensland ...	*	*	*	*	*	1,735	*	1,735	*	1,199	*	3,201
South Australia ...	87	2,933	98	1,582	107	2,217	120	2,765	125	3,286	*	*
Western Australia...	51	613	17	280	60	559	34	1,127	24	552	23	525
Tasmania ...	*	*	*	*	*	*	*	*	*	*	*	*
Commonwealth ...	...	116,174	...	19,777	...	135,100	...	§1,015	...	§21,598	...	...

\* Figures not available. Ensilage is made in small quantities in Tasmania, though no returns have been published.

† In the case of Victoria the number of holdings is given, which will approximately represent the number of silos.

‡ Exclusive of Queensland and Tasmania.

§ Exclusive of Tasmania.

It will be noted that since the last drought greater attention has been paid to ensilage than heretofore, and though the quantity made in 1905-6 shews a falling-off this does not necessarily indicate that the quantity on hand is less, as owing to the favourable season pasturage has been very abundant, and consequently the ensilage on hand has not been availed of to as great an extent as would be the case under less propitious circumstances.



## § 20. Fertilisers.

1. **General.**—In the early days of settlement and cultivation in the Commonwealth scientific cultivation was in a much less developed state than to-day. The early farmers were neither under the necessity, nor were they as a rule aware of the need, of supplying the constituents to the soil demanded by each class of crop. The widely-divergent character of the soils in the Commonwealth, their degeneration by repeated cropping, the limitations of climatic conditions, the difficulties of following any desired order of rotation of crops, all rendered it necessary to give attention to artificial manuring. The introduction of the modern seed-drill, acting also as a fertiliser distributor, has greatly facilitated the use of artificial manures, and much land formerly regarded as useless for cultivation has now been made available. There is reason to believe that this feature will be even more strikingly characteristic of the future.

2. **Fertilisers Acts.**—In order to protect the interests of users of artificial manures an Act has been passed in each of the States, Tasmania excepted, regulating the sale and preventing the adulteration of fertilisers. The following is a list of such Acts:—

New South Wales ...	The Fertilisers Act of 1904.
Victoria ...	The Artificial Manures Acts of 1904 and 1905.
Queensland...	The Fertilisers Act of 1905.
South Australia ...	The Fertilisers Act of 1900; amended 1903.
Western Australia ...	The Fertilisers and Feeding Stuffs Act of 1904; amended 1905.

As regards their main features these several Acts are practically identical. The words "fertiliser" or "manure" mean any substance containing nitrogen, phosphoric acid, or potash, manufactured, produced, or prepared in any manner for the purpose of fertilising the soil or supplying nutriment to plants, but do not include farm-yard or stable manure or similar articles in their natural or unmanufactured state. The Acts provide that every vendor of fertilisers shall, within a stated period, forward to the Secretary of Agriculture, or corresponding officer, samples of the fertilisers on sale by him, together with the distinctive name or brands by which they are known, and the price at which he intends to sell during the year. On every bag, package, or bundle of fertiliser sold, or exposed for sale, he must attach a printed label shewing thereon:—

- (i.) The number of net pounds of fertiliser in such bag or parcel;
- (ii.) The figure or trade mark attached to the fertiliser and intended to identify it;
- (iii.) The proportion per centum of nitrogen, phosphoric acid, and potash contained therein.

In addition to the above the vendor must furnish every purchaser with an invoice certificate, signed by himself or his agent, stating his full name and place of business and the quality of the fertiliser sold.

Any officer or analyst appointed under the Acts may enter any manufactory, warehouse, store, vessel, wharf, railway station, conveyance, or other place where fertiliser is manufactured, stored, exposed for sale, or in course of delivery or transit, and demand and take samples of such fertiliser. Every sample so taken must be divided by such officer into three parts, and each marked, sealed and fastened by him in the presence of the person in charge, and disposed of as follows:—

- (i.) One part to be taken by person in charge.
- (ii.) One part to be used for analysis.
- (iii.) One part to be retained by the officer for future comparison.

Every buyer of fertiliser is entitled to submit a sample of such to the analyst appointed under the Act, and receive a certificate of the analysis of such. If the analysis prove it to be under what it is represented to be, the vendor must pay the cost of analysis.

3. **Imports.**—The local production of artificial manures falls short of the existing demand, and large quantities are consequently imported.

The steadily increasing demand for artificial manures appears in the following table:—

IMPORTS OF FERTILISERS, 1901 TO 1906.

