

SECTION VIII.

AGRICULTURAL PRODUCTION.

NOTE.—Except where otherwise stated, the "agricultural" years hereinafter mentioned are taken as ending on the 31st March.

I. 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 that locality 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 60 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. At the end of 1850 the area under cultivation in Victoria, which was then the Port Phillip District of New South Wales, was 52,190 acres.

The 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; the area under cultivation in New South Wales decreased by nearly 66,000 acres, while in Tasmania a falling-off of over 41,000 acres was experienced. 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 totalled over a million acres. The largest increase took place in Victoria, which returned an area of 299,000 acres. For the same year 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 crop in each of the Commonwealth States and Territories at quinquennial intervals since 1860 and during each of the last two seasons. The area under permanent 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, 1860-61 to 1912-13.

Season.	New South Wales.	Victoria.	Queens- land.	South Australia.	W. Aust.	Tas- mania.	N.T.	Fed. Terr.	Common- wealth.
	Acres.	Acres.	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
1905-6	2,840,235	3,219,962	522,748	2,255,569	364,704	230,237	...	...	9,433,455
1910-11	3,386,017	3,952,070	667,113	2,746,334	855,024	286,920	360	...	11,893,838
1911-12	3,628,513	3,640,241	526,388	2,965,338	1,072,653	270,000	375	3,509	12,107,017
1912-13	3,737,085	4,079,356	668,483	3,062,998	1,199,991	286,065	330	3,741	13,038,049

The increase in the area under crop during the past twelve years has been most marked in the case of New South Wales, Western Australia and Victoria, the respective increases being 1,291,521, 998,653, and 965,224 acres. During the same period an increase of 693,318 acres was experienced in South Australia, 211,086 in Queensland, and 61,713 acres in Tasmania. The total area under crop in the Commonwealth increased during the period by 4,225,586 acres, and the total for 1912-13 was the highest ever attained by the Commonwealth. During the past seven seasons the percentage of increase was particularly high in Western Australia, viz., 229 per cent. South Australia and New South Wales had an increase of 35½ and 31½ per cent., while Victoria, Queensland and Tasmania added to their areas under crop to the extent of 26½, 26¼ and 24¼ per cent. respectively.

3. **Relation to Population.**—From the following table it will be seen that for the Commonwealth as a whole the area under crop has, during the seasons under review, with the exception of 1911-12, increased at a rate which is somewhat greater than that

at which the population of the Commonwealth has increased. This relatively greater increase is in evidence in all the States, being most marked in the case of Western Australia, which has now a larger area under crop per head of population than any State except South Australia. Details for 1901-2 and for the past five seasons are as follows:—

TOTAL AREA UNDER CROP PER 1000 OF POPULATION.

Season.	N.S.W.	Vic.	Q'land	S. Aust	W. Aus.	Tas.	Northern Territory	Federal Terr	C'wth.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1901-2 ...	1,656	2,451	954	6,224	1,123	1,327	...	...	2,200
1908-9 ...	1,740	2,769	962	6,018	2,254	1,405	...	...	2,327
1909-10 ...	1,971	2,865	1,050	6,440	2,718	1,419	...	...	2,538
1910-11 ...	2,060	3,037	1,114	6,750	3,089	1,480	109	...	2,688
1911-12 ...	2,169	2,671	846	7,091	3,646	1,396	115	1,827	2,650
1912-13 ...	2,102	2,955	1,050	7,122	3,920	1,451	95	1,928	2,755

4. **Relation to Total Area.**—The next table furnishes a comparison of the area under crop in the Commonwealth and the several States and Territories, with the respective total areas. For the Commonwealth as a whole, the area under crop represented for 1912-13 only about one acre in every 146. In Victoria the area under crop was about one acre in every 14, in New South Wales one in 53, in Tasmania one in 59, in South Australia one in 79, in Western Australia one in 520, in Queensland one in 642, in the Northern Territory one in 1016, and in the Federal Territory one in 156.

PERCENTAGE OF AREA UNDER CROP TO TOTAL AREA OF EACH STATE AND OF COMMONWEALTH FOR SEASONS 1901-2 and 1908-9 to 1912-13.

Season.	N.S.W.	Vic.	Q'land.	S. Aust.	W. Aus.	Tas.	Northern Territory	Federal Terr.	C'wth.
	%	%	%	%	%	%	%	%	%
1901-2 ...	1.147	5.273	0.113	0.919	0.035	1.386	...	...	0.442
1908-9 ...	1.368	6.155	0.125	0.955	0.094	1.605	...	...	0.520
1909-10 ...	1.601	6.505	0.141	1.040	0.116	1.633	...	...	0.576
1910-11 ...	1.705	7.026	0.155	1.129	0.137	1.710	0.0001	...	0.625
1911-12 ...	1.832	6.472	0.123	1.219	0.172	1.609	0.0002	0.609	0.636
1912-13 ...	1.887	7.253	0.156	1.259	0.192	1.705	0.0001	0.641	0.685

5. **Artificially-Sown Grasses.**—In all the States considerable areas are devoted to artificially-sown grasses, frequently sown on uncultivated land after burning off. Statistics regarding the area under such grasses are as shewn hereunder:—

AREA UNDER SOWN GRASSES, 1901-2 and 1908-9 to 1912-13.

Season.	New South Wales.	Victoria.	Queensland.	South Australia	Western Australia	Tasmania.	Fed. Terr.	Commonwealth.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1901-2	467,839	162,954	34,679	23,510	3,711	314,422	...	1,007,115
1908-9	807,924	1,029,711	82,784	23,297	10,265	491,422	...	2,445,403
1909-10	888,937	988,671	108,438	23,343	9,017	439,450	...	2,457,856
1910-11	1,055,303	991,195	140,196	26,416	8,348	493,233	...	2,714,691
1911-12	1,119,738	1,041,772	166,175	30,431	5,760	505,940	50	2,869,866
1912-13	1,152,399	1,085,346	205,363	30,377	5,168	508,714	50	a 2,987,419

(a) Including 2 acres Northern Territory.

The considerable increase in the area of the grass lands of the Commonwealth is due in large measure to the great development of the dairying industry which has taken place during the last ten years, and which is referred to in the succeeding section. The areas contained in the above table relate in most cases to grasses sown for grazing purposes on uncultivated land, generally after burning off, and are consequently not included with "area under crop."

§ 3. Relative Importance of Crops.

1. **Various Crops.**—In the following table are furnished details concerning the areas in the several States under each of the principal crops for the season 1912-13:—

DISTRIBUTION OF CROPS IN AUSTRALIA, 1912-13.

Crop.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	N.T.	Fed. Terr.	Total for C'wealth
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Wheat	2,230,500	2,085,216	124,963	2,079,633	793,096	25,226	3	1,014	7,339,651
Oats	84,979	439,242	4,232	155,545	127,645	62,445	...	196	874,284
Maize	176,665	19,936	117,993	...	25	...	35	56	314,936
Barley—									
Malting	13,189	52,311	7,400	52,769	2,384	7,824	1	2	135,880
Other	3,720	19,320	2,047	16,195	3,242	978	...	5	45,507
Beans and Peas	399	11,875	60	9,308	1,364	17,362	14	...	40,382
Rye	3,069	1,428	103	1,027	681	858	...	13	7,179
Other Cereals ... ..	...	...	1	2	4	...	50	...	57
Hay	914,725	1,203,728	87,643	647,069	231,630	99,839	10	2,337	3,217,041
Green Forage	154,272	84,460	135,354	39,954	7,339	6,304	60	13	427,756
Grass Seed ... ..	...	2,429	1,845	45	...	3,028	...	...	7,347
Orchards&other									
Fruit Gardens	49,329	63,209	18,556	23,905	19,540	30,575	...	60	205,174
Vines—									
Productive	7,414	19,234	1,325	21,353	2,392	...	...	...	51,718
Unproductive	749	5,345	103	3,855	618	...	...	...	10,670
Market Gardens	9,836	10,414	2,386	2,857	3,664	1,458	50	11	30,676
Sugar Cane—									
Productive	6,137	...	78,142	...	...	...	1	...	84,280
Unproductive	7,777	...	63,510	...	...	...	...	...	71,287
Potatoes... ..	34,720	47,575	11,675	8,581	5,175	24,612	5	31	132,374
Onions	205	4,977	53	288	61	52	...	...	5,636
Other root crops	383	2,632	796	310	254	4,216	...	...	8,646
Tobacco	1,914	138	692	...	...	...	1	...	2,745
Broom Millet	1,828	474	391	...	...	...	...	...	2,693
Pumpkins and									
Melons	4,174	2,632	6,122	...	731	...	...	3	13,662
Hops ... ..	...	131	...	5	...	1,247	...	...	1,383
All other crops	1,096	2,550	3,091	121	86	41	100	...	7,085
Total Area...	3,737,085	4,079,356	668,483	3,062,998	1,199,991	286,065	330	3,741	13,038,049

2. **Relative Areas of Crops in States and Territories.**—Taking the principal crops, *i.e.*, those in the case of which the cultivation amounts to more than 50,000 acres in the Commonwealth, the proportion of each in the various States and Territories to the total area under crop for the season 1912-13 is shewn in the next table. In four of the States, *viz.*, New South Wales, Victoria, South Australia, and Western Australia, wheat-growing for grain is by far the most extensive form of cultivation, while in each of these States the hay crop is second in importance. In New South Wales maize ranks third, but in Victoria, South Australia, and Western Australia, and also in the Commonwealth as a whole, the oat crop occupies third position. In Queensland, on the other hand, the three principal crops in the order of importance are sugar cane, green forage, and wheat, while in Tasmania hay, oats, and orchards occupy the leading positions. For the Commonwealth as a whole, the wheat, hay, and oat crops represent nearly 88 per cent. of the total area under crop.

PROPORTION OF AREA UNDER CHIEF CROPS, 1912-13.

Crop.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	N. T.	Federal Terr.	C'wealth
	%	%	%	%	%	%	%	%	%
Wheat ...	59.69	51.12	18.69	67.89	66.09	8.82	0.91	27.10	56.29
Hay ...	25.28	29.51	13.11	21.13	19.31	34.90	3.03	62.47	24.67
Oats ...	2.27	10.77	0.63	5.08	10.64	21.83	...	5.24	6.71
Maize ...	4.73	0.49	17.65	0.01	...	...	10.61	1.50	2.42
Green Forage	4.13	2.07	20.25	1.30	0.61	2.20	18.18	0.35	3.28
Orchards and Fruit G'dens	1.32	1.55	2.78	0.78	1.63	10.69	...	1.60	1.57
Sugar Cane...	0.37	...	21.19	...	...	...	0.30	...	1.19
Potatoes ...	0.93	1.17	1.75	0.28	0.43	8.60	1.52	0.83	1.02
Barley ...	0.45	1.75	1.41	2.25	0.47	3.08	0.30	0.19	1.39
Vineyards ...	0.22	0.60	0.21	0.82	0.25	...	...	...	0.48
All Other ...	0.61	0.97	2.33	0.46	0.57	9.88	65.15	0.72	0.98
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

3. Relative Positions of States and Territories in regard to Principal Crops.—

The relative proportion of acreage of the several crops and position regarding them in each State and Territory is shewn in the following table. New South Wales exhibits the largest area under wheat, maize, and green forage; Victoria the leading position in regard to hay, oats, orchards and fruit gardens, potatoes, and barley; and Queensland first in sugar cane and second in maize and green forage. South Australia had the largest area under vineyards, and the second largest area under barley; Western Australia third position in oats and fourth in wheat, hay, and vineyards; while Tasmania was third in regard to potatoes, orchards and fruit gardens.

RELATIVE POSITIONS OF THE SEVERAL STATES AND TERRITORIES IN REGARD TO AREA UNDER EACH OF THE PRINCIPAL CROPS DURING THE SEASON 1912-13.

Crop.	N.S.W.	Vict.	Q'land.	S. Aust.	W. A.	Tas.	N. T.	Federal Terr.	C'with.
Wheat ...	30.39	28.41	1.70	28.34	10.81	0.35	...	...	100.00
position	1	2	5	3	4	6	8	7	
Hay ...	29.37	37.42	2.73	20.11	7.20	3.10	...	0.07	100.00
position	2	1	6	3	4	5	8	7	
Oats ...	9.72	50.24	0.49	17.79	14.60	7.14	...	0.02	100.00
position	4	1	6	2	3	5	8	7	
Maize ...	56.09	6.35	37.46	0.06	0.01	...	0.01	0.02	100.00
position	1	3	2	4	6	7	6	5	
Green Forage	36.06	19.75	31.65	9.34	1.72	1.47	0.01	...	100.00
position	1	3	2	4	5	6	7	8	
Orchards and Fruit Gardens...	24.05	30.81	9.04	11.65	9.52	14.90	...	0.03	100.00
position	2	1	6	4	5	3	8	7	
Sugar Cane	8.97	...	91.03	...	...	...	...	...	100.00
position	2	...	1	...	...	...	...	...
Potatoes ...	26.23	35.94	8.82	6.48	3.91	18.59	0.01	0.02	100.00
position	2	1	4	5	6	3	8	7	
Barley ...	9.32	39.50	5.21	38.02	3.10	4.85	...	...	100.00
position	3	1	4	2	6	5	8	7	
Vineyards ...	13.08	39.40	2.29	40.40	4.83	...	...	...	100.00
position	3	2	5	1	4	...	...	...
All other crops	17.96	31.17	12.19	10.95	5.37	22.17	0.17	0.02	100.00
position	3	1	4	5	6	2	7	8	
Total area under crop	28.66	31.29	5.13	23.49	9.20	2.20	...	0.03	100.00
position	2	1	5	3	4	6	8	7	

4. **Acreege of Principal Crops, Commonwealth.**—The acreage devoted to each of the principal crops in the whole Commonwealth during the last five seasons is shewn below:—

ACREAGE OF CHIEF COMMONWEALTH CROPS, 1908-9 to 1912-13.

Crop.	1908-9.	1909-10.	1910-11.	1911-12.	1912-13.
	Acres.	Acres.	Acres.	Acres.	Acres.
Wheat	5,262,473	6,586,236	7,372,456	7,427,834	7,339,651
Hay	2,452,682	2,228,029	2,258,405	2,518,288	3,217,041
Oats	676,156	698,448	676,688	616,857	874,284
Maize	323,875	364,585	414,914	340,065	314,936
Green Forage	413,511	306,082	374,862	424,440	427,756
Orchards and Fruit Gardens	173,388	178,798	185,156	194,524	205,174
Sugar Cane	140,883	142,261	155,542	144,283	155,567
Potatoes	125,685	137,070	151,515	130,463	128,889
Barley	140,243	143,013	108,424	116,466	181,387
Vineyards	59,450	58,151	59,114	60,602	62,388
All other Crops	122,897	129,626	136,762	133,195	130,976
Total	9,891,243	10,972,299	11,893,838	12,107,017	13,038,049

During the period under review the area devoted to the several crops has varied considerably, that under wheat attaining a maximum in the season 1911-12, and a minimum in 1908-9, while hay reached its maximum area in 1912-13 and its minimum in 1909-10. Of the other crops oats, green forage, orchards and fruit gardens, sugar-cane, barley, and vineyards attained their maximum areas in 1912-13, maize and potatoes in 1910-11.

§ 4. Wheat.

1. **Progress of Wheat-Growing.**—(i.) *Acreege.* 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 1912-13.

Season.	N.S.W.	Victoria.	Q'land.	Sth. Aust.	W. Aust.	Tas.	N. T.	Fed. Terr.	C'wealth.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1860-1	128,829	161,252	196	273,672	13,584	66,450	...	...	643,983
1865-6	181,653	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
1905-6	1,939,447	2,070,517	119,356	1,757,036	195,071	41,319	...	...	6,122,746
1910-11	2,128,826	2,398,039	106,718	2,104,717	581,862	52,242	2	...	7,372,456
1911-12	2,379,968	2,164,066	42,962	2,190,782	612,104	37,208	2	742	7,427,834
1912-13	2,230,500	2,085,216	124,963	2,079,633	793,096	25,226	3	1014	7,339,651

The area devoted in the Commonwealth to the production of wheat for grain was higher for the season 1911-12 than for any previous season. Owing to climatic conditions at the time for sowing, there was a decrease for 1912-13 in New South Wales,

Victoria, South Australia, and Tasmania. In Queensland and Western Australia, however, there was a substantial increase. The maximum area under wheat for grain was attained by the several States in the following seasons:—New South Wales, and South Australia, 1911-12; Victoria, 1910-11; Queensland, 1904-5; Western Australia, 1912-13; and Tasmania, 1897-8. The average area under wheat in the Commonwealth in the past ten seasons was 6,331,361 acres. The past four seasons exceeded this average, while the previous six seasons fell short of it. According to the preliminary reports available it appears that the area of wheat reaped for grain in 1913-14 will exceed that for 1912-13, and will probably exceed 9,000,000 acres.

(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 1912-13.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aus.	Tas.	N. T.	Federal Terr.	C'wealth.
	Bushels.	Bushels.	Bushels.	Bushels.	B'shls.	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	2,870,469	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	9,727,369	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
1905-6	20,737,200	23,417,670	1,137,321	20,143,798	2,308,305	776,478	...	...	68,520,772
1910-11	27,913,547	34,813,019	1,022,373	24,344,740	5,897,540	1,120,744	20	...	91,111,983
1911-12	25,080,111	20,891,877	285,109	20,352,720	4,358,904	659,615	20	7,991	71,636,347
1912-13	32,466,506	26,223,104	1,975,505	21,496,216	9,168,594	630,315	...	20,830	91,981,070

Notwithstanding the decrease of area under wheat, the harvest of 1912-13 was a very satisfactory one, exceeding that of the previous season by 20,344,723 bushels, an average increase of 2.89 bushels per acre for the Commonwealth as a whole.

The harvest of 1910-11 was the largest ever reaped in the Commonwealth, and exceeded by 3,130,913 bushels that of 1912-13, the next largest harvest; the 1909-10 yield was 90,413,597 bushels, these being the only three occasions on which a yield exceeding 90,000,000 bushels has been obtained. The prospects for the forthcoming harvest of 1913-14 are very good, and it appears probable that the aggregate yield for the season will approximate 110,000,000 bushels. For latest particulars to date of going to press, see Appendix.

(iii.) *Average Yields.* In the next table will be found the average yield of wheat per acre in each of the seasons 1901-2 and 1908-9 to 1912-13 and for the decennium:—

YIELD OF WHEAT PER ACRE, 1901-2 and 1908-9 to 1912-13.

Season.	N.S.W.	Vic.	Q'land.	S. Aus.	W Aus.	Tasmania.	N. T.	Fed. Terr.	C'wealth
	Bushels.	B'shls.	B'shls.	B'shls.	B'shls.	B'shls.	B'shls.	B'shls.	B'shls.
1901-2	10.64	6.91	19.40	4.60	10.10	21.86	...	...	7.54
1908-9	11.11	13.12	14.87	11.45	8.63	24.08	...	...	11.89
1909-10	14.34	13.72	13.41	13.26	12.48	21.41	...	...	13.73
1910-11	13.11	14.52	9.58	11.57	10.14	21.45	10.00	...	12.90
1911-12	10.54	9.65	6.64	9.29	7.12	17.73	10.00	10.77	9.64
1912-13	14.56	12.58	15.81	10.34	11.56	24.99	...	20.54	12.53
Average for 10 seasons	12.06	11.67	12.60	10.30	10.45	19.93	5.71	16.41	11.37

As the above figures shew, there were considerable variations in the average yields, chiefly due of course to the vagaries of the season.

For the Commonwealth as a whole the average yield for 1912-13 of 12.53 bushels per acre was 1.16 above the average yield of 11.37 per acre during the last ten seasons. The highest average yield for any State was in Tasmania with 24.99 bushels per acre. Queensland, New South Wales, and Victoria produced an average of 15.81, 14.56, and 12.58 respectively. Western Australia and South Australia had an average yield of 11.56 and 10.34 bushels per acre respectively, the former being 1.11 and the latter 0.04 above the average for the decennium.

(iv.) *Relation to Population.* During the seasons embraced in the following table, the Commonwealth's production of wheat per head of population has varied between 3½ bushels in 1902-3 and 21½ bushels in 1910-11. The State in which wheat-growing occupies the most important position relatively to population is South Australia, which in 1909-10 had a yield which averaged close upon 64 bushels per head. Queensland is the State in which the average production of wheat per head is least. Particulars for 1901-2 and the past five seasons are as follows:—

AUSTRALIAN WHEAT PRODUCTION PER 1000 OF POPULATION.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	N. T.	Fed. Terr.	C'wealth.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bush'ls.	Bush'ls.	Bushels.
1901-2	10,766	10,023	3,340	22,299	4,943	5,499	...	...	10,082
1908-9	9,915	18,670	2,159	50,275	9,477	3,655	...	...	14,789
1909-10	17,679	22,537	2,720	63,971	21,087	4,110	...	...	20,910
1910-11	16,981	26,750	1,707	59,835	21,304	5,783	6	...	21,494
1911-12	14,993	15,330	485	48,671	14,817	3,409	6	4,056	15,955
1912-13	18,265	18,995	3,104	49,981	29,950	3,196	...	10,737	19,433

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, ranging from Belgium with a maximum of 38½ bushels per acre, to Tunis with a minimum of 5½ bushels per acre. Australia with approximately 9½ occupies a subordinate position; it must be remembered, however, that in this year, the yield is much below the average. (See table on previous page.)

