CHAPTER XVII.

AGRICULTURAL PRODUCTION.

NOTE.—Except where otherwise stated, the "agricultural" years hereafter mentioned are taken as ending on 30th June.

§ 1. Introductory.

1. **Early Attempts at Agriculture.**—The instructions issued to Captain Phillip on the 25th April, 1787, directed him, amongst other things, to proceed as soon as possible to the cultivation of the soil "under such regulations as may appear to be necessary and best calculated for securing supplies of grain and provisions." When the settlers landed at Botany Bay, however, it was found that the glowing accounts published in England by members of Captain Cook's expedition of the fertility of the soil in 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 dispatch of the 15th May, 1788, Captain Phillip states that it was proposed to sow 8 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 grain crops were successfully raised. In his dispatch 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 3 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, 3,361 acres; maize, 1,527 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, 6,874 acres; maize, 3,389 acres; barley, 544 acres; oats, 92 acres; peas and beans, 100 acres; potatoes, 301 acres; turnips, 13 acres orchards, 546 acres; and flax and hemp, 37 acres.

By the year 1850 the area 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.**—(i) *General.* The following table shows the area under crop in each of the States and Territories of Australia at decennial intervals since 1860 and during each of the last five seasons :—

AREA UNDER CROP, 1860 TO 1927–28.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	Nor. Ter.	Fed. Cap. Ter.	Australia.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1860–1	246,143	387,283	3,353	359,284	24,705	152,860	..	..	1,173,628
1870–1	385,151	692,840	52,210	801,571	54,527	157,410	..	..	2,143,709
1880–1	606,277	1,548,809	113,978	2,087,237	63,902	140,788	..	..	4,560,991
1890–1	852,704	2,031,955	224,993	2,093,515	69,878	157,376	..	..	5,430,221
1900–1	2,446,767	3,114,132	457,397	2,369,680	201,338	224,352	..	..	8,813,666
1910–11	3,386,017	3,952,070	667,113	2,746,334	855,024	286,920	360	..	11,893,838
1920–21	4,465,143	4,489,503	779,497	3,231,083	1,804,987	297,383	296	1,966	15,069,858
1922–23	4,694,287	4,862,548	863,755	3,575,452	2,274,998	298,611	427	2,172	16,572,250
1923–24	4,809,591	4,682,144	871,968	3,562,551	2,323,070	279,122	440	2,300	16,531,186
1924–25	4,912,124	4,761,394	1,069,837	3,557,405	2,710,856	263,872	342	2,361	17,278,191
1925–26	4,541,360	4,433,492	1,033,765	3,583,867	2,932,110	266,412	391	2,181	16,793,578
1926–27	4,593,847	4,735,173	941,783	3,883,920	3,324,523	289,364	440	3,449	17,772,499
1927–28	4,998,272	4,942,258	1,066,613	4,192,167	3,720,100	296,875	570	2,539	19,219,394

The progress of agriculture was uninterrupted from 1860 until 1915–16 when, as the result of a special war effort, Australia cultivated 18,528,234 acres. Following that year, the decline in wheat-growing and the effects of the drought of 1918–19 reduced the acreage to 13,296,407 acres in 1919–20, a decrease of 5,231,827 acres in the space of four years. With the removal of the obstacles to the disposal of the wheat crop, the area began to expand in 1920–21, and despite occasional adverse seasons, the area planted in 1927–28 amounted to nearly 19¼ million acres. This area is the largest yet cultivated and exceeds the previous record of 1915–16 by 691,160 acres. Wheat continues to be the most extensively-grown crop in Australia, the area thereunder for both grain and hay during 1927–28 amounting to nearly 70 per cent. of the total acreage under cultivation. The extension of the wheat area since 1919–20, despite intermittent adverse climatic and market conditions, is a happy augury for the continuance of agricultural development in Australia.

(ii) *Relation to Population.* The total area under cultivation per head of population reached its lowest point in recent years during 1919–20, but since that year the position

has considerably improved. The rate of progress during the past decennium has more than kept pace with the gain in population. Details for the past five seasons are as follows :—

AREA UNDER CROP PER 1,000 OF POPULATION, 1923–24 TO 1927–28.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Nor. Ter.	Fed. Cap. Ter.	Australia.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1923–24 ..	2,177	2,881	1,075	6,789	6,566	1,274	124	877	2,875
1924–25 ..	2,179	2,873	1,281	6,606	7,444	1,211	95	788	2,942
1925–26 ..	1,976	2,633	1,200	6,497	7,878	1,228	107	553	2,803
1926–27 ..	1,957	2,766	1,068	6,857	8,777	1,347	113	701	2,908
1927–28 ..	2,082	2,838	1,186	7,281	9,483	1,375	131	443	3,083

(iii) *Relation to Total Area.* The next table furnishes a comparison of the area under crop in the several States and Territories and Australia with the respective total areas. For Australia as a whole, the area under crop in 1927–28 represented only about 1 acre in every 99. In Victoria the proportion was about 1 acre in every 11, in New South Wales 1 in 40, in Tasmania 1 in 57, in South Australia 1 in 58, in Western Australia 1 in 168, in Queensland 1 in 402, and in the Federal Territory 1 in 237.

PERCENTAGE OF AREA UNDER CROP ON TOTAL AREA, 1923–24 TO 1927–28.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Nor. Ter.	Fed. Cap. Ter.	Australia.
	%	%	%	%	%	%	%	%	%
1923–24 ..	2.429	8.324	0.203	1.465	0.372	1.664	..	0.382	0.868
1924–25 ..	2.480	8.465	0.249	1.462	0.434	1.573	..	0.392	0.908
1925–26 ..	2.293	7.882	0.241	1.473	0.469	1.587	..	0.362	0.882
1926–27 ..	2.320	8.418	0.219	1.597	0.532	1.725	..	0.573	0.934
1927–28 ..	2.524	8.787	0.249	1.723	0.596	1.769	..	0.422	1.009

In the Northern Territory the proportion which the area under crop bears to the total area is, at present, practically negligible.

3. **Artificially-sown Grasses.**—In all the States there are considerable areas under artificially-sown grasses mainly sown on uncultivated land after burning off the existing vegetation, and not included in "area under crops." Statistics regarding the areas under such grasses are as shown hereunder :—

AREA UNDER SOWN GRASSES, 1923–24 TO 1927–28.

Season.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania	Nor. Ter.	Fed. Cap. Ter.	Australia.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1923–24	1,930,894	1,024,591	498,552	30,800	38,022	799,443	500	18	4,322,820
1924–25	1,993,694	944,339	538,165	64,212	60,257	866,331	500	24	4,467,522
1925–26	2,017,831	933,271	532,052	60,453	89,170	821,807	500	18	4,455,102
1926–27	2,036,873	952,239	543,528	74,484	128,751	791,210	500	18	4,527,603
1927–28	2,180,852	887,052	546,575	76,912	169,105	782,136	500	18	4,643,150

The increase in the area of the grass lands of Australia during recent years is due in large measure to the development of the dairying industry referred to in the next chapter.

§ 3. Relative Importance of Crops.

1. **Distribution of Crops.**—The following table gives the areas in the several States under each of the principal crops for the season 1927–28 :—

DISTRIBUTION OF CROPS, 1927–28.

Crop.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Nor. Ter.	Fed. Cap. Ter.	Australia.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Wheat ..	3,029,950	3,064,172	215,073	2,941,360	2,998,523	29,448	..	562	12,279,088
Oats.. ..	114,988	529,392	2,272	197,024	235,469	42,950	..	208	1,122,303
Maize ..	148,801	17,645	234,013	..	63	..	10	12	400,544
Barley—									
Malting ..	2,642	50,005	2,366	208,446	8,507	4,517	..	..	276,483
Other ..	2,958	26,763	854	11,045	3,631	584	..	..	45,835
Beans and Peas	286	12,176	19	26,446	1,631	24,050	..	..	64,608
Rye ..	1,611	791	25	611	186	..	..	..	3,224
Other Cereals	9,891	..	..	..	173	..	10	..	10,074
Hay ..	680,919	908,804	65,412	532,568	357,065	85,769	..	1,682	2,632,219
Green Forage	848,042	94,895	155,843	184,782	82,241	23,409	..	8	1,389,220
Grass and other Seeds ..	..	788	4,936	630	..	496	..	..	6,850
Orchards and other Fruit Gardens ..	76,999	81,397	36,206	30,983	18,393	33,834	..	14	277,826
Vines—									
Productive ..	12,997	37,974	1,475	47,238	4,520	..	..	..	104,204
Unproductive	1,883	3,014	287	3,425	439	..	..	..	9,048
Market Gardens	7,729	18,984	1,083	1,303	2,647	732	..	32	32,510
Sugar Cane—									
Productive ..	8,556	..	203,748	..	..	..	..	..	212,304
Unproductive	7,905	..	71,090	..	..	..	..	..	78,995
Potatoes ..	21,578	77,649	10,035	4,309	5,280	44,359	..	21	163,231
Onions ..	155	7,659	430	379	60	..	..	..	8,683
Other Root Crops	1,589	3,128	2,800	503	153	4,990	25	..	13,188
Tobacco ..	803	1,176	135	17	2	..	..	..	2,133
Broom Millet ..	4,047	2,059	1,306	..	..	..	10	..	7,422
Pumpkins and Melons ..	3,796	1,401	15,760	331	451	..	..	..	21,739
Hops ..	..	294	..	1	..	1,303	..	..	1,598
Cotton—									
Productive ..	..	..	14,950	..	..	..	25	..	14,975
Unproductive	..	..	13,880	..	..	..	30	..	13,910
All other Crops	10,147	2,092	12,615	766	666	434	460	..	27,180
Total Area ..	4,998,272	4,942,258	1,066,613	4,192,167	3,720,100	296,875	570	2,539	19,219,394

2. **Relative Areas of Crops in States and Territories.**—Taking the principal crops, i.e., those in the case of which the cultivation in Australia amounts to more than 100,000 acres, the proportion of each in the various States and Territories on the total area under crop for the season 1927–28 is shown 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 the three latter States the hay crop is second in importance, with green forage in New South Wales occupying a similar position. In Victoria and Western Australia the oat crop occupies third position, while hay ranks third in New South Wales, and barley in South Australia. In Queensland the principal crops in the order of importance are sugar cane, maize, wheat and green forage, while in Tasmania, hay, potatoes, oats, and orchards and fruit gardens occupy the leading positions.

As pointed out previously, wheat is the main crop in Australia, the area thereunder for grain and hay representing in 1927–28 nearly 70 per cent. of the total area under cultivation.

RELATIVE AREAS UNDER CROP, 1927–28.

Crop.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Nor. Ter.	Fed. Cap. Ter.	Australia
	%	%	%	%	%	%	%	%	%
Wheat ..	60.62	62.00	20.16	70.16	80.60	9.92	..	22.14	63.89
Hay ..	13.62	18.39	6.13	12.70	9.60	28.89	..	66.24	13.70
Oats ..	2.30	10.71	0.21	4.70	6.33	14.47	..	8.24	5.84
Green Forage ..	16.97	1.92	14.61	4.41	2.21	7.88	..	0.34	7.23
Maize ..	2.98	0.36	21.94	..	0.00	..	1.75	0.48	2.08
Barley ..	0.11	1.55	0.30	5.24	0.33	1.72	..	..	1.68
Orchards and Fruit Gardens	1.54	1.65	3.39	0.74	0.49	11.40	..	0.55	1.45
Sugar-cane	0.33	..	25.77	..	..	..	..	..	1.52
Potatoes ..	0.45	1.57	1.09	0.10	0.14	14.94	4.39	0.83	0.86
Vineyards	0.26	.77	.14	1.13	0.12	..	..	..	0.54
All other ..	0.82	1.08	6.26	0.82	0.18	10.78	93.86	1.18	1.21
Total ..	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

3. **Area of Chief Crops, Australia, 1923–24 to 1927–28.**—The acreage under each of the principal crops in Australia during the last five seasons is shown below :—

AREA OF CHIEF CROPS.—AUSTRALIA, 1923–24 TO 1927–28.

Crop.	1923–24.	1924–25.	1925–26.	1926–27.	1927–28.
	Acres.	Acres.	Acres.	Acres.	Acres.
Wheat	9,540,434	10,824,966	10,201,276	11,687,919	12,279,088
Hay	3,406,226	3,026,405	2,832,003	2,699,631	2,632,219
Oats	1,076,930	1,165,127	1,013,233	844,114	1,122,303
Green Forage ..	961,311	564,924	1,055,210	880,957	1,389,220
Maize	316,307	398,949	297,140	286,178	400,544
Barley	258,775	260,248	374,876	370,943	322,318
Orchards and Fruit Gardens	273,845	276,904	275,245	276,451	277,826
Sugar-cane ..	237,280	273,512	288,872	284,828	291,299
Potatoes	134,352	138,776	136,925	139,445	163,231
Vineyards	112,965	114,394	111,697	112,120	113,252
All other crops ..	212,761	233,986	207,101	189,913	228,094
Total ..	16,531,186	17,278,191	16,793,578	17,772,499	19,219,394

Seasonal and economic influences are reflected in the areas of the principal crops grown in Australia during the past five years. Since 1923–24 the areas devoted to the various crops have increased in nearly all instances, the greatest being that for wheat, followed by green forage and oats, while the only decrease recorded is that under hay.

§ 4. Wheat.

1. Progress of Wheat-Growing.—(i) *Area and Production.* Wheat is the principal crop raised in Australia, and its development during the past 30 years constitutes the most interesting feature of Australian agriculture. Since 1895, when the area under wheat amounted to 3½ million acres, an average of 265,000 acres has been added annually, until in 1927–28 more than 12¼ million acres were cut for grain. The area and yield of wheat for grain are given below for each State for the five years ended 1927–28, and are shown from the year 1860 onwards in the graphs hereinafter. An estimate is also appended for the 1928–29 crop :—

WHEAT.—AREA AND PRODUCTION, 1923–24 TO 1928–29.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	Fed. Cap. Ter.	Australia.
				AREA.				
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1923–24 ..	2,945,040	2,454,117	51,149	2,418,415	1,656,915	14,503	295	9,540,434
1924–25 ..	3,549,367	2,705,323	189,145	2,499,852	1,867,614	12,954	711	10,824,966
1925–26 ..	2,924,745	2,513,494	165,999	2,465,648	2,112,032	19,091	267	10,201,276
1926–27 ..	3,352,298	2,915,315	57,084	2,768,403	2,571,187	23,194	438	11,687,919
1927–28 ..	3,029,950	3,064,172	215,073	2,941,360	2,998,523	29,448	562	12,279,088
1928–29(*a*) ..	4,076,600	3,718,904	200,000	3,443,563	3,343,197	30,000	..	14,812,264
				YIELD.				
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bush.	Bushels.
1923–24 ..	33,171,300	37,795,704	243,713	34,551,955	18,920,271	305,628	4,700	124,993,271
1924–25 ..	59,752,435	47,364,495	2,779,829	30,528,625	23,887,397	231,388	14,565	164,558,734
1925–26 ..	33,800,619	29,255,534	1,973,477	28,603,101	20,471,177	395,603	4,881	114,504,392
1926–27 ..	47,373,713	46,886,020	379,339	35,558,711	30,021,616	537,000	5,487	160,761,886
1927–28 ..	27,042,000	26,160,814	3,783,584	24,066,012	36,370,219	773,142	4,004	118,199,775
1928–29(*a*) ..	49,182,600	46,818,833	2,370,261	26,826,094	33,827,601	700,000	..	159,725,389

(*a*) Preliminary figures.

The area devoted to the production of wheat for grain reached its maximum in 1915–16, when 12,484,512 acres were sown, largely as the result of a special war effort. After that year, however, there was a serious decline, brought about by war conditions and unfavourable seasons, and the area in 1919–20 fell to 6,419,160 acres, or only half that of 1915–16. The promise of remunerative Government guarantees, coupled with the prospects of high prices, was responsible for a marked avdance in 1920–21, and the area has been extended during each of the subsequent years, the total gain for Australia since 1919–20 amounting to almost 6 million acres.

Although final figures for 1928–29 for all the States are not yet available, the data to hand indicate the total area under wheat for grain in Australia at about 14,812,264 acres, an increase of 2,533,176 acres on the previous year's figure, which is the greatest area yet devoted to the cultivation of this cereal and exceeds the previous record of 1915–16 by more than 2 million acres. The season, however, opened favourably, but the absence of rain at the critical period resulted in a yield of 159,725,299 bushels, or an average of 10.78 bushels per acre, which is about 1.42 bushels below the average for the decennium ending 1927–28.