Fertiliser.		1901.	1902.	1903.	1904.	1905.	1906.		
Bonedust	Cwt.	94,680	94,387	1,588,803 246,746	1,710,028 287,024	64,241	80,625		
"	£	22,050	18,741			15,849	20,094		
Guano	Cwt.	262,866	449,236			534,573	818,580		
"	£	35,151	64,801			68,088	103,953		
Superphosphates	Cwt.	895,904	795,091			1,240,403	1,153,249		
"	£					192,178	170,514		
Rock superphos.	Cwt.	158,195	131,955			306,592	547,079		
"	£					38,327	70,782		
Other	Cwt.					33,736	84,979		
"	£					10,126	24,659		
Total	cwt.	1,253,450	1,338,714	1,588,893	1,710,028	2,179,545	2,684,512		
	£	215,396	215,497	246,746	287,024	324,568	390,002		

The increase of imports alone of fertilisers has been over 100 per cent. during the six years of Federation. The chief item, both as regards quantity and value, is superphosphates, a fertiliser suitable for the growing of cereals in Australian soils. The greater quantity of this manure is manufactured in the United Kingdom, whence comes nearly 70 per cent. of the total imported during 1906. Belgium, Germany and the Netherlands also contribute, and of recent years Japan has also joined in the market. Guano is imported chiefly from Ocean Island, one of the South Sea group, and in lesser quantities from Malden Island and the United States of America. Ocean Island is also the principal contributor of rock phosphates, next in order being Christmas Island and the Straits Settlements. India has practically a monopoly of the bonedust trade with the Commonwealth; only a very small amount comes from the United Kingdom and Belgium.

**4. Production.**—Statistics relating to the fertiliser manufactories of the Commonwealth, which in 1906 only numbered fourteen (exclusive of bone-mills), are not available, but the output is, as yet, very small in comparison with that which is imported.

The great increase in the wheat production of the Commonwealth during the years 1901 to 1906, viz., from thirty-eight million to sixty-six million bushels, though due mainly to favourable seasons, is also in no inconsiderable measure contributed to by better agriculture and the increasing use of superphosphates and other artificial manures. It has been urged that superphosphates tend to deprive the soil of its moisture, but long continued experiments have disposed of such a view, and have shewn on the contrary that through the decay of the larger roots which result from its use, there is a resulting increase of moisture in the soil.

**5. Statistics of Use of Fertilisers.**—The only statistics available in connection with the use of manures in the Commonwealth are those of Victoria and Western Australia. Particulars concerning the former State are given hereunder:—

FERTILISERS USED IN VICTORIA, 1901 TO 1906.

Season.	Total Area of Crops.	Farmers Using Manure.	Area Manured.		Manure Used.	
			Aggregate.	Percentage to Total Area of Crop.	Natural (Stable-yard, etc.).	Artificial.
	Acres.		Acres.		Tons.	Tons.
1901-2	2,965,681	11,439	556,777	18.77	153,611	23,535
1902-3	3,246,568	18,537	1,099,686	33.87	206,676	36,630
1903-4	3,389,069	19,921	1,205,443	35.57	207,817	41,639
1904-5	3,321,785	20,167	1,521,946	45.82	190,903	45,940
1905-6	3,219,962	21,586	1,791,537	55.64	210,507	54,674
1906-7	3,303,586	23,072	1,985,148	60.09	205,906	60,871

The marked increase in the percentage of the area on which manure is used to the total area under crop is apparent in the above table, and ample proof of the value of the use of fertilisers is afforded by the fact of that percentage having increased from 19 per cent. in 1901 to 60 per cent. in 1906. Corresponding particulars relative to Western Australia for the past three seasons are given in the following table, and furnish interesting evidence of the rapid extension of the use of manures in that State:—

FERTILISERS USED IN WESTERN AUSTRALIA, 1904 TO 1906.

Season.	Total Area of Crops.	Area Manured.		Manure Used.	
		Aggregate.	Percentage to Total Area of Crops.	Natural (Stable-yard, etc.).	Artificial.
	Acres.	Acres.		Loads.	Tons.
1904-5 ...	327,391	205,923	63.90	72,523	10,787
1905-6 ...	364,704	257,469	70.60	83,033	12,676
1906-7 ...	460,825	340,401	73.87	81,653	16,127

## § 21. Graphical Representation.

1. **Areas of Principal Crops.**—A graphical representation of the areas in the Commonwealth devoted to each of the leading crops from 1860 to the present time is furnished on page 357.