AVERAGE YIELD OF WHEAT IN VARIOUS COUNTRIES, 1911.

Country.	Average Yield in bushels per acre.	Country.	Average Yield in bushels per acre.
Belgium ...	38.67	Italy ...	16.39
Netherlands ...	37.58	Servia ...	16.04
New Zealand ...	36.73	Spain ...	15.30
United Kingdom ...	32.96	United States ...	12.16
Sweden (1910) ...	32.48	India ...	12.02
Germany ...	30.63	Algeria ...	11.08
Bulgaria ...	26.06	Uruguay ...	10.96
Canada ...	20.80	Portugal ...	9.78
Egypt ...	21.69	Argentine Republic ...	9.75
Hungary ...	20.77	Australia ...	9.64
Japan ...	20.32	Russia in Asia ...	7.09
France ...	19.47	Russia in Europe ...	6.99
Rumania ...	19.05	Tunis ...	5.76
Austria ...	19.01		

3. *Wheat Crops of the World.*—The latest available official statistics of the production of wheat in various countries are given in the following table:—

WHEAT YIELD OF VARIOUS COUNTRIES, 1911.

Country.	Yield in Bushels.	Country.	Yield in Bushels.
United States ...	602,448,000	United Kingdom ...	64,313,456
Russia in Europe ...	445,642,680	Austria ...	57,046,056
India ...	366,930,664	Algeria ...	36,586,160
France ...	304,486,872	Egypt ...	28,940,368
Canada ...	215,851,296	Japan ...	24,848,808
Italy ...	192,343,080	Servia ...	15,307,488
Hungary ...	190,188,672	Belgium ...	14,612,520
Argentine Republic ...	166,144,864	Portugal ...	11,846,400
Germany ...	149,370,040	Uruguay ...	8,754,400
Spain ...	148,454,776	Tunis ...	8,078,128
Russia in Asia ...	116,082,176	New Zealand† ...	7,913,403
Rumania ...	90,827,264	Sweden ...	7,699,176
Bulgaria ...	71,984,576	Netherlands ...	5,340,736
Australia * ...	71,636,347	Denmark ...	4,298,976

* 1912—91,981,070. † 1912—5,179,626.

Various estimates of the total quantity of wheat produced in the world have been made. That furnished by the United States Department of Agriculture gives the following figures for the five years 1908 to 1912 :—

WORLD'S PRODUCTION OF WHEAT.

Year ...	1908.	1909.	1910.	1911.	1912.
Production ...	1,000,000 bushels. 3,085	1,000,000 bushels. 3,472	1,000,000 bushels. 3,466	1,000,000 bushels. 3,432	1,000,000 bushels. 3,844

In this estimate the figures given for Australia and New Zealand relate to the agricultural year ending on 31st March in the year specified.

For the five years referred to, the Australian production of wheat aggregated 364,409,000 bushels, thus representing slightly over 2 per cent. of the world's production. The total quantity of wheat produced in the British Empire during the same period of five years was approximately 3,105,000,000 bushels, so that the Australian production of wheat represented 11½ per cent. of that of the British Empire, while the British Empire production represented 18 per cent. of the world's total.

4. Prices of Wheat.—(i.) *British Wheat.* Since the United Kingdom is the largest importer of Australian wheat, the price of wheat in the British markets is a matter of considerable interest to the local producer. The table below gives the average prices per Imperial quarter realised for British-grown wheat :—

PRICES OF BRITISH WHEAT PER QUARTER, 1861 to 1912.

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	1905 ...	29 8	32 3	26 8
1871 ...	56 8	60 0	52 6	1906 ...	28 3	30 9	25 9
1881 ...	45 4	55 2	40 9	1907 ...	30 7	36 3	26 0
1891 ...	37 0	41 8	32 3	1908 ...	32 0	35 6	30 5
1901 ...	26 9	27 8	25 8	1909 ...	36 11	44 9	31 4
1902 ...	28 1	31 8	24 10	1910 ...	31 8	33 9	29 0
1908 ...	26 9	30 3	24 11	1911 ...	31 8	33 4	30 0
1904 ...	28 4	30 6	26 3	1912 ...	34 9	39 2	29 10

(ii.) *Australian and other Wheat.* 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 five 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,
1908 TO 1912.**

Country.	Average Price per Imperial Quarter.					Country.	Average Price per Imperial Quarter.				
	1908.	1909.	1910.	1911.	1912.		1908.	1909.	1910.	1911.	1912.
	s. d.	s. d.	s. d.	s. d.	s. d.		s. d.	s. d.	s. d.	s. d.	s. d.
Australia ...	37 7	41 5	37 2	34 10	33 5	Germany ...	33 7	38 3	36 11	33 6	36 8
Russia ...	38 3	39 3	35 7	33 4	37 6	Bulgaria ...	35 10	...	32 11	35 1	36 4
Rumania ...	38 5	40 9	34 2	34 7	37 3	United States ...	36 2	38 6	37 3	34 9	35 9
British India ...	37 8	40 8	35 5	33 7	37 0	Argentina ...	35 6	39 9	34 11	33 4	35 6
Chile... ..	35 1	39 1	33 7	33 0	36 9	Canada ...	35 1	39 3	36 9	34 10	35 2

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

EXPORT VALUES OF AUSTRALIAN WHEAT, 1903 to 1912.

Particulars.	1903.	1904.	1905.	1906.	1907.	1908.	1909.	1910.	1911.	1912.
Price per bushel	3s. 1d.	3s. 2d.	3s. 5d.	3s. 3d.	3s. 4d.	4s. 1d.	4s. 2d.	4s. 2d.	3s. 6d.	3s. 11d.

The export values here shewn are the average declared values for the successive years at the several ports of shipment in the Commonwealth.

5. Imports and Exports of Wheat and Flour.—(i.) *Quantities.* The table hereunder shews the imports, exports, and net exports of wheat and flour during 1901 and 1908 to 1912. 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. During 1903 the Commonwealth imports of wheat and flour were equivalent to 12,607,940 bushels of wheat. This importation was necessitated by the failure of the crop in the preceding season. In ordinary seasons the import of wheat and flour is negligible. During the past five years the export has ranged between 20,867,538 bushels in 1908 and 63,942,390 bushels in 1911, the net exports for that period averaging 43,717,000 bushels.

IMPORTS AND EXPORTS OF WHEAT AND FLOUR, COMMONWEALTH,

1901 AND 1908 TO 1912.

Year.	Imports.			Exports.			Net Exports.
	Wheat.	Flour.	Total.	Wheat.	Flour.	Total.	
	Bushels	Eq Bshls. ¹	Bushels.	Bushels	Eq. Bshls. ¹	Bushels.	Bushels.
1901	22,992	302,550	325,542	20,260,058	4,840,700	25,100,758	24,775,216
1908	142	8,900	9,042	15,027,388	5,840,150	20,867,538	20,858,496
1909	128	4,000	4,128	31,549,498	6,498,450	38,047,948	38,043,820
1910	325	8,600	8,925	47,761,895	6,997,300	54,759,195	54,750,270
1911	113	12,150	12,263	55,147,840	8,794,550	63,942,390	63,930,127
1912	1,483	7,300	8,783	32,604,248	3,404,700	41,008,948	41,000,165

1. Equivalent in bushels of wheat.

(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 1908-12. 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 ports, the countries in which these ports are cannot be properly considered as the ultimate destination of the whole of the wheat said to be exported to them.

EXPORTS OF WHEAT FROM THE COMMONWEALTH, 1908 to 1912.

Country to which Exported.	1908.	1909.	1910.	1911.	1912.	Total for Five Years.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
U. Kingdom	11,538,962	26,030,722	36,998,625	37,475,188	23,099,670	135,143,167
Sth. African Union ...	2,475,283	3,234,603	3,001,145	2,458,780	1,784,382	12,954,193
Canary Is.*	...	238,410	3,280,215	4,756,647	3,107,257	11,382,529
France ...	19,542	24,803	918,815	5,468,993	53,773	6,485,926
Peru ...	253,865	627,417	1,270,360	1,594,610	1,201,682	4,947,934
Belgium ...	40,810	120,237	1,174,210	1,639,140	1,414,263	4,388,660
Chile ...	75,617	...	102,025	477,573	...	655,215
Japan ...	57	61,448	231,320	99,560	42,550	434,935
Germany ...	...	40,403	290,905	255,740	556,508	1,143,556
India ...	485,078	101,135	...	...	...	586,213
China ...	...	42	...	...	...	42
Italy ...	...	483,783	54,140	...	488,697	1,026,620
Egypt ...	70,045	...	...	156,485	427,988	654,518
Philippine I. ...	...	178,153	...	152	1,667	179,972
New Zealand	31,622	72,130	8,410	12,247	1,695	126,104
New Caledonia ...	722	3,275	470	642	1,400	6,509
Ceylon ...	510	308	820	1,325	1,487	4,450
Other Countries ...	35,275	332,629	430,435	750,758	421,229	1,970,326
Total ...	15,027,388	31,549,498	47,761,895	55,147,840	32,604,248	182,090,869

* For orders.

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

EXPORTS OF FLOUR FROM THE COMMONWEALTH, 1908 to 1912.

Country to which Exported.	1908.	1909.	1910.	1911.	1912.	Total for Five Years.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Sth. African Union	23,662	24,460	29,535	35,136	23,420	136,213
United Kingdom	13,545	33,128	23,323	24,616	34,406	129,018
Java ...	13,492	13,346	18,808	30,964	26,138	102,748
Portuguese East Africa ...	17,689	16,496	22,517	8,421	3,807	68,930
Philippine Islands	9,790	11,803	9,359	16,634	14,507	62,093
Straits Settlements	5,665	6,250	12,374	22,036	13,551	59,876
Hong Kong ...	481	1,511	1,742	5,687	1,743	11,164
New Zealand	14,464	5,439	3,148	2,818	1,465	27,334
New Caledonia ...	4,056	3,897	4,049	4,174	3,582	19,758
Mauritius ...	3,461	3,090	2,894	1,974	1,107	12,526
Ceylon ...	2,716	2,257	2,287	3,046	3,483	13,789
China ...	363	300	816	1,656	1,552	4,687
Fiji ...	...	1,810	1,760	2,230	2,168	7,968
Japan ...	1	337	815	269	404	1,826
Other Countries ...	7,418	5,845	6,519	16,230	18,752	54,764
Total ...	116,803	129,969	139,946	175,891	150,085	712,694

During the five years under review the export of wheat to the United Kingdom totalled 135,143,167 bushels, or about 74 per cent. of the total export for the period. On the other hand, the export of flour to the United Kingdom aggregated only 129,018 tons, or about 18 per cent. of the total export. During the five years the heaviest exports of flour have been to South Africa, the United Kingdom, Java, Portuguese East Africa, the Philippine Islands, the Straits Settlements, and New Zealand.

(iii.) *Exports of Wheat and Flour.* From the foregoing returns it will be seen that the quantity of Australian wheat exported in the form of flour during the past five years represents, on the average, slightly over 16 per cent. of the total equivalent in wheat exported as wheat or flour from the Commonwealth. One cause of this, and probably the chief one, is the fact that Australian wheats are in considerable demand with the English millers for mixing purposes, while the Australian flour has not, up to the present, received that consideration from the English bakers which its admitted qualities undoubtedly merit. Steps which have recently been taken to bring these qualities before the British public may possibly have the effect of increasing the proportion of wheat exported in the form of flour.

A point of some interest in connection with the export of wheat, and one which bears also on the proportions of wheat and flour exports just referred to, is that concerning the quantity of phosphoric acid which this export has the effect of removing from the Commonwealth, and the necessity which exists for the return to the soil of this substance in some form.

According to an estimate furnished by the chemist to the New South Wales Department of Agriculture (F. B. Guthrie, Esq., F.C.S., etc.), the proportions of milled product from a bushel (60 lbs.) of wheat are, approximately, 42 lbs. of flour, 9 lbs. of bran, and 9 lbs. of pollard, while the percentage of phosphoric acid contained 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.

During the past ten years the net exports from the Commonwealth of wheat and its milled products have amounted to 291,542,756 bushels of wheat, 1,234,131 tons of flour, and 5,592,443 bushels of bran, pollard, and sharps. On the basis of the figures quoted above this export would contain no less than 150,000,000 lbs. of phosphoric acid, the value of which as a fertiliser would be about £930,000.

(iv.) *Local Consumption of Wheat.* The estimated consumption of wheat as human food and for seed purposes in the Commonwealth during the past eight years is given in the following tables:—

WHEAT USED FOR HUMAN CONSUMPTION IN THE COMMONWEALTH.

Year.	Flour Milled.	Net Exports of Flour.		Net Quantity Available for Home Consumption.		Net Quantity Available per Head of Population.	
		Flour.	Flour in Biscuits Exp'd.	Flour.	Equivalent in Terms of Wheat.	Flour.	Equivalent in Terms of Wheat.
	Tons.	Tons.	Tons.	Tons.	Bushels.	Tons.	Bushels.
1905 ...	596,908	153,206	1,100	442,602	22,130,100	.1106	5.531
1906 ...	613,923	166,005	1,570	446,348	22,317,400	.1099	5.496
1907 ...	652,135	163,064	1,840	487,231	24,361,550	.1182	5.908
1908 ...	552,388	116,625	1,810	433,953	21,697,650	.1035	5.173
1909 ...	603,688	129,887	1,980	471,819	23,590,950	.1104	5.519
1910 ...	649,282	139,774	2,340	507,168	25,358,400	.1161	5.803
1911 ...	691,301	175,649	2,570	513,082	25,654,100	.1143	5.713
1912 ...	677,053	149,954	2,820	524,279	26,213,950	.1129	5.644
Aggregate 8 years ...	5,036,678	1,194,166	16,030	3,826,482	191,324,100	.1120	5.601

**ESTIMATED QUANTITY OF WHEAT USED FOR SEED PURPOSES IN THE
COMMONWEALTH.**

Year.	Wheat for Seed Purposes.		
	Quantity.	Per Acre.	Per Head of Population.
	Bushels.	Bushels.	Bushels.
1905	6,747,000	.946	1.686
1906	6,664,000	.954	1.641
1907	6,261,000	.960	1.518
1908	6,429,000	.962	1.533
1909	7,322,000	.960	1.713
1910	8,332,000	.966	1.907
1911	8,282,000	.922	1.844
1912	8,484,000	.919	1.827
Aggregate for 8 years	58,521,000	.947	1.713

In addition to the above there is to be taken into consideration grain fed to poultry and other live stock. This, doubtless, varies in quantity from year to year according to the prices current for wheat, and other causes. No data is available on which to base an estimate of actual quantity so consumed. The flour available for human consumption necessarily fluctuates from year to year coincident with stocks being heavy or light. In 1907 the flour available per head of population, after deducting net exports from quantity milled, shewed a substantial increase over the average for the previous two years, this, however, being counterbalanced for by a decline in the following year. The average quantity of flour consumed per annum for the eight years under consideration was 0.112 tons per head of population, this, when expressed in equivalent terms in wheat, representing 5.6 bushels. The estimates of quantity of grain used for seed purposes have been based on data supplied by the Agricultural Departments of the several States, giving average quantities of seed used per acre for wheat sown either for grain, hay or green fodder. The average annual quantity thus used during the eight years was 1.7 bushels per head of population, and 0.947 bushels per acre sown.

6. **Value of the Wheat Crop.**—The estimated value of the wheat crop in each State and in the Commonwealth during the season 1912-13 is shewn below :—

VALUE OF THE WHEAT CROP,* 1912-1913.

Particulars.	N.S.W.	Vic.	Q'land.	S. Aust.	W. Aust.	Tas.	Fed. Terr.	C'w'lth.
	£	£	£	£	£	£	£	£
Aggregate value	5,877,791	4,698,306	493,876	3,851,477	1,604,504	115,557	3,771	16,645,282
Value per acre	£2/12/8	£2/5/1	£3/19/0	£1/17/0	£2/0/6	£4/11/7	£3/14/5	£2/5/4

* Exclusive of the value of straw.

§ 5. Oats.

1. **Progress of Cultivation.**—Oats comes next in importance to wheat amongst the grain crops cultivated last season, but while wheat grown for grain accounted for over 56 per cent., oats represented only 6½ per cent. of the area under crop in the Commonwealth. The progress of cultivation of oats since 1860 is shewn in the table hereunder, and more fully in the graphs hereinafter:—

CULTIVATION OF OATS, 1860-1 to 1912-13.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Federal Terr.	C'wealth.
	Acres.	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
1905-6	38,543	312,052	533	56,950	15,713	42,776	...	466,567
1910-11	77,991	392,681	2,537	77,674	61,918	63,887	...	676,688
1911-12	70,943	302,238	557	107,881	77,488	57,583	167	616,857
1912-13	84,979	439,242	4,232	155,545	127,645	62,445	196	874,284

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

COMMONWEALTH OAT CROP, 1860-1 to 1912-13.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	Fed. Terr.	C'wealth.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bush'ls	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	...	3,980,875
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
1905-6	883,081	7,232,425	5,858	869,146	233,987	1,200,024	...	10,474,521
1910-11	1,702,706	9,699,127	50,469	1,136,618	776,233	2,063,303	...	15,423,456
1911-12	1,152,827	4,585,326	5,783	1,349,480	961,385	1,504,633	2,337	9,561,771
1912-13	1,669,259	8,323,639	82,420	1,673,503	2,105,812	2,257,258	4,816	16,116,712

The principal oat-growing State of the Commonwealth is Victoria. During the past five seasons it has produced about 58 per cent. of the total quantity of oats grown in the Commonwealth; Tasmania, New South Wales, South Australia, and Western Australia come next in order of importance. In New South Wales and Tasmania, the highest production of oats for any season was that of 1909-10, while Victoria experienced a maximum yield in 1903-4, and Queensland, South Australia and Western Australia in 1912-13. For the Commonwealth as a whole the record yield was that of 17,541,210 bushels in the season 1903-4, while the yields of 16,248,857 and 16,116,712 for 1908-9 and 1912-13 respectively, rank second and third.

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 in each of the seasons 1901-2 and 1908-9 to 1912-13, and also for the decennium, are given in the succeeding table:—

AVERAGE YIELD OF OATS PER ACRE.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Fed. Terr.	C'wealth.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bush'ls	Bushels
1901-2	21.31	20.43	27.50	13.54	16.78	31.48	...	21.22
1908-9	18.70	26.50	21.60	16.31	12.43	34.35	...	24.03
1909-10	24.14	20.60	17.93	14.17	17.02	32.93	...	21.10
1910-11	21.83	24.70	19.89	14.63	12.54	32.30	...	22.80
1911-12	16.25	15.17	10.38	12.51	12.41	26.13	13.99	15.50
1912-13	19.64	18.95	19.48	10.76	16.50	36.15	24.57	18.43
Average for 10 Seasons	19.83	21.67	20.06	12.55	14.90	30.82	19.71	20.75

The smallest average yield per acre for the Commonwealth for the past ten-year period was that experienced in the season 1907-8, being 14.29, while the largest was that of the season 1903-4, amounting to 28.25 bushels per acre.

4. **Relation to Population.**—The State in which oat production occupies the most important position in relation to population is Tasmania, the yield for that State representing for 1912-13 about 11½ bushels per head, as compared with 3½ bushels per head for the Commonwealth as a whole. Particulars for the seasons 1901-2 and 1908-9 to 1912-13 are furnished in the succeeding table :—

OAT PRODUCTION PER 1000 OF POPULATION.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Federal Territory.	C'wealth
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1901-2	500	5,558	83	1,306	845	9,734	...	2,559
1908-9	717	8,897	70	3,318	2,847	10,150	...	3,339
1909-10	1,219	6,197	87	3,077	4,698	12,156	...	3,408
1910-11	1,036	7,453	84	2,794	2,804	10,646	...	3,487
1911-12	689	3,365	9	3,227	3,268	7,777	1,217	2,093
1912-13	939	6,029	129	3,891	6,879	11,446	2,482	3,405

5. **Value of Oat Crop.**—The estimated value of the oat crop of the several States of the Commonwealth for the season 1912-13 is as follows :—

VALUE OF OAT CROP,* 1912-13.

Particulars.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Fed. Terr.	C'wealth.
Aggregate value	£250,389	£1,014,443	£17,514	£167,351	£236,904	£263,347	£722	£1,950,670
Value per acre	£2/8/11	£2/6/2	£4/2/9	£1/1/6	£1/17/1	£4/4/4	£3/13/8	£2/4/7

* Exclusive of the value of straw.

6. **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, 1906, 1908, and 1912. The quantities and values of oats imported into and exported from the Commonwealth during the years 1901 and 1908 to 1912 are given hereunder :—

COMMONWEALTH IMPORT AND EXPORT OF OATS, 1901 and 1908 to 1912.

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
1908	1,401,870	206,283	67,058	10,594	1,334,812	195,689
1909	320,543	32,607	339,258	35,375	18,715	2,768
1910	19,510	2,232	129,490	14,893	109,980	12,661
1911	4,522	639	391,465	46,493	386,943	45,854
1912	2,939,325	398,114	106,275	14,688	2,833,050	383,426

Note. — signifies net imports.

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

7. **Oatmeal, etc.**—Importations of oatmeal, etc., into the Commonwealth take place principally from the United Kingdom, the United States, and Canada. The total importations of oatmeal, wheatmeal, and rolled oats during 1912 amounted to 759,072 lbs., and represented a value of £9509.

8. **Comparison 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, 1911.