The harvest of 179,065,703 bushels reaped in 1915–16 represents the maximum production of wheat in Australia. The annual production during the seasons 1918–19 to 1927–28 averaged 118,904,881 bushels, and the extent to which this average may be exceeded during any year depends in a great measure on seasonal conditions. For the last nine seasons the yield has exceeded 100 million bushels, the average for the period being 136,351,206 bushels. This is the first occasion on which such a succession of good harvests has occurred, and emphasizes clearly the value of bare fallowing, seed selection, and the application of manures. It is the considered opinion of agricultural experts that the improved cultural methods practised by modern wheat-growers preclude the possibility of absolute failure of this crop.

(ii) *Average Yields.* In the next table will be found the average yield of wheat per acre in each of the last five seasons, and for the decennium 1918–28 :—

WHEAT.—YIELD PER ACRE, 1923–24 TO 1927–28.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	Fed. Cap. Ter.	Australia.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1923–24 ..	11.26	15.40	4.76	14.29	11.42	21.07	15.93	13.10
1924–25 ..	16.83	17.51	14.70	12.21	12.79	17.86	20.49	15.20
1925–26 ..	11.56	11.64	11.89	11.60	9.69	20.72	18.28	11.22
1926–27 ..	14.13	16.08	6.65	12.84	11.68	23.15	12.53	13.75
1927–28 ..	8.92	8.54	17.59	8.16	12.12	26.25	7.12	9.63
Average 10 seasons, 1918–28	12.12	13.67	14.37	11.53	10.81	21.34	15.47	12.20

As the above figures show, there were considerable variations in the average yields, chiefly due to the vagaries of the seasons. Considerable improvement has been shown in the average yields for the past three decades, the figures being 8.54, 11.37, and 12.20 bushels per acre respectively. The increased yields of the later years are principally due to the better cultural methods employed in wheat farming. The excellence of the 1920–21 and 1924–25 seasons is reflected in the splendid averages obtained in those years, the average of the former year, viz., 16.08 bushels, having been exceeded only once by the 16.35 bushels reaped as far back as 1866, when less than 1,000,000 acres were sown in relatively fertile areas.

(iii) *Relation to Population.* During the seasons embraced in the following table, the Australian production of wheat per head of population has varied between 18 bushels in 1927–28 and 28 bushels in 1924–25. The State in which wheat growing occupies the most important position relatively to population is Western Australia, which in 1927–28 had a yield averaging 92 bushels per head. Queensland and Tasmania are the States in which the average production of wheat per head is least, the quantity raised been generally below that required for local consumption. Particulars for the past five seasons are as follows :—

WHEAT.—YIELD PER 1,000 OF POPULATION, 1923–24 TO 1927–28.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	Fed. Cap. Ter.	Australia.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1923–24 ..	15,013	23,253	300	65,845	53,475	1,395	1,793	21,739
1924–25 ..	26,504	28,583	3,329	56,691	65,602	1,062	4,858	28,107
1925–26 ..	14,706	17,372	2,292	51,852	55,003	1,823	1,240	19,019
1926–27 ..	20,178	27,389	430	62,781	79,266	2,501	1,115	26,309
1927–28 ..	11,266	15,023	4,208	41,798	92,712	3,582	698	18,958

The normal annual consumption of wheat in Australia, exclusive of the requirements for seed, poultry and other live stock, is 304 lb. (5.06 bushels) per head of population.

2. **Australian and Foreign Wheat Yields.**—(i) *Average Yield.* The next table gives the average return per acre in the principal wheat-growing countries of the world, ranging from a maximum in Netherlands of 41 bushels per acre to a minimum in the Union of South Africa of 9 bushels per acre. Australia, with approximately 14½, occupies a relatively subordinate position, but in comparison with the yields obtained in those countries where wheat is extensively grown the results obtained in Australia are very satisfactory. Germany, with 26.53 bushels; France, 20.83 bushels; Canada, 16.26 bushels; Italy, 17.71 bushels; and United States, 14.56 bushels, exceed the Australian average, but the latter is in excess of the yields obtained in the Soviet Republics, India, Argentine, Spain, and Rumania.

WHEAT.—YIELD PER ACRE, VARIOUS COUNTRIES, 1924 TO 1927.

Country.	Average Yield in Bushels per acre.		Country.	Average Yield in Bushels per acre.	
	Average, 1924–1926.	1927.		Average, 1924–1926.	1927.
Netherlands ..	41.07	33.93	Jugo-Slavia ..	16.23	12.51
Denmark ..	40.77	34.32	Lithuania ..	16.20	17.78
Belgium	38 04	41.63	Bulgaria ..	15.69	17.62
United Kingdom ..	32.64	32.64	United States of America ..	14.56	14.88
Switzerland ..	31.65	32.40	**Australia** ..	**14.39**	**9.63**
New Zealand ..	31.21	34.08	Spain	13.52	13.38
Sweden	31.01	27.93	Rumania ..	11.81	12.62
Japan	26.68	25.17	Korea	11.74	10.08
Germany.. ..	26.53	27.89	Peru	11.31	12.28
Egypt	24.88	26.80	Argentine Republic	10.92	12.89
Norway	23.99	24.65	Soviet Republics	10.89	9.86
Czecho-Slovakia ..	23.16	25.58	India	10.85	10.67
France	20.83	21.14	Portugal ..	10.53	10.58
Brazil	20.17	12.76	Uruguay ..	10.47	13.37
Austria	19.50	23.67	Cyprus	9.84	14.01
Hungary ..	19.04	19.13	French Morocco ..	9.57	10.68
Italy	17.71	15.93	Greece	9.26	14.13
Chile	17.20	18.50	Union of South Africa ..	8.95	*a*9.65
Poland	17.03	19.27			
Canada	16.26	19.59			

(*a*) Year 1926.

(ii) *Total Production.* The latest available official statistics of the production of wheat in various countries are given in the following table :—

WHEAT.—YIELD IN VARIOUS COUNTRIES, 1924 TO 1927.

Country.	Yield in Bushels (,000 omitted).		Country.	Yield in Bushels (,000 omitted).	
	Average, 1924–1926.	1927.		Average, 1924–1926.	1927.
United States of America ..	790,501	871,705	French Morocco ..	24,376	24,618
Soviet Republics ..	634,810	749,039	Belgium ..	13,430	16,277
Canada	363,207	440,032	Syria	12,312	14,583
India	337,904	333,797	Sweden	11,010	11,298
France	281,266	276,131	Portugal ..	10,769	11,447
Italy	210,546	195,811	Greece	10,668	16,106
Argentine Republic	201,038	239,165	Korea	10,435	9,044
Australia ..	**146,603**	**118,200**	Uruguay ..	10,392	13,887
Spain	143,658	144,826	Mexico	10,014	11,519
Germany.. ..	100,948	120,523	Tunis	9,995	8,267
Rumania.. ..	95,349	96,738	Austria	9,533	11,960
Jugo-Slavia ..	69,282	56,569	Denmark ..	8,127	9,408
Hungary ..	66,051	76,934	Union of South Africa ..	7,990	6,643
United Kingdom ..	52,263	55,764	New Zealand ..	5,700	9,200
Poland	45,831	54,230	Netherlands ..	5,232	5,096
Bulgaria	39,675	47,347	Brazil	4,845	4,203
Egypt	35,880	44,347	Lithuania ..	4,261	5,273
Czecho-Slovakia ..	35,226	40,385	Switzerland ..	3,552	4,120
Japan	30,628	29,222	Peru	2,910	*a*2,673
Chile	25,246	28,307	Cyprus	1,851	2,390
Algeria	24,459	28,324			

(*a*) Year 1926.

NOTE.—The harvests reported above for 1927 relate to the year 1927 for the Northern, and 1927–28 for the Southern Hemisphere.

The complete compilation of the world's production of wheat is not possible owing to the failure of certain countries to report their harvests. The International Institute of Agriculture, Rome, has, however, compiled figures obtained from all the producing countries reporting, with the following results :—

WHEAT.—WORLD'S PRODUCTION(a), 1909-13 TO 1927.

Years.	Area.	Yield.	Yield per acre.
	Acres.	Bushels.	Bushels.
Average, 1909–1913 ..	270,266,000	3,779,479,000	13.98
1924	268,603,000	3,558,554,000	13.25
1925	278,346,000	4,049,181,000	14.55
1926	297,479,000	4,175,084,000	14.03
1927	305,764,000	4,241,101,000	13.87
Average, 1924–1927 ..	286,160,000	4,005,980,000	14.00

(a) From countries reporting.

It is stated in the Report of the Institute that if all countries for which progress data are lacking were taken into account, the world's total production of wheat may be approximately estimated at 4,500 million bushels.

The total area harvested in 1927 again shows an increase on the figures for the previous year. Europe, mainly on account of the Soviet Union, was most largely responsible for this increase, followed by the United States of America and Canada. The area sown was the largest since the war, and exceeded the pre-war average by more than 35,000,000 acres. Nevertheless, in comparison with the pre-war period, areas sown to wheat are still 3 per cent. lower in European Countries, though considerably more in other continents, especially in North America, Argentina and Australia.

The increase in sowing was accompanied by favourable weather conditions in the Northern Hemisphere where good yields were obtained. In the Southern Hemisphere, however, the yields were not so satisfactory, but the total world output was the greatest since the war, and exceeded the 1909–13 average by 462,000,000 bushels.

The Australian contribution to the world's production shown above during the past four years amounted to almost 3½ per cent.

3. 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 prime importance to the local producer. The table below gives the average prices per Imperial quarter realized for British grown wheat :—

BRITISH WHEAT.—PRICES PER QUARTER, 1861 TO 1927.

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	1920 ..	80 10	90 11	72 6
1871 ..	56 8	60 0	52 6	1921 ..	71 6	89 10	44 0
1881 ..	45 4	55 2	40 9	1923 ..	42 2	49 3	37 6
1891 ..	37 0	41 8	32 3	1924 ..	49 3	56 1	41 5
1901 ..	26 9	27 8	25 8	1925 ..	52 2	59 3	43 11
1911 ..	31 8	33 4	30 0	1926 ..	53 3	62 2	47 6
1918 ..	72 10	74 5	71 2	1927 ..	49 3	54 8	42 2
1919 ..	72 11	73 4	72 5	1928 ..	42 10	48 3	38 11

(ii) *Australian Export Values.* In the next table will be found a statement of the export values of Australian wheat during each of the last five years :—

AUSTRALIAN WHEAT.—EXPORT VALUES, 1924-25 TO 1928-29.

Item.	1924–25.	1925–26.	1926–27.	1927–28.	1928–29.
	s. d.	s. d.	s. d.	s. d.	s. d.
Price per bushel	6 8	6 4	5 7	5 6	4 10

The export values here shown are the values for the successive years in the principal markets of Australia.

4. **Imports and Exports of Wheat and Flour.**—(i) *Quantities.* The table hereunder shows the imports, exports, and net exports of wheat and flour from 1923–24 to 1927–28. For the sake of convenience, flour has been expressed at its equivalent in wheat, 1 ton of flour being taken as equal to 48 bushels of grain. In ordinary seasons the Australian imports of wheat and flour are negligible. During the past five years the exports ranged between 73,864,517 bushels in 1927–28 and 125,044,344 bushels in 1924–25, the net exports for the period averaging 91,846,379 bushels.

WHEAT AND FLOUR.—IMPORTS AND EXPORTS, AUSTRALIA, 1923–24 TO 1927–28.

Year.	Imports.			Exports.			Net Exports.
	Wheat.	Flour.	Total.	Wheat.	Flour.	Total.	
	Bushels.	Eq. Bushels.*a*	Bushels.	Bushels.	Eq. Bushels.*a*	Bushels.	Bushels.
1923–24	203	1,920	2,123	59,910,480	24,537,168	84,447,648	84,445,525
1924–25	42	2,784	2,826	103,538,088	21,506,256	125,044,344	125,041,518
1925–26	13	3,456	3,469	54,227,728	24,049,536	78,277,264	78,273,795
1926–27	257	3,456	3,713	73,925,315	23,686,272	97,611,587	97,607,874
1927–28	133	1,200	1,333	53,042,357	20,822,160	73,864,517	73,863,184

(*a*) Equivalent in bushels of wheat.

(ii) *Destination of Exported Breadstuffs.* In the next two tables will be found a list of the principal countries to which Australia exported wheat and flour during each year of the period 1923–24 to 1927–28. The countries are as shown in the Australian Customs returns, but wheat ships are frequently instructed to call for orders at various ports, and the countries to which these ports belong cannot, therefore, always be considered as the ultimate destination of the whole of the wheat said to be exported to them.

WHEAT.—EXPORTS, AUSTRALIA, 1923–24 TO 1927–28.

Country to which Exported.	1923–24.	1924–25.	1925–26.	1926–27.	1927–28.	Total for Five Years.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
United Kingdom	23,017,707	39,356,580	22,319,823	26,510,696	20,465,490	131,670,296
Italy	6,483,732	15,560,605	4,642,202	10,316,509	7,151,695	44,154,743
Japan ..	13,067,907	7,018,627	10,861,863	4,298,567	3,199,720	38,446,684
France ..	3,562,313	14,580,859	53,865	7,254,063	622,785	26,073,885
Union of South Africa ..	3,721,697	3,674,773	3,117,007	2,005,233	6,941,395	19,460,105
Belgium ..	622,283	4,440,158	1,349,347	4,782,332	1,729,143	12,923,263
Egypt ..	1,339,707	1,887,777	668,288	4,625,270	3,827,150	12,348,192
Germany ..	110,770	3,061,950	941,252	2,132,607	2,356,622	8,603,201
Netherlands ..	142,753	3,297,382	2,211,050	3,379,723	726,993	9,757,901
New Zealand ..	1,247,362	2,682,908	2,533,847	1,040,672	701,862	8,206,651
India ..	..	..	1,326,860	2,713,827	1,987,995	6,028,682
Peru	..	528,367	1,635,802	854,747	1,382,618	4,401,534
Sweden ..	1,304,445	1,040,585	129,397	168,000	1,010,467	3,652,894
Norway ..	106,415	326,037	225,877	..	44,800	703,129
China ..	..	..	985,865	..	..	985,865
Canary Islands(*a*)	..	470,527	..	..	13,163	483,690
Other Countries	5,183,389	5,610,953	1,225,383	3,843,070	880,459	16,743,254
Total ..	59,910,480	103,538,088	54,227,728	73,925,316	53,042,357	344,643,969

(*a*) For orders.

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

FLOUR.—EXPORTS, AUSTRALIA, 1923–24 TO 1927–28.

Country to which Exported.	1923–24.	1924–25.	1925–26.	1926–27.	1927–28.	Total for Five Years.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Eygpt	182,938	172,416	194,909	185,392	150,795	886,450
United Kingdom	92,425	103,817	70,537	76,167	71,837	414,783
Netherlands East Indies ..	49,262	44,875	66,868	64,648	65,923	291,576
Malaya (British) ..	33,683	29,408	48,910	42,451	41,071	195,523
Union of South Africa ..	37,685	25,475	22,780	18,912	22,183	127,035
Philippine Islands	13,012	10,016	11,389	8,754	7,569	50,740
Ceylon	10,142	10,416	18,130	16,060	20,203	74,951
Hong Kong	11,739	13,247	9,703	3,966	5,856	44,511
Mauritius	8,569	6,496	3,990	7,781	4,979	31,815
Japan	15,430	156	732	711	844	17,873
Malta	5,631	1,967	4,317	5,407	3,932	21,754
New Caledonia	3,765	3,522	3,911	3,319	4,055	18,572
Portuguese East Africa ..	2,963	2,621	5,441	5,802	7,531	24,358
China	12,905	219	132	306	263	13,825
New Zealand	294	4,258	12,363	28,383	5,053	50,351
Fiji	3,024	2,989	4,039	3,567	3,789	17,408
French Indo-China ..	1,884	1,295	3,421	1,719	2,037	10,356
India	130	470	1,584	226	387	2,797
Papua	780	912	946	788	752	4,178
Italy	2,025	156	..	..	..	2,181
Other Countries	22,905	13,316	16,430	19,105	14,736	86,492
Total	511,191	448,047	501,032	493,464	433,795	2,387,529

For the five years under review the export of wheat to the United Kingdom amounted to 131,670,296 bushels, or 38.31 per cent. of the total export for the period, while the export of flour to the same destination aggregated 414,783 tons, or 17.37 per cent. of the total export. The country to which the largest consignments of flour were made during the last quinquennium was Egypt, followed by the United Kingdom, Netherlands East Indies, Malaya (British), and the Union of South Africa.