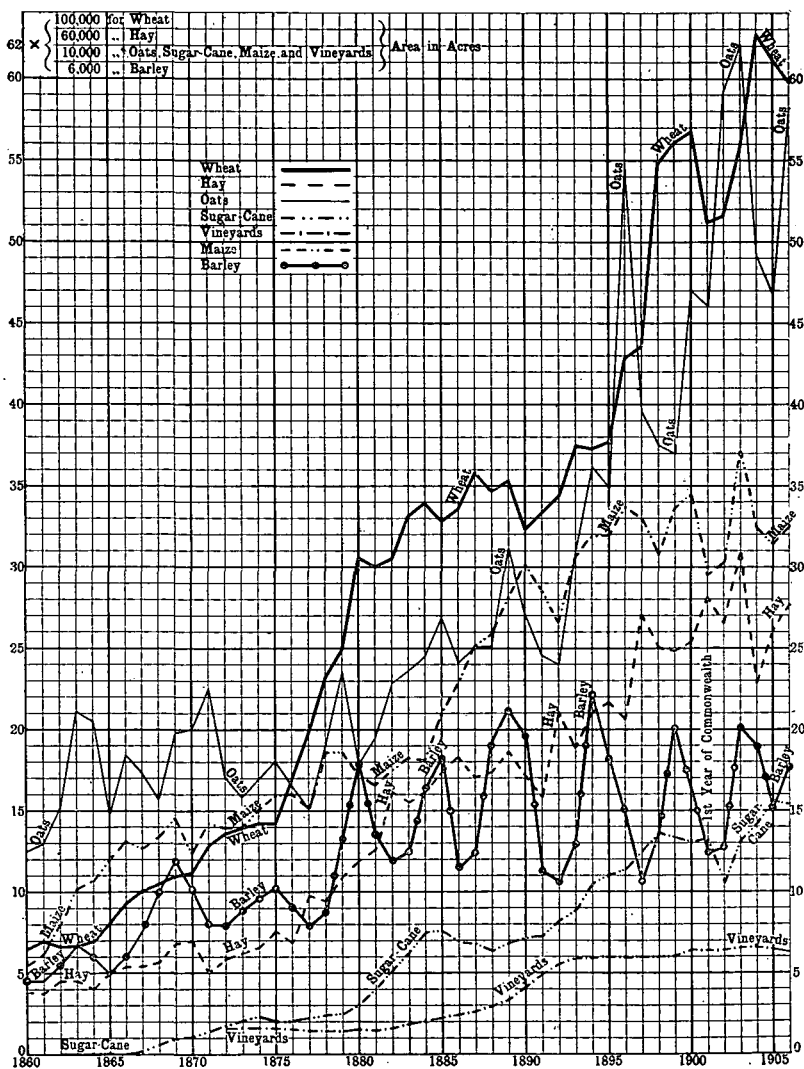
(i.) *Wheat.* In the case of wheat, the Commonwealth's principal crop, the graph indicates that the forty-six seasons under review divide themselves naturally into five distinct periods, three of moderate and fluctuating increases and two of extremely rapid increases. Thus, between the seasons 1860-1 and 1875-6, a moderate rate of increase was in evidence, the area increasing from 640,000 to 1,420,000 acres. During the five succeeding seasons a very rapid increase took place, the total in 1880-1 amounting to over 3,000,000 acres. For fifteen years thereafter the increase in area was not large, and in two seasons, viz., 1885-6 and 1890-1, marked decreases were experienced. The total increase for the fifteen years was about 700,000 acres, the total for 1895-6 being rather more than 3,750,000 acres. The succeeding five years witnessed a rapid increase in area to a total of more than 5,600,000 acres, followed by a further period of marked fluctuations; this latter period, however, contained the season of maximum wheat-cropping, viz., 1904-5, when an area of 6,270,000 acres was so devoted.

(ii.) *Hay.* Hay-growing, which, next to the growing of wheat for grain, is the most important branch of agriculture in the Commonwealth, will be seen from the graph to have fluctuated very considerably from year to year during the period under review, these fluctuations being due in the main to seasonal variations and to variations in the relative prices of grain and hay crops. It will be seen that the features of the graphs are a moderate increase from 1860-1 to 1875-6, a fairly rapid increase from 1875-6 to 1882-3, moderate increase thence to 1896-7, succeeded by marked fluctuations from this point onwards with, on the whole, a moderate rate of increase. The maximum area under hay was reached in the season 1903-4, when a total of 1,850,000 acres was attained.