Country.	Quantity of Oats produced	Country.	Quantity of Oats produced	Country.	Quantity of Oats produced.
	Bushels		Bushels.		Bushels
United States ...	894,264,000	Hungary ...	78,505,888	Rumania ...	25,411,728
Russian Empire ...	716,516,032	Sweden ...	61,501,000	New Zealand ...	19,663,056
Germany ...	435,380,480	Argentina ...	56,738,872	Netherlands ...	17,176,056
Canada ...	303,548,168	Denmark ...	39,644,536	Bulgaria ...	16,771,504
France ...	295,043,096	Belgium ...	33,921,816	Algeria ...	9,918,520
United Kingdom ...	162,933,336	Italy ...	33,609,872	Australia* ...	9,561,771
Austria ...	130,966,040	Spain ...	27,773,744	Norway ...	8,475,576

* 1912—16,116,713 bushels.

9. **Comparison of Yields.**—The average yield per acre of oats in Australia is a somewhat low 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, with the exception of Denmark, Sweden and Norway, for which particulars are not available, according to the magnitude of the average yield of oats for the year 1911, the results are as follows:—

YIELD OF OATS PER ACRE, 1911.

Country.	Average per Acre.	Country.	Average per Acre.	Country.	Average per Acre.
	Bushels.		Bushels.		Bushels.
Belgium ...	56.06	Canada ...	32.87	United States ...	23.68
Netherlands ...	50.32	France ...	29.57	Argentina ...	22.28
New Zealand ...	48.73	Austria ...	28.23	Algeria... ..	22.14
Germany ...	40.73	Hungary ...	27.08	Spain	21.91
United Kingdom... ..	40.22	Italy	26.46	Australia* ...	15.50
Bulgaria	37.56	Rumania	25.63	Russian Empire... ..	13.53

* 1912—18.43 bushels.

10. **Price of Oats.**—The average wholesale prices of oats in the markets of the several capitals for the year 1912 are given in the following table:—

AVERAGE WHOLESALE PRICE OF OATS PER BUSHEL, 1912.

Particulars.	Sydney.	Melbourne.	Brisbane.	Adelaide.	Perth.	Hobart.
Average price per bushel ...	s. d. 3 6	s. d. 3 3	s. d. 4 3	s. d. 2 11	s. d. 3 3	s. d. 3 2

§ 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 1912-13 being 294,658 acres, or nearly 94 per cent. of the total for the Commonwealth. Of the balance, Victoria contributed 19,986 acres, South Australia 176 acres, Western Australia 25 acres, and the Northern Territory 35 acres. The climate of Tasmania prevents the growing of maize for grain in that State. In South Australia prior to 1908 particulars concerning maize had not been 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, from 1875 onwards, is given in the following table, and 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 fluctuated somewhat during the succeeding seventeen years, it may be considered to have remained at about that figure. The greatest divergence during the period occurred in 1903-4, when a record total of 371,906 acres was harvested. For 1908-9 and the two following seasons a continuous increase in the area devoted to maize was in evidence, and the total of 414,914 acres for 1910-11 is the highest ever attained. The unfavourable weather conditions during 1911-12 resulted in the acreage under maize for that season being reduced by 74,849 acres as compared with its predecessor; the 1912-13 season shewed a further slight decline.

AREA UNDER MAIZE, 1875-6 to 1912-3.

Season.	N.S.W.	Victoria.	Queensland.	South Aust.	W. Aust.	N. T.	Fed. Terr.	C'wealth.
	Acres.	Acres.	Acres.	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
1905-6	189,353	11,785	113,720	...	43	...	...	314,901
1910-11	213,217	20,151	180,862	*619	46	19	...	414,914
1911-12	167,712	18,223	153,916	97	29	19	69	340,065
1912-13	176,665	19,986	117,993	176	25	35	56	314,936

* Particulars for years prior to 1907-8 not available.

3. **Total Yield.**—The average yield per acre of this cereal for the season 1912-13 was not so high as that obtaining for some of the previous years, but compared favourably with the average for the decade, being only 1.22 bushels below the decennium average. The 1910-11 crop was a record one, and exceeded 13,000,000 bushels. The average annual production of maize during the last decade was 9,420,770 bushels. Particulars concerning the yield from 1875 onwards are as hereunder:—

MAIZE CROP, 1875-6 to 1912-13.

Season.	N.S.W.	Victoria.	Queensland.	S. Aust.	W. Aust.	N. T.	Fed. Terr.	C'wealth.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	B'shls.	B'shls.	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
1905-6	5,539,750	641,216	2,164,674	...	428	...	...	8,346,068
1910-11	7,594,130	982,103	4,460,306	*6,375	718	449	...	13,044,081
1911-12	4,506,547	792,660	3,637,562	1,490	401	400	795	8,939,855
1912-13	5,111,056	715,299	2,524,371	2,628	470	1,400	934	8,356,158

* Particulars for years prior to 1907-8 not available.

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 seasons, 1901-2 and 1908-9 to 1912-13, and also for the decennium:—

AVERAGE YIELD OF MAIZE PER ACRE, 1901-2 and 1908-9 to 1912-13.

Season.	N.S.W.	Victoria.	Q'sland.	S. Aust.	W. Aust.	N. T.	Fed. Terr.	C'wealth
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	B'shls.	Bushels.
1901-2 ...	22.98	61.42	21.96	*	10.16	...	...	23.86
1908-9 ...	28.85	46.45	21.68	15.57	11.80	...	...	26.72
1909-10 ...	33.36	60.59	18.96	16.00	14.64	...	...	29.54
1910-11 ...	35.62	48.74	24.66	10.30	15.61	23.63	...	31.44
1911-12 ...	26.87	43.50	23.63	15.36	13.83	21.05	11.52	26.29
1912-13 ...	28.93	35.79	21.39	14.93	18.80	40.00	16.68	26.53
Average for 10 Seasons	30.14	51.60	21.79	†13.63	12.88	‡30.81	13.83	27.75

* Particulars not available. † Average for 6 seasons. ‡ Average for 3 seasons.
 ‡ Average for 2 Seasons.

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 1912-13 has been estimated at £1,745,998, made up as follows:—

VALUE OF MAIZE CROP, 1912-13.

Particulars.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	N. T.	Federal Terr.	C'wealth.
	£	£	£	£	£	£	£	£
Aggregate value	979,619	134,119	631,093	526	112	350	179	1,745,998
Value per acre	£5/10/11	£6/14/3	£5/7/0	£2/19/9	£4/9/7	£10/0/0	£3/3/11	£5/10/11

6. **Relation to Population.**—During the past ten seasons the Commonwealth production of maize has ranged between $1\frac{3}{4}$ bushels per head of population in 1912-3 and 3 bushels per head in 1910-11. The production in Queensland, the State in which the maize yield per head of population is highest, ranged during the same period between $3\frac{3}{4}$ bushels per head in 1903-4 and $7\frac{1}{2}$ bushels per head in 1910-11. Details for the several States for the seasons 1901-2 and 1908-9 to 1912-13 are as follows:—

MAIZE PRODUCTION PER 1000 OF POPULATION, 1901-2 and 1908-9 to 1912-13.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	N. T.	Federal Terr.	C'wealth.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1901-2	2,795	509	5,070	*	27	...	...	1,839
1908-9	3,340	520	4,963	49	8	...	...	2,045
1909-10	4,398	907	4,342	9	8	...	...	2,491
1910-11	4,620	755	7,446	16	3	132	...	2,948
1911-12	2,786	596	5,921	4	1	121	447	2,013
1912-13	2,875	518	3,967	6	2	403	481	1,765

* Particulars not available.

7. **Australian and Foreign Maize Production.**—The following table gives the production of maize in Australia and in the leading maize producing countries of the world. The figures shew that of the total production the United States of America was responsible for 73 per cent.

PRODUCTION OF MAIZE IN VARIOUS COUNTRIES, 1911.

Country.	Production of Maize.	Country.	Production of Maize.
	Bushels.		Bushels.
United States ...	2,454,528,000	Bulgaria ...	53,911,424
Argentine Republic ...	276,051,000	Spain ...	26,807,176
Hungary ...	150,294,344	Servia ...	24,747,480
Rumania ...	107,290,736	Canada ...	18,772,696
Russian Empire ...	88,568,816	Austria ...	11,452,864
Italy ...	87,410,640	Australia* ...	9,039,855
Egypt ...	65,131,872		

* 1912, 8,356,158 bushels.

8. **Comparison of Yields.**—The average yield per acre of maize in the Commonwealth of $26\frac{1}{2}$ bushels may be regarded as highly satisfactory when compared with that of other maize producing countries. Canada, Bulgaria, Egypt, and Argentine Republic are the only countries shewing a higher average. The remaining countries shewn in the following table had average yields per acre ranging from $15\frac{1}{2}$ to $23\frac{1}{2}$ bushels.

AVERAGE YIELD OF MAIZE IN VARIOUS COUNTRIES, 1911.

Country.	Average yield per acre.	Country.	Average yield per acre.
	Bushels.		Bushels.
Canada ...	59.39	Italy ...	21.50
Bulgaria ...	34.54	Hungary ...	21.14
Egypt ...	34.17	Rumania ...	20.83
Argentine Republic ...	32.66	Servia ...	17.16
Australia* ...	26.29	Russian Empire ...	16.02
Spain ...	23.42	Austria ...	15.43
United States of America ...	23.19		

* 1912, 26.53 bushels.

9. **Oversea Imports and Exports.**—Except in the years 1902, 1903 and 1912, when many of the maize crops failed, the Commonwealth oversea trade in maize has been practically insignificant. In the first of the years mentioned nearly two million, and in each of the latter two years considerably more than a million bushels were imported. In 1908 and 1909 also, owing to the small harvests of seasons 1907-8 and 1908-9, the imports of maize were largely in excess of the exports. Details of imports and exports for 1901 and the past five years are as follows:—

COMMONWEALTH IMPORTS AND EXPORTS OF MAIZE, 1901 and 1908 to 1912.

Year.	Imports.		Exports.		Net Imports.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value
	Bushels.	£	Bushels.	£	Bushels.	£
1901 ...	188,423	24,764	533	75	187,890	24,689
1908 ...	271,723	49,291	2,018	444	269,705	48,847
1909 ...	628,063	104,367	5,054	999	623,009	103,368
1910 ...	133,730	19,554	12,557	1,904	121,173	17,650
1911 ...	31,764	4,925	19,914	3,438	11,850	1,487
1912 ...	1,133,755	218,233	37,968	8,402	1,095,787	209,831

The principal countries to which maize has been exported from the Commonwealth are South Africa, New Zealand, and China, while the principal countries from which importations have taken place are the United States, the Pacific Islands, South Africa, and Java.

10. **Prepared Maize.**—A fairly large quantity of corn-flour is imported annually into the Commonwealth, the principal countries of supply being the United Kingdom and the United States. During the year 1912 these importations amounted to 437,635 lbs., and represented a value of £6738.

11. **Price of Maize.**—The average wholesale price of maize in the Sydney market is given in the following table for each of the years 1903 to 1912:—

AVERAGE PRICE OF MAIZE PER BUSHEL, 1903 to 1912.

Particulars.	1903.	1904.	1905.	1906.	1907.	1908.	1909.	1910.	1911.	1912.
Average price per bushel...	s. d. 4 1	s. d. 2 4	s. d. 3 3	s. d. 3 0	s. d. 3 2	s. d. 4 7	s. d. 4 2	s. d. 2 11	s. d. 3 0	s. d. 4 8

§ 7. Barley.

1. **Area under Barley.**—The area devoted to barley in the Commonwealth has fluctuated very considerably, though with a tendency to increase during the past few years. The principal barley-growing State is Victoria, which, for the season 1912-13, accounted for 39½ per cent. of the Commonwealth area devoted to this crop; South Australia was next in importance with a percentage of 38 per cent.; the remaining 22½ per cent. being represented by New South Wales, Queensland, Tasmania and Western Australia in the order named. 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 sub-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 1912-13.

Season.	N.S.W.	Victoria.	Q'land.	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
1905-6	9,519	40,938	5,201	26,250	3,665	5,372	90,945
1910-11	7,082	52,687	5,578	34,473	3,369	5,235	103,424
1911-12	10,803	53,541	1,634	40,743	3,664	6,081	116,466
1912-13	16,909	71,631	9,447	68,964	5,626	8,802	*181,387

* Including 1 acre Northern and 7 acres Federal Territory.

2. **Malting and other Barley.**—In recent years the statistics of all the States have distinguished between "malting" and "other" barley. Particulars for the Commonwealth for 1912-13 season are as follows:—

AREA UNDER MALTING AND OTHER BARLEY, 1912-13.

Particulars.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	North. Ter.	Fed. Ter.	C'wealth.
	Acres.	Acres	Acres	Acres.	Acres	Acres	Acres.	Acres.	Acres.
Malting barley	13,189	52,311	7,400	52,769	2,384	7,824	1	2	135,880
Other barley	3,720	19,320	2,047	16,195	3,242	978	...	5	45,507
Total ...	16,909	71,631	9,447	68,964	5,626	8,802	1	7	181,387

It will be seen that, taking the Commonwealth as a whole, about 75 per cent. of the area devoted to this grain in 1912-13 was 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 1912-13 amounted to 3,859,116 bushels, exceeding the yield of the previous season by 1,802,280 bushels. Particulars concerning the yields of the several States from 1875 onwards are as follows:—

COMMONWEALTH BARLEY CROP, 1875-6 to 1912-13.

Season.	N.S.W.	Victoria.	Q'land.	Sth. Aust.	W. 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	1,068,830	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
1905-6	111,266	1,062,139	61,816	505,916	49,497	106,042	1,896,676
1910-11	82,005	1,340,387	83,621	544,471	33,566	142,318	2,226,368
1911-12	129,008	1,024,584	15,369	702,855	37,011	148,009	2,056,836
1912-13	289,562	1,744,527	146,847	1,318,734	93,418	265,903	*3,859,116

* Including 120 bushels, Federal Territory.

4. **Value of Barley Crop.**—The estimated value of the total barley crop of the Commonwealth for the season 1911-12 was £483,151, while that for 1912-13 was £765,643. The extent to which the several States have contributed to the total is shewn in the following table:—

VALUE OF BARLEY CROP,* 1912-13.

Particulars.	N.S.W.	Victoria.	Q'land.	Sth. Aust.	W. Aust.	Tas.	Fed. Terr.	C'wealth.
Total value ...	£68,349	£365,634	£33,040	£232,794	£16,703	£49,099	£24	£765,643
Value per acre	£4/0/11	£5/2/1	£3/9/11	£3/7/6	£2/19/4	£5/11/7	£3/8/7	£4/4/5

* Exclusive of the value of straw.

5. **Relation to Population.**—During the seasons embraced in the following table, the quantity of barley produced in the Commonwealth has averaged about half a bushel per head of population. For the season 1912-13 the production ranged from about 3 bushels per head in South Australia to one-sixth of a bushel in New South Wales. Details for the period are as follows:—

BARLEY PRODUCTION PER 1000 OF POPULATION, 1901-2 and 1908-9 to 1912-13.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	C'wealth.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1901-2 ...	75	573	547	677	179	956	397
1908-9 ...	107	1,209	247	2,140	287	827	679
1909-10 ...	169	801	335	1,760	383	796	563
1910-11 ...	50	1,002	140	1,338	121	734	503
1911-12 ...	78	771	25	1,709	129	778	458
1912-13 ...	163	1,264	231	3,066	305	1,348	815

6. **Commonwealth Imports and Exports.**—The Commonwealth oversea trade in barley is not extensive, and in most years the imports exceed the exports. In 1902, 1903, and 1912, 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 droughts of those periods. In 1904, the excellent crop of the season 1903-4 furnished the material for a heavy exportation to Japan, the total exported thither during that year being 551,821 bushels. In 1909 also a fairly heavy export took place, mainly to the United Kingdom. Particulars of the Commonwealth oversea imports and exports of barley for the years 1901 and 1908 to 1912 are contained in the following table:—

COMMONWEALTH IMPORTS AND EXPORTS OF BARLEY, 1901 and 1908 to 1912.

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
1908 ...	452,462	107,126	1,148	290	—451,314	—106,836
1909 ...	51,332	12,356	188,946	28,774	137,614	16,418
1910 ...	34,684	8,498	39,146	5,155	4,462	— 3,343
1911 ...	218,316	58,922	9,420	1,256	—208,896	— 57,666
1912 ...	546,177	109,466	1,782	322	544,395	—109,144

Note. — signifies net imports.

Only in three years during the period embraced in the above table have the Commonwealth exports of barley exceeded in value the imports, viz., in 1904, 1905, and 1909. During the last ten years the total importations amounted to 2,848,963 bushels, valued at £580,319, and the total exports to 1,109,324 bushels, valued at £142,021, giving a net importation of 1,739,639 bushels in quantity and £438,298 in value.

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 Japan. The total imported during 1912 amounted to only 8377 lbs. in weight, with a value of £102.

From time to time a considerable export trade in Australian pearl and Scotch barley has been carried on, mainly with the United Kingdom and New Zealand, the total exports for 1909 reaching 1,155,346 lbs., valued at £3573, and for 1910, 119,337 lbs., valued at £510. During 1911 and 1912, however, the exports were only 588 lbs., valued at £8, and 712 lbs., valued at £10, respectively.

7. Commonwealth 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, Austria-Hungary, and Germany, but principally from the United Kingdom. Details of imports and exports for the years 1901 and 1908 to 1912 are given hereunder:—

COMMONWEALTH IMPORTS AND EXPORTS OF MALT, 1901 and 1908 to 1912.

Year.	Imports.		Exports.		Net Imports.	
	Quantity.	Value	Quantity.	Value.	Quantity.	Value.
	Bushels.	£	Bushels.	£	Bushels	£
1901	516,135	140,615	...	...	516,135	140,615
1908	210,860	67,219	528	199	210,332	67,020
1909	110,563	35,239	470	174	110,093	35,065
1910	108,168	34,696	258	66	107,910	34,630
1911	102,760	32,798	82	32	102,678	32,766
1912	128,800	45,226	117	48	128,683	45,178

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 1911 are as follow, the Australian figures being added for the sake of comparison:—

PRODUCTION OF BARLEY IN VARIOUS COUNTRIES, 1911.

Country.	Production of Barley.	Country.	Production of Barley.
	Bushels.		Bushels.
Russian Empire ...	417,797,784	Denmark ...	20,205,128
United States ...	155,368,000	Chili ...	15,207,600
Germany ...	139,289,056	Tunis ...	13,429,168
Spain ...	83,297,864	Sweden ...	13,300,648
Hungary ...	72,565,912	Italy ...	10,444,312
Austria ...	67,238,968	Egypt ...	10,409,664
United Kingdom ...	57,803,216	Servia ...	4,423,216
France ...	47,303,408	Belgium ...	4,410,200
Japan ...	46,553,656	Netherlands ...	3,310,000
Algeria ...	45,841,496	Norway... ..	2,470,872
Canada ...	39,015,360	Australia* ...	2,056,836
Rumania ...	25,348,752	New Zealand† ...	1,253,064

* 1912 : 3,859,116 bushels. † 1912: 1,377,610 bushels.

9. **Average Yield.**—The average yield per acre of barley varies considerably in the different States, being as a rule highest in Tasmania and Victoria, and lowest in Western Australia and New South Wales. Details for each State for 1901-2 and the past five seasons, and also for the decennium, are given in the following table:—

AVERAGE YIELD PER ACRE OF BARLEY, 1901-2 and 1908-9 to 1912-13.

Season.	N.S.W.	Victoria.	Q'land.	Sth. Aust.	West Aust.	Tas.	C'wealth.
1901-2 ...	Bushels. 17.16	Bushels. 21.40	Bushels. 23.53	Bushels. 15.68	Bushels. 13.01	Bushels. 27.44	Bushels. 20.40
1908-9 ...	7.50	23.38	18.64	18.39	10.19	24.50	20.49
1909-10 ...	18.07	17.46	14.77	16.50	12.67	24.42	17.04
1910-11 ...	11.58	25.44	14.99	15.79	9.96	27.19	20.53
1911-12 ...	11.94	19.14	9.41	17.25	10.10	24.34	17.66
1912-13 ...	17.12	24.35	15.54	19.12	16.60	30.21	21.28
Average for 10 Seasons ...	15.13	22.03	17.36	17.27	12.54	25.19	19.41

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

AVERAGE PRICE OF BARLEY PER BUSHEL, 1903 to 1912.

Particulars.	1903.	1904.	1905.	1906.	1907.	1908.	1909.	1910.	1911	1912.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Malting barley	3 11	3 6	4 0	4 5	4 8	4 10	3 10	4 1	4 10 $\frac{1}{4}$	5 11 $\frac{1}{2}$
Cape barley ...	3 1	1 9	2 7	2 4	2 8	3 8	2 7	2 5	2 8	4 11

§ 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 1912-13 was 40,382 acres, giving a total yield of 847,633 bushels, or an average of 20.99 bushels per acre, being 1.64 over the average yield for the decennium ended 1912-13, which was 19.35 bushels per acre. The States in which the greatest area is devoted to beans and peas are Tasmania, Victoria and South Australia. The total area under rye in the Commonwealth during the season 1912-13 was 7179 acres, yielding 96,007 bushels, and giving an average of 13.37, this being above the average for the past ten seasons, which is 12.63 bushels per acre. Nearly 44 per cent. of the rye grown during the season was produced in New South Wales, 21 per cent. in Tasmania, and 18 per cent. in Victoria. In addition to these grain crops a small area of rice has for some years been cultivated in Queensland and the Northern Territory. The results obtained, however, have not up to the present been very satisfactory. 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; Tasmania prior to 1909-10 usually ranking second and New South Wales third; the relative positions of these two States have, however, been reversed during the last four seasons. The lower figures for Tasmania relating to 1909-10 and onwards may mainly be attributed to the prevalence of the Irish potato blight in that State; New South Wales, on the other hand, has increased her acreage under this crop from 26,301 acres in 1908-9 to 43,079 in 1911-12, and 34,093 in 1912-13. The area devoted to this crop in the Commonwealth, which has fluctuated somewhat, reached its highest point in the season 1910-11, with a total of 151,515 acres.