(iii) *Exports of Wheat and Flour.* From the foregoing returns it will be seen that the quantity of wheat exported in the form of flour during the past five years represents, on the average, about 25 per cent. of the total equivalent in wheat exported as wheat or flour from Australia.

A point of some interest in connexion with the export of wheat, and one which bears also on the proportion 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 Australia, 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., &c.), the proportions of milled product from a bushel (60 lb.) of wheat are, approximately, 42 lbs. of flour, 9 lbs. of bran, and 9lbs. of pollard, while the percentage of phosphoric acid contained in these products is as follows :—

Flour	0.32 per cent., or	0.13 lb. 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 lb., of which 0.13 lb. is in the flour and 0.35 lb. in the offal.

During the last ten years the net exports from Australia of wheat and its milled products have amounted to 679,909,913 bushels of wheat, 4,372,116 tons of flour, and 10,955,920 bushels of bran, pollard, and sharps. On the basis of the figures quoted above this export would contain no less than 362,883,918 lbs. of phosphoric acid, the value of which as a fertilizer would amount to approximately four million pounds sterling.

5. **Local Consumption of Wheat.**—The estimated consumption of wheat for food and for seed purposes in Australia during the past ten years is given in the following tables :—

WHEAT.—HUMAN CONSUMPTION, AUSTRALIA, 1918-19 TO 1927-28.

Year.	Flour Milled.	Net Exports of Flour.		Net Quantity Available for Home Consumption.		Net Quantity Available per Head of Population.	
		Flour.	Flour in Biscuits Exported.	Flour.	Equivalent in Terms of Wheat.	Flour.	Equivalent in Terms of Wheat.
	Tons.	Tons.	Tons.	Tons.	Bushels.	Tons.	Bushels.
1918-19 ..	1,046,268	483,340	6,437	556,491	26,711,570	.1098	5.270
1919-20 ..	1,050,228	517,708	4,590	527,930	25,340,640	.1000	4.801
1920-21 ..	801,511	229,648	3,375	568,488	27,287,420	.1052	5.050
1921-22 ..	911,452	359,698	2,284	549,470	26,374,560	.0999	4.798
1922-23 ..	985,479	394,457	1,831	589,191	28,281,170	.1049	5.034
1923-24 ..	1,092,856	511,151	1,727	579,978	27,838,940	.1011	4.853
1924-25 ..	1,068,698	447,989	1,814	618,895	29,706,960	.1054	5.058
1925-26 ..	1,135,968	500,960	2,473	682,535	32,761,680	.1139	5.467
1926-27 ..	1,141,748	493,392	1,570	646,786	31,045,730	.1058	5.081
1927-28 ..	1,092,632	433,770	1,613	657,249	31,547,950	.1054	5.060
Aggregate 10 years	10,376,840	4,372,113	27,714	5,977,013	286,896,620	.1050	5.042

WHEAT USED FOR SEED.—AUSTRALIA, 1918 TO 1927.

Year.	Area for Grain and Hay.	Wheat for Seed Purposes.		
		Quantity.	Per Acre.	Per Head of Population.
	Acres.	Bushels.	Bushels.	Bushels.
1918	9,428,398	9,054,000	.960	1.782
1919	8,250,572	7,774,000	.942	1.466
1920	10,271,055	9,471,000	.922	1.750
1921	10,878,401	10,077,000	.926	1.847
1922	11,253,078	10,456,000	.929	1.878
1923	11,016,608	10,328,000	.937	1.816
1924	11,859,102	10,967,000	.925	1.890
1925	11,405,943	10,627,000	.932	1.774
1926	12,543,025	11,591,000	.924	1.897
1927	13,390,294	12,417,000	.927	1.992
Aggregate for 10 years ..	110,296,476	102,762,000	.932	1.806

In addition to the above, the quantity of grain fed to poultry and other live stock as well as that used as seed for green forage crops must be taken into consideration. These quantities vary from year to year according to the price of wheat and the nature of the season, and sufficient data are not available on which to base an annual estimate, but, taken over a period, the amount so consumed has been estimated to range from one half to one bushel per head of population per annum. The flour available for human consumption necessarily fluctuates from year to year coincident with stocks. In some years the flour available per head of population, after deducting net exports from the quantity milled, shows a substantial increase over the average for the previous year, this, however, being counterbalanced by a decline in the following year. The average quantity of

flour consumed per annum for the ten years under consideration was 0.1050 tons per head of population, which, expressed in equivalent terms in wheat, represents 5.042 bushels. The estimates of quantity of grain used for seed purposes are 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 or hay. The average annual quantity thus used during the ten years was 1.806 bushels per head of population, and 0.932 bushels or 56 lbs. per acre sown. For all purposes the consumption of wheat in Australia during the past seven years averaged 43,037,000 bushels, or 7.33 bushels per head of the population.

6. **Value of the Wheat Crop.**—The estimated value of the wheat crop in each State and in Australia during the season 1927–28 is shown below :—

WHEAT.—VALUE OF CROP(*a*), 1927–28.

Particulars.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Fed. Cap. Ter.	Australia.
	£	£	£	£	£	£	£	£
Aggregate value..	7,211,290	6,984,987	1,040,486	6,542,947	9,921,039	193,280	1,068	31,895,047
Value per acre ..	£2/7/7	£2/5/7	£4/16/9	£2/4/6	£3/6/2	£6/11/3	£1/16/3	£2/12/0

(*a*) Exclusive of the value of straw.

7. **Voluntary Wheat Pools.**—Reference to the operations of the voluntary Wheat Pools in the various States during 1928–29 will be found in the Appendix at the end of this volume.

§ 5. Oats.

1. **Progress of Cultivation.**—(i) *Area and Yield.* Oats came next in importance to wheat amongst the grain crops cultivated last season, but while wheat grown for grain accounted for 63.89 per cent., oats represented only 5.84 per cent. of the area under crop in Australia. The area under cultivation of oats for the last five years is shown in the table hereunder, and more fully in the graphs herein :—

OATS.—AREA AND YIELD, 1923–24 TO 1927–28.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	Fed. Cap. Ter.	Australia.
				AREA.				
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1923–24	86,402	520,654	216	176,299	241,608	51,460	291	1,076,930
1924–25	122,994	517,229	4,010	155,214	318,982	46,175	523	1,165,127
1925–26	100,652	437,696	1,293	158,062	278,344	36,741	445	1,013,233
1926–27	104,450	303,424	210	152,178	234,826	48,361	665	844,114
1927–28	114,988	529,392	2,272	197,024	235,469	42,950	208	1,122,303
				YIELD.				
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1923–24	1,564,970	9,366,205	2,427	2,157,938	2,846,670	1,359,785	5,330	17,303,325
1924–25	2,500,951	9,572,003	63,912	1,939,415	4,241,074	1,065,933	10,449	19,393,737
1925–26	1,607,520	4,998,165	14,546	1,808,443	2,939,380	835,473	8,130	12,211,657
1926–27	1,890,746	4,884,006	1,674	1,713,337	2,716,436	1,357,000	8,004	12,571,203
1927–28	1,654,560	4,682,724	43,788	1,378,437	2,922,865	1,399,824	2,067	12,084,265

The oat crop exhibited considerable variation during the past decennium, ranging from 10,441,080 bushels in 1918–19 to 19,393,737 bushels in 1924–25, with an average around 14,000,000 bushels. The demand for the grain for oatmeal is limited to about 2,000,000 bushels annually. It is mainly used as feed grain, and its value, particularly in good seasons, is not sufficient to warrant the increase in cultivation which may be expected when oats are more generally marketed through live stock and better prices thereby realized than those now offering on the local market.

The principal oat-growing State is Victoria, which produces on the average more than one-third of the total quantity of oats grown in all States. For Australia as a whole the record yield of oats was obtained during 1924–25, when 19,393,737 bushels were harvested.

(ii) *Average Yield.* The average yield per acre of oats varies considerably in the different States, being highest in Tasmania and lowest in South Australia. Particulars as to average yield in each of the last five seasons, and for the decennium 1918 to 1928 are given in the succeeding table :—

OATS.—AVERAGE YIELD PER ACRE, 1923–24 TO 1927–28.

Season.	N.S.W.	Vic.	Q'land.	S. Aust.	W. Aust.	Tas.	Fed. Cap. Ter.	Australia.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1923–24	18.11	17.99	11.24	12.24	11.78	26.42	18.32	16.07
1924–25	20.33	18.51	15.94	12.50	13.30	23.08	19.98	16.65
1925–26	15.97	11.42	11.25	11.44	10.56	22.74	18.27	12.05
1926–27	18.10	16.10	7.97	11.26	11.57	28.06	12.04	14.89
1927–28	14.39	8.85	19.27	7.00	12.41	32.59	9.94	10.77
Average for 10 seasons 1918–28	16.58	15.78	17.26	10.55	11.73	27.09	15.92	14.60

The smallest average yield per acre ever recorded for Australia was that experienced in the abnormally dry season 1914–15, viz., 5.60 bushels, while the largest in the past ten years was that of the season 1920–21, amounting to 19.77 bushels per acre.

(iii) *Relation to Population.* The State in which oat production occupies the most important position in relation to population is Western Australia, the yield for that State representing about 8 bushels per head during the last five years, as compared with 2.41 bushels per head for Australia as a whole. Particulars for the seasons 1923–24 to 1927–28 are furnished in the succeeding table :—

OATS.—YIELD PER 1,000 OF POPULATION, 1923–24 TO 1927–28.

Season.	N.S.W.	Vic.	Q'land.	S. Aust.	W. Aust.	Tas.	Fed. Cap. Ter.	Australia.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1923–24	708	5,762	3	4,112	8,046	6,207	2,033	3,009
1924–25	1,109	5,776	76	3,601	11,647	4,893	3,485	3,302
1925–26	699	2,968	17	3,278	7,898	3,850	2,066	2,038
1926–27	805	2,853	2	3,025	7,172	6,319	1,627	2,057
1927–28	689	2,689	49	2,394	7,451	6,485	360	1,938

2. **Comparison with other Countries.**—(i) *Total Production.* 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 :—

OATS.—PRODUCTION IN VARIOUS COUNTRIES, 1924 TO 1927.

Country.	Yield in Bushels (000 omitted).		Country.	Yield in Bushels (000 omitted).	
	Average, 1924–1926.	1927.		Average, 1924–1926.	1927.
United States of America ..	1,148,678	956,008	Hungary ..	17,613	18,011
Soviet Republics ..	564,323	718,465	Netherlands ..	16,993	18,298
Canada	369,118	373,753	Latvia	15,630	9,764
Germany.. ..	322,667	349,803	Lithuania ..	15,054	13,393
France	265,766	274,626	**Australia** ..	**14,726**	**12,034**
Poland	161,181	186,842	Norway ..	9,606	10,132
United Kingdom ..	137,565	125,427	Algeria	8,960	8,485
Czecho-Slovakia ..	71,438	80,339	Japan	8,384	9,898
Sweden	65,293	63,116	Estonia ..	7,352	5,382
Argentine Republic	53,378	41,833	Bulgaria ..	6,679	5,985
Denmark ..	50,501	48,691	Union of South Africa ..	5,086	4,864
Rumania ..	46,093	47,848	New Zealand ..	4,420	3,559
Belgium	36,650	36,882	Portugal ..	4,232	4,423
Irish Free State ..	34,439	37,388	Greece	4,082	5,662
Italy	32,379	24,576	Chile	3,389	5,116
Finland	30,709	34,887	Korea	2,880	3,342
Spain	29,681	31,373	Switzerland ..	2,265	2,304
Austria	21,216	24,185	Uruguay ..	1,982	2,116
Jugo-Slavia ..	18,457	16,091	Tunis	1,727	1,185

(ii) *Yield per Acre.* The average yield per acre of oats is very low in Australia compared with other countries where its cultivation is more extensive. Arranging the countries contained in the foregoing table according to the magnitude of average yield for the years specified, the results are as follows :—

OATS.—YIELD PER ACRE, VARIOUS COUNTRIES, 1924 TO 1927.

Country.	Yield in Bushels per acre.		Country.	Yield in Bushels per acre.	
	Average, 1924–26.	1927.		Average, 1924–26.	1927.
Belgium	55.65	56.09	Poland	25.19	28.86
Irish Free State ..	49.79	58.00	Hungary ..	24.80	28.01
Denmark ..	46.08	48.13	Chile	24.76	37.20
Netherlands ..	45.40	49.97	Jugo-Slavia ..	21.31	17.20
Switzerland ..	45.31	45.57	Argentine Republic	19.87	24.00
United Kingdom ..	43.15	42.40	Estonia ..	19.28	14.97
Norway	40.49	42.26	Latvia	19.27	12.95
Germany.. ..	37.48	40.73	Bulgaria ..	19.16	18.65
New Zealand ..	36.59	43.66	Soviet Republics ..	17.84	16.73
Sweden	35.38	35.00	Lithuania ..	17.38	17.48
Czecho-Slovakia ..	34.34	38.11	Spain	16.81	16.43
Japan	31.11	32.73	Uruguay ..	16.01	21.84
France	30.77	32.14	Rumania ..	15.99	17.85
Finland	28.69	31.38	Greece	15.69	20.24
Austria	27.67	31.45	**Australia** ..	**14.62**	**10.77**
Italy	27.45	20.44	Algeria	14.19	16.09
Canada	26.43	28.23	Korea	10.78	12.28
United States of America ..	26.11	22.64	Portugal ..	8.09	7.67

3. **World's Production.**—The production of oats in the world for the year 1927, as reported by the International Institute of Agriculture, amounted to 3,620 millions of bushels. The past two seasons have not been very favourable, and the production has fallen slightly despite an increase in the acreage sown. In the pre-war years 1909 to 1913 the production averaged 3,613 millions of bushels from an average area of 142,870,000

acres. Subsequently the area declined in Europe, but a considerable increase was recorded in North America, with the result that the area in 1927 amounted to 149,000,000 acres.

4. **Price of Oats.**—The average wholesale prices of oats in the markets of the several capitals for the year 1927–28 are given in the following table :—

OATS.—AVERAGE WHOLESALE PRICES, 1927–28.

Particulars.	Sydney.	Melbourne.	Brisbane.	Adelaide.	Perth.	Hobart.
	s. d.	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*
Average price per bushel ..	4 11	4 5	5 5	3 6	3 8	4 5

5. **Imports and Exports.**—The production of oats in Australia has not yet reached sufficient proportions to admit of a regular export trade ; in fact in certain years the imports have exceeded the exports, notably in 1903, 1906, 1908, 1910, in each of the four years prior to 1916–17, in 1922–23 and during the past three years. The quantities and values of oats imported into and exported from Australia during the years 1923–24 to 1927–28 are given hereunder :—

OATS.—IMPORTS AND EXPORTS, AUSTRALIA, 1923–24 TO 1927–28.

Year.	Imports.		Exports.		Net Exports.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Bushels.	£	Bushels.	£	Bushels.	£
1923–24 ..	108,260	18,624	190,453	41,647	82,193	23,023
1924–25 ..	1,723	482	219,278	42,255	217,555	41,773
1925–26 ..	266,103	49,927	76,978	15,844	—189,125	—34,083
1926–27 ..	197,070	40,553	137,768	26,301	—59,302	—14,252
1927–28 ..	525,568	92,301	64,988	14,172	—460,580	—78,129

NOTE.—(—) signifies net import.

The principal country from which imports of oats have been obtained is New Zealand, while the principal countries to which oats were exported during the period under review were New Zealand, Malaya (British), Ceylon, and Mauritius.

6. **Oatmeal, etc.**—The production of oatmeal in Australia during 1927–28 amounted to 293,365 cwts., practically the whole of which is consumed locally. Oversea trade in this and similar products is small, the importations of oatmeal, wheatmeal and rolled oats during 1927–28 amounting to 236,578 lbs., while the exports totalled 572,322 lbs.

7. **Value of Oat Crop.**—The estimated value of the oat crop of the several States of Australia for the season 1927–28 is as follows :—

OATS.—VALUE OF CROP,(*a*) 1927–28.