(iii.) *Oats.* The graph relating to oats exhibits extremely marked fluctuations from year to year in the area devoted to this crop, the general tendency, however, being towards increase. This feature was specially marked from 1892-3 to 1896-7, while the succeeding years were characterised by very extensive fluctuations. The maximum area under oats was reached in the season 1903-4, with a total of more than 620,000 acres.

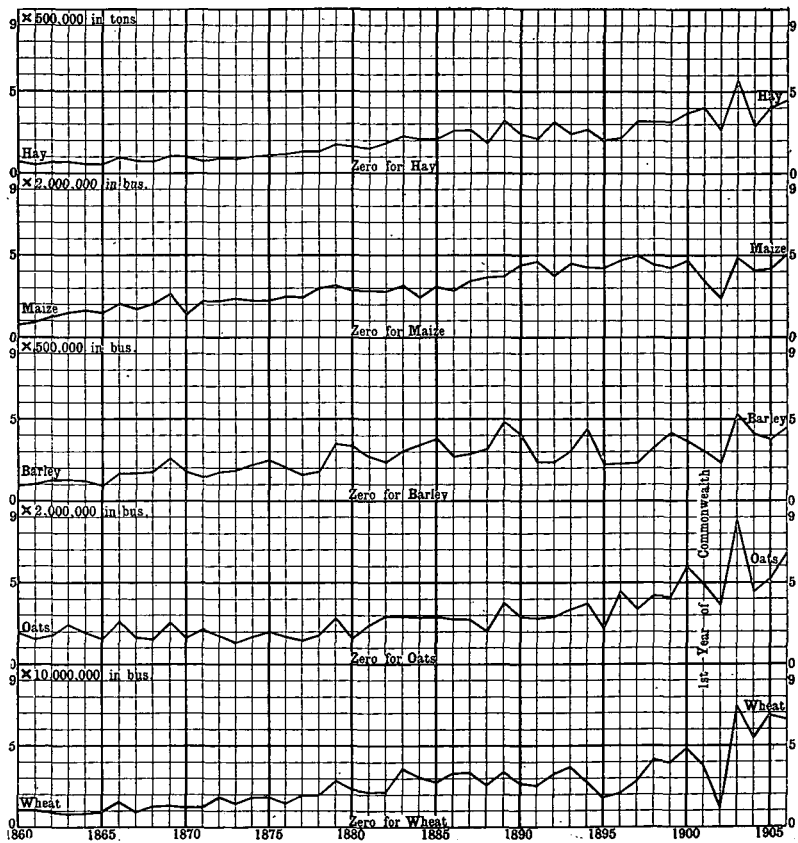
(iv.) *Maize.* The graph relating to maize indicates that the area devoted thereto in Australia, although somewhat fluctuating, increased with fair rapidity until the season

GRAPHS SHEWING THE AREA UNDER THE PRINCIPAL CROPS IN THE COMMONWEALTH FROM 1860-1 TO 1906-7.



EXPLANATION OF GRAPHS.—The base of each small square represents an interval of one year, while the vertical height represents a number of acres, varying with the nature of the crop in accordance with the scale given in the upper left-hand corner of the diagram. The height of each graph above the base line denotes, for the crop to which it relates, the total area grown in the Commonwealth during the successive seasons.

GRAPHS SHEWING THE PRODUCTION OF THE PRINCIPAL CROPS IN THE COMMON-  
WEALTH FROM 1860-1 TO 1906-7.



EXPLANATION OF GRAPHS.—In this diagram a separate base line is provided for each of the crops dealt with. In each instance the base of a small square represents an interval of one year. the vertical height of such square representing in the case of the wheat graph, 10,000,000 bushels; oats, 2,000,000 bushels; barley, 500,000 bushels; maize, 2,000,000 bushels; and hay, 500,000 tons. The height of each graph above its base line denotes the aggregate yield in the Commonwealth of that particular crop during the successive seasons.

1896-7, since when it has varied above and below the point then reached, on the whole remaining practically stationary. The area for the season 1906-7 was, in fact, somewhat less than that for 1896-7. The maximum area under maize, viz., 372,000 acres, was attained in the season 1903-4.

(v.) *Sugar-Cane.* In the case of sugar-cane the graph shows a fairly rapid rate of increase to 1874-5, followed by a period of five years during which the area increased but slowly. From 1879-80, however, the sugar-cane area rose rapidly until in 1884-5 a total of more than 75,000 acres was reached. Then followed a period of diminished cultivation, and it was not until 1892-3 that so high a total was again attained. After this the area rose rapidly to 136,000 acres in 1898-9, but during the next five years a decline took place, the area for 1903-4 being 132,000 acres. A marked decline was in evidence in 1902-3, and a corresponding recovery in 1903-4. The season of maximum area, viz., 156,000 acres, was 1905-6.