The area under potatoes in each State from 1890 onwards is given hereunder :—

COMMONWEALTH AREA UNDER POTATOES, 1890-1 to 1912-13.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Fed. Terr.	C'wealth.
	Acres.	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	43,395	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
1905-6 ...	26,374	44,670	7,170	9,540	2,145	28,634	...	118,533
1910-11 ...	44,452	62,904	8,326	7,812	1,791	26,230	...	151,515
1911-12 ...	43,079	47,692	7,688	7,412	2,705	21,818	69	130,463
1912-13 ...	34,093	47,575	8,822	8,581	5,175	24,612	31	128,889

2. **Total Yield.**—For the season 1912-13, Victoria's production represented about 45½ per cent. of the total for the Commonwealth, New South Wales and Tasmania coming next in order with 22 and 17½ per cent. respectively. 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 1912-13.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Fed. Terr.	C'wealth.
	Tons.	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
1905-6 ...	50,386	115,352	11,308	20,328	6,297	64,606	...	263,277
1910-11 ...	121,033	163,312	15,632	23,920	5,864	70,090	...	399,851
1911-12 ...	75,040	119,092	13,087	22,668	9,312	62,164	126	301,489
1912-13 ...	91,600	191,112	16,386	33,078	13,558	72,565	42	418,341

3. **Average Yield per Acre.**—The suitability of the soil, climate, and general conditions of Tasmania for potato growing is evidenced by the high yields per acre which are almost invariably obtained in the island State, the average yield during the past ten seasons being 3½ tons per acre. The lowest average yield is that obtained in Queensland

with an average of a little under two tons for the same period. Particulars for each State for the seasons 1901-2 and 1908-9 to 1912-13, and also for the past decennium, are given hereunder :—

AVERAGE YIELD OF POTATOES, 1901-2 and 1908-9 to 1912-13.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Federal Terr.	C'wealth.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1901-2	1.50	3.13	2.25	2.41	3.14	4.51	...	2.94
1908-9	2.73	3.19	1.85	2.67	3.30	3.46	...	3.07
1909-10	2.80	2.80	1.76	2.28	3.42	3.46	...	2.82
1910-11	2.72	2.60	1.88	3.06	3.27	2.67	...	2.64
1911-12	1.74	2.50	1.70	3.06	3.44	2.85	1.83	2.31
1912-13	2.69	4.02	1.86	3.85	2.62	2.95	1.35	3.25
Average for 10 Seasons	2.43	2.85	1.88	2.73	2.92	3.76	...	2.88

4. **Value of Potato Crop.**—The estimated value of the potato crop of each State for the season 1912-13 is furnished in the following table, together with the value per acre :—

VALUE OF POTATO CROP, 1912-13.

Particulars.	N.S.W.	Victoria.	Q'land	S. Aust.	W. Aust.	Tas.	Federal Territory.	C'wealth.
Tot. value	£415,784	£764,448	£204,825	£244,856	£111,515	£435,390	£211	£2,177,029
Value per acre ...	£12/3/11	£16/1/4	£23/5/4	£28/10/8	£21/11/0	£17/13/10	£6/16/1	£16/17/10

5. **Relation to Population.**—The average production of potatoes per annum per head of the population of the Commonwealth for the past ten seasons has been approximately 201 lbs. In Tasmania, where this crop is of far greater importance in relation to population than is the case in any other State, the production per head in 1906-7 was nearly a ton, and in 1911-12 about 6½ cwt. Details for the seasons 1901-2 and 1908-9 to 1912-13 are as follow :—

POTATO PRODUCTION PER 1000 POPULATION.

Season.	N.S.W.	Victoria.	Q'land.	Sth. Aust.	W. Aust.	Tas.	Federal Terr.	C'wealth.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1901-2 ...	28	104	44	42	30	655	...	84
1908-9 ...	46	122	21	56	26	634	...	91
1909-10 ...	62	137	23	47	22	382	...	90
1910-11 ...	93	125	26	59	21	362	...	90
1911-12 ...	45	90	21	55	32	327	69	67
1912-13 ...	52	138	26	77	44	368	22	88

6. **Commonwealth 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, the Pacific Islands, and the Philippine Islands. Thus, during 1907, out of a total export of 17,842 tons, 13,346 tons went to New Zealand, 2102 tons to the Pacific

Islands, and 2112 tons to the Philippine Islands. On the other hand, when in 1902, 1903, and 1912, the droughts of those periods had brought about a shortage in some of the States, importations from New Zealand took place to the extent of 11,471 tons and 2279 tons in the former years, and 17,732 tons in the latter year. The quantities and values of the Commonwealth oversea imports and exports of potatoes for 1901 and the past five years are contained in the following table:—

COMMONWEALTH IMPORTS AND EXPORTS OF POTATOES, 1901 and 1908 to 1912

Year.	Imports.		Exports.		Net Exports.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
1901 ...	Tons. 17,655	£ 86,067	Tons. 6,028	£ 45,485	Tons. — 11,627	£ — 40,582
1908 ...	129	1,112	3,375	18,560	3,246	17,448
1909 ...	138	1,202	2,604	16,370	2,466	15,168
1910 ...	1,665	1,313	7,089	42,395	5,424	41,082
1911 ...	245	1,881	1,834	12,241	1,589	10,360
1912 ...	18,151	163,249	1,619	15,331	— 16,532	— 147,918

Note. — signifies net imports.

7. **Comparison with Other Countries.**—The following table will furnish means for comparing the potato crop of Australia for 1911 with those of some of the leading potato-producing countries of the world for the same year:—

POTATO CROPS OF VARIOUS COUNTRIES, 1911.

Country.	Yield.	Country.	Yield.
	Tons.		Tons.
Germany ...	33,821,782	Italy ...	1,665,004
Russian Empire ...	31,403,068	Canada ...	1,650,575
France ...	12,569,422	Sweden ...	1,276,041
Austria ...	11,418,481	Denmark ...	710,418
United Kingdom ...	7,520,168	Japan (1909) ...	589,376
United States ...	7,318,000	Norway ...	533,412
Hungary ...	4,926,338	Australia* ...	301,489
Netherlands ...	2,506,760	New Zealand ...	144,912
Belgium (1909) ...	2,419,648	Luxemburg ...	125,640

* 1912, 418,341 tons.

§ 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 1912-13 being only 17,767 acres. The principal of these crops are onions, mangolds, turnips, and "sweet potatoes" (*Batatas edulis*). Of these, onions are most largely grown in Victoria, mangolds in Tasmania and Victoria, turnips in Tasmania, and sweet potatoes in Queensland. The total area under onions in the Commonwealth during the season 1912-13 was 5636 acres, giving a total yield of 31,947 tons, and averaging 5.67 tons per acre. The area devoted in 1912-13 to root crops other than potatoes and onions, viz., 12,131 acres, yielded 93,154 tons, and gave an average of 7.68 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. **Commonwealth 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 1912 oversea imports of onions amounted to 3763 tons, obtained principally from Japan, the United States, and New Zealand, of which total 2747 tons went to New South Wales and 837 tons to Queensland. For the same year the exports of onions totalled 3572 tons, the principal countries to which they were exported being the Philippine Islands, the Pacific Islands, and the United States of America.

§ 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 1912-13 represented nearly 25 per cent. of the area under crop 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 1912-13.

Season.	N.S.W.	Victoria.	Q'land.	Sth. Aust.	W. Aust.	Tas.	N. T.	Fed. Terr.	C'wealth.
	Acres.	Acres.	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
1905-6	438,036	591,771	37,425	317,924	124,906	64,350	...	...	1,574,412.
1910-11	638,577	832,669	98,558	440,177	175,432	72,992	...	...	2,258,405
1911-12	651,866	860,205	61,299	521,182	344,032	77,466	18	2,220	2,518,288
1912-13	944,725	1,203,728	87,643	647,069	231,690	99,839	10	2,337	3,217,041

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. The area under hay in the Commonwealth for the season 1912-13 was the highest on record, and exceeded that of the previous year by 698,753 acres.

2. **Kinds of Hay.**—Particulars concerning the kind of crop cut for hay are furnished in the returns prepared by five of the States: no information is available in the case of Tasmania.

Details for the past five seasons are given in the following table:—

KINDS OF HAY GROWN, 1908-9 to 1912-13.

Kind of Hay Crop.	1908-9.	1909-10.	1910-11.	1911-12.	1912-13.
NEW SOUTH WALES—	Acres.	Acres.	Acres.	Acres.	Acres.
Wheaten	490,828	380,784	422,972	439,591	703,509
Oaten	169,441	178,968	142,805	146,162	181,400
Barley	1,566	1,917	2,241	2,309	1,703
Lucerne	54,061	68,822	70,559	63,804	56,403
Other ... ..	...	...	...	...	1,710
Total	715,896	630,491	638,577	651,866	944,725
VICTORIA—					
Wheaten	278,005	186,400	240,026	304,388	386,370
Oaten	662,141	660,525	575,791	535,146	790,268
Other	16,225	17,434	16,852	20,671	27,090
Total	956,371	864,359	832,669	860,205	1,203,728
QUEENSLAND—					
Wheaten	4,075	9,031	19,894	1,763	12,710
Oaten	9,314	16,752	13,052	5,403	19,539
Lucerne	48,247	42,935	61,750	51,059	50,814
Other	3,868	3,580	3,862	3,074	4,580
Total	65,004	72,298	98,558	61,299	87,643
SOUTH AUSTRALIA—					
Wheaten	348,307	318,197	336,439	401,648	492,980
Oaten	68,659	96,496	96,062	113,011	147,963
Lucerne	3,162	2,537	2,055	2,411	2,414
Other	4,796	7,218	5,621	4,112	3,712
Total	424,924	424,448	440,177	521,182	647,069
WESTERN AUSTRALIA—					
Wheaten	151,745	101,590	135,521	284,073	176,744
Oaten	48,309	55,006	33,637	58,393	52,904
Lucerne	124	254	233	167	205
Other	1,696	1,779	1,041	1,399	1,837
Total	201,874	158,629	175,432	344,032	231,690

It will be seen that wheat is the principal hay crop in New South Wales, South Australia, and Western Australia, oats in Victoria, and lucerne in Queensland.

3. Total Yield.—The Commonwealth hay crop for the season 1912-13 amounted to 3,955,311 tons, or 37.91 per cent. more than that produced in the previous season, and represented the largest ever harvested in the Commonwealth, the highest previous records being that of 3,153,196 tons for the season 1909-10, and 3,175,887 for

1910-11. For many years past the State of Victoria has been the largest hay producer in the Commonwealth, and in the season 1912-13 accounted for nearly 40 per cent. of the total production. The total yields of the several States from 1860 onwards are given hereunder:—

COMMONWEALTH HAY CROP, 1860-1 to 1912-13.

Season.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	N. T.	Fed. Ter.	Commonwealth.
	Tons.	Tons.	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
1905-6	459,182	864,177	56,829	435,546	139,380	90,077	...	...	2,045,191
1910-11	843,080	1,292,410	151,252	595,064	178,891	115,190	...	...	3,175,887
1911-12	727,054	1,032,288	94,553	605,239	299,695	107,684	40	1,420	2,867,973
1912-13	1,105,350	1,572,933	119,867	714,766	255,751	183,709	10	2,925	3,955,311

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 1912-13:—

VALUE OF HAY CROP, 1912-13.

Particulars.	New South Wales.	Victoria.	Queensland.	South Aust.	Western Aust.	Tasmania.	N. T.	Fed. Ter.	Commonwealth.
Total value ...	£4,045,458	£4,561,506	£704,281	£2,180,036	£1,072,549	£549,237	£80	£12,887	£13,126,034
Value per acre	£4/5/8	£3/15/9	£8/0/9	£3/7/5	£4/12/7	£5/10/0	£8/0/0	£5/10/3	£4/1/7

5. **Average Yield per Acre.**—The States of the Commonwealth in which the highest average yields per acre have been obtained are those of Tasmania and Queensland, these being also the States in which the smallest areas are devoted to this crop. For the past ten seasons the lowest yield for the Commonwealth as a whole was that of 19 cwt. per acre in 1907-8, and the highest that of 31 cwt. in 1903-4. The average per decennium was 25 cwt. Particulars for the several States for the seasons 1901-2 and 1908-9 to 1912-13, and also for the decennium, are given hereunder:—

AVERAGE YIELD OF HAY PER ACRE, 1901-2 and 1908-9 to 1912-13.

Season.	N.S.W.	Vic.	Q'land.	S. Aus.	W. Aus.	Tas.	N. T.	Fed. Terr.	Com'wealth.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1901-2 ...	1.07	1.34	1.94	0.94	0.97	1.78	...	...	1.20
1908-9 ...	1.02	1.48	1.43	1.39	0.84	1.55	...	...	1.28
1909-10 ...	1.56	1.37	1.34	1.35	1.23	1.53	...	...	1.42
1910-11 ...	1.32	1.55	1.53	1.35	1.02	1.58	...	...	1.41
1911-12 ...	1.12	1.20	1.54	1.16	0.87	1.39	2.22	0.72	1.14
1912-13 ...	1.17	1.31	1.36	1.10	1.10	1.84	1.00	1.25	1.23
Average for 10 seasons	1.18	1.37	1.50	1.25	1.02	1.54	...	...	1.27

6. **Relation to Population.**—During the past ten seasons the Commonwealth hay production per head of population has varied between 7 cwt. in 1904-5 and 16½ cwt. in 1912-13; averaging about 12½ cwt. per head for the period. The State in which the hay production per head of population is highest is South Australia. Details for the seasons 1901-2 and 1908-9 to 1912-13 are given hereunder:—

HAY PRODUCTION PER 1000 OF POPULATION.

Season.	N.S.W.	Vict.	Q'nd.	S. Aust.	W. Aust.	Tas.	N. T.	Fed. Ter.	C'with.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1901-2 ...	339	231	241	964	463	624	...	...	529
1908-9 ...	467	1,132	167	1,532	655	717	...	...	741
1909-10 ...	608	929	168	1,462	735	615	...	...	729
1910-11 ...	513	993	253	1,463	648	594	...	...	718
1911-12 ...	440	777	154	1,472	1,045	566	12	899	639
1912-13 ...	622	1,139	188	1,662	835	932	3	1,508	836

7. **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 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 £25,343 only in 1912, while the exports of compressed and other fodder, which amounted in value to £142,472 in 1904, had shrunk to £27,630 in 1912.

During 1912 the principal consignees of the hay and chaff exported from the Commonwealth were India, the Straits Settlements, and Ceylon, while the principal countries to which compressed fodder was exported were the Philippine Islands, Ceylon, and the Straits Settlements.

Imports of hay and chaff into the Commonwealth are usually unimportant, and for the year 1912 totalled 700 tons, valued at £3706, obtained from New Zealand.

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 1912 represented by 4,385,235 tons from 2,895,477 acres, while from permanent grasses a yield of 9,638,987 tons of hay was obtained from 6,678,642 acres, giving a total of 14,024,222 tons from 9,574,119 acres, or about 29¼ 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 1912-13 was 427,756 acres, which was 3316 acres more than the corresponding area for 1911-12. Of this total the New South Wales area represented about 36 per cent., that in Queensland 31½ per cent., while that in Victoria amounted to 19¾ 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 1912-13.

Season.	N.S.W.	Vic.	Q'land.	S. Aust.	W. Aust.	Tas.	N. T.	Fed. Terr.	C'wealth.
	Acres.	Acres.	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
1905-6	95,058	34,041	66,183	23,842	1,873	4,882	...	...	225,879
1910-11	179,382	71,826	89,667	20,728	4,545	8,695	19	...	374,862
1911-12	211,693	75,177	93,049	33,673	5,021	5,627	19	181	424,440
1912-13	154,272	84,460	135,354	39,954	7,339	6,304	60	13	427,756

2. **Value of Green Forage Crops.**—The value of these crops is variously estimated in the several States, and the Commonwealth total for the season 1912-13 may be taken approximately as £1,424,000, or about £3 6s. per acre.

3. **Relation to Population.**—Particulars concerning the area under green forage per 1000 of the population of the Commonwealth and the several States for the seasons 1901-2 and 1908-9 to 1912-13 are given hereunder:—

AREA UNDER GREEN FORAGE PER 1000 OF POPULATION.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	N. T.	Fed. Terr.	C'wealth.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1901-2	82	27	79	38	8	24	...	...	54
1908-9	151	50	157	42	19	33	...	...	98
1909-10	74	44	174	44	23	35	...	...	71
1910-11	109	55	150	51	16	45	6	...	85
1911-12	128	57	151	82	18	30	6	102	95
1912-13	87	61	213	93	24	32	17	7	90

§ 13. Sugar-Cane.

1. **Area.**—Sugar-cane is grown for sugar-making purposes 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 155,567 acres under sugar-cane in the Commonwealth for the season 1912-13 there were 141,652 acres, or about 91 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. From 1902-3 to 1906-7 it remained practically stationary; from that time it gradually fell to 13,763 acres in 1910-11, the lowest area under sugar-cane since 1882-3. Since then a slight upward tendency has been in evidence. In Queensland, on the other hand, although fluctuations in area are in evidence throughout, the general trend has been one of satisfactory increase, the area under cane for the season 1910-11 being the highest on record, that for 1912-13 being the next highest and that for 1905-6 only a little short of it. In 1907-8 the area in Queensland declined to 126,810 acres, and in 1908-9 still further to 123,902 acres, but there was a marked increase in 1909-10, while in 1910-11 there was a further increase, when it rose to 141,779 acres. Owing to unfavourable climatic conditions the area under cane for 1911-12 shewed a falling off of 11,403 acres, or a reduction of about 8 per cent.; the 1912-13 figures, however, again shewed an increase, and were virtually the same as those for 1910-11. The area under sugar-cane in the Commonwealth from 1865 is given in the following table:—

AREA UNDER SUGAR-CANE, 1865-6 to 1912-13.

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	1908-9	16,981	123,902	140,883
1875-6	6,454	13,459	19,913	1909-10	14,033	128,178	142,261
1880-1	10,971	20,224	31,195	1910-11	13,763	141,779	155,542
1885-6	16,419	59,186	75,605	1911-12	13,907	130,376	144,283
1890-1	20,446	50,922	71,368	1912-13	13,914	141,652	*155,567
1895-6	32,927	77,247	110,174				

* Including 1 acre Northern Territory.

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 quantity required for plants. In the season 1912-13 the New South Wales total comprised 6137 acres of productive and 7777 acres of unproductive cane, while in the case of Queensland the productive cane amounted to 78,142 acres and the unproductive to 63,510 acres.

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 2,000,758 tons for the record season 1910-11. The average yield per acre of productive cane is much higher in New South Wales than in Queensland, the average during the last decade being 22.83 tons for the former and 15.60 for the latter State. During the six seasons 1901-2 to 1906-7 in the case of New South Wales the yield remained practically constant at about 21 tons per acre. In 1907-8 the yield in New South Wales was so excellent that, notwithstanding the comparative smallness of the area cultivated, the aggregate amount of cane produced was the largest in that State since 1898-9. In 1909-10, on the other hand, owing mainly to the decline in area of productive cane, the total yield amounted to only 131,081 tons, the lowest for the State since 1888. In 1910-11 there was a further decline in the acreage of productive cane; the yield of over 28½ tons per acre, however, was so excellent that the production exceeded that of the previous season by 29,230 tons of cane. The yield per acre for 1911-12 was approximately the same as for the previous year, but owing to the falling off in the acreage cropped, a decline to the extent of 12,512 tons was in evidence in regard to the quantity of cane produced. The area of productive cane for 1912-13 shewed an increase of 893 acres, the yield, however, was 6885 tons below that of the previous season, the average

tons per acre being 22.96 for 1912-13 as against 28.18 for 1911-12. In Queensland the average yield per acre for 1910-11 was by far the highest recorded for that State, viz., 19.45 tons, while that for 1912-13 was 12.72, being 2.88 below the average in that State for the last ten years. Particulars relative to the total and average yields of the Commonwealth sugar crops for the seasons 1901-2 and 1908-9 to 1912-13 are as follows:—

YIELD OF SUGAR-CANE, 1901-2 and 1908-9 to 1912-13.

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
1908-9 ...	144,760	1,433,315	1,573,075	20.83	15.54	15.91
1909-10 ...	131,081	1,163,569	1,294,650	20.23	14.53	14.95
1910-11 ...	160,311	1,840,447	2,000,758	28.65	19.45	19.96
1911-12 ...	147,799	1,534,451	1,682,250	28.18	16.02	16.65
1912-13 ...	140,914	994,212	1,135,141*	22.96	12.72	13.47

* Including 15 tons Northern Territory.