Particulars.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Fed. Cap. Ter.	Australia.
	£	£	£	£	£	£	£	£
Aggregate value..	386,060	974,007	11,859	272,816	407,983	268,200	482	2,321,407
Value per acre ..	£3/7/2	£1/16/10	£5/4/5	£1/7/8	£1/14/8	£6/4/11	£2/6/4	£2/1/4

(*a*) Exclusive of the value of straw.

§ 6. Maize.

1. **States Growing Maize.**—Maize is grown for grain chiefly in New South Wales and Queensland, the area so cropped in these States during the season 1927–28 being 382,814 acres, or nearly 96 per cent. of the total for Australia. Of the balance, Victoria contributed 17,645 acres, Western Australia 63 acres, Northern Territory 10 acres, and the Federal Capital Territory 12 acres. The climate of Tasmania is unsuitable for the growing of maize for grain. In all the States, the crop is grown to a greater or less extent for green forage, particularly in connexion with the dairying industry.

2. Progress of Maize-growing.—(i) *Area and Yield.* Notwithstanding its valuable properties and its pre-eminence as the world's most extensively grown cereal, the cultivation of maize has decreased in Australia during the past decennium. Compared with the pervious year, however, the area increased by more than 110,000 acres and has been exceeded on one occasion only, i.e., that of 1910–11, when it amounted to 414,914 acres. The average area under cultivation during the decennium 1918–28 was 315,407 acres. The area and yield of maize for grain in each State are given in the following table for the last five years. The fluctuations from year to year are shown more fully on the graph herein.

MAIZE.—AREA AND YIELD, 1923–24 TO 1927–28.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Nor. Ter.	Fed. Cap. Ter.	Australia.
			AREA.					
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1923–24	166,933	29,104	120,092	94	43	..	41	316,307
1924–25	146,564	23,126	229,160	7	71	21	..	398,949
1925–26	120,955	21,913	154,252	2	8	10	..	297,140
1926–27	128,512	20,046	137,542	2	32	40	4	286,178
1927–28	148,801	17,645	234,013	..	63	10	12	400,544
			YIELD.					
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1923–24	4,621,950	1,464,731	2,024,902	1,266	834	..	1,050	8,114,733
1924–25	4,208,200	891,987	7,330,821	276	333	420	..	12,432,037
1925–26	3,278,350	768,761	3,384,172	51	227	..	..	7,431,561
1926–27	3,625,410	685,407	2,658,895	99	342	..	120	6,970,273
1927–28	3,930,570	757,780	6,703,518	..	1,098	..	84	11,393,050

The maximum production of maize in Australia was recorded in 1910–11, when the harvest amounted to 13,000,000 bushels. This figure was considerably in excess of the yields during recent years, save that of 1924, when a bountiful harvest in Queensland increased the Australian total to 12,500,000 bushels. The yield for the year under review amounted to 11,393,050 bushels. Nevertheless, the average for the past decennium was only 8,251,000 bushels.

A maize reaper-thresher, invented and manufactured in Australia, and an imported maize picker and husker were used in the maize fields of Queensland during recent seasons, and proved most suitable for the work for which they were designed. The perfecting of a machine for harvesting and threshing maize is a matter of very great importance in the development of the industry.

(ii) *Average Yield.* The following table gives particulars of the average yield per acre of the maize crops of the States for the seasons 1923–24 to 1927–28, and for the decennium 1918–1928 :—

MAIZE.—AVERAGE YIELD PER ACRE, 1923–24 TO 1927–28.

Season.	N.S.W.	Vic.	Q'land.	S. Aust.	W. Aust.	N. Ter.	Fed. Cap. Ter.	Australia.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1923–24	27.69	50.33	16.86	13.47	19.40	..	25.61	25.65
1924–25	28.71	38.57	31.99	39.43	4.70	20.00	..	31.16
1925–26	27.10	35.08	21.94	25.50	28.38	..	..	25.01
1926–27	28.21	34.19	19.33	49.50	10.69	..	30.00	24.36
1927–28	26.42	42.95	28.65	..	17.43	..	7.00	28.45
Average for 10 seasons 1918–28	26.76	39.19	23.65	17.61	13.31	7.94	20.83	26.16

The average yield of maize per acre in Victoria during the year 1927–28 was the highest in the world. This is due, in large measure, to the fact that the area under maize in that State is comparatively small and is situated in districts peculiarly suited to its growth. The average yield in New South Wales exceeds that obtained in Queensland.

(iii) *Relation to Population.* During the past five seasons the Australian production of maize has averaged just under 1½ bushels per head of population, while the average for Queensland, the State in which the production per head is highest, amounted to approximately 4½ bushels. Details for the several States during the past five seasons are as follow :—

MAIZE.—YIELD PER 1,000 OF POPULATION, 1923–24 TO 1927–28.

Season.	N.S.W.	Vic.	Q'land.	S. Aust.	W. Aust.	N. Ter.	Fed. Cap. Ter.	Australia.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1923–24 ..	2,092	901	2,496	2	2	..	400	1,411
1924–25 ..	1,866	538	8,781	1	1	117	..	2,117
1925–26 ..	1,426	457	3,930	..	1	..	..	1,240
1926–27 ..	1,544	400	3,013	..	1	..	24	1,141
1927–28 ..	1,638	435	7,455	..	3	..	15	1,827

3. **Australian and Foreign Maize Production.**—(i) *Total Yield.* The United States of America is the most important maize-producing country of the world. On the average, approximately 100,000,000 acres are planted annually in that country, and nearly 3,000,000,000 bushels are reaped, representing about 75 per cent. of the world's production. Of the huge quantities raised, about 85 per cent. is fed to live stock on farms, 10 per cent. is used for human food, and only a very small fraction, viz., 1½ per cent., is exported. The yields of the various countries are as follows :—

MAIZE.—PRODUCTION IN VARIOUS COUNTRIES, 1924 TO 1927.

Country.	Yield in Bushels (000 omitted).		Country.	Yield in Bushels (000 omitted).	
	Average, 1924–1926.	1927.		Average, 1924–1926.	1927.
United States of America ..	2,662,177	2,786,265	Czecho-Slovakia ..	10,911	11,754
Argentine Republic	262,051	305,694	Salvador ..	(*b*) 10,629	(*b*) 10,629
Rumania ..	186,703	139,094	Canada ..	10,119	4,262
Brazil	154,318	158,260	**Australia** ..	**8,598**	**11,393**
Jugo-Slavia ..	144,293	83,008	Belgian Congo ..	8,469	8,464
Soviet Republics ..	136,970	148,835	Greece ..	7,710	(*a*) 8,132
Italy	111,249	87,378	French Indo-China	6,003	7,056
Mexico	87,147	81,166	Rhodesia ..	5,532	6,820
Hungary ..	79,546	68,348	French Morocco ..	4,659	4,788
Egypt	75,113	(*a*) 80,586	Uruguay ..	4,550	9,191
Dutch East Indies	74,542	(*a*) 78,618	Guatemala ..	4,202	4,321
India	73,093	(*a*) 76,760	Madagascar ..	4,101	4,166
Union of South Africa ..	60,595	67,721	French Equatorial and West Africa	4,035	5,914
Bulgaria ..	28,147	20,614	Poland ..	3,932	4,042
Spain	23,733	26,105	Austria ..	3,763	4,948
Philippine Islands	17,811	19,145	Japan	3,370	(*a*) 2,971
France	16,818	20,721	Kenya	3,159	(*c*) 3,309
Portugal ..	11,738	(*a*) 12,275	Korea	2,686	2,854
			Paraguay ..	1,673	2,280

(*a*) Year 1926. (*b*) Year 1924. (*c*) Year 1925.

(ii) *Yield per Acre.* The average yield per acre of maize in Australia during 1927–28 was 28.45 bushels, which may be regarded as satisfactory when compared with those of other maize-producing countries; the yields per acre for which are shown in the following table :—

MAIZE.—YIELD PER ACRE IN VARIOUS COUNTRIES, 1924 TO 1927.

Country.	Average Yield for acre in Bushels.		Country.	Average Yield per acre in Bushels.	
	Average, 1924–1926.	1927.		Average, 1924–1926.	1927.
Canada	40.83	32.38	Bulgaria ..	18.90	12.41
Egypt	36.83	*a*37.23	French Indo-China	18.65	20.12
Belgian Congo ..	35.54	*a*36.06	Salvador ..	*c*16.67	*c*16.67
Hungary ..	30.73	26.04	Japan	16.61	*a*23.07
Italy	29.24	23.27	Dutch East Indies	16.48	*a*16.46
Jugo-Slavia ..	28.84	16.25	Paraguay ..	*d*16.39	*b*19.97
Czecho-Slovakia ..	28.13	30.06	Portugal ..	16.04	15.77
Argentine Republic	27.26	34.72	Greece	14.73	*a*14.16
United States of America ..	26.43	28.17	Philippine Islands	13.61	15.93
Australia ..	**26.22**	**28.45**	India	13.48	13.91
Austria	25.20	33.59	French Equatorial and West Africa	12.71	10.85
Kenya	*d* 24.05	21.23	French Morocco ..	12.60	9.08
Brazil	23.87	20.21	Union of South Africa ..	12.48	14.10
Spain	21.33	22.84	Guatemala ..	12.32	14.94
Poland	20.43	20.59	Mexico	11.61	10.12
Madagascar ..	20.29	20.72	Korea	11.26	11.38
Soviet Republics ..	19.96	20.87	Uruguay ..	10.21	15.37
France	19.91	24.05	Basutoland ..	8.04	*a* 9.87
Rumania ..	19.52	13.34			
Rhodesia.. ..	19.22	*a*18.83			

(*a*) Year 1926. (*b*) Year 1925. (*c*) Year 1924. (*d*) Average years 1923–25.

4. **World's Production.**—The maize harvest in 1925 was one of the most abundant on record, when the production amounted to 4,685 million bushels. Since then the total yield has declined although the area shows only a slight falling off. The average yields per acre since 1925 are 25, 24, and 23 bushels respectively. The total yields from 1909 to 1927 were as follows :—

Average 1909 to 1913, 4,119,000,000. bushels
1923, 4,563,000,000 bushels.
1924, 3,855,000,000 „
1925, 4,685,000,000 „
1926, 4,463,700,000 „
1927, 4,391,000,000 „

5. **Price of Maize.**—The average wholesale price of maize in the Sydney market for each of the last five years is given in the following table :—

MAIZE.—AVERAGE PRICE, SYDNEY, 1923–24 TO 1927–28.

Particulars.	1923–24.	1924–25.	1925–26.	1926–27.	1927–28.
	s. d.	*s. d.*	*s. d.*	*s. d.*	*s. d.*
Average price per bushel ..	5 1	3 11	5 8	6 10	4 7

6. **Oversea Imports and Exports.**—The decline in the production of maize in Australia of late years has necessitated an average annual import of more than 1,000,000 bushels during the past quinquennium, the bulk of the supplies being furnished by South Africa. Details of imports and exports for the years 1923–24 to 1927–28 are as follows :—

MAIZE.—IMPORTS AND EXPORTS, AUSTRALIA, 1923–24 TO 1927–28.

Year.	Imports.		Exports.		Net Imports.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Bushels.	£	Bushels.	£	Bushels.	£
1923–24 ..	2,572,809	515,468	37,918	9,524	2,534,891	505,944
1924–25 ..	480	242	2,554,052	511,921	—2,553,572	—511,679
1925–26 ..	1,562,454	323,486	54,720	14,734	1,507,734	308,752
1926–27 ..	1,173,514	277,821	2,477	890	1,171,037	276,931
1927–28 ..	115,637	25,443	145,401	24,421	—29,764	1,022

NOTE.—(—) denotes net exports.

7. **Prepared Maize.**—A small quantity of corn-flour is imported annually into Australia, the principal countries of supply being the United Kingdom, South Africa, and the United States of America. During the year 1927–28 the imports amounted to 1,330,653 lb., and represented a value of £13,671. The exports from Australia are small, and amounted to only 11,105 lb., valued at £276 in 1927–28.

8. **Value of Maize Crop.**—The value of the Australian maize crop for the season 1927–28 has been estimated at £2,799,297, made up as follows :—

MAIZE.—VALUE OF CROP, 1927–28.

Particulars.	N.S.W.	Vic.	Q'land.	S. Aust.	W. Aust.	F.C.T.	Australia.
	£	£	£	£	£	£	£
Aggregate value	818,860	164,438	1,815,536	..	445	18	2,799,297
Value per acre	£5/10/0	£9/6/5	£7/15/2	..	£7/1/3	£1/10/0	£6/19/9

§ 7. Barley.

1. **Progress of Cultivation.**—(i) *Area and Yield.* The area under barley in Australia has fluctuated very considerably, but results for the last ten years reveal a marked advance. The average annual area sown for the decennium 1918 to 1928 amounted to 308,519 acres, which was nearly double the average of the previous ten-yearly period, i.e., 167,039 acres. Victoria was originally the principal barley growing State, but the rapid expansion of the cultivation of this crop in South Australia during recent years brought the latter State into the lead in 1913–14, and, during 1927–28, the area under barley in South Australia accounted for more than 68 per cent. of the Australian acreage. Victoria was next in importance with 24 per cent., leaving a small balance

of about 8 per cent. distributed among the other States. The figures here given relate to the areas harvested for grain; small areas only are cropped for hay, while more considerable quantities are cut for green forage. These, however, are not included in this subsection. The area and yield of barley for grain in the several States are shown in the following table for the last five years, while the progress since 1860 is illustrated in the graphs herein :—

BARLEY.—AREA AND YIELD, 1923-24 TO 1927-28.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	Australia.
			AREA.				
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1923–24 ..	4,350	56,564	665	184,286	8,673	4,230	a258,775
1924–25 ..	6,638	63,764	8,798	166,432	11,606	3,010	260,248
1925–26 ..	6,614	103,395	7,001	239,337	13,306	5,223	374,876
1926–27 ..	5,626	88,896	399	256,528	13,826	5,665	b370,943
1927–28 ..	5,600	76,768	3,220	219,491	12,138	5,101	322,318
			YIELD.				
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1923–24 ..	71,700	1,455,435	3,808	3,251,885	97,779	94,634	a4,975,451
1924–25 ..	118,300	1,444,823	171,124	3,103,718	177,537	50,729	5,066,231
1925–26 ..	105,150	1,774,963	92,441	4,134,824	158,300	90,619	6,356,297
1926–27 ..	100,221	1,920,722	1,991	4,630,044	128,136	149,800	b6,930,953
1927–28 ..	65,850	1,552,109	72,400	3,001,420	126,835	141,407	4,960,021

(*a*) Including Federal Capital Territory, 7 acres, 210 bushels.
(*b*) Including Federal Capital Territory, 3 acres, 39 bushels.

The States in which the annual production of barley averaged over 1,000,000 bushels for the past decade were South Australia and Victoria, the yields being respectively 3,391,087 and 1,897,939 bushels, the higher return per acre in the latter State tending to diminish the advantage held by South Australia in regard to acreage.

(ii) *Malting and other Barley.* (*a*) *Year 1927–28.* In recent years the statistics of all the States have distinguished between "malting" and "other" barley. Particulars for the season 1927–28 are as follows :—

BARLEY, MALTING AND OTHER.—AREA AND YIELD, 1927–28.

Particulars.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	Australia.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Malting barley..	2,642	50,005	2,366	208,446	8,507	4,517	276,483
Other barley ..	2,958	26,763	854	11,045	3,631	584	45,835
Total ..	5,600	76,768	3,220	219,491	12,138	5,101	322,318
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
Malting barley..	31,950	866,213	57,032	2,869,485	88,142	128,153	4,040,975
Other barley ..	33,900	685,896	15,368	131,935	38,693	13,254	919,046
Total ..	65,850	1,552,109	72,400	3,001,420	126,835	141,407	4,960,021

The cultivation of malting barley is a special industry to cater for the demands of the brewing trade. Its expansion, however, appears to be restricted, although of late years the exports have increased. Taking Australia as a whole, about 86 per cent. of the area under barley in 1927–28 was sown with the malting variety. The proportion varies largely in the several States.

(*b*) *Progress of Cultivation.* The following table sets out the acreage and yield of malting and other barley in Australia as a whole during the past five seasons :—

BARLEY, MALTING AND OTHER.—AREA AND YIELD, AUSTRALIA, 1923–24 TO 1927–28.