(vi.) *Barley.* The Commonwealth barley crop, although not an extensive one, is yet one which has exhibited from time to time very marked fluctuations in area. The graph representing this crop is consequently a very irregular line. The total has, on the whole, increased but slightly since 1880, rapid increases in certain years being succeeded by equally rapid decreases in subsequent years. The maximum area under barley, viz., 133,000 acres, was attained in the season 1894-5.

(vii.) *Vines.* The graph relating to area under vines, from 1872-3 onwards, indicates that there were two periods of very slow increase, one from 1872-3 to 1881-2, the other from 1893-4 onwards. Between these, viz., from 1881-2 to 1893-4, a moderate rate of increase of area was experienced, the total for the Commonwealth advancing during that time from 14,600 acres to 57,400. The season of maximum area under vineyards was 1904-5, with a total of about 65,700 acres.

2. **Production.**—The diagram on page 358 furnishes a graphical representation of the aggregate yields from 1860-1 to 1906-7 of five of the principal crops of the Commonwealth.

(i.) *Wheat.* This graph brings out clearly the fact that while on the whole the production of wheat in the Commonwealth is increasing with fair rapidity, the fluctuations in the total quantity produced are more marked in recent than in earlier years. Thus since the year 1890 there have been three seasons of extremely low output, viz., in 1891-2, 1895-6, and 1902-3, with aggregate yields respectively of 25,700,000 bushels, 18,300,000 bushels, and 12,400,000 bushels. On the other hand there have been three seasons in which the total production was exceptionally high. These will be seen from the graph to have been the seasons 1893-4, 1900-1, and 1903-4, the total yields for which were 37,100,000 bushels, 48,400,000 bushels, and 74,100,000 bushels respectively. Each of these yields represented at the date of its attainment the maximum Australian wheat crop, the last mentioned being the highest yet reached.

(ii.) *Oats.* From 1860-1 to 1880-1 the oat crop of the Commonwealth, although exhibiting from year to year fluctuations more or less marked, gave no indication of a tendency to increase with the advance in population. This is well shewn in the diagram, by the persistence with which the oats graph for this period adheres to the line denoting 4,000,000 bushels, the yield for 1880-1 being actually lower than that for 1860-1. From this latter season to 1894-5 the variation was on a somewhat higher level, and is shewn in the diagram to have been in the vicinity of the line representing 6,000,000 bushels. From this point onwards a tendency to more rapid increase in production is in evidence, obscured somewhat by extensive fluctuations corresponding to those referred to above in the case of wheat. Thus in 1895-6 and 1902-3 the total yields were only 4,400,000 and 7,300,000 bushels respectively, while in 1900-1 and 1903-4 aggregates respectively of 12,000,000 and 17,500,000 bushels were reached, this latter being the maximum oat crop of the Commonwealth.

(iii.) *Barley.* The Australian barley crop will from the graph be seen to have fluctuated very considerably throughout, these variations being due rather to fluctuations in the area sown than to adverse seasons. From 1879-80 to 1902-3 the curve rises above and falls below the line representing 1,500,000 bushels. For more recent years the graph bears evidence of an increasing, though still fluctuating, output. The maximum barley crop of the Commonwealth was that of 2,660,000 bushels in 1903-4.

(iv.) *Maize.* The maize graph indicates a rapid increase in output from 1860-1 to 1869-70, followed by a moderate increase from the latter season to 1886-7, and a further rapid increase to 1891-2. From the last mentioned season onwards the production has fluctuated considerably, but little increase has, on the whole, been experienced, the total for 1891-2 being 9,300,000 bushels as compared with 10,200,000 bushels for 1906-7, the maximum Australian maize crop. As in the case of all other crops, the maize yield for 1903-4 was much higher than those for the years immediately preceding and succeeding.

(v.) *Hay.* The graph relating to the Commonwealth output of hay indicates a fairly continuous increase in production from the season 1860-1, when the total stood at 340,000 tons, to that of 1887-8 when it reached 1,330,000 tons. In subsequent years marked fluctuations have been in evidence, but the tendency has, on the whole, been one of increase. The maximum hay crop of the Commonwealth was that of the season 1903-4, when the total production reached 2,900,000 tons. The yield for 1906-7, viz., 2,260,000 tons, was higher than for any season except 1903-4.