A preliminary estimate for Queensland for the season 1913-14 states that the prospects are extremely favourable. The acreage cut for crushing will probably prove to be in the neighbourhood of 103,000 acres, the estimated yield of which is 2,065,144 tons of cane, an increase of 1,070,932 tons over the previous year's returns. The sugar production is expected to be a record, the estimated yield being 241,496 tons of raw sugar.

4. **Relation to Population.**—The sugar-cane production of the Commonwealth during the past five seasons has averaged about 7 cwt. per head of population. In Queensland, the principal sugar-producing State, the production of cane per head has ranged between 1½ tons in 1912-13 and 3 tons in 1910-11. Details for the period 1908-9 to 1912-13 are as follows:—

SUGAR PRODUCTION PER 1000 OF POPULATION.

State.	1908-9.	1909-10.	1910-11.	1911-12.	1912-13.
	Tons.	Tons	Tons	Tons	Tons.
New South Wales ...	93	81	98	89	79
Queensland ...	2,573	2,014	3,072	2,498	1,562
Commonwealth ...	373	299	452	375	240

5. **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 seasons 1902-3 to 1906-7 the sugar content of the cane crushed continuously diminished, so that while 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 10½ per cent. of the weight of cane crushed. For the season 1907-8, the cane was of much better quality, and the quantity required to produce a ton of sugar was only 8.84 tons, the sugar content representing in this case somewhat more than 11½ per cent. of the weight of cane crushed. In 1908-9, owing in large measure to the effect of frosts, the quantity of cane required to produce one ton of sugar was increased to 9.49 tons, the sugar thus representing only about 10½ per cent. of the weight of cane crushed, while in 1909-10 only 8.65 tons of cane were required to each ton of sugar, the sugar representing about 11½ per cent. of the weight of cane crushed. The especially favourable weather existing throughout 1910 resulted in a very high average quantity of cane per acre being obtained, while the moisture which caused this led to a slight diminution in the saccharine density as compared with the previous year.

During 1910-11 and the two following seasons the quantity of cane required to produce one ton of sugar was 8.73, 8.85, and 8.79 tons in the order named, the sugar produced representing about 11½ per cent. of the weight of cane crushed in each of those years, while the average quantity of sugar obtained per acre crushed was 2.23 tons in 1910, 1.81 in 1911, and 1.45 in 1912. It should be noted 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.

6. **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. An account of the various Acts in connection with sugar bounties and sugar excise tariffs will be found on pages 394 to 396 of the previous issue of the Year Book. In 1912 the Sugar Excise Repeal Act and the Sugar Bounty Abolition Act were passed by the Federal Parliament, conditionally on the Queensland Parliament approving of legislation prohibiting the employment of coloured labour in connection with the industry. The State Sugar Cultivation Act, the Sugar Growers Act, and the Sugar Growers' Employees Act, of 1913, having been approved of, the 1912 Federal Acts, which repeal all previous enactments in regard to excise on sugar and bounty on cane, came into force by proclamation in July, 1913.

7. **Beet Sugar.**—During the past few years an effort has been made to revive the sugar-beet industry in Victoria. During 1910-11 £554 was paid as bounty on 1847 tons of beet, £2244 on 7481 tons during 1911-12, and £1667 on 6207 tons during 1912-13.

8. **Cost of Bounties.**—The amounts paid by the Commonwealth Government in sugar bounties and the expenses in connection therewith during the period 1908-9 to 1912-13 are shewn in the following table:—

SUGAR BOUNTIES AND EXPENSES, 1908-9 to 1912-13.

Particulars.	1908-9.	1909-10.	1910-11.	1911-12.	1912-13.
	£	£	£	£	£
Bounties ...	477,090	402,132	630,762	543,503	370,306
Expenses ...	6,616	5,645	6,862	*	*
	483,706	407,777	637,624	*	*

* Not available.

9. **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 years 1901-2 and 1908-9 to 1912-13. In this table refunds and drawbacks have been deducted and the requisite adjustment has been made between the States:—

SUGAR EXCISE, 1901-2 and 1908-9 to 1912-13.

Year.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	C'wealth.
	£	£	£	£	£	£	£
1901-2 ...	119,577	40,189	10,658	781	8,184	10,156	189,545
1908-9 ...	250,329	229,409	116,215	69,267	49,434	36,122	750,776
1909-10 ...	137,672	229,981	126,626	9,373	32,526	12,538	548,716
1910-11 ...	*	*	*	*	*	*	794,645
1911-12 ...	*	*	*	*	*	*	748,670
1912-13 ...	*	*	*	*	*	*	518,508

* Amounts not allocated to separate States.

10. **Production by White and Coloured Labour.**—The following table contains particulars furnished by the Commonwealth Treasury concerning the production of sugar in New South Wales and Queensland since 1902, and furnishes an indication of the decline in the employment of coloured labour in the sugar industry during that period:—

SUGAR PRODUCTION, 1902-3 to 1912-13.

Season.	New South Wales.			Queensland.			Commonwealth.		
	Cane Sugar Produced by—			Cane Sugar Produced by—			Cane Sugar Produced by—		
	White Labour.	Coloured Labour.	Total.	White Labour.	Coloured Labour.	Total.	White Labour.	Coloured Labour.	Total.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1902-3 ...	19,434	1,526	20,960	12,254	65,581	77,835	31,688	67,107	98,795
1903-4 ...	19,236	2,561	21,797	24,406	65,456	89,862	43,642	68,017	111,659
1904-5 ...	17,812	1,838	19,650	39,404	105,616	145,020	57,216	107,454	164,670
1905-6 ...	18,019	1,964	19,983	50,897	101,362	152,259	68,916	103,326	172,242
1906-7 ...	21,905	1,613	23,518	127,539	54,619	182,158	149,344	56,232	205,576
1907-8 ...	28,247	934	29,181	162,480	22,583	185,063	190,727	23,517	214,244
1908-9 ...	14,351	964	15,315	132,049	18,358	150,407	146,400	19,322	165,722
1909-10 ...	13,639	815	14,454	118,298	14,451	132,749	132,137	15,266	147,403
1910-11 ...	17,936	892	18,828	191,406	15,776	207,182	209,942	16,668	226,010
1911-12 ...	16,412	887	17,299	160,091	10,371	170,462	176,503	11,258	187,761
1912-13 ...	16,483	240	16,723	106,088	6,453	112,541	122,571	6,693	129,264

During the period under review the proportion of sugar produced by coloured labour declined from 68 per cent. of the total for 1902-3 to 5 per cent. of the total for 1912-13. The sugar production of 1913-14 is expected to be a record, the estimated yield being 241,496 tons of raw sugar.

11. **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 remained fairly extensive until 1906, the principal countries engaged in supplying this commodity being Java, Mauritius, and Fiji. In 1907 the exports of sugar exceeded the imports for the first time, the value of the net exports being £166,121. In 1908 the imports exceeded the exports by 4811 tons in quantity and £37,080 in value; while in the following year the excess of imports over exports was 91,647 tons, value £1,004,308. In 1910 and 1911 the net imports fell in quantity to 27,424 tons and 25,945 tons respectively, the corresponding values being £297,958 and £283,518. During 1912-13 the net imports amounted to 96,224 tons, being the highest recorded during the period under review. The principal countries to which sugar is exported are South African Union, the Pacific Islands, the United Kingdom, and Portuguese East Africa, but the bulk of the sugar exported from the Commonwealth is not of Australian origin, but merely a re-export of sugar produced elsewhere. Thus of 2257 tons exported during 1912, only 90 tons were of Australian origin. The sugar so re-exported comes mainly from Fiji, Java, and Mauritius. Particulars concerning the imports and exports of cane sugar for 1901 and the past five years are as follow:—

IMPORTS AND EXPORTS OF CANE SUGAR, 1901 and 1908 to 1912.

Year.	Oversea Imports.		Oversea Exports.		Net Imports.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons.	£	tons.	£	tons.	£
1901 ...	98,544	1,239,550	4,738	68,876	93,806	1,170,674
1908 ...	19,552	245,495	14,741	208,415	4,811	37,080
1909 ...	99,698	1,122,863	8,051	118,555	91,647	1,004,308
1910 ...	34,008	406,709	6,584	108,751	27,424	297,958
1911 ...	33,276	404,474	7,331	120,956	25,945	283,518
1912 ...	98,481	1,189,763	2,257	39,614	96,224	1,150,149

§ 14. Vineyards.

1. *Nature and Extent.*—The introduction of the vine into Australia has been set down by different investigators as at various dates, the years 1815 and 1828 being principally favoured. It would seem, however, that the vine was really brought out with the First Fleet, which initiated the colonisation of Australia, in 1788, and that consequently the Australian vine is as old as Australian settlement. As already mentioned a report of Governor Hunter's gives the area under vines in 1797 as 8 acres. 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 1912-13.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	C'wealth.
	Acres.	Acres.	Acres	Acres.	Acres		Acres.
1860-1	1,584	1,138	—	3,180	335	There are no vineyards in Tasmania.	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
1905-6	8,754	26,402	2,044	23,603	3,541		64,344
1910-11	8,321	23,412	1,634	22,952	2,795		59,114
1911-12	8,231	24,193	1,371	23,986	2,821		60,602
1912-13	8,163	24,579	1,428	25,208	3,010		62,388

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. Each of the five following seasons shewed a diminution, the area in 1909-10 being reduced to 58,151 acres; this decline was in evidence in all the States. An increase took place in each of the three succeeding seasons, the total Commonwealth area under vines amounting to 62,388 acres in 1912-13.

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.

In the States of Victoria, Queensland, South Australia, and Western Australia satisfactory increases in the area under vines were recorded in 1912-13, while in New South Wales a small decrease was shewn.

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 expected that when their qualities are duly recognised the wine production of Australia will exhibit a rapid development. Particulars concerning the quantity of wine produced in the several States during 1901-2 and the past five seasons are contained in the table given hereunder:—

AUSTRALIAN WINE PRODUCTION, 1901-2 and 1908-9 to 1912-13.

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	2,681,563	185,735		5,816,087
1908-9 ...	736,262	1,437,106	77,698	3,132,247	192,488		5,515,801
1909-10 ...	808,870	991,941	91,410	2,569,797	140,559		4,602,577
1910-11 ...	805,600	1,362,420	74,806	3,470,058	153,665		5,866,049
1911-12 ...	850,210	983,423	57,358	2,921,597	162,559		4,975,147
1912-13 ...	719,100	1,206,111	54,627	3,974,838	149,132		6,103,808.

3. Relation to Population.—In relation to population the area of the vineyards of the several States exhibits a well-marked decline during the first eight seasons under review, the Commonwealth total having fallen during the period from 17 to 13 acres per 1000 of the population; during the past four seasons, however, the relation has remained stationary. Details for the period are furnished in the succeeding table:—

AREA OF VINEYARDS PER 1000 OF POPULATION.

Season.	N.S.W.	Victoria.	Q'land.	Sth. Aust.	W. Aust.	Tas	C'wealth
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1901-2 ...	6	24	4	58	19	...	17
1908-9 ...	5	20	3	57	12	...	14
1909-10 ...	5	18	3	57	11	...	13
1910-11 ...	5	18	3	56	10	...	13
1911-12 ...	5	18	2	57	10	...	13
1912-13 ...	5	18	2	59	10	...	13

4. Imports and Exports.—During the past ten years the importations of wine into the Commonwealth have exhibited a marked fluctuation, declining continuously in value from £161,945 in 1901 to £96,870 in 1904, then increasing continuously to £133,114 in 1908 and decreasing again in 1909 to £116,021, and again increasing in the two following years; the 1912 importations, valued at £169,207, exhibited a slight decrease as compared with the previous year. The principal countries of origin of wine imported into Australia are France, Spain, Portugal, and Germany, the greater portion of the sparkling wines coming from France and of still wines from Spain and Portugal. Particulars relative to the importations of wine into the Commonwealth during 1901 and the past five years are given hereunder:—

COMMONWEALTH IMPORTS OF WINE, 1901 and 1908 to 1912.

Year.	Quantity.			Value.		
	Sparkling.	Other.	Total.	Sparkling.	Other.	Total.
	Gallons.	Gallons.	Gallons.	£	£	£
1901	55,341	165,472	220,813	104,700	57,245	161,945
1908	56,806	68,252	125,058	106,108	27,006	133,114
1909	47,669	60,946	108,615	91,046	24,975	116,021
1910	50,932	70,903	121,835	97,296	29,106	126,402
1911	78,115	75,446	153,561	153,561	31,363	184,924
1912	67,851	85,874	153,725	132,830	36,377	169,207

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 1901 and the past five years are given in the following table:—

COMMONWEALTH EXPORTS OF WINE, 1901 and 1908 to 1912.

Year.	Quantity.			Value.		
	Sparkling.	Other.	Total.	Sparkling.	Other.	Total.
	Gallons.	Gallons.	Gallons.	£	£	£
1901	2,936	863,147	866,083	6,972	122,751	129,723
1908	2,824	728,421	731,245	4,541	98,333	102,874
1909	2,649	974,413	977,062	4,455	121,116	125,571
1910	2,830	949,033	951,913	5,340	123,593	128,933
1911	2,343	1,097,624	1,099,967	4,126	147,608	151,734
1912	2,467	784,371	786,838	4,803	116,327	121,130

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

5. **Other Viticultural Products.**—In addition to grapes for wine-making purposes, large quantities are grown in all the States for table use, while, 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 1901-2 and the past five seasons are as follows:—

TABLE GRAPES, 1901-2 and 1908-9 to 1912-13.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	C'wealth.
	Tons	Tons.	Tons.	Tons.	Tons.	Tons	Tons.
1901-2	3,475	5,110	750*	2,800*	1,100*	...	13,235
1908-9	3,150	3,018	1,336	3,214	1,982	...	12,700
1909-10	4,181	3,189	1,520	2,496	3,928	...	15,314
1910-11	3,914	2,913	1,254	2,531	3,200	...	13,812
1911-12	4,223	3,102	973	2,123	3,506	...	13,927
1912-13	3,893	2,624	1,046	2,194	1,891	...	11,648

* Estimated.

Statistics of the quantities of raisins and currants dried are available for a series of years for Victoria and South Australia, and are as follows for 1901-2 and the past five seasons:—

RAISINS AND CURRANTS DRIED, 1901-2 and 1908-9 to 1912-13.

Season.	Raisins.		Currants.	
	Victoria.	Sth. Australia.	Victoria.	Sth. Australia.
	lbs.	lbs.	lbs.	lbs.
1901-2	3,083,665	822,080	285,157	382,256
1908-9	7,788,032	3,136,784	1,336,048	2,738,288
1909-10	9,076,928	3,114,496	3,069,696	4,037,824
1910-11	8,883,616	3,891,440	2,956,128	4,509,232
1911-12	11,527,488	3,880,912	5,240,368	5,229,840
1912-13	12,283,824	3,947,776	5,413,744	5,847,296

In New South Wales, Queensland, and Western Australia also small quantities of raisins and currants are dried, but until recently no statistics were collected. The quantity so produced in New South Wales amounted to 100,912 lbs. in 1907-8, 160,720 lbs. in 1908-9, 165,984 lbs. in 1909-10, 297,472 lbs. in 1910-11, 429,968 lbs. in 1911-12, and 494,704 in 1912-13. In Western Australia 176,400 lbs. were dried during 1912-13. For Queensland there are no particulars available.

§ 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 ten years by no less than 56,936 acres. The States in which the increase was most marked were:—Tasmania, 17,900 acres; Victoria, 12,731 acres; Western Australia, 12,668 acres; and South Australia, 6529 acres. During the same period the Queensland fruit-growing area increased 5738 acres, while that in New South Wales exhibited a slight increase of 1310 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 and 1908-9 to 1912-13.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	N.T.	Fed. Terr.	C'wealth.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1901-2...	48,448	50,055	14,396	16,315	6,076	11,485	...	...	146,775
1908-9...	45,880	54,946	14,104	20,855	15,016	20,757	...	...	171,558
1909-10	45,892	56,108	15,360	21,760	15,609	24,069	...	...	178,798
1910-11	47,533	57,375	15,153	22,410	16,738	25,934	13	...	185,156
1911-12	48,385	59,985	16,817	23,214	18,194	27,868	13	48	194,524
1912-13	49,329	63,209	18,556	23,905	19,540	30,575	...	60	205,174

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 four-fifths of the area in that State devoted to fruit-growing, small fruits, such as the currant, raspberry, and gooseberry, are very extensively grown, and the balance of the area is mainly occupied with the pear, plum, apricot, peach, and cherry. The following table gives the acreage under the principal kinds of fruit grown, and the quantity and value of fruit produced. With the exception of Tasmania the acreages shewn are exclusive of young trees not yet bearing. The acreages for each kind of fruit in Victoria is not available:—

PARTICULARS OF THE PRINCIPAL KINDS OF FRUIT GROWN IN THE SEVERAL STATES OF THE COMMONWEALTH DURING THE SEASON 1912-13.

Fruit.	N S.W. (a)	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	C'wealth.
Apples ... acres	6,507	...	627	6,501	5,153	24,370	...
bushels	548,801	2,036,756	15,904	448,468	311,316	1,331,324	...
£	137,201	390,378	7,157	140,621	95,340	316,189	1,086,886
Apricots ... acres	1,082	...	67	1,892	282	1,111	...
bushels	88,782	138,881	4,967	116,366	17,823	62,306	...
£	24,415	59,024	993	42,178	8,392	18,691	153,693
Bananas ... acres	108	...	7,037	...	127	...	...
bunches	46,570	...	1,139,404	...	(b) 2,021	...	...
£	3,730	...	142,426	...	1,718	...	147,874
Lemons ... acres	2,712	...	54	530	119	...	...
bushels	276,397	48,170	4,288	31,515	14,796	...	...
£	55,279	18,264	1,394	9,455	3,976	...	88,368
Nectarines and peaches { acres	6,306	...	771	1,244	851	113	...
bshls.	468,814	294,861	35,131	72,509	53,023	(c)	...
£	117,203	88,394	7,027	32,569	21,209	(c)	(d)266,402
Oranges ... acres	9,843	...	2,396	1,742	1,121	...	...
bushels	817,500	44,039	319,544	137,031	84,121	...	...
£	204,375	20,368	87,875	61,664	27,076	...	401,358
Pineapples acres	12	...	2,584	...	...	...	...
dozen	4,220	...	679,646	...	...	...	...
£	360	...	67,965	...	...	...	68,325
Pears ... acres	1,522	...	77	840	627	2,232	...
bushels	142,104	669,898	3,347	91,533	43,776	149,546	...
£	46,184	43,472	1,004	28,723	15,778	29,909	165,070
Other fruits acres	8,658	...	2,992	4,126	1,540	2,749	...
£	244,027	260,757	49,336	78,223	37,042	(e)20,088	689,473
Total ... acres	36,750	48,368	16,605	16,875	9,820	(f)30,575	(f)158,993
£	832,774	880,657	365,177	393,433	210,531	384,877	3,067,449

(a) Including Federal Territory. (b) Bushels. (c) Separate figures not available. (d) Excluding Tasmania. (e) Including nectarines and peaches. (f) Including unproductive area in Tasmania.

2. Relation to Population.—In relation to population the orchards and fruit gardens of the Commonwealth have exhibited an increase during the seasons under review, more than compensating for the decline which was experienced in the case of vineyards. Taking the two in conjunction, the relative area under vineyards and orchards has, during the period, remained practically stationary at about 55 acres per 1000 of population. Details for 1901-2 and the past five seasons are as follow :—

AREA OF ORCHARDS AND FRUIT GARDENS PER 1000 OF POPULATION.

Season.	N.S.W.	Victoria.	Q'land.	Sth. Aust.	W. Aust.	Tas.	N.T.	Fed. Terr.	C'wealth.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1901-2...	35	41	28	45	31	66	...	...	38
1908-9...	29	44	25	54	58	109	...	...	41
1909-10	28	44	27	55	59	125	...	...	41
1910-11	29	44	25	55	60	134	4	...	42
1911-12	29	44	27	56	62	144	4	25	43
1912-13	28	46	29	56	64	155	...	31	43

3. Commonwealth Imports and Exports.—A very considerable fruit trade, both import and export, is carried on by the Commonwealth with oversea 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 Arabian, Persian, and Turkish, the raisins mainly of Spanish, and the sultanas of Turkish origin. Of the fresh fruits imported during 1912 the bananas were chiefly from Fiji, the oranges and lemons from Italy, and the apples from the United States and Canada. The dried fruits imported during the year were valued at £81,913, and the fresh at £217,796. In 1907 a very marked development in the trade in Australian dried fruits took place, the total export for the year being valued at £76,872, of which £71,506 represented Australian fruits and £5366 re-exports of foreign fruits. In 1908 the total export of dried fruits from Australia was valued at £35,359, of which £33,111 represented Australian fruits, and £2248 re-exports of foreign fruits. There was a further decline in 1909, when the total value of exports was only £13,013, made up of £11,826 of Australian produce, and £1187 of re-exports. There was a small increase in the total exports in 1910 and 1911, the exports for the latter year amounting to £23,900; 1912 experienced a further and more substantial increase, the value of dried fruits exported in that year being £48,012; of this sum £46,491 represented Australian produce, and the balance of £1521 re-exports of foreign fruits. The principal consignees of Australian dried fruits exported were United Kingdom and New Zealand. The fresh fruits exported during the year were valued at £163,306, and consisted mainly of apples. These were all of Australian origin with the exception of re-exports valued at £809. The principal countries to which these were sent were the United Kingdom, Germany, New Zealand, Brazil, United States of America, and India. The value of the net imports of dried fruits for the year 1912 was £33,901, whilst in the case of fresh fruits, the value of the net exports was £250,510, the largest net export value yet recorded.