Season.	Acres.			Bushels.			Average Yields per Acre.		
	Malting.	Other.	Total.	Malting.	Other.	Total.	Malting.	Other.	Total.
1923–24 ..	217,613	41,162	258,775	4,196,008	779,443	4,975,451	19.28	18.94	19.23
1924–25 ..	211,761	48,487	260,248	4,163,896	902,335	5,066,231	19.66	18.61	19.47
1925–26 ..	319,441	55,435	374,876	5,401,489	954,808	6,356,297	16.91	17.22	16.96
1926–27 ..	320,846	50,097	370,943	5,872,144	1,058,809	6,930,953	18.30	21.13	18.68
1927–28 ..	276,483	45,835	322,318	4,040,975	919,046	4,960,021	14.62	20.05	15.39
Average 10 seasons 1918–28	247,781	60,738	308,519	4,540,901	1,172,159	5,713,060	18.30	19.30	18.52

During the past ten seasons the area and production of malting barley have represented more than four times the corresponding figures for other barley. The average yield per acre differs very little in respect of the two classes, the results for the past ten-yearly period being slightly in favor of the Cape variety.

(iii) *Average Yield.* The average yield of barley per acre varies considerably in the different States, being as a rule highest in Victoria and Tasmania, and lowest in Western Australia. Details for each State during the past five seasons, and for the decennium 1918–28, are given in the following table :—

BARLEY.—YIELD PER ACRE, 1923–24 TO 1927–28.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Australia.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1923–24	16.48	25.73	5.73	17.65	11.27	22.37	19.23
1924–25	17.82	22.66	19.45	18.65	15.30	16.85	19.47
1925–26	15.90	17.17	13.20	17.28	11.89	17.35	16.96
1926–27	17.81	21.61	4.99	18.05	9.27	26.44	18.68
1927–28	11.76	20.22	22.48	13.67	10.45	27.72	15.39
Average for 10 seasons 1918–28	14.88	21.77	17.36	17.46	11.40	22.80	18.52

(iv) *Relation to Population.* During the last five seasons the quantity of barley produced in Australia has averaged 1 bushel per head of population. For the season 1927–28 the production ranged from 5 bushels per head in South Australia to 4 lbs. per head in Queensland. Details of the years 1923–24 to 1927–28 are as follows :—

BARLEY.—PRODUCTION PER 1,000 OF POPULATION, 1923–24 TO 1927–28.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Australia.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1923–24	32	895	5	6,197	276	432	865
1924–25	52	872	205	5,764	488	233	863
1925–26	46	1,054	107	7,496	425	418	1,061
1926–27	43	1,122	2	8,175	338	698	1,134
1927–28	27	891	81	5,213	323	655	796

2. **Comparison with Other Countries.**—(i) *Total Yield.* In comparison with the barley production of other countries, that of Australia appears extremely small. Particulars for some of the leading countries during recent years are as follows, the Australian figures being added for the purpose of comparison :—

BARLEY.—PRODUCTION IN VARIOUS COUNTRIES, 1924 TO 1927.

Country.	Yield in Bushels (000 omitted).		Country.	Yield in Bushels (000 omitted).	
	Average, 1924–1926.	1927.		Average, 1924–1926.	1927.
Soviet Republics ..	228,111	206,855	Sweden	13,720	11,973
United States of America ..	186,567	254,949	Argentine Republic	13,568	13,977
India	121,931	114,240	Bulgaria ..	11,061	13,479
Germany	112,730	120,721	Italy	10,422	9,065
Canada	96,369	93,059	Lithuania ..	10,240	8,285
Spain	89,252	88,532	Egypt	10,238	11,483
Japan	81,449	79,184	Austria	8,160	10,497
Poland	65,257	72,058	Latvia	7,765	5,736
United Kingdom ..	49,680	42,894	Greece	7,622	11,339
Rumania	49,589	55,632	Syria	7,310	14,712
Czecho-Slovakia ..	49,373	56,652	Finland ..	6,274	6,308
France	45,141	48,314	**Australia** ..	**6,118**	**4,960**
French Morocco ..	42,536	32,597	Irish Free State ..	6,053	6,043
Korea	37,038	33,899	Tunis	5,835	3,968
Denmark ..	33,335	34,639	Estonia ..	5,397	4,161
Algeria	25,285	33,173	Norway ..	4,799	4,485
Hungary ..	21,008	22,737	Chile	4,757	6,512
Jugo-Slavia ..	15,647	13,871	Belgium ..	3,872	4,002
			Netherlands ..	3,415	2,906

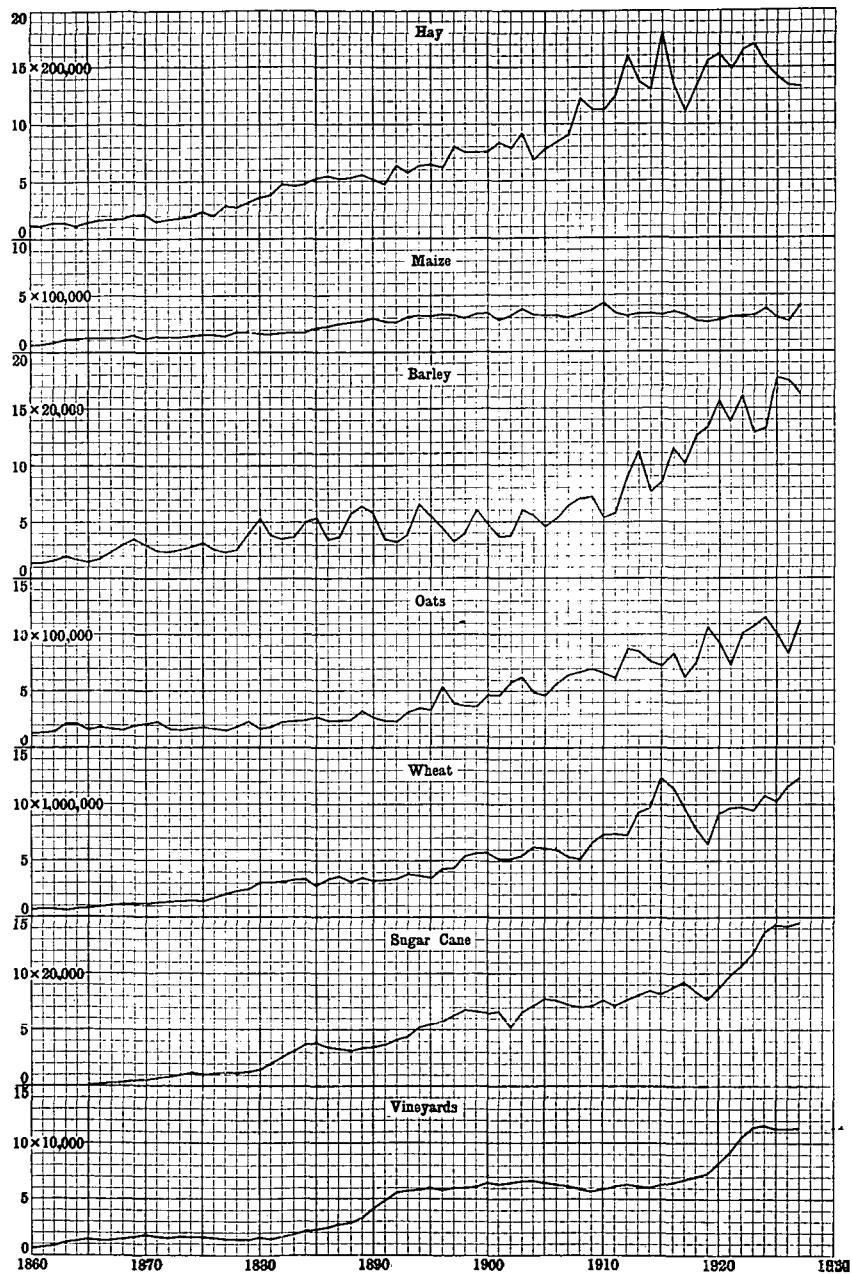
(ii) *Yield per Acre.* The following table shows the average yield of barley per acre in various countries of the world, the return ranging from 50.38 bushels in Netherlands to 7.57 bushels in Algeria :—

BARLEY.—AVERAGE YIELD PER ACRE IN VARIOUS COUNTRIES, 1924 TO 1927.

Country.	Yield in Bushels per acre.		Country.	Yield in Bushels per acre.	
	Average, 1924–1926.	1927.		Average, 1924–1926.	1927.
Netherlands ..	50.38	44.78	Bulgaria ..	20.52	24.30
Belgium	47.66	50.67	Spain	20.24	19.89
Denmark ..	44.25	42.12	Hungary ..	20.22	22.69
Irish Free State ..	40.33	50.03	Lithuania ..	20.18	18.09
New Zealand ..	36.90	49.99	**Australia** ..	**18.24**	**15.39**
Chile	36.72	38.69	Estonia ..	18.18	14.12
United Kingdom ..	35.38	36.73	Italy	18.01	15.54
Norway	34.42	29.93	Jugo-Slavia ..	17.72	14.36
Japan	33.11	33.79	Latvia	17.24	12.53
Sweden	32.10	28.86	Korea	17.17	15.48
Germany	31.34	33.05	Argentine Republic	17.03	17.87
Czecho-Slovakia ..	28.81	32.28	India	15.22	a17.51
Egypt	28.66	30.58	Greece	14.89	20.27
France	26.05	27.66	French Morocco ..	13.23	13.20
Canada	26.00	26.55	Soviet Republics	13.16	11.83
United States of America ..	24.35	26.86	Union of South Africa ..	11.92	9.05
Austria	23.28	28.71	Rumania ..	11.79	12.76
Finland	23.08	23.63	Syria	10.17	22.45
Poland	21.55	23.53	Algeria	7.57	9.87

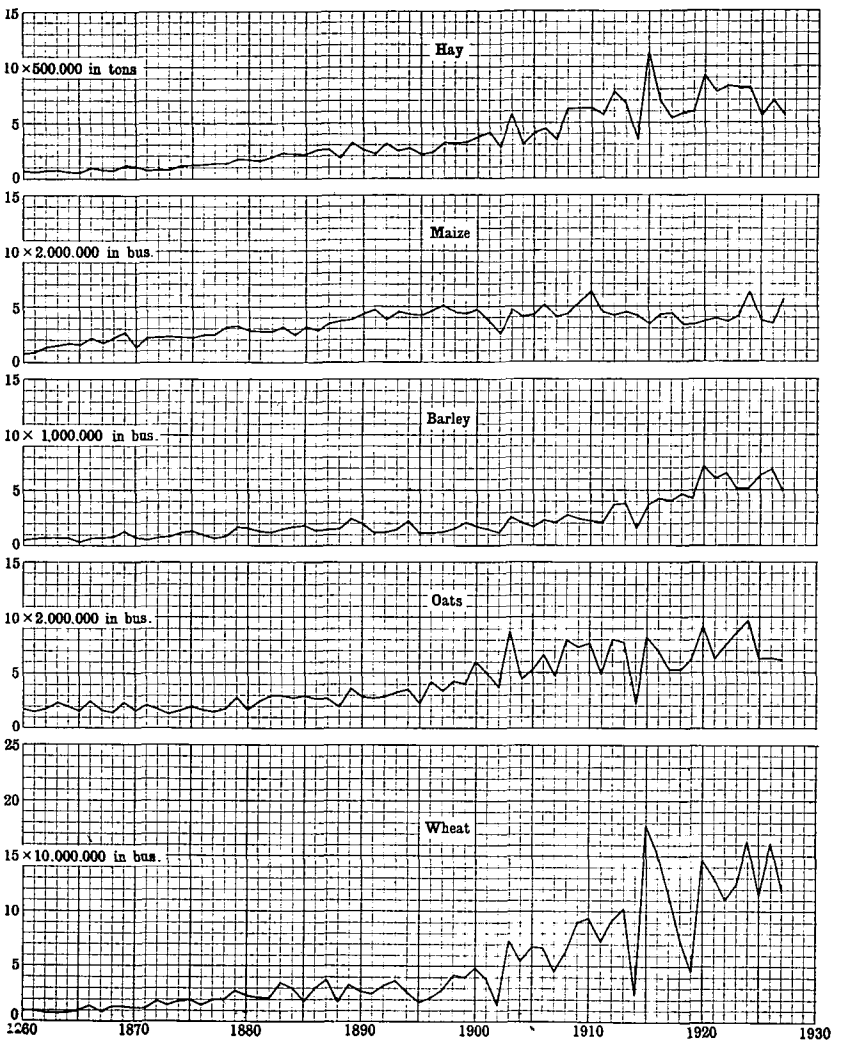
(a) Year 1926.

AREA UNDER PRINCIPAL CROPS—AUSTRALIA, 1860 TO 1928.

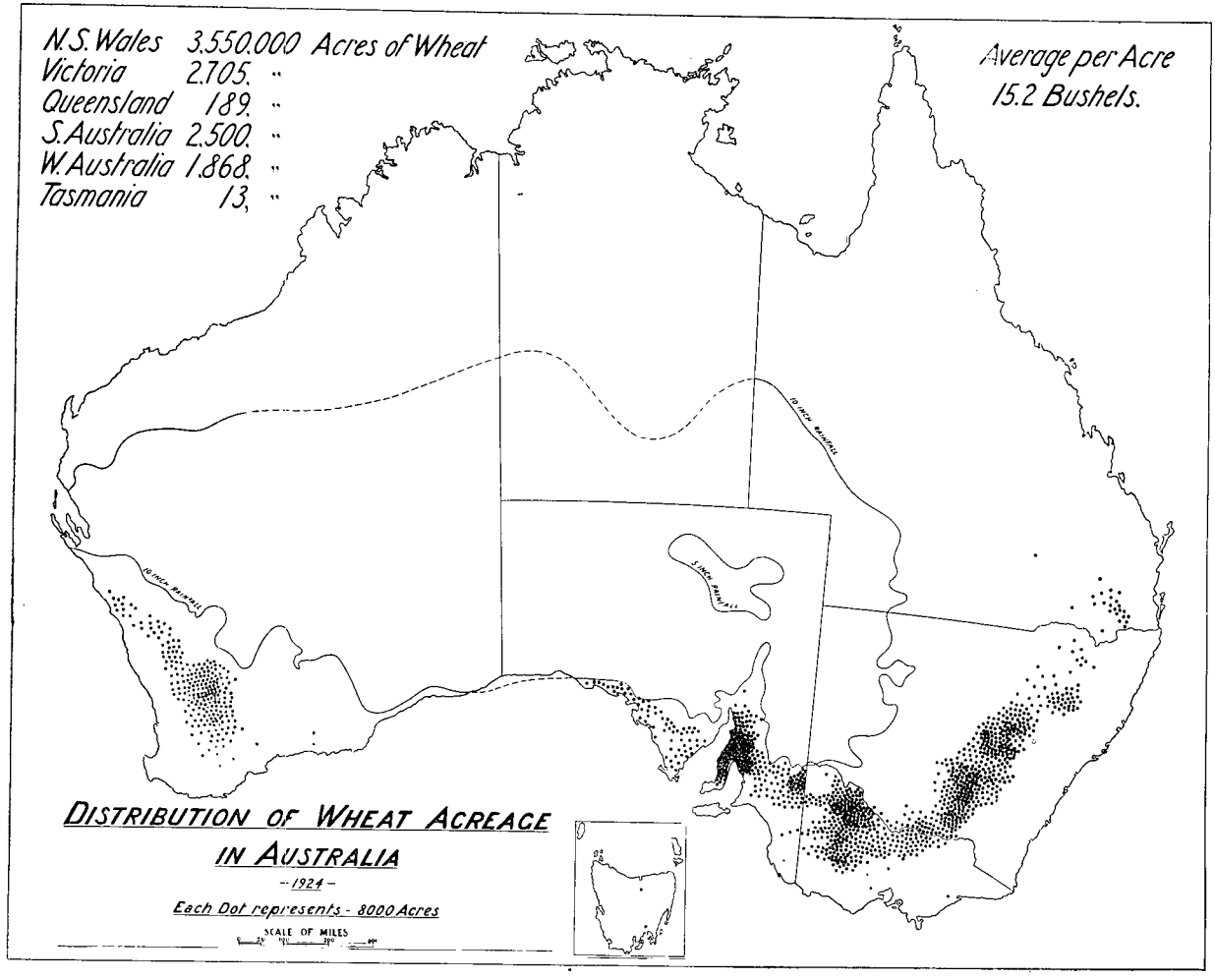


EXPLANATION.—The base of each small square represents an interval of one year, while the vertical height represents a number of acres, varying with the nature of the crop in accordance with the scale given on the left of the graph. The height of each curve above its base line denotes, for the crop to which it relates, the total area under cultivation in Australia during the successive seasons.

PRODUCTION OF PRINCIPAL CROPS—AUSTRALIA, 1860 TO 1928.



EXPLANATION.—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 wheat, 10,000,000 bushels; oats, 2,000,000 bushels; barley, 1,000,000 bushels; maize, 2,000,000 bushels; and hay, 500,000 tons. The height of each curve above its base line denotes the aggregate yield in Australia of the particular crop during the successive seasons.


N.S. Wales 3.550.000 Acres of Wheat
Victoria 2.705. "
Queensland 189. "
S. Australia 2.500. "
W. Australia 1.868. "
Tasmania 13. "
Average per Acre
15.2 Bushels.
10 INCH RAINFALL
10 INCH RAINFALL
5 INCH RAINFALL
DISTRIBUTION OF WHEAT ACREAGE
IN AUSTRALIA
-1924-
Each Dot represents - 8000 Acres
SCALE OF MILES

3. **World's Production.**—The area under barley in 1927 exceeded that of the previous year. Compared with the average pre-war area, i.e., for 1909–13, the total area under cultivation shows a decline of 6 per cent. while the production shows a falling-off of 6.5 per cent. In each case the Soviet Republics are included. Weather conditions were not so favourable in certain of the producing areas, and the total yield, whilst higher than the previous year, was below that of 1925. The production of barley in millions of bushels from 1909 onwards was as follows :—

Year.	Production.
Average 1909–1913	1,676 millions of bushels.
1923	1,490 ,,
1924	1,346 ,,
1925	1,619 ,,
1926	1,531 ,,
1927	1,567 ,,

4. **Price of Barley.**—The average price of barley in the Melbourne market during each of the past five years is given in the following table :—

BARLEY.—AVERAGE MELBOURNE PRICE PER BUSHEL, 1923 TO 1927–28.

Particulars.	1923.	1924.	1925–26.	1926–27.	1927–28.
	s. d.	*s. d.*	*s. d.*	*s. d.*	*s. d.*
Malting barley	4 0¾	5 8	4 11	4 3	4 7¾
Cape barley	3 1½	4 7¾	..	3 11	4 3

5. **Imports and Exports.**—The Australian export trade in barley has increased in recent years, the average annual shipments during the last five years amounting to 1,450,000 bushels, as compared with an average of 1,336,000 bushels for the previous quinquennium. The grain was consigned mainly to the United Kingdom and Belgium, South Australia being the principal exporting State. Particulars of the Australian overseas imports and exports for the years 1923–24 to 1927–28 are contained in the following table :—

BARLEY.—IMPORTS AND EXPORTS, AUSTRALIA, 1923–24 TO 1927–28.

Year.	Imports.		Exports.		Net Exports.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Bushels.	£	Bushels.	£	Bushels.	£
1923–24	4	3	1,828,788	318,912	1,828,784	318,909
1924–25	67,242	16,926	1,490,416	420,432	1,423,174	403,506
1925–26	32	14	729,528	142,948	729,496	142,934
1926–27	696	285	2,021,480	383,103	2,020,784	382,818
1927–28	262	108	1,251,444	291,636	1,251,182	291,528

In some years there is an export of Australian pearl and Scotch barley, the total for 1927–28 reaching 34,656 lb., valued at £362. The trade for the year was mainly with New Zealand and the Territory of New Guinea.

6. **Imports and Exports of Malt**—In pre-war times the imports of malt into Australia were fairly extensive, the supply being obtained principally from the United Kingdom. Since the outbreak of the war in 1914, however, imports have practically ceased,

and in 1917–18 and 1920–21 fairly large quantities were exported to South Africa and Japan. Details of imports and exports for the years 1923–24 to 1927–28 are given hereunder :—

MALT.—IMPORTS AND EXPORTS, AUSTRALIA, 1923–24 TO 1927–28.

Year.	Imports.		Exports.		Net Exports.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Bushels.	£	Bushels.	£	Bushels.	£
1923–24	28	13	3,573	1,550	3,545	1,537
1924–25	43	29	3,228	1,698	3,185	1,669
1925–26	325	182	1,830	971	1,505	789
1926–27	688	197	2,285	1,340	1,597	1,143
1927–28	365	119	3,593	1,498	3,228	1,379

7. **Value of Barley Crop.**—The estimated values of the barley crop of Australia for the seasons 1923–24 to 1927–28 were £879,811, £1,363,656, £1,305,328, £1,291,470 and £1,199,136 respectively. The extent to which the several States have contributed to the total in 1927–28 is shown in the following table :—

BARLEY.—VALUE OF CROP(a), 1927–28.

Particulars.	N.S.W.	Vic.	Q'land.	S. Aust.	W. Aust.	Tas.	Fed. Cap. Ter.	Australia.
Total value..	£16,820	£372,358	£17,771	£737,235	£26,142	£28,810	..	£1,199,136
Value per acre	£3/16/7	£4/17/0	£5/10/5	£3/7/2	£2/3/1	£5/12/11	..	£3/14/5

(a) Exclusive of the value of straw.

§ 8. Rice.

The success attending the efforts of rice growers on the Murrumbidgee Irrigation Area has proved that rice can be grown profitably on the settlement. Experimental rice cultivation has been carried on at the Yanco Experimental Farm for some years, but it was not until 1924–25 that an attempt was made to grow the cereal on a commercial basis. In that year 153 acres were cropped for a yield of 16,240 bushels. Consignments of " paddy " rice were forwarded to Sydney and Melbourne for the necessary treatment before marketing, and the results showed that the quality was much superior to the imported article. In 1925–26, 1,556 acres were reaped for 61,098 bushels, or an average yield of 39.27 bushels per acre. In 1926–27 the area was increased to 3,958 acres, from which 214,740 bushels were reaped for an average of 54.25 bushels per acre. Similar particulars for 1927–28 reveal that 9,901 acres were harvested for 879,113 bushels, averaging 88.88 bushels per acre. This production represents about 16,483 tons and was almost sufficient to meet local requirements, which during the past five years averaged approximately 17,000 tons per annum. It is estimated that the production for the season 1928–29 will amount to 25,000 tons, grown on 14,000 acres. According to the Irrigation Commission there are about 53,000 acres of land on the settlement suitable for rice-growing, and it is estimated that at least 40,000 acres could be so used, of which probably 20,000 acres would be under fallow each year and 20,000 under crop. Over-production should not prevent undue difficulties, as there is a ready market in the East, as well as in England and Germany. The United States of America first grew rice commercially in 1912, and having met her own requirements is now exporting to European countries and to Japan. The Commonwealth Government has protected the new industry by the imposition of a Customs duty of 3s. 4d. per cental on uncleaned rice and 6s. per cental on other than uncleaned.

§ 9. Other Grain and Pulse Crops.

In addition to the grain crops already specified, the only other grain and pulse crops extensively grown in Australia are beans, peas, and rye. The total area under the two former crops for the season 1927–28 was 64,608 acres, giving a yield of 789,961 bushels, or an average of 12.23 bushels per acre, being below the average yield for the decennium ended 1927–28, which was 15.62 bushels per acre. The States in which the greatest area is devoted to beans and peas are Tasmania, South Australia and Victoria. The total area under rye in Australia during the season 1927–28 was 3,224 acres, yielding 43,968 bushels, giving an average of 13.64 bushels per acre. This was higher than the average for the past ten seasons, which was 12.07 bushels per acre. Over 60 per cent. of the rye grown during the season was produced in New South Wales, and 25 per cent. in Victoria.

§ 10. Potatoes.

1. **Progress of Cultivation.**—(i) *Area and Yield.* The principal potato-growing State is Victoria, which possesses peculiar advantages for the growth of this tuber. The rainfall is generally satisfactory, while the atmosphere is sufficiently dry to be unfavourable to the spread of Irish blight, consequently potatoes are grown in nearly every district except in the wheat belt. Tasmania comes next in order of importance, followed by New South Wales.

The area and production of potatoes in each State during the last five years are given hereunder :—

POTATOES.—AREA AND YIELD, 1923–24 TO 1927–28.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Fed. Cap. Ter.	Australia.
AREA.								
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1923–24 ..	21,850	59,306	6,127	5,239	4,761	37,040	29	134,352
1924–25 ..	23,384	61,295	9,493	3,292	5,122	36,171	19	138,776
1925–26 ..	22,723	63,369	10,478	2,895	4,262	33,190	8	136,925
1926–27 ..	21,906	66,185	8,642	3,549	5,144	33,984	35	139,445
1927–28 ..	21,578	77,649	10,035	4,309	5,280	44,359	21	163,231
YIELD.								
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1923–24 ..	60,949	238,520	8,878	21,327	17,830	99,936	130	447,570
1924–25 ..	57,179	139,043	20,314	12,226	19,891	83,377	95	332,125
1925–26 ..	43,081	160,729	15,386	10,764	16,052	67,341	56	313,409
1926–27 ..	53,223	162,909	9,749	15,375	17,755	114,100	65	373,176
1927–28 ..	47,397	230,348	18,914	17,749	16,746	138,837	50	470,041

The cultivation of potatoes in Australia declined in recent years, but a considerable improvement was shown during 1927–28 when the area under cultivation reached 163,231 acres. This figure has been exceeded on one occasion, i.e., in 1913–14 when 170,233 acres were cultivated. Victoria and Tasmania—the chief potato-growing areas—with increases of 11,464 and 10,375 acres respectively, were responsible for this improvement. The average yield during the last ten years was 358,045 tons, compared with 371,861 tons during the previous decade. The record production of 507,153 tons was obtained in 1906–7.

(ii) *Average Yield.* The suitability of the soil, climate, and general conditions for potato growing is evidenced by the satisfactory yields per acre which are generally obtained in Australia despite the little attention paid to this crop, the average yield during the past ten seasons being 2.63 tons per acre. The lowest yield is that obtained in Queensland with an average of 1.70 tons for the same period.

Particulars for each State for the seasons 1923–24 to 1927–28, and for the past decennium, are given hereunder :—

POTATOES.—YIELD PER ACRE, 1923–24 TO 1927–28.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Fed. Cap. Ter.	Australia.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1923–24	2.79	4.02	1.45	4.07	3.74	2.70	4.48	3.33
1924–25	2.45	2.37	2.14	3.71	3.88	2.31	5.00	2.39
1925–26	1.90	2.54	1.47	3.72	3.77	2.03	7.00	2.29
1926–27	2.43	2.46	1.13	4.33	3.45	3.36	1.86	2.68
1927–28	2.40	2.97	1.88	4.12	3.17	3.13	2.38	2.88
Averages for 10 seasons 1918–28	2.15	2.75	1.70	3.65	3.57	2.71	3.50	2.63

The comparatively low yield per acre is due in large measure to the neglect of rotation, and the insufficient use of manures. Rotation and manuring are carefully studied in many European countries, with the result that the production per acre is double that obtained in Australia.

(iii) *Relation to Population.* The average annual production of potatoes per head of the population of Australia for the past five seasons was approximately 145 lb. 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, while for the past five seasons it has averaged about 9 cwt. Details for the seasons 1923–24 to 1927–28 are as follows :—

POTATOES.—PRODUCTION PER 1,000 OF POPULATION, 1923–24 TO 1927–28.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Fed. Cap. Ter.	Australia.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1923–24 ..	28	147	11	41	50	456	50	78
1924–25 ..	25	84	24	23	55	383	32	57
1925–26 ..	19	95	18	20	43	310	14	52
1926–27 ..	23	95	11	27	47	531	13	61
1927–28 ..	20	132	21	31	43	643	9	75

2. **Imports and Exports.**—Under normal conditions there is a moderate export trade in potatoes carried on by Australia principally with the Pacific Islands and Papua. On the other hand, when the recurrence of droughts causes a shortage in any of the

States, importations are usually made from New Zealand. The quantities and values of the Australian oversea imports and exports of potatoes during the past five years are shown in the following table :—

POTATOES.—IMPORTS AND EXPORTS, AUSTRALIA, 1923-24 TO 1927-28.

Year.	Imports.		Exports.		Net Exports.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Tons.	£	Tons.	£	Tons.	£
1923-24	38	639	3,951	29,974	3,913	29,335
1924-25	71	877	5,832	30,283	5,761	29,406
1925-26	8,168	77,056	1,017	16,674	— 7,151	— 60,382
1926-27	14,491	125,188	1,158	14,950	— 13,333	— 110,238
1927-28	218	1,831	2,132	16,619	1,914	14,788

NOTE.—The minus sign (—) signifies net imports.

3. **Value of Potato Crop.**—The estimated value of the potato crop of each State for the season 1927-28 is given in the following table, together with the value per acre :—

POTATOES.—VALUE OF CROP, 1927-28.

Particulars.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Fed. Cap. Ter.	Australia.
	£	£	£	£	£	£	£	£
Total value ..	236,990	944,427	178,895	126,067	163,099	677,080	250	2,326,808
Value per acre	£10/19/8	£12/3/3	£17/16/7	£29/5/2	£30/17/9	£15/5/3	£11/18/1	£14/5/1

§ 11. 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 1927-28 being only 21,871 acres. The principal of these crops are onions, mangolds, sugar beet, turnips, and "sweet potatoes." Of these, onions, sugar beet and mangolds are most largely grown in Victoria, turnips in Tasmania, and sweet potatoes in Queensland. The total area under onions in Australia during the season 1927-28 was 8,683 acres, giving a yield of 37,293 tons, and averaging 4.29 tons per acre. The area devoted in 1927-28 to root crops other than potatoes and onions, viz., 13,188 acres, yielded 99,959 tons, and gave an average of 7.58 tons per acre. The areas and yields here given are exclusive of the production of "market gardens," reference to which is made further on.

2. **Imports and Exports.**—The only root crop, other than potatoes, in which any considerable oversea trade is carried on by Australia is that of onions. During the past five years 7,057 tons, valued at £90,936, were imported, principally from Japan, the United States of America, and New Zealand, while during the same period the exports totalled 20,312 tons, valued at £189,481, and were shipped mainly to New Zealand, the Pacific Islands, the Philippine Islands, and Canada.

§ 12. Hay.

1. Nature and Extent.—(i) *Area and Yield.* As already stated, the chief crop in Australia is wheat grown for grain. Next in importance is hay, which for the season 1927–28 averaged over 13 per cent. of the total area cropped. In most European countries the hay consists almost entirely of meadow and other grasses, but in Australia a very large proportion is composed of wheat and oats. Large quantities of lucerne hay are also made, particularly in New South Wales and Queensland. The area under hay of all kinds in the several States during the last five years is given hereunder. The progress from 1860 onwards may be traced from the graph accompanying this chapter.

HAY.—AREA AND YIELD, 1923–24 TO 1927–28.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	N. Ter.	Fed. Cap. Ter.	Australia.
				AREA.					
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1923–24	1,022,118	1,277,606	46,909	631,267	329,534	97,183	10	1,599	3,406,226
1924–25	762,242	1,120,312	95,007	562,253	397,591	87,945	10	1,045	3,026,405
1925–26	749,192	1,013,613	66,828	517,220	391,142	92,595	..	1,413	2,832,003
1926–27	623,424	1,080,993	40,141	496,105	358,487	98,289	..	2,192	2,699,631
1927–28	680,919	908,804	65,412	532,568	357,065	85,769	..	1,682	2,632,219
				YIELD.					
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1923–24	1,170,737	1,541,287	43,407	781,768	368,122	144,298	5	2,310	4,051,934
1924–25	1,151,238	1,492,588	136,804	716,749	448,525	121,110	30	1,375	4,068,419
1925–26	564,006	929,068	99,742	612,671	355,269	114,920	..	2,269	2,677,945
1926–27	875,227	1,387,971	47,740	598,835	423,839	151,200	..	2,540	3,487,352
1927–28	754,176	1,001,251	94,996	464,905	416,707	124,924	..	2,004	2,858,963

In all the States marked fluctuations occur yearly in the area under hay. 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 grain is not satisfactory. 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 Australia during the season 1915–16, i.e., 3,597,771 acres, was the highest on record, whilst the average during the past decennium amounted to 2,998,120 acres.

(ii) *Average Yield.* The States in which the highest average yields per acre have been obtained during the last decennium are Tasmania, Queensland and Victoria, in the former two of which States also the smallest areas are devoted to this crop. For the same period the lowest yield for Australia as a whole was that of 19 cwt. per acre in 1925–26, while the highest was that of 29 cwt. in 1920–21, followed closely by 27 cwt.

obtained in 1924–25. The average for the decennium was 24 cwt. Particulars for the several States for the seasons 1923–24 to 1927–28, and the average for the last ten years are given hereunder :—

HAY.—YIELD PER ACRE, 1923–24 TO 1927–28.