Particulars concerning the oversea imports and exports of dried fruits for 1901 and the last five years are as follows :—

**COMMONWEALTH OVERSEA IMPORTS AND EXPORTS OF DRIED FRUITS,
1901 AND 1908 TO 1912.**

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
1908	10,351,443	99,518	2,509,640	35,359	7,841,803	64,159
1909	13,242,198	121,059	1,089,730	13,013	12,152,468	108,046
1910	9,885,118	89,076	973,171	14,765	8,911,947	74,311
1911	6,526,498	68,942	1,291,795	23,900	5,234,703	45,042
1912	7,484,432	81,913	2,545,779	48,012	4,938,653	33,901

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

**COMMONWEALTH OVERSEA IMPORTS AND EXPORTS OF FRESH FRUITS,
1901 AND 1908 TO 1912.**

Year.	Oversea Imports.		Oversea Exports.		Net Exports.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Centals.	£	Centals.	£	Centals.	£
1901	*	45,955	*	167,926	*	121,971
1908	166,341	107,666	377,926	263,307	211,585	155,641
1909	250,311	146,081	372,308	243,699	121,997	97,618
1910	137,733	90,100	500,661	322,694	362,928	232,594
1911	338,749	197,924	651,837	420,780	313,088	222,856
1912	306,079	217,796	674,695	468,306	368,616	250,510

* Not available.

4. **Jams and Jellies.**—A small oversea trade in jams and jellies is carried on by the Commonwealth, the value of the imports for the year 1912 amounting to £13,081, and of the exports to £23,089. 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, Philippine Islands and Fiji. Particulars relative to imports and exports for 1901 and the last five years are as follow :—

COMMONWEALTH OVERSEA TRADE IN JAMS AND JELLIES, 1901 and 1908 to 1912.

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
1908 ...	280,525	6,893	1,714,060	26,155	1,433,535	19,257
1909 ...	334,738	7,956	1,706,400	26,124	1,371,662	18,168
1910 ...	365,752	8,859	1,814,002	28,372	1,448,250	19,513
1911 ...	322,487	8,304	1,288,729	20,896	966,242	12,592
1912 ...	476,504	13,081	1,429,338	23,089	952,834	10,008

5. **Preserved Fruit.**—Details concerning the quantities and values of preserved fruit imported into and exported 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 fruits, dried fruits, potatoes, and onions, imported into Australia during 1912 was £57,856, and the corresponding value of exports was £37,825.

§ 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, Pumpkins and Melons, Turnips, Mangolds, 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 1912-13 devoted to minor crops was 72,703 acres, of which market gardens accounted for 30,676 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 1901-2 and each of the last five seasons is given in the table hereunder:—

COMMONWEALTH MARKET GARDENS, 1901-2 and 1908-9 to 1912-13.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	N. T.	Federal Terr.	C'wealth.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1901-2 ...	7,834	8,752	2,328	9,005	2,142	1,746	...	...	31,807
1908-9 ...	10,331	9,279	2,875	2,818	3,471	1,603	...	...	30,377
1909-10 ...	10,254	10,214	2,677	2,784	3,481	1,720	...	...	31,130
1910-11 ...	9,813	10,778	2,317	2,818	3,576	1,741	*58	...	31,101
1911-12 ...	9,488	10,331	2,293	2,848	3,120	2,144	58	10	30,292
1912-13 ...	9,836	10,414	2,386	2,857	3,664	1,458	50	11	30,676

* Included with South Australia prior to 1910-11.

In all the States the area for 1908-9 was in excess of that for 1901-2 with the exception of South Australia, where the falling-off is more apparent than real, being in large part due to a change in the classification of crops introduced in connection with the new system of collection which came into force for 1907-8. It is believed that the figures given for the earlier years are considerably in excess of the truth. During the past five seasons there has been very little variation in the total area of market gardens in any of the States; Victoria shews the largest increase, viz., 1135 acres.

3. **Grass Seed.**—The total area under this crop during 1912-13 was 7347 acres, of which 3028 acres were in Tasmania, 2429 acres in Victoria, 1845 acres in Queensland, and 45 acres in South Australia. The total yield for 1912-13 was 81,617 bushels, or 24.72 bushels per acre.

4. **Tobacco.**—The tobacco-growing industry is one which has experienced marked fluctuations in Australia and which once 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 1912-13 was only 2745 acres, distributed as follows:—New South Wales, 1914 acres; Victoria, 138 acres; and Queensland, 692 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 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 the requirements of consumers. The value of the net importations of tobacco into the Commonwealth during the year 1912 amounted to £914,439, comprising unmanufactured tobacco (£610,420), cigars (£163,898), cigarettes (£50,932), manufactured tobacco (£88,165), and snuff (£1024).

5. Pumpkins and Melons.—The total area under this crop in the Commonwealth during 1912-13 was 13,662 acres, of which 4174 acres were in New South Wales, 2632 acres in Victoria, 6122 acres in Queensland, and 731 acres in Western Australia; the production for the first three named was 14,961, 24,392 and 17,645 tons respectively; the quantity produced in Western Australia is not available.

6. Hops.—Hop-growing in the Commonwealth is practically confined to Tasmania and some of the cooler districts of Victoria, the total area for the season 1912-13 being 1383 acres, of which 1247 acres were in Tasmania, and 131 acres in Victoria; a small area of 5 acres was also grown in South Australia. The Tasmanian area, though still small, has increased rapidly during the past nine years, the total for the seasons 1901-2 being only 599 acres. On the other hand, the Victorian area, which in 1901-2 was 307 acres, has diminished to 131 acres in 1912-13. The cultivation of hops was much more extensive in Victoria some thirty years ago than at present, the area devoted to this crop in 1883-4 being no less than 1758 acres. During the year 1912 the net importations of hops into the Commonwealth represented a weight of 1,077,261 lbs. and a value of £87,022. The total value of the net importations of hops into Australia during the past ten years amounted to £540,764, thus indicating the existence of a regular and extensive local demand.

7. Millet.—Millet appears in the statistical records of three of the Commonwealth States. The total area devoted thereto in 1912-13 was 2693 acres, of which 1828 acres were in New South Wales, 474 in Victoria, and 391 in Queensland. 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.

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

9. Cotton.—Cotton-growing on a small scale has been tried in Queensland, but so far without very marked success; 441 acres were devoted to this crop in 1912-13, giving a yield of 150,414 lbs. of seed cotton, valued at £3760. 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, and 15 acres were under cultivation in 1912-13. The tropical portions of Western Australia have also long been regarded as suitable for its cultivation.

10. **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 an area of 547 acres was recorded. Since then the area continuously declined to 1906-7, when it was as low as 256 acres. During the season 1907-8 an improvement occurred and the total reached was 304 acres, succeeded by a fall to 235 acres in 1908-9, 200 acres in 1910-11, 198 acres in 1911-12, and 196 acres in 1912-13. In the last-mentioned season the yield amounted to 131,928 lbs., valued at £4947.

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

§ 17. Bounties on Agricultural Products.

1. **General.**—The Bounties Act of 1907 passed by the Federal Parliament in order to encourage the manufacture and production of certain articles in the Commonwealth, includes among the number of items on which bonuses are payable, several agricultural products. The most important of these, viz., sugar, has been referred to on page 339 of this publication. Minor products of the soil on which these bounties are payable are as set out in the following table :—

AGRICULTURAL PRODUCTS (OTHER THAN SUGAR) ON WHICH BOUNTIES ARE PAYABLE.

Article.	Period dating from 1st July, 1907, during or in respect of which Bounty may be paid.	Rates of Bounty.	Maximum amounts which may be assigned in any one year.
Cotton, ginned	8 years	10 % on market value	£ 6,000
Fibres—			
New Zealand flax	10 "	10 " "	3,000
Flax and hemp	5 "	10 " "	8,000
Jute	5 "	20 " "	9,000
Sisal hemp	10 "	10 " "	3,000
Oil materials supplied to an oil factory for the manufacture of oil—			
Cottonseed	8 "	10 " "	1,000
Linseed (flax seed)	5 "	10 " "	5,000
Rice, uncleaned	5 "	20s. per ton	1,000
Coffee, raw, as prescribed	8 "	1d. per lb.	1,500
Tobacco leaf for the manufacture of cigars, high grade, of a quality to be prescribed	5 "	2d. "	4,000
Fruits—			
Dates (dried)	15 "	1d. "	1,000
Dried (except currants and raisins) or candied, and exported	5 "	10 % on market value	6,000

* Any unexpended amount assigned in any year is available for the years following.

Although the rate of bonus on the several articles, is, as shewn above, fairly liberal, the bounties have not been availed of to any great extent, as will be seen from the following table, which gives particulars as to the quantity of the articles raised and the amounts paid as bounties in respect thereof for the five financial years ended 1912-13 :—

PARTICULARS OF BOUNTIES PAID ON AGRICULTURAL PRODUCTS (OTHER THAN SUGAR), 1908-9 to 1912-13.

Article.	Quantity produced on which Bounties were paid.					Amount paid as Bounties.				
	1908-9.	1909-10.	1910-11.	1911-12.	1912-13.	1908-9.	1909-10.	1910-11.	1911-12.	1912-13.
Cotton, ginned ...lbs.	21,865	24,994	53,178	60,443	46,043	£ 32	£ 34	£ 91	£ 137	£ 95
Fibres—										
Flax and hemp tons	32	28	28	137	101	126	120	123	480	215
Sisal hemp	14	11	45	8	...	34	25	112	18	...
Oil materials supplied to an oil factory for the manufacture of oil—										
Cottonseed ... ..lbs.	36,491	45,610	96,312	...	84,479	12	10	22	...	13
Linseed (flax seed) cwt.	36	...	...	...	100	6	...	...	...	9
Coffee, raw, as prescribed lbs.	53,365	28,134	26,825	16,269	30,053	222	117	112	68	125
Tobacco leaf for the manufacture of cigars, high grade, of a quality to be prescribed lbs.	14,538	33,093	10,902	9,258	25,820	121	276	90	78	215
Fruits—										
Dried (except currants and raisins) or candied, & exported lbs.	12,096	23,932	454,075	636,452	168,001	28	104	940	1,734	576

During the year 1912-13 the total amount paid in respect of cotton, cotton seed, and coffee was claimed by the State of Queensland. Victoria collected £327, South Australia £160, and Tasmania £89 of the fruit bonus, while £195 of the bounty paid for tobacco leaf was paid to Queensland, the remaining £9 being earned in New South Wales. Victoria claimed the total amount paid for flax and hemp.

No bounties have yet been paid on New Zealand flax, jute, uncleaned rice or dates.

§ 18. Fertilisers.

1. General.—In the early days of settlement and cultivation in the Commonwealth, scientific cultivation was in a much less developed state than it is 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 legislation has been passed in each of the States, regulating the sale and preventing the adulteration of fertilisers. A list of these Acts and their main features will be found in the previous issue of the Year Book (pages 406 and 407).

3. Imports.—The local production of artificial manures has assumed large proportions during the last few years, though considerable quantities are still imported.

The importation of fertilisers has increased nearly 200 per cent. since 1901. The chief items, both as regards quantity and value, are those relating to phosphates, a fertiliser which has proved itself to be very suitable for the growing of cereals in Australian.

soils. The greatest quantity of the manufactured superphosphates imported from any one country during 1912 was obtained from Japan, whence came over 52½ per cent. of the total imported, while the United Kingdom contributed over 36 per cent., Germany 6½ per cent., and the Netherlands 4½ per cent., the balance being imported from Belgium and France. Ocean Island, with 76 per cent., was the principal contributor of rock phosphates; of the balance about 13 per cent. was obtained from Christmas Island, and 11 per cent. from the Caroline Islands. Guano is imported chiefly from Ocean Island, one of the South Sea group, and in lesser quantities from Malden Island and Peru, while the East Indies had practically a monopoly of the bone-dust trade with the Commonwealth during 1912.

The imports of artificial manures during the last five years is shewn in the following table. It will be noticed that the quantity of rock phosphates imported during that period has shewn a steady increase. The imports were particularly large during 1910 and 1912. The figures for the manufactured superphosphates shewed an increase of about 50 per cent. during 1910, those for 1911 shew a further increase of some 5 per cent., while those for 1912 shew a decrease of 23 per cent. as compared with those of the previous year.

COMMONWEALTH IMPORTS OF FERTILISERS, 1908 to 1912.

Fertiliser.			1908.	1909.	1910.	1911.	1912.
Bonedust	...	Cwt.	74,657	71,959	12,740	4,164	8,769
"	"	£	18,088	17,632	3,294	1,086	2,309
Guano	...	Cwt.	696,660	468,215	788,304	484,003	541,873
"	"	£	84,961	56,723	89,961	52,447	64,833
Superphosphates	...	Cwt.	610,596	757,515	1,196,613	1,254,692	967,480
"	"	£	94,203	105,229	174,751	183,632	155,643
Rock Phosphates	...	Cwt.	1,267,665	1,006,030	2,112,127	1,721,140	1,963,640
"	"	£	183,817	143,246	294,212	228,292	259,394
Other	...	Cwt.	197,240	151,241	377,327	161,121	247,026
"	"	£	60,676	38,007	107,573	47,479	82,769
Total	...	Cwt.	2,846,818	2,454,960	4,487,111	3,625,320	3,728,788
		£	441,745	360,837	669,791	513,136	565,548

4. **Exports.**—The subjoined table shows the exports of artificial manures for the years 1908 to 1912. Practically the whole of the fertiliser is manufactured locally, and is shipped mainly to New Zealand, Japan and the Pacific Islands:—

COMMONWEALTH EXPORTS OF FERTILISERS, 1908 to 1912.

Fertiliser.			1908.	1909.	1910.	1911.	1912.
Bonedust	...	Cwt.	65,491	62,637	80,602	122,456	125,546
"	"	£	17,069	16,571	19,066	34,787	38,188
Guano	...	Cwt.	...	...	2,812	2,719	500
"	"	£	...	...	490	603	100
Superphosphates	...	Cwt.	250,236	235,939	260,261	200,925	182,377
"	"	£	47,418	44,041	51,051	38,007	34,400
Rock Phosphates	...	Cwt.	5,077	3,320	11,190	2,106	...
"	"	£	1,145	658	1,819	353	...
Soda Nitrate	...	Cwt.	429	3,579	6,215	6,107	5,523
"	"	£	222	2,075	2,844	3,098	2,660
Ammonia Sulphate	...	Cwt.	70,258	69,894	69,015	56,630	73,193
"	"	£	45,915	43,766	43,081	37,141	51,022
Other	...	Cwt.	120,524	177,189	229,841	215,382	146,348
"	"	£	28,565	33,880	48,989	53,510	49,316
Total	...	Cwt.	512,015	552,558	659,936	606,325	533,487
		£	140,334	139,991	167,340	167,499	175,686

5. **Statistics of Use of Fertilisers.**—The statistics available in connection with the use of manures in the Commonwealth for a series of years refer to New South Wales, Victoria, South Australia, and Western Australia; those for Tasmania were collected for the first time for 1911-12. Particulars concerning the first-mentioned State are given hereunder:—

FERTILISERS USED IN NEW SOUTH WALES, 1908-9 to 1912-13.

Season.	Total Area of Crops.	Area Manured.		Manure Used.	
		Aggregate.	Percentage to Total Area of Crop.	Natural (Stable-yard, etc.).	Artificial.
	Acres.	Acres.	%	Loads.	Tons.
1908-9 ...	2,717,085	509,262	18.74	216,078	15,545
1909-10 ...	3,180,561	826,197	25.98	189,008	21,659
1910-11 ...	3,386,017	1,030,554	30.43	186,204	25,017
1911-12 ...	3,628,513	1,407,453	38.80	178,689	33,820
1912-13 ...	3,737,035	1,642,078	43.94	170,312	38,918

Particulars for Victoria for 1901-2 and the past five seasons are as follows:—

FERTILISERS USED IN VICTORIA, 1901-2 and 1908-9 to 1912-13.

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.	No.	Acres.	%	Tons.	Tons.
1901-2 ...	2,965,681	11,439	556,777	18.77	153,611	23,535
1908-9 ...	3,461,761	24,437	2,053,987	59.33	235,492	64,715
1909-10 ...	3,658,535	26,690	2,407,331	65.80	197,446	77,579
1910-11 ...	3,952,070	27,845	2,714,854	68.69	203,884	86,316
1911-12 ...	3,640,241	26,159	2,676,408	73.52	205,739	82,581
1912-13 ...	4,079,356	29,524	3,029,418	74.26	222,253	94,010

The figures relating to the use of fertilisers in South Australia are shewn in the table below:—

FERTILISERS USED IN SOUTH AUSTRALIA, 1908-9 to 1912-13.

Season.	Total Area of Crops.	Area Manured.		Manure Used.	
		Aggregate.	Percentage to Total Area of Crop.	Natural (Stable-yard, etc.).	Artificial.
	Acres.	Acres.	%	Loads.	Tons.
1908-9 ...	2,321,812	1,712,394	73.75	120,648	64,842
1909-10 ...	2,530,301	2,031,832	80.30	133,935	76,413
1910-11 ...	2,746,334	2,235,578	81.40	129,918	81,899
1911-12 ...	2,965,338	2,511,130	84.68	134,503	87,475
1912-13 ...	3,062,998	2,603,136	84.99	111,434	91,607

Corresponding particulars relative to Western Australia for the seasons 1908-9 to 1912-13 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, 1908-9 to 1912-13.

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.
1908-9 ...	585,339	493,545	84.32	61,834	21,358
1909-10...	722,086	608,870	84.32	67,263	24,654
1910-11...	855,024	773,561	90.47	62,229	33,194
1911-12...	1,072,653	992,463	92.52	51,600	43,843
1912-13...	1,199,991	1,120,334	93.36	55,085	47,563

Statistics relating to the use of manures in Tasmania were collected for the first time in 1911-12, particulars for the past two seasons are as follows:—

FERTILISERS USED IN TASMANIA, 1911-12 and 1912-13.

Season.	Total Area of Crops.	Area Manured.		Manure Used.	
		Aggregate.	Percentage to Total Area of Crops.	Natural (Stableyard, etc.).	Artificial.
	Acres.	Acres.	%	Tons.	Tons.
1911-12...	270,000	129,914	48.12	25,792	8,750
1912-13...	286,065	137,653	48.12	27,328	9,272

A marked increase in the proportion of cropped land treated with manure is in evidence in all of the States for which returns are available. Thus, in New South Wales the area of manured land represented in 1908-9 only 13 $\frac{3}{4}$ per cent. of the area under crop, as against nearly 44 per cent. in 1912-13. Similarly, in Victoria the percentage increased from 18 $\frac{3}{4}$ per cent. in 1901-2 to 59 $\frac{1}{2}$ per cent. in 1908-9 and to 74 $\frac{1}{2}$ per cent. in 1912-13, in South Australia from 73 $\frac{3}{4}$ per cent. in 1908-9 to over 85 per cent. in 1912-13, and in Western Australia from 64 per cent. in 1904-5 to 93 $\frac{1}{2}$ per cent. in 1912-13.

6. Local Production of Fertilisers.—Statistics relative to the local production of fertilisers are very incomplete, and detailed returns for fertiliser factories other than bone mills are not available. The number of firms engaged in the manufacture of artificial manures in the Commonwealth at latest available date was 37, made up as follows:—New South Wales, 14; Victoria, 32; Queensland, 13; South Australia, 20; Western Australia, 6; and Tasmania, 2. If, however, approximately complete returns of the quantities of fertilisers used in the various States could be given, a comparison with the importations would give valuable information, but, as already mentioned, such particulars are only available for four of the States prior to 1911-12, and even then do not furnish the whole of the information necessary.

7. Benefits Derived from the Use of Fertilisers.—There is little doubt that the increased and increasing use throughout the Commonwealth of fertilisers, natural and artificial, combined with the greater attention being devoted to fallowing and to the combination of sheep-farming with agriculture, is having the effect of improving the

prospects of those dependent for a livelihood on the products of the soil. Reference has previously been made to the loss to the soil of phosphoric acid which the Commonwealth export of wheat and its milled products involves, and the necessity which thus arises for returning this ingredient in some form. Similarly, other staple products exported impose their respective tolls upon the soil of the Commonwealth, and the increased use of fertilisers furnishes evidence that producers are alive to the necessity for making good the deficiency so arising.

§ 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 that lambing 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. In the rearing of lambs for the London market, ensilage appears to be destined to play an important part, as the lambs thrive upon it much better than upon dry food. 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 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. The silos vary in capacity from forty to 130 tons. A portable silo made of iron, which has been devised, is made in sections of such size and weight as to admit of ready handling. These silos can be increased in diameter or height by the addition of further sections.

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, have for some years been making special efforts to educate the farming community in this respect, so that mistakes may be avoided and the conditions essential for the production of good ensilage may be better appreciated. These conditions vary with the climate and with the locality. The Government also undertakes the erection of silos on very liberal terms, repayment extending over a series of years. Experts supervise the erection of the silos, and give practical lessons as to packing them, etc. The New South Wales Government have, by giving advice in the "Agricultural Gazette" and by the issue of special bulletins, taken steps towards the education of the farmers. Silos have also been erected on the various experimental farms with a view to demonstrating the value of ensilage. No financial assistance is, however, given in New South Wales in this connection.