Season.	N.S.W.	Vic.	Q'land.	S. Aust.	W.Aust.	Tas.	N. Ter.	Fed. Cap. Ter.	Australia.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1923–24	1.15	1.21	0.93	1.24	1.12	1.48	0.50	1.44	1.19
1924–25	1.51	1.33	1.44	1.27	1.13	1.38	3.00	1.32	1.34
1925–26	0.75	0.92	1.49	1.18	0.91	1.24	..	1.60	1.05
1926–27	1.40	1.28	1.19	1.21	1.18	1.54	..	1.16	1.29
1927–28	1.11	1.10	1.45	0.87	1.17	1.46	..	1.19	1.09
Average for 10 seasons 1918–1928 ..	1.19	1.24	1.33	1.17	1.08	1.46	3.45	1.35	1.20

(iii) *Relation to Population.* During the past five seasons the Australian hay production per head of population has varied between 9 cwt. in 1927–28 and 14 cwt. in 1923–24, averaging about 13½ cwt. per head for the period. Hay production per head of population is generally highest in South Australia. Details for the seasons 1923–24 to 1927–28 are given hereunder :—

HAY.—YIELD PER 1,000 OF POPULATION, 1923–24 TO 1927–28.

Season.	N.S.W.	Vic.	Q'land.	S. Aust.	W. Aust.	Tas.	N. Ter.	Fed. Cap. Ter.	Australia.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1923–24 ..	530	948	54	1,490	1,040	659	1	881	705
1924–25 ..	511	901	163	1,331	1,231	556	8	459	693
1925–26 ..	245	552	116	1,111	955	530	..	576	497
1926–27 ..	373	811	54	1,057	1,119	714	..	516	571
1927–28 ..	314	575	102	807	1,062	578	..	349	459

(iv) *Varieties Grown.* Particulars concerning the kinds of crop cut for hay are furnished in the returns prepared by five of the States. In the case of Tasmania the bulk consists of oaten hay ; full particulars, however, are not available for that State.

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

HAY.—VARIETIES GROWN, 1923–24 TO 1927–28.

Varieties.	1923–24.	1924–25.	1925–26.	1926–27.	1927–28.
NEW SOUTH WALES—	Acres.	Acres.	Acres.	Acres.	Acres.
Wheaten	695,369	388,422	449,653	311,073	369,960
Oaten	241,161	274,408	209,047	216,403	200,872
Barley	1,584	1,150	781	692	015
Lucerne	83,256	97,994	89,368	95,003	103,194
Other	748	268	343	253	278
Total	1,022,118	762,242	749,192	623,424	680,919

HAY.—VARIETIES GROWN, 1923-24 TO 1927-28.—*continued.*

Varieties.	1923-24.	1924-25.	1925-26.	1926-27.	1927-28.
	Acres.	Acres.	Acres.	Acres.	Acres.
VICTORIA—					
Wheaten	163,826	87,312	230,364	101,243	224,454
Oaten	1,084,136	1,000,382	759,209	959,019	659,983
Lucerne, etc.	29,644	32,618	24,040	20,731	24,367
Total ..	1,277,606	1,120,312	1,013,613	1,080,993	908,804
QUEENSLAND—					
Wheaten	8,714	9,457	10,514	2,798	3,637
Oaten	1,344	8,304	2,214	790	2,468
Lucerne	33,505	61,089	50,526	33,263	48,346
Other	3,346	16,157	3,574	3,290	10,961
Total	46,909	95,007	66,828	40,141	65,412
SOUTH AUSTRALIA—					
Wheaten	381,962	304,183	273,300	230,120	289,219
Oaten	234,899	246,825	234,923	256,417	233,709
Lucerne	7,270	8,344	6,218	5,613	5,649
Other	7,136	2,901	2,779	3,955	3,991
Total	631,267	562,253	517,220	496,105	532,568
WESTERN AUSTRALIA—					
Wheaten	223,770	242,216	238,110	207,841	223,827
Oaten	103,723	153,315	150,534	148,150	130,109
Lucerne	175	339	368	340	120
Other	1,866	1,721	2,130	2,156	3,009
Total	329,534	397,591	391,142	358,487	357,065

Wheaten hay is the principal hay crop in New South Wales, South Australia, and Western Australia, oaten hay in Victoria and Tasmania, and lucerne in Queensland.

2. **Comparison with 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 prominent places. The statistics of hay production in these countries are not prepared on a uniform basis, consequently any attempt to furnish extensive comparisons would be misleading. It may be noted, however, that in Great Britain the production of hay from clover, sainfoin, etc., for the year 1928 amounted to 2,769,000 tons from 1,968,696 acres, while from permanent grasses a yield of 4,533,000 tons of hay was obtained from 4,666,463 acres, giving a total of 7,302,000 tons from 6,635,159 acres, or about 22 cwt. per acre.

3. **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 Australia. During 1927-28, 1,103 tons were imported, while the exports amounted to 2,589 tons, valued at £20,548, the principal purchases being made by New Zealand, India, the Philippine Islands, Malaya (British), Ceylon, and Hong Kong.

4. **Value of Hay Crop.**—The following table shows the value and the value per acre of the hay crop of the several States for the season 1927–28 :—

HAY.—VALUE OF CROP, 1927–28.

Particulars.	N.S.W.	Vic.	Q'land.	S. Aust.	W. Aust.	Tas.	Fed. Cap. Ter.	Australia.
	£	£	£	£	£	£	£	£
Total Value ..	6,080,960	4,630,786	603,715	1,859,620	1,247,373	680,720	17,104	15,120,278
Value per acre ..	£8/18/7	£5/1/11	£9/4/7	£3/9/11	£3/9/10	£7/18/9	£10/3/5	£5/14/11

§ 13. Green Forage.

1. **Nature and Extent.**—(i) *Area.* In all the States a considerable area is devoted to the production of green forage, mainly in connexion with the dairying industry. The total area so cropped is considerably swollen in adverse seasons by the inclusion of wheat or other cereal crops deemed unsuitable for the production of either grain or hay. Under normal conditions 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 during each of the last five years are given in the following table :—

GREEN FORAGE.—AREA, 1923–24 TO 1927–28.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Nor. Ter.	Fed. Cap. Ter.	Australia.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1923–24	429,765	107,371	306,693	55,282	51,754	10,389	50	7	961,311
1924–25	166,030	99,531	134,109	73,023	78,586	13,602	..	43	564,924
1925–26	479,434	107,873	247,482	102,732	100,558	17,101	..	30	1,055,210
1926–27	217,385	87,241	342,580	105,170	109,314	19,213	..	54	880,957
1927–28	848,042	94,895	155,843	184,782	82,241	23,409	..	8	1,389,220

(ii) *Relation to Population.* Particulars of the area under green forage per 1,000 of the population for the seasons 1923–24 to 1927–28 are given hereunder :—

GREEN FORAGE.—AREA PER 1,000 OF POPULATION, 1923–24 TO 1927–28.

Season.	N.S.W.	Vic.	Q'land.	S. Aust.	W. Aust.	Tas.	Nor. Ter.	Fed. Cap. Ter.	Australia.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1923–24 ..	195	66	378	105	146	47	14	3	167
1924–25 ..	74	60	161	136	216	62	..	14	96
1925–26 ..	209	64	287	186	270	79	..	8	176
1926–27 ..	93	51	388	186	289	89	..	11	144
1927–28 ..	353	54	173	321	210	103	..	1	223

2. **Value of Green Forage Crops.**—The value of these crops is variously estimated in the several States, and the Australian total for the season 1927–28 may be taken approximately as £2,731,485 or about £1 19s. 4d. per acre.

§ 14. Sugar-cane and Sugar-beet.

1. **Sugar-cane.**—(i) *Area.* Sugar-cane for sugar-making purposes is grown only in Queensland and New South Wales, and much more extensively in the former than in the latter. Thus, of a total area of 291,299 acres under sugar-cane in Australia for the season 1927–28, there were 274,838 acres, or about 94½ per cent., in Queensland. Sugar-cane growing appears to have been started in Australia in or about 1862, as the earliest statistical record of sugar-cane as a crop is that which credits Queensland with an area of 20 acres for the season 1862–63. In the following season the New South Wales returns show an area of 2 acres under this crop. The area under cane in New South Wales reached its maximum in 1895–96 with a total of 32,927 acres. Thenceforward

with slight variations it gradually fell to 10,490 acres in 1918–19, but from that year onwards considerable improvement has taken place, and during the past five years more than 5,000 acres have been added to the cane-fields. In Queensland, although fluctuations in area are manifest, the general trend has been upwards, the acreage under cane for the season 1927–28 being the highest on record. The area under sugar-cane in Australia from 1923–24 is given in the following table, and particulars for earlier years may be seen from the accompanying graphs.

SUGAR-CANE.—AREA, 1923–24 TO 1927–28.

Season.	New South Wales.		Queensland.		Australia.		
	Productive.	Unproductive.	Productive.	Unproductive.	Productive.	Unproductive.	Total.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1923–24 ..	6,733	10,582	138,742	81,223	145,475	91,805	237,280
1924–25 ..	7,761	12,232	167,649	85,870	175,410	98,102	273,512
1925–26 ..	8,688	10,675	189,675	79,834	198,363	90,509	288,872
1926–27 ..	10,128	8,181	189,312	77,207	199,440	85,388	284,828
1927–28 ..	8,556	7,905	203,748	71,090	212,304	78,995	291,299

(ii) *Productive and Unproductive Cane.* The areas given in the preceding table do not include the small acreage cut for green forage. The whole area was not necessarily cut for crushing during any one season, there being always a considerable amount of young and "stand over" cane, as well as a small quantity required for plants. The season in which the highest acreage is recorded may not show the greatest area of productive cane cut for crushing, as was evidenced in 1923–24, when, although the total acreage was greater, the area cut was less than in the previous year.

(iii) *Yield of Cane and Sugar.* Queensland statistics of the production of sugar-cane are not available for dates prior to the season 1897–98. In that season the total for Australia was 1,073,883 tons, as against the maximum production of 3,965,587 tons in 1925–26. The average production of cane during the decennium ended 1927–28 was 2,697,396 tons. The three highest yields of sugar were in 1925–26, 1927–28 and 1924–25, the quantities being 517,970 tons, 509,094 tons, and 435,818 tons respectively. The decennial average was 332,039 tons of sugar. Particulars relative to the total yields of cane and sugar for the past five years are as follows :—

SUGAR-CANE.—YIELD OF CANE AND SUGAR, 1923–24 TO 1927–28.

Season.	New South Wales.		Queensland.		Australia.	
	Cane.	Sugar.	Cane.	Sugar.	Cane.	Sugar.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1923–24 ..	132,084	16,829	2,045,808	269,175	2,177,892	286,004
1924–25 ..	228,978	26,682	3,171,341	409,136	3,400,319	435,818
1925–26 ..	297,335	32,385	3,668,252	485,585	3,965,587	517,970
1926–27 ..	230,254	26,604	2,925,662	389,272	3,155,916	415,876
1927–28 ..	208,612	23,349	3,555,827	485,745	3,764,439	509,094

The production of raw sugar in Australia in 1927–28 amounted to 509,094 tons manufactured from 3,764,439 tons of cane. These figures show considerable improvement on the returns for the previous year, while the production for Queensland was the greatest yet recorded for that State. New South Wales, however, shows a fall of over 3,000 tons compared with the previous year. The assistance given by the Commonwealth and State Governments during recent years has greatly benefited the sugar industry. In 1920–21 the area cultivated in Queensland was 162,619 acres and the number of cane farmers was 3,930, whereas in 1927–28, 274,838 acres were under cultivation and the number of growers of 5 acres and over had risen to 6,587, or an increase of 2,657 in the seven years.

Final figures for the 1928–29 season are not yet available, but the season was very favourable for the growth of the cane and it is estimated that 3,932,000 tons were cut. Owing to the substantial rains in the early part of the year, followed by a dry winter and

spring, the commercial sugar content of the cane was remarkably good, and approximately 544,000 tons of sugar were crushed during the season, this being the greatest quantity of sugar yet produced in Australia.

Early indications pointed to a good crop in 1929–30, but later advices report various climatic drawbacks, and it is now believed that the yield will be slightly below that of the previous year.

(iv) *Average Yield of Cane and Sugar.* 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 25.77 tons for the former and 17.53 for the latter State. For some years prior to 1910–11, the yield in New South Wales remained practically constant at about 21 tons per acre. Since that year, the average yield per acre has shown an upward tendency, reaching 30 tons or over during 1913–14, 1914–15, 1917–18, and 1925–26. The climatic conditions affecting the long coastal area where this industry is situated in Queensland are largely responsible for the great variations in the yields of sugar for that State, the figures ranging during the past decennium from 14.75 tons per acre in 1923–24 to 24.88 tons in 1917–18.

The greatest production of sugar per acre crushed during the past decennium occurred in 1917–18, when 2.87 tons were obtained, the respective crushings for New South Wales and Queensland averaging 3.56 and 2.83 tons. The average yield per acre for the past ten years was 2.95 tons in New South Wales, and 2.17 tons in Queensland.

(v) *Quality of Cane.* The quantity of cane required to produce a ton of sugar varies with the variety sown, the district where grown, also with the season, and for the decennium ended 1927–28 averaged 8.12 tons, the average production of sugar being 12.30 per cent. of the weight of cane crushed. As the result of the systematic study of cane culture in Queensland, the sugar contents of the cane have been considerably increased in recent years. During the ten years ended 1917–18 it required on the average 8.74 tons of cane to produce 1 ton of sugar, whereas the average figure for the past decennium was reduced to 8.08 tons.

SUGAR-CANE AND SUGAR.—YIELD PER ACRE, 1923–24 TO 1927–28.

Season.	New South Wales.			Queensland.			Australia.		
	Cane per acre Crushed.	Sugar per acre Crushed.	Cane to each ton of Sugar.	Cane per acre Crushed.	Sugar per acre Crushed.	Cane to each ton of Sugar.	Cane per acre Crushed.	Sugar per acre Crushed.	Cane to each ton of Sugar.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1923–24	19.62	2.50	7.85	14.75	1.94	7.60	14.97	1.97	7.60
1924–25	29.50	3.44	8.58	18.92	2.44	7.75	19.38	2.48	7.80
1925–26	34.22	3.73	9.18	19.34	2.56	7.55	19.99	2.61	7.66
1926–27	22.73	2.63	8.65	15.45	2.06	7.52	15.82	2.09	7.59
1927–28	24.38	2.73	8.93	17.45	2.38	7.32	17.73	2.40	7.39
Average 10 seasons 1918–28 ..	25.77	2.95	8.75	17.53	2.17	8.08	17.90	2.20	8.12

The Bureau of Sugar Experiment Stations established in Queensland is rendering splendid service to the sugar industry in that State, by advocating and demonstrating better methods of cultivation, the use of green manures, limes, and fertilizers, together with the introduction and distribution of improved varieties of sugar cane.

The Falkiner cane-harvester was again in the field during the year, and although the machine is promising, it requires further alterations and adjustments to enable it to operate successfully. A cane harvester of a lighter character, invented in the district, was tried at Mackay and revealed great possibilities. Further trials are awaited with interest. A third cane harvester manufactured in New South Wales was also tried at Bundaberg, but no details are available. Improvements in cultivating machinery moreover, are continually being made, and the use of tractors is universal in the sugar districts of North Queensland.

(vi) *Relation to Population.* The yield of sugar in Australia during the five years 1923–24 to 1927–28 was more than sufficient to supply local requirements, the average production during the period amounting to 162 lbs. per head of population, while the

consumption was estimated to average 118 lbs. per head. Details for the period 1923–24 to 1927–28 are as follows :—

SUGAR.—PRODUCTION PER HEAD OF POPULATION, 1923–24 TO 1927–28.

State.	1923–24.	1924–25.	1925–26.	1926–27.	1927–28.
	lbs.	lbs.	lbs.	lbs.	lbs.
New South Wales ..	17	27	32	25	22
Queensland	743	1,098	1,263	988	1,210
Australia	111	166	194	152	183

2. **Sugar-beet.**—(i) *Area and Yield.* The following table shows the acreage under sugar-beet, and the production in Victoria during the past five seasons :—

SUGAR-BEET.—AREA AND PRODUCTION IN VICTORIA, 1923–24 TO 1927–28.