3. **Quantity Made.**—Particulars concerning the number of silos and the quantity of ensilage made in the several States of the Commonwealth in the seasons 1908-9 to 1912-13 are furnished in the table given hereunder:—

COMMONWEALTH ENSILAGE-MAKING, 1908-9 to 1912-13.

State or Territory.	1908-9.		1909-10.		1910-11.		1911-12.		1912-13.	
	*Holdings.	Ensilage Made.	*Holdings.	Ensilage Made.	*Holdings.	Ensilage Made.	*Holdings.	Ensilage Made.	*Holdings.	Ensilage Made.
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
New South Wales	300	27,468	364	34,847	258	29,616	158	20,477	144	18,509
Victoria	392	18,205	518	27,280	460	25,969	371	20,888	287	17,877
Queensland	59	4,654	79	4,517	97	5,804	61	4,379	58	4,156
South Australia	67	2,017	81	2,244	68	1,530	39	1,250	28	2,200
Western Australia	51	1,171	28	770	14	414	9	307	23	479
Tasmania	11	512	13	686	21	1,073	34	280	20	424
Federal Territory	...	...	...	...	...	...	...	...	1	10
Commonwealth	880	54,027	1,083	70,344	918	64,406	672	47,581	561	43,655

* No. of holdings on which ensilage was made.

Since the drought of 1902-3 greater attention has been paid to ensilage than was previously the case, and during the four seasons ended 1909-10 a continuous and fairly rapid increase was in evidence in all the States, both in the number of holdings on which ensilage was made, and in the quantity produced. The seasons for 1911-12 and 1912-13 shew a falling-off in all the States. The reduction cannot be accepted as an indication of a lessening of appreciation of the benefits of ensilage, but rather of the fact that stocks had not been drawn upon to any great extent during the previous seasons.

§ 20. Agricultural Colleges and Experimental Farms.

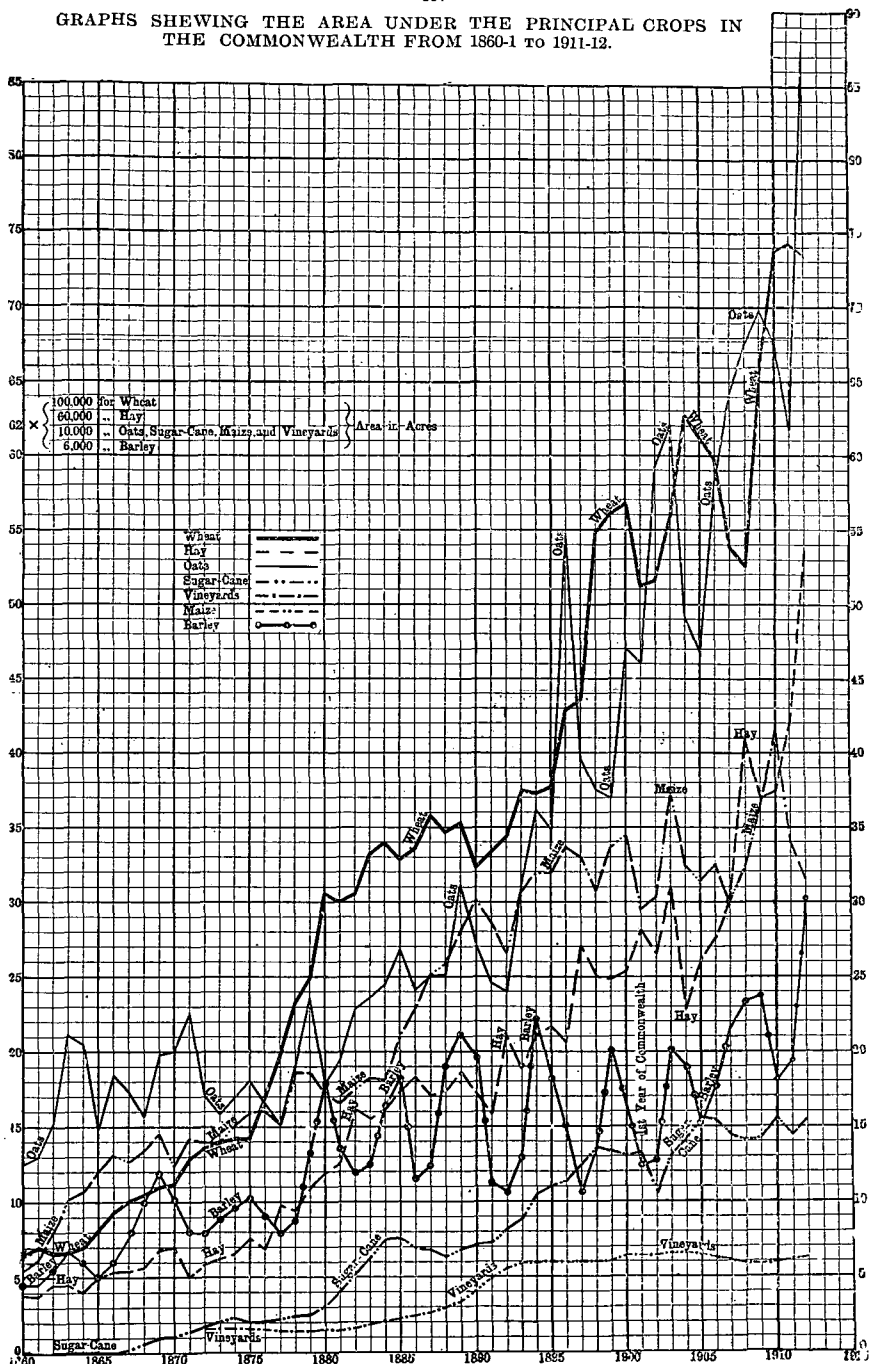
1. **Introduction.**—It has been thought preferable to refer to what may be called the effort in the direction of agricultural education in this section rather than under the heading of education.

In most of the States agricultural colleges and experimental farms have been established with a view to promoting agriculture and to establishing improved and more scientific systems of stock-breeding and dairying. In these colleges and on 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 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.

2. **Particulars of Agricultural Colleges and Experimental Farms.**—In the tables given below particulars of agricultural colleges and experimental farms in the several States of the Commonwealth in 1912-13 are shewn. Tasmania is the only State in which such colleges or farms are not established.

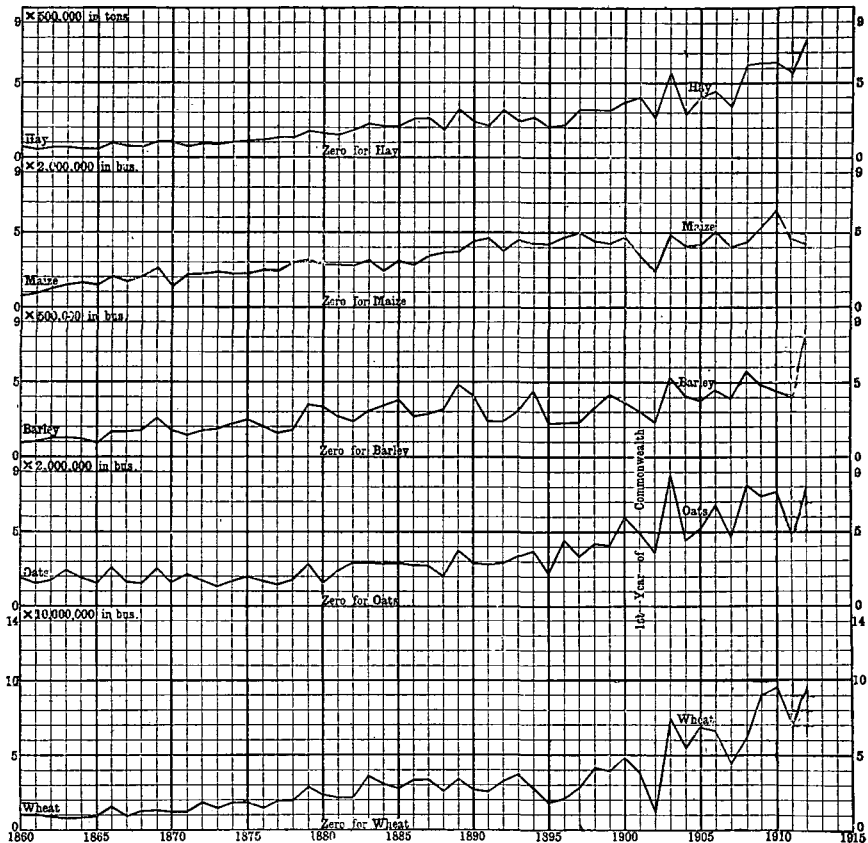
GRAPHS SHEWING THE AREA UNDER THE PRINCIPAL CROPS IN THE COMMONWEALTH FROM 1860-1 TO 1911-12.



(See pages—for wheat, 310; oats, 315; maize, 321; barley, 324; hay, 332; sugar-cane, 337; and vineyards, 341.)

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 on the left-hand of the diagram. The height of each graph above the base line denotes, for the crop to which it relates, the total area under cultivation in the Commonwealth during the successive seasons.

GRAPHS SHEWING THE PRODUCTION OF THE PRINCIPAL CROPS IN THE COMMON WEALTH FROM 1860-1 TO 1911-12.



(See pages—for wheat, 311; oats, 318; maize, 322; barley, 325; and hay, 333.)

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.

PARTICULARS OF AGRICULTURAL COLLEGES AND EXPERIMENTAL FARMS IN THE SEVERAL STATES OF THE COMMONWEALTH DURING THE SEASON 1912-13.

Particulars.	Unit of Quantity.	New South Wales.	Vic.	Q'land.	South Aust.	West. Aust.	Tasmania. (a)	Northern Terr.	C'wlth.
No. of agricultural colleges	No.	1	2	1	1	...	...	...	5
" experimental farms ...	"	16	5	5	8	4	...	2	40
" students ...	"	401	203	47	54	4	...	...	709
" hands employed ...	"	157	150	58	57	20	...	33	475
Value of plant & machinery	£	16,560	10,555	5,800	8,647	2,559	...	8,000	52,121
" produce for year ...	"	22,569	12,586	4,067	9,903	3,610	...	...	52,736
Receipts—									
Government grant ...	"	15,397	12,040	...	15,222	...	...	...	42,659
Fees ...	"	4,552	3,305	1,049	1,923	95	...	50	10,974
Sales of produce, &c. ...	"	3,598	5,888	3,788	4,505	3,054	...	...	20,813
Other ...	"	239	704	...	2,107	683	...	...	3,733
Total receipts ...		23,786	21,917	4,837	23,757	3,832	...	50	78,179
Expenditure—									
Salaries, professional ...	"	4,341	5,134	3,295	2,740	...	...	700	16,210
" general ...	"	6,936	8,679	5,042	6,774	3,219	...	4,000	34,650
Buildings & maintenance	"	1,528	22,090	11,202	8,458	3,607	...	2,500	73,427
Other ...	"	10,981	...	...	5,785	276	...	7,000	...
Total expenditure ...		23,786	35,903	19,539	23,757	7,102	...	14,200	124,287
Agriculture, &c.—									
Area under cereals for grain	Acres	1,066	1,087	195	2,584	1,085	...	18	6,035
" hay ...	"	1,171	629	311	986	255	...	17	3,369
" fruit trees, &c. ...	"	259	90	37	25	41	...	...	452
" vines ...	"	122	81	9	52	2	...	...	266
" green fodder ...	"	1,317	394	158	242	369	...	74	2,554
" root crops ...	"	78	30	41	5	1	...	5	160
" other crops ...	"	62	67	31	107	95	...	20	352
Total under crop ...		4,075	2,378	782	4,001	1,848	...	134	13,218
Area of land in fallow ...	"	347	991	69	2,584	1,100	...	45	5,136
" under artificially sown grasses ...	"	581	32	107	10	50	...	...	780
New ground broken up during season ...	"	260	100	84	510	350	...	147	1,451
Previously cropped land lying idle ...	"	821	1,778	190	1,223	718	...	...	4,733
Total area of arable land		6,087	5,279	1,232	8,328	4,066	...	326	25,318
Balance of area ...	"	20,242	5,718	13,794	7,960	3,490	...	4,794	55,998
Total of area ...		26,329	10,997	15,026	16,288	7,556	...	5,120	81,316
Live stock—									
Horses ...	No.	440	210	176	225	72	...	49	1,172
Dairy cows ...	"	520	186	114	212	98	...	11	1,141
All other cattle ...	"	489	221	616	54	77	...	10	1,467
Sheep ...	"	5,360	2,000	1,009	2,702	751	...	42	12,764
Pigs ...	"	711	239	242	296	80	...	26	1,594
Capacity of tanks or dams ...	Gal.	87,130	8,750,000	233,870	2,160,800	15,000	...	8,000	11,254,800

(a) There are no Agricultural Colleges or Experimental Farms in Tasmania.

3. 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 sixteen experimental farms are now established by the New South Wales Government. Theoretical instruction in agriculture, with practical illustrations, forms part of the curriculum of the Sydney Technical College. The School of Agriculture in the Sydney

University, which has been established for three years, is doing very satisfactory work. 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, lecturing on the value, necessity, and advantages of agricultural knowledge, and giving practical demonstrations wherever practicable.

4. **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 were in existence in different parts of the State during 1912-13. There are five 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.

5. **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 for some 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.

6. **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, has an extensive membership distributed throughout the agricultural districts of the State. 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.

7. **Western Australia.**—A considerable amount of developmental work has been done of late years towards the promulgation of agricultural knowledge on the State farms at Chapman and Narragin, and, more recently still, on the experimental farms at Brunswick and Nangeenan.

8. **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 agriculturists, such as suitability of various districts for growth or production of animal and vegetable products, information respecting plants, methods of cultivation, breeding and feeding animals, and how best to 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 or experimental farms, and practically no agricultural teaching is given in the elementary schools.

§ 21. Government Loans to Farmers.

1. **Introduction.**—All the Australian States 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* nearly a century later in France was a creation of a similar character. This latter institution was 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* was empowered to 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 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. Particulars of advances made under the *Closer Settlement* and similar Acts are dealt with in the section on *Closer Settlement*. (See page 243.)

2. **Aggregate of Transactions in each State, 1909 to 1913.**—The subjoined table gives aggregate of transactions in reference to advances to farmers in each State during the past five years.

STATE GOVERNMENT ADVANCES DEPARTMENTS.—AGGREGATE OF LOANS TO FARMERS, 1909 to 1913 (a).

State.	TOTAL ADVANCED TO DATE.					BALANCE DUE.				
	1909.	1910.	1911.	1912.	1913.	1909.	1910.	1911.	1912.	1913.
	£	£	£	£	£	£	£	£	£	£
N.S.W. (b)...	1,062,625	1,362,853	1,617,192	1,948,885	2,423,955	591,292c	795,113c	928,086	1,074,358	1,396,336
Victoria ...	2,492,698	2,657,713	2,797,323	2,954,618	3,208,903	1,298,404c	1,308,425c	1,306,657	1,343,834	1,511,798
Q'nsland ...	187,014	235,793	306,944	430,403	623,498	136,946	163,640	206,997	305,652	470,795
S. Aust. (d)...	1,386,153	1,544,946	1,786,762	2,064,583	2,370,076	668,535	710,316	819,818	966,670	1,150,020
W. Aust ...	1,004,675	1,257,082	1,540,241	1,946,184	2,582,937	835,239	935,960	976,811	1,280,732	1,883,957
Tasmania	5,687	9,187	14,610	18,636	23,915	5,657	8,521	13,561	16,592	21,089
C'wealth ...	6,138,852	7,067,574	3,063,072	9,363,309	11,233,284	3,531,073	3,921,975	4,251,930	4,987,838	6,433,995
	ANNUAL PROFITS.					ACCUMULATED PROFITS.				
	£	£	£	£	£	£	£	£	£	£
N.S.W. (b)...	4,661	5,390	8,200	9,543	10,335	6,583	8,039	15,606	25,349	35,684
Victoria ...	7,037	5,926	3,022	3,069	5,203	75,987	81,913	84,936c	88,006c	93,209e
Q'nsland ...	1,405	1,974	2,548	3,318	3,354	4,023	6,003	8,551	11,869	15,223
S. Aust. (d)...	4,218	4,587	6,662	6,289	8,218	33,598	38,186	44,843	51,137	59,355
W. Aust. ...	6,061	6,823	6,753	8,060	... (f)	24,255	31,078	37,831	45,892	... f
Tasmania	...	(-) 98	48	81	473	...	(-) 98	(-) 50	31	503
C'wealth ...	23,382	24,602	27,233	30,360	27,582g	144,451	165,121	191,722	222,284	203,974 g

(a) Compiled from figures furnished by the Government Savings Bank of Victoria. (b) For years ended 31st December prior. (c) Balance after deduction of special principal payments in advances. (d) Includes loans to farmers and other producers and to local bodies on the security of their own rates. (e) Including profits in connection with House and Shop loans. (f) Not available. (g) Exclusive of Western Australia.

3. **Particulars of Transactions in each State.**—An account of the initial legislation in each State in reference to advances to settlers, subsequent legislation, security on which, and objects for which, advances were made, amount of advances and repayments up to the end of 1911-12, etc., will be found in previous issues of the Year Book (see No. 6, pages 417-25).

4. **Transactions in each State, 1912-13.**—The following tables gives particulars of applications received and granted, and amounts advanced and repaid during 1912-13:—

PARTICULARS OF TRANSACTIONS OF STATE GOVERNMENT ADVANCES TO FARMERS DURING THE YEAR 1912-13.

Particulars.		New South Wales.	Victoria.	Queens-land.	South Australia.		Western Australia.	Tasmania. (a)
					State Bank (a).	Settlers' Board (b).		
Applications received ...	No.	2,641	1,032	(c)	409	563	3,836	129
" granted ...	£	1,637,261	736,671	(c)	384,066	149,336	800,000	12,594
" received ...	No.	1,929	466	(c)	112	394	3,442	96
" repaid ...	£	1,143,637	291,470	268,560	97,955	122,109	493,872	7,219
Amounts advanced ...	£	771,272	254,285	193,078	95,205	106,519	636,753	5,279
" repaid ...	£	119,756	86,320	27,935	38,063	1,185	33,528	643

(a) Year ended 31st March, 1913. (b) Year ended 30th June, 1913. (c) Not available.

(i.) *New South Wales Closer Settlement Promotion Act 1910.* In 1910 an Act was passed in New South Wales whereby intending settlers might acquire by direct purchase from the owner, areas of private land suitable for closer settlement, under the same

conditions, regarding residence, the payment of purchase money etc. as apply to settlement purchases under the Closer Settlement Acts. The purchasers are financed to the extent of 95 per cent. of the purchase money, provided that such does not exceed the bank's valuation of the properties. It is anticipated that a considerable amount of business will be done under this Act which will materially expand the operations of advances to farmers in this State. The following table will shew the business transacted up to the end of 1912 :—

**TRANSACTIONS UNDER THE CLOSER SETTLEMENT PROMOTION ACT
IN NEW SOUTH WALES.**

Applications.	Estates.	Farms.	Prices agreed upon by Vendors and Purchasers. £
Cases settled and surrender arranged since inception of Act	46	341	742,370
„ reported on but not yet settled	36	256	585,682
„ awaiting inspection and report	27	125	267,655
„ inspection not yet authorised	17	70	144,369
„ refused since inception of Act	41	150	213,958
Total cases submitted up to end of 1912	167	942	1,954,034

The number of estates submitted during the year to bank by the Lands Department was 108, comprising 538 farms, the purchase price asked being £1,168,427.

(ii.) *Particulars of Transactions of Agricultural Bank of Western Australia, 1908 to 1912.* The following table gives particulars of transactions of the Agricultural Bank for each year from 1908 to 1912 inclusive :—

**TRANSACTIONS OF AGRICULTURAL BANK, WESTERN AUSTRALIA, 1908 to 1912.
AMOUNTS ADVANCED FOR WHICH IMPROVEMENTS HAVE BEEN EFFECTED.**

Year ended the 30th June.	Amounts Advanced to Date.	Improvements Effected to Date.							
		Clearing.	Cultivating.	Ring-barking.	Fencing.	Drain- ing.	Wells and Reservoirs.	Build- ings.	Total.
£	£	£	£	£	£	£	£	£	£
1908	743,599	643,341	120,688*	44,363	98,663	4,127	34,789	82,325	1,028,296
1909	1,004,675	780,907	124,338*	62,711	177,410	4,675	48,543	83,708	1,282,292
1910	1,257,082	899,712†	124,782*	81,042	240,729	5,043	61,387	83,868	1,496,563
1911	1,540,241	1,031,891†	124,812*	107,676	297,077	5,386	78,581	83,868	1,729,291
1912	1,946,184	1,194,750†	124,782*	149,043	361,637	5,660	103,519	83,868	2,023,259

* Including £4321 for orchards. † Including £6300 in 1910, £8611 in 1911, and £12,180 in 1912 for poison and blackboy grubbing.

5. **Particulars Respecting Agricultural and Stock Departments.**—On pages 364 to 369 will be found particulars respecting agricultural and stock departments of the several States of the Commonwealth as on 30th June, 1913. The main features of organisations are set out under their respective headings, and will be found to embrace such items as the number on staffs, expenditure, facilities for agricultural education and work undertaken in agricultural colleges, technical schools and experimental farms, orchards and vineyards. The nature of lectures given by experts, and other forms of agricultural instruction, the extent of distribution of plants, and the special steps taken by departments for distribution of information amongst agriculturists, and with a view to improving the markets for the products of the States, are also given.

PARTICULARS RESPECTING AGRICULTURAL AND STOCK DEPARTMENTS

MAIN FEATURES OF ORGANISATIONS.	NEW SOUTH WALES.				VICTORIA.				QUEENSLAND.
I. <i>Designation of Minister by whom Dep't. is controlled.</i>	Minister for Lands and Agriculture.				Minister of Agriculture.				The Secretary for Agriculture.
II. <i>Staff on 30th June, 1913—</i>	Agri- culture.	Forestry.	Stock and Brands.	Botanic Gardens, etc.	Head Office.	Agri- culture.	Stock and Dairy.	Exports.	Agricultural and Stock Department.
Administrative	3	1	1	1	1	1	1	1	1
Professional ...	90	2	5	5	23	21	7	4	166
Clerical ...	55	18	14	3	2	12	1	1	46
Temporary ...	244	58	175	35	2	15	52	32	...
General ...	13	46	10	103	6	13	11	27	123
Total ...	405	125	205	147	32	50	83	65	336
III. <i>Expenditure 1912-13</i>	£273,916				£154,858.				£100,857.
IV. <i>Facilities for Agricultural Education—</i>	Hawkesbury. Hurlstone Continuation School (Dept. of Public Instruction).				Dookie. Longerenong.				Gatton.
(i.) <i>Agricultural Colleges.</i>									
(ii.) <i>Technical Schools at which Agriculture is taught.</i>	Farm Schools at Wagga and Bathurst. Apprentice Schools at Cowra, Glen Innes, Wollongbar, Grafton and Yanco.				Working Men's College, Melbourne. Gordon College, Geelong.				At present agriculture is not taught in any of the Technical Colleges, but at various Colleges classes are conducted in milk and cream testing, veterinary science, wool classing and sorting, sheep and wool training and sugar chemistry.
(iii.) <i>Experimental Farms, Orchards and Vineyards.</i>	Hawkesbury Agricultural College. Experimental Farms at Wagga Wagga, Bathurst, Wollongbar, Glen Innes, Cowra, Grafton, Coonamble, Berry, Yanco, Pera Bore. Demonstration Farms at Nyn-gan, Temora, Condobolin and Dural. Viticultural Stations at Howlong and Raymond Terrace.				Dookie and Longerenong Agricultural Colleges, Werri-bee Central Research Farm, Rutherglen Viticultural Station, W y u n a Irrigation Farm, Burnley Horticultural Gardens, Bamawm Experimental Farm.				State Farms Warwick, Emerald, Rockhampton, Roma, Atherton. State Nursery Cairns and Sugar Experiment Station, Mackay.
<i>Nature and extent of—</i>	Elementary principles of agriculture taught in most of the schools. Experimental plots in many schools. A travelling instructor in agriculture gives lessons and lectures.				Elementary agriculture is taught in a large number of rural elementary schools, and the numbers are steadily increasing. The subject is taken in 700 schools, as against 600 at the beginning of the year. The work is largely experimental, and deals with the properties of soils, the growing of common crops and the principles of manuring.				Since the beginning of 1910 the teaching of agriculture has found a place in a large number of Primary schools, especially in agricultural centres. It is placed amongst the science subjects to be taught, and is to some extent optional. The branches dealt with are (a) tree-planting, (b) flower and vegetable gardening, (c) farm work, including experimental work with maize, wheat, potatoes, bananas, pineapples, hay and fodder crops, grasses, manuring, watering and the conservation of soil moisture; orchard work—pruning, budding, grafting, etc., and dairy work—fodders and feeding, milk and cream testing.
(i.) <i>Agricultural Teaching given in Primary Schools.</i>									

OF THE SEVERAL STATES OF THE COMMONWEALTH.

SOUTH AUSTRALIA.			WESTERN AUSTRALIA.			TASMANIA.	
Minister of Agriculture and Irrigation.			Minister for Agriculture and Industries.			Minister of Agriculture.	
Agricultural Branch.	Stock and Brands.	Produce Department.	Agricultural.	Stock and Brands.	Miscellaneous.	Agricultural Branch.	Stock and Brands Branch.
2	2	3	1	...	...	1	...
8	11	...	9	4	...	7	...
17	5	26	36	2	...	5	...
67	6	90	21	2	...	2	...
34	...	60	43	6	...	1	7
123	24	179	110	14	174	16	7
£125,019.			£87,122.			£9472.	
Roseworthy			Nil.			Nil. (One at present under construction.)	
Adelaide School of Mines.			Perth Technical School, Perth Modern School, Kalgoorlie School of Mines, University of Western Australia.			Nil.	
Farms—Roseworthy, Kybybolite, Turretfield, Booboorowie, Veitch's Well. Poultry Station—Parafield. Vineyard—Roseworthy. Orchards—Adelaide and Coromandel Valley. Experimental plots at 16 centres.			Nangeenan, Narrogin, Chapman, Brunswick and Denmark.			State Farm at Deloraine, and experimental plots in privately-owned orchards under supervision of the Fruit Expert.	
No systematic agricultural teaching in primary schools. Experimental elementary agriculture taken up by individual teachers—result satisfactory. Work optional, but not widespread.			The teaching of systematic agriculture is not undertaken in Primary schools. Nature study is general, and in many cases includes much that may be termed elementary agriculture. The life histories of various kinds of plants and the principles of cultivation are studied in the school gardens or in experimental plots. Many simple experiments are carried on in connection with cereals and to a less extent with fodder plants and vegetables. An officer is employed specially for the organisation of such work, and his advice can always be had by teachers. Many suggestions are given through the monthly "Circular" which the Department sends to all teachers.			Most schools have flower and vegetable plots, but the subject of agriculture is taught with little system and only to a very moderate extent.	

PARTICULARS RESPECTING AGRICULTURAL AND STOCK DEPARTMENTS

MAIN FEATURES OF ORGANISATION.	NEW SOUTH WALES.	VICTORIA.	QUEENSLAND.
(ii.) Agricultural Teaching given in Technical Schools.	Instruction in agricultural principles, climate and rainfall, clearing, building, etc.; draining, irrigation, crops, and manures, dairying, sheep and wool, and wool classing, orcharding, pig and poultry breeding, etc.	Agricultural chemistry, woolclassing and Poultry breeding.	Botany, agriculture, sugar, chemistry, scientific baking and milling, dairying, milk and cream testing, plant pathology and economic entomology, horticulture, veterinary science, wool classing and sorting, swine husbandry, poultry farming.
(iii.) Work undertaken in Agricultural Colleges.	Instruction of students, complete course three years, in practical and theoretical agriculture, chemistry, botany, entomology, veterinary science, dairying, sheep and wool, wool classing, orcharding, pig and poultry breeding, etc. During the college vacation in June a short course is held for farmers.	Complete course in practical and theoretical agriculture extending over three years.	Practical and theoretical agriculture, pre-eminence being given to the former. The curriculum includes botany, elementary science and physics, dairying, gardening, elementary chemistry, veterinary science, bacteriology and agricultural chemistry.
(iv.) Work undertaken on Experimental Farms, Orchards and Vineyards.	Instruction of students—the full course is two years—in practical and theoretical agriculture, similar to but less theoretical than at the Hawkesbury College. Producing and harvesting crops, carrying out experiments in methods of cultivation, manuring, etc. Irrigation at Yanco.	Experiments in methods of cultivation, manuring, stock breeding, improving cereals by selection and cross fertilisation, testing of fodder plants.	Experimental and acclimatisation work, stock breeding, hybridisation, object lessons in cultivation, orchard work, etc. Pupils are taken at some of the farms.
(v.) Instruction given by Travelling Diaries, etc.	Nil.	None now employed. Demonstrations in cheese making given by experts, also practical instruction in fruit preserving, drying, etc., flax manufacture, poultry dressing, etc.	Nil.
(vi.) Lectures given by experts.	Agricultural, dairy, fruit, sheep and wool, viticultural and other experts and inspectors visit the different districts under the auspices of the Agricultural Bureau and Societies and give lectures. They also give practical demonstrations in the field. The Veterinary Surgeons of the Department also give lectures and demonstrations.	Agricultural classes, free lectures and practical demonstrations given by departmental experts throughout the State under the auspices of local agricultural and other associations.	Lectures, illustrated by lantern slides, are given by the Departmental Technical Instructors on all agricultural, horticultural and pastoral subjects. The local Agricultural, Horticultural, or Pastoral Society provides the hall, attends to advertising, etc. These lectures are free to all.
(vii.) Other forms of Agricultural Instruction.	The publication of the Agricultural Gazette monthly, which is issued free to farmers. Reprints of special articles in the Gazette are issued as pamphlets. Bulletins on special branches of agriculture, dairying, fruit growing, and stock, etc., are also issued.	Issue of monthly "Journal of Agriculture" and Bulletins.	Monthly issue of Agricultural Journal and pamphlets on given subjects. Practical demonstrations in the field by the technical instructors on the erection of silos, stacks, pruning, budding and cultivating, correct methods of inoculating cattle, applying insecticides and fungicides, the use of explosives in farming. The establishment of experimental plots on private lands for practically demonstrating improved methods of cultivating, manuring, etc. Inspectors travel the country and give advice to settlers. Displays at Shows illustrative of the agricultural, horticultural and pastoral possibilities of the State.

OF THE SEVERAL STATES OF THE COMMONWEALTH—Continued.

SOUTH AUSTRALIA.	WESTERN AUSTRALIA.	TASMANIA.
<p>Lectures and agricultural practical work, viticulture, fruit culture, botany lectures in conjunction with School of Mines and also by Horticultural Instructor.</p>	<p>Classes in such subjects as fruit-growing and wool classing are held in the Technical Schools at Perth and Fremantle.</p>	<p>Nil.</p>
<p>The training of young men in the practice of science of agriculture, viticulture, dairying and stock. Experimental and research work.</p>	<p>There are no Agricultural Colleges.</p>	<p>At the State Farm, Deloraine, students will be taken in 1914. The work will comprise all branches of agriculture and the growing of all fruits and crops suitable to the soil and climate.</p>
<p>Experimental work in manuring, irrigation, rotation of crops, stock rearing, breeding and selection of cereals. General cultural work of farm, orchard and vineyard.</p>	<p>Practical agriculture and orcharding are taught without any of the scientific aspects.</p>	
<p>Nil.</p>	<p>The Agricultural Commissioner for the South-west lectures on and advises on this subject.</p>	<p>A dairy school is held yearly in different centres.</p>
<p>Lectures and practical demonstrations are given by the departmental experts in various parts of the State. Special series of veterinary lectures and demonstrations and the classing and handling of wool.</p>	<p>Lectures are given by the dairy expert, fruit expert, irrigation and stock experts, botanist and pathologist, potato expert and poultry expert in their special work, and the Commissioner for the Wheat Belt on general agriculture, mixed farming and stock affecting the wheat growing portion of the State, and questions affecting the use and registration of fertilisers.</p>	<p>On dairying, pig and poultry raising, fruit pruning, horticulture, forestry, stock raising, veterinary work and general agriculture.</p>
<p>Nil.</p>	<p>Apart from the experiments carried out at State Farms, pruning demonstrations are given, individual holdings are visited and advice given on irrigation, and all questions on which the technical and professional staff is employed.</p>	<p>Practical instruction by experts in dairying, orcharding, farming, and poultry raising.</p>

PARTICULARS RESPECTING AGRICULTURAL AND STOCK DEPARTMENTS

MAIN FEATURES OF ORGANISATION.	NEW SOUTH WALES.	VICTORIA.	QUEENSLAND.
V. <i>General work of Department—</i>			
(i.) Extent to which distribution of plants is carried out by Department and General Regulations governing such distribution.	Small packets of seeds are distributed for experimental purposes to farmers on condition that reports are forwarded to the Department in due course.	Select-bred seed wheat, oats and barleys are grown for ultimate distribution among farmers. These are sold in small parcels to farmers at market rates.	The distribution of seeds and plants is not free, excepting in the case of seeds new to the country and that have not been cultivated here before. Surplus seeds and plants produced by the Agricultural Colleges and State Farms are sold at market values. Trees for shade purposes for public institutions are supplied free of charge. State School gardens are supplied free with both seed and trees.
(ii.) No. of inspectors employed—			
(a) Fruit and Orchard Inspectors ...	43	19	21
(b) Stock Inspectors ...	60	15	56
(c) Rabbit Inspectors ...	43	67	3
(d) Other Inspectors ...	45	67	50
(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. Stock Act. Stock (Tick) Act. Vine and Vegetation Act. Fruit Pests Act.	Vegetation Diseases Act. Stock Diseases Act. Vermin Destruction Act. Milk and Dairy Supervision Act. Bees Act. Sheep Dipping Act. Thistle Act.	Diseases in Plants Act. Diseases in Stock Act. Marsupial Act. Diseases in Sheep Act. Local Authorities Act. Prickly Pear Destruction Act. Rabbit Boards Acts.
(iv.) Special features of Entomological or other work of the Department.		Economic entomology, vegetable pathology, botany and biology lectures to farmers, horticulturists, etc. on fungus, insect and other pests, and the means adopted for their eradication and prevention. Field experiments with fungicides and insecticides, etc. Cultivation of pure yeasts for wine making, bacteriology of soils, etc.	The features of entomological work in Queensland are varied, as might be expected in a country where the range of climatic conditions is so great that every known product on the world's market can be grown. It cannot therefore be said that there are any special features to be mentioned. The same may be said of other work of the Department, but the main directions are in wool, sugar, meat export, dairying, fruit growing, grain growing and stock breeding.
(v.) Special steps taken by Department for distribution of information—			
(a) Amongst the agriculturists of the State.	Distribution of Agricultural Gazette, Bulletins and pamphlets.	"Journal of Department of Agriculture," Annual Reports, also publications on special subjects. The Departmental exhibit is forwarded for inspection at Agricultural Shows.	The distribution of the "Queensland Agricultural Journal" and pamphlets, lectures, object lessons at farms and Agricultural College. About 75% of those who pass through the Agricultural College follow rural pursuits, and in themselves are a valuable means of distributing information.
(b) With a view to improving the market for the State's product.	An Agent-General in London and Commercial Agents in the East and America. Samples are sent to the Agent-General for exhibition purposes.	Agent-General is supplied with samples of produce, etc., which are exhibited in Great Britain. Cool storage provided by Government to assist export trade. Daily quotations of wheat in London published in press. Fruit cool stores erected by Government.	By close inspection of exports and by collecting and distributing information from markets where business is likely to be profitable.

OF THE SEVERAL STATES OF THE COMMONWEALTH—Continued.

SOUTH AUSTRALIA.	WESTERN AUSTRALIA.	TASMANIA.
<p>Special varieties of cereals and fodder crops are distributed free, chiefly from the Agricultural Bureau. Large quantities of selected cereals are raised at the various farms for sale.</p>	<p>A seed bureau is established at headquarters, from which varieties of farm and garden seeds are distributed to settlers for experimental purposes, and with the object of encouraging the use of those varieties of cereals, etc., which have been proved by the experts concerned to be the best adapted to the varying conditions prevailing throughout the State.</p>	<p>Seeds are distributed to schools and to members of the Boards of Agriculture, and forest trees to public bodies for planting in public places.</p>
<p>16 14</p>	<p>15 10 8 ...</p>	<p>Appointed by Local Authorities. 13</p>
<p>The Vine, Fruit and Vegetable Protection Acts. Insecticides Acts. Phylloxera Act. Stock Diseases Act. Brands Act. Noxious animals and weeds come under the local governing bodies and not under the Agricultural Department. Work confined to economic phases of entomology and vegetable pathology aims at identifying and instructing horticulturists how to detect different insects and fungi, and to apply best remedies for prevention; tests conducted with fungicides and insecticides and uses demonstrated.</p>	<p>Stock Disease Act 1895. Insects Pests Amendment 1898. Noxious Weeds Act 1904. Vermin Boards Act 1909. Rabbit Act 1902. Beneficial parasites of a predaceous nature are distributed. Laboratory investigations made in diseases affecting plants, fruits, etc. Soil and water analyses made. Bacteriological investigation into stock diseases performed. Tubercular testing of dairy cattle, inoculation against tuberculosis and glanders in imported stock undertaken.</p>	<p>State Act. Contagious Diseases Cattle Act. Importation Diseases Cattle Act. Scab Act. Rabbit Destruction Act. Codlin Moth Act. California Thistle Act. Vegetation Diseases Act. Work largely of a practical nature.</p>
<p>Agricultural Bureaux with 155 branches, established; the latter meet at intervals, and matters relating to agriculture discussed. "Journal of Department of Agriculture" published monthly. Special bulletins and pamphlets on agriculture and other matters published at intervals. Departmental library open to those interested.</p>	<p>Pamphlets are issued by the Department on questions of particular importance to agriculturists, such as dairying, irrigation, fruit culture, production of cereals, poultry raising, destruction of vermin, production of fodder crops, etc. These are kept up to date and reissued from time to time.</p>	<p>Information given to public press. Publication of pamphlets. Issue of Agricultural Gazette. Communications to Boards of Agriculture.</p>
<p>South Australian exhibits are forwarded to various shows in Great Britain; daily quotations of wheat in London published in Sth. Aust. press. Produce of all kinds shipped to London and elsewhere, trial shipments of any classes of produce for which there is likely to be an opening in Europe are forwarded to the Trade Commissioner, who make it a special feature of his work to place these to the best advantage and also to investigate and report on the possibilities of extending markets.</p>	<p>This work is performed by the Colonial Secretary and Agent-General's office. Much has been done in a very practical way in sending abroad samples of our produce with a view of exploiting fresh markets.</p>	<p>Mainly in the hands of private persons. Samples of produce of various kinds are forwarded to the Agent-General for exhibition.</p>

§ 22. Graphical Representation of Crops.

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 fifty-three 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 four seasons of maximum wheat-cropping, viz., that of 1909-10, when an area of 6,586,000 acres was so cropped, that of 1910-11, when the area amounted to 7,372,456 acres, that of 1911-12, when 7,427,834 acres, and that of 1912-13 when 7,339,651 acres were cropped.

(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 until 1908-9 when 2,453,000 acres were attained, succeeded by a decline in 1909-10 to 2,228,000 acres, and a slight increase in 1910-11 to 2,258,000 acres, a further increase in 1911-12, and another substantial increase in 1912-13, when the maximum of 3,217,041 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 one of increase, especially during the period 1892-3 to 1896-7. During the four seasons following 1905-6 the area under oats increased rapidly to 698,000 acres in 1909-10, the succeeding two years experiencing a slight falling off, when areas of 677,000 and 617,000 acres were so cropped during 1910-11 and 1911-12 respectively; the 1912-13 season, however, experienced a heavy increase, attaining a maximum of 874,284 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 1896-7, since when it has varied above and below the point then reached, on the whole remaining practically stationary up to 1909-10. The maximum area under maize, prior to 1910-11, viz., 372,000 acres, was attained in the season 1903-4; in 1910-11 this record was exceeded by 43,000 acres; a falling off occurred in 1911-12, and again in 1912-13, the area under crop for the latter season being 315,000 acres.

(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. The season of maximum area, viz., 156,000 acres, was 1905-6. A marked decline in area was in evidence during the four following seasons; in the years 1910-11 and 1912-13, however, the former maximum was again attained, although a slight falling off took place in the intermediate season, 1911-12, to the extent of 11,000 acres.

(vi.) *Barley*. The Commonwealth barley crop has exhibited from time to time very marked fluctuations in area. The graph representing this crop shows 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., 181,000 acres, was attained in the season 1912-13.

(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 to 1904-5. 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 acres, while from 1904-5 to 1909-10 the area fluctuated considerably, the general tendency evidencing a fairly consistent diminution. During the past three seasons, however, an upward tendency has been in evidence. 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 1912-13 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 have been more marked in recent than in earlier years. Thus, since the year 1890 there have been four seasons of extremely low output, viz., in 1891-2, 1895-6, 1896-7, and 1902-3, with aggregate yields respectively of 25,700,000 bushels, 18,300,000 bushels, 20,900,000 and 12,400,000 bushels. On the other hand there have been six 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, 1903-4, 1909-10, 1910-11, and 1912-13, the total yields for which were 37,100,000 bushels, 48,400,000 bushels, 74,100,000 bushels, 90,400,000 bushels, 95,100,000 bushels, and 92,000,000 bushels respectively. Each of these yields, with the exception of 1912-13, represented at the date of its attainment the maximum Australian wheat crop, that for 1910-11 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 indications of a tendency to increase with the advance in population. This is well shewn in the diagram, by the persistence with which the 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. The 1912-13 crop was the highest for four seasons, and has only been exceeded on two occasions, viz., in 1903-4 and 1908-9.

(iii.) *Barley.* The Australian barley crop will be seen from the graph 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 the evidence of an increasing, though still fluctuating, output. The maximum barley crop of the Commonwealth was that of 3,860,000 bushels in 1912-13, thus exceeding the next highest record, viz., 1908-9, by 985,000 bushels.

(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 9,262,000 bushels, as compared with 10,771,000 bushels for 1909-10, the maximum Australian maize crop up to that date; this was exceeded in the following season, when the production of maize amounted to 13,044,000 bushels. The maize yields for 1911-12 and 1912-13 were considerably lower than that for the year immediately preceding them.

(v.) *Hay.* The graph relating to the Commonwealth output of hay indicated 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 1912-13, when the total production reached 3,955,000 tons.