Particulars.		1923–24.	1924–25.	1925–26.	1926–27.	1927–28.
Area harvested ..	acres	1,937	1,897	1,880	2,024	2,353
Production ..	tons	29,512	24,468	21,194	9,851	25,438
Average per acre ..	,,	15.24	12.90	11.27	4.87	10.81
Sugar produced ..	,,	3,499	3,017	2,315	1,177	2,352

Seasonal conditions were much more favourable during 1927–28 than in the previous year and the area under beets was increased. While the area harvested is the largest recorded, the yield is much below that of 1923–24, when the average was 15.24 tons per acre.

(ii) *Encouragement of Beet-growing.* During recent years an effort has been made to revive the sugar-beet industry in Victoria. The State Government has advanced its irrigation scheme on the Macalister River to provide water for the district for the 1927–28 season. A fine grade of white sugar is manufactured at Maffra, and considerable quantities of beet pulp and molasses are distributed for stock feed.

3. **Sugar Bounties.**—The provision of bounties or similar aids to the sugar growers of Australia early occupied the attention of the Commonwealth Parliament, the object in view being that of assisting the industry, and at the same time diminishing the employment of coloured labour in connexion therewith. An account of the various Acts in connexion with sugar bounties and sugar excise tariffs will be found on pages 394 to 396 of Year Book No. 6. 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 connexion 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.

4. **Sugar Purchase by Commonwealth Government.**—The steps taken by the Commonwealth Government in connexion with this matter were alluded to in previous issues of the Year Book. (See No. 18, p. 720.)

By agreement between the Commonwealth and Queensland Governments in 1925, it was arranged that the embargo on the importation of foreign sugar should be extended for three years from 1st September, 1925. The price payable for the raw sugar needed for home consumption was fixed at £27 per ton, less £1 per ton to defray administrative and general expenses of the Sugar Board, and to provide special concessions to certain consumers of sugar, while for that portion reserved for export, the price was fixed at a much lower figure, the latter of course being subject to realization adjustments. The embargo was later extended for a further period of three years until 1st August, 1931, on practically the same terms as heretofore. Final calculations by the Sugar Board showed that 56 per cent. of the total production in 1925–26 was consumed in Australia, while the net value per ton of exported sugar was £11 5s. 9d., making the average price for the whole crop £19 10s. 7d. per ton.

Owing to the reduced production in the 1926–27 season 81⅓ per cent. was delivered for home consumption, and the net value of the surplus exported was £14 18s. 10d. per ton, making an average return of £24 10s. 10d. per ton.

In 1927–28 the percentage of the sugar crop retained for consumption was 68.82, the net value of the exportable surplus was £1,913,280, or £12 2s. 6d. per ton, and the average net return for the whole crop was £22 0s. 4d. per ton.

With the record yield of 1928–29 the quantity required for home consumption was 64.3 per cent. of the total production, which left a greater proportion available for export when compared with the previous year. Consequently the average price returned for the whole crop was lower, realizing £20 17s. 11d. per ton, while the net value of the surplus exported amounted to £10 10s. per ton.

5. **Imports and Exports of Sugar.**—Owing to the embargo and the increased production of sugar in Australia, the imports have dwindled to insignificant proportions. Supplies to make up for local deficiencies are usually drawn from Java and Fiji. Particulars concerning the imports and exports of cane sugar for the past five years are as follows :—

CANE SUGAR.—IMPORTS AND EXPORTS, AUSTRALIA, 1923–24 TO 1927–28.

Year.	Oversea Imports.		Oversea Exports.		Net Exports.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Tons.	£	Tons.	£	Tons.	£
1923–24	525	12,200	15,591	443,183	15,066	430,983
1924–25	3,046	65,579	82,747	2,162,309	79,701	2,096,730
1925–26	345	9,425	208,805	5,313,135	208,460	5,303,710
1926–27	3,611	47,844	66,523	1,730,095	62,912	1,682,251
1927–28	20	457	154,654	4,020,095	154,634	4,019,638

6. **Sugar By-products.**—Large quantities of molasses are produced as a by-product in the sugar mills, but, at present, much of it is allowed to run to waste. Details for a series of years of the quantity produced and the proportions used for distilling, fuel, manure and other purposes will be found in Chapter XXII.—" Manufacturing."

Keen interest has recently been aroused in the utilization of the by-products of sugar manufacture. A distillation plant erected at the Plane Creek Central Sugar Mill, Mackay, was opened during 1927 and alcohol of a very fine quality was produced, but operations were suspended pending the arrival from overseas and the installation of additional plant embodying new scientific developments and discoveries in the field of liquid fuel.

Steps are also being taken to launch an industry to undertake the manufacture of a building material known as " megass board " from megass or bagasse, i.e., the residuum of crushed fibre left over from the sugar cane after the removal of the sugar content. The Australian megass board is claimed to possess superior qualities to the " celotex " made from bagasse in America.

7. **Sugar Prices.**—The prices of sugar in Australia from 1915 to 1931 are shown in the table below. During recent years the prices were fixed in accordance with the agreement referred to previously.

AUSTRALIAN SUGAR PRICES, 1915 TO 1931.

Date.	Raw Sugar.	Refined Sugar.	
	Price to Grower and Miller per Ton.	Wholesale Price per Ton.	Retail Price per lb.
	£ s. d.	£ s. d.	d.
19.7.15 to 15.1.16	18 0 0	25 10 0	3
16.1.16 to 30.6.17	18 0 0	29 5 0	3½
1.7.17 to 24.3.20	21 0 0	29 5 0	3½
25.3.20 to 30.6.20	21 0 0	49 0 0	6
1.7.20 to 31.10.22	30 6 8	49 0 0	6
1.11.22 to 30.6.23	30 6 8	42 0 0	5
1.7.23 to 21.10.23	27 0 0	42 0 0	5
22.10.23 to 31.8.25	26 0 0	37 11 4	4½
1.9.25 to 31.8.31	(a)26 10 0	37 6 8	4½

(a) The price of raw sugar for the years 1925 to 1931 is estimated at £26 10s. per ton, but, as the result of the values received for the surpluses exported, the actual price obtained in 1925–26 was £19 10s. 7d.; in 1926–27, £24 10s. 10d.; in 1927–28, £22 0s. 4d.; and in 1928–29, £20 17s. 11d.

§ 15. Vineyards.

1. **Progress of Cultivation.**—(i) *Area of Vineyards.* The date of introduction of the vine into Australia has been variously set down by different investigators, the years 1815 and 1828 being principally favoured. It would seem, however, that plants were brought out with the first fleet in 1788, consequently the Australian vine is as old as Australian settlement. As already mentioned, a report by Governor Hunter gives the area under vines in 1797 as 8 acres. From New South Wales the cultivation spread to Victoria and South Australia, and these States have now far outstripped the mother State in the area under this crop. In Queensland and Western Australia also, vine-growing has been carried on for many years, but little progress has been made. 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. :—(*a*) for wine-making, (*b*) for table use, and (*c*) for drying. The total area under vines in the several States during each of the last five years is given in the following table, while particulars from 1860 onwards may be gathered from the graph accompanying this chapter.

VINEYARDS.—AREA, 1923-24 TO 1927-28.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Australia.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1923–24.. ..	14,559	42,599	1,269	49,303	5,235	There are no vineyards in Tasmania.	112,965
1924–25.. ..	14,737	42,467	1,579	50,280	5,331		114,394
1925–26.. ..	14,465	40,712	1,656	50,594	5,270		112,697
1926–27.. ..	14,281	40,612	1,682	50,271	5,274		112,120
1927–28.. ..	14,880	40,988	1,762	50,663	4,959		113,252

The area under vines in Australia amounted to 65,673 acres in 1904–5. From that year onwards a gradual decline set in, and at the end of 1914–15 the acreage had decreased to 60,985. Since that date, however, as a result of extensive plantings, particularly of the dried grape varieties, the 1904–5 figure was soon exceeded, and the total for 1924–25 was the highest on record. Marketing difficulties have temporarily hindered progress during the past three years.

The wine-growing industry in Australia, especially in Victoria and New South Wales, received a severe check by various outbreaks of phylloxera. With a view to the eradication of this disease extensive uprooting of vineyards in the infested areas was undertaken, while further planting within such areas, except with phylloxera-resistant stocks, was prohibited.

(ii) *Wine Production.* The production of wine has not increased as rapidly as the suitability of soil and climate would appear to warrant. The cause is probably twofold, being due in the first place to the fact that Australians are not a wine-drinking people, and consequently do not provide a local market for the 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 now being taken to bring the Australian wines under notice, while the Commonwealth bounty on the export of fortified wine of specified strength has greatly benefited the industry during the past three years. The rate of bounty was fixed at 4s. per gallon, but from 1st September, 1927, the rate was reduced to 1s. 9d., and from 9th March, 1928, to 1s. per gallon. The date of expiry of the bounty is set down as 31st August, 1930.

Particulars of the quantity of wine produced in the several States during the past five seasons are given in the table hereunder :—

WINE.—PRODUCTION, 1923-24 TO 1927-28.

Season.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Australia.
	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.		Gallons.
1923-24 ..	1,459,778	2,177,127	37,242	10,756,538	233,196	No production of wine in Tasmania.	14,663,881
1924-25 ..	1,171,264	1,368,765	33,119	10,502,381	223,761		13,299,290
1925-26 ..	1,240,893	1,637,274	39,375	13,074,874	238,726		16,231,142
1926-27 ..	1,625,507	2,346,314	32,974	16,159,595	291,951		20,456,341
1927-28 ..	2,295,030	1,739,560	38,571	12,820,733	408,717		17,302,611

(iii) *Relation to Population.* In relation to population the areas of the vineyards of the several States have varied little during the last five years, the Australian total declining slightly during the period, as the result of marketing difficulties already referred to. Details for the seasons 1923-24 to 1927-28 are given in the suceeding table :—

VINEYARDS.—AREA PER 1,000 OF POPULATION, 1923-24 TO 1927-28.

Season.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Australia.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1923-24 ..	7	26	2	94	15	..	20
1924-25 ..	7	26	2	93	15	..	19
1925-26 ..	6	24	2	92	14	..	19
1926-27 ..	6	24	2	89	14	..	18
1927-28 ..	6	24	2	88	13	..	18

2. **Imports and Exports of Wine.**—(i) *Imports.* The principal countries of origin of wine imported into Australia are France, Spain, Portugal, and Italy, the bulk of the sparkling wines coming from France. Particulars relative to the importations of wine into Australia during the past five years are given hereunder :—

WINE.—IMPORTS, AUSTRALIA, 1923-24 TO 1927-28.

Year.	Quantity.			Value.		
	Sparkling.	Other.	Total.	Sparkling.	Other.	Total.
	Gallons.	Gallons.	Gallons.	£	£	£
1923-24 ..	21,770	54,988	76,758	56,069	38,434	94,503
1924-25 ..	28,324	52,999	81,323	72,042	33,743	105,785
1925-26 ..	25,896	61,511	87,407	65,763	37,432	103,195
1926-27 ..	27,720	61,878	89,598	64,134	37,325	101,459
1927-28 ..	20,737	55,403	76,140	45,703	33,997	79,700

(ii) *Exports.* The principal countries to which wine is exported from Australia are the United Kingdom and New Zealand, the bulk of the increased shipments during the past two years being consigned to the former country. Details concerning the exports of wine from Australia during the past five years are given in the following table :—

WINE.—EXPORTS, AUSTRALIA, 1923–24 TO 1927–28.

Year.	Quantity.			Value.		
	Sparkling.	Other.	Total.	Sparkling.	Other.	Total.
	Gallons.	Gallons.	Gallons.	£	£	£
1923–24 ..	3,601	987,703	991,304	7,180	210,132	217,312
1924–25 ..	4,003	877,466	881,469	8,304	180,387	188,691
1925–26 ..	3,564	1,719,045	1,722,609	7,156	364,766	371,922
1926–27 ..	2,956	3,078,841	3,081,797	6,075	827,722	833.797
1927–28 ..	2,744	3,770,035	3,772,779	5,577	1,056,831	1,062,408

3. **Other Viticultural Products.**—(i) *Table Grapes.* In addition to grapes for wine-making purposes, large quantities are grown in all the States for table use, but the greatest development in the industry has taken place in the drying of raisins and currants particularly in Victoria and South Australia. The quantities of table grapes grown in the several States during the past five seasons are as follows :—

TABLE GRAPES.—PRODUCTION, 1923–24 TO 1927–28.

Season.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Australia.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1923–24 ..	3,983	2,726	1,038	1,056	2,662	..	11,465
1924–25 ..	3,590	2,672	961	1,156	2,069	..	10,448
1925–26 ..	3,837	3,616	996	1,063	2,284	..	11,796
1926–27 ..	4,689	4,634	1,410	791	2,195	..	13,719
1927–28 ..	4,250	3,338	1,474	581	2,642	..	12,285

(ii) *Raisins and Currants.* Statistics of the quantities of raisins and currants dried during each of the past five seasons are given in the following table :—

RAISINS AND CURRANTS.—QUANTITIES DRIED, 1923–24 TO 1927–28.

Season.	N.S. Wales.		Victoria.		South Aust.		Western Aust.		Australia.	
	Raisins.	Currants.	Raisins.	Currants.	Raisins.	Currants.	Raisins.	Currants.	Raisins.	Currants.
	cwt.	cwt.	cwt.	cwt.	cwt.	cwt.	cwt.	cwt.	cwt.	cwt.
1923–24 ..	16,967	6,658	438,827	150,867	125,006	131,000	9,606	15,769	590,406	304,294
1924–25 ..	19,180	5,953	366,999	104,948	139,385	109,446	7,940	12,689	533,504	233,036
1925–26 ..	23,168	6,132	351,506	123,733	111,261	103,910	9,631	10,919	495,566	244,694
1926–27 ..	41,064	9,106	657,714	135,464	162,401	87,662	8,861	22,936	870,040	255,168
1927–28 ..	30,833	4,536	402,321	73,101	55,131	50,424	16,206	24,431	504,491	152,492
Average 10 seasons 1918–28	16,419	4,973	315,659	94,805	85,623	86,132	7,918	11,547	425,619	197,457

4. Imports and Exports of Raisins and Currants.—The following table gives the oversea imports and exports of raisins and currants during each of the past five years :—

RAISINS AND CURRANTS.—IMPORTS AND EXPORTS, AUSTRALIA, 1923–24 TO 1927–28.

Year.	Oversea Imports.		Oversea Exports.		Net Exports.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
			RAISINS.			
	lbs.	£	lbs.	£	lbs.	£
1923–24 ..	433,907	8,137	26,399,830	803,365	25,965,923	795,228
1924–25 ..	193,372	8,682	56,046,855	1,392,566	55,853,483	1,383,884
1925–26 ..	103,094	5,224	35,556,767	1,026,339	35,453,673	1,021,115
1926–27 ..	98,317	5,385	44,078,938	1,265,994	43,980,621	1,260,609
1927–28 ..	108,430	4,388	54,288,593	1,398,595	54,180,163	1,394,207
			CURRANTS.			
1923–24 ..	4,267	178	16,458,561	420,380	16,454,294	420,202
1924–25 ..	7,852	231	21,558,804	509,179	21,550,952	508,948
1925–26 ..	15,147	494	18,844,854	402,283	18,829,707	401,789
1926–27 ..	5,202	173	19,210,967	377,895	19,205,765	377,722
1927–28 ..	209	4	8,213,729	177,605	8,213,520	177,601

The quantities of raisins and currants imported into Australia were generally greater than the exports for all years prior to 1912, when the increased production in Australia left a surplus available for export. During the last five years the value of the exports exceeded that of the imports by £7,741,305, the average annual excess for the quinquennium being £1,548,261.

§ 16. Orchards and Fruit Gardens.

1. Progress of Cultivation.—(i) *Area.* The maximum area under orchards and fruit gardens was recorded in 1921–22, when 281,149 acres were planted. Since that year the industry has declined slightly owing to difficulties experienced in disposing of the surplus production. The total area under orchards and fruit gardens in the several States is given in the following table :—

ORCHARDS AND FRUIT GARDENS.—AREA, 1923–24 TO 1927–28.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Fed. Cap. Ter.	Australia.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1923–24 ..	72,372	85,570	29,568	33,472	18,776	34,076	11	273,845
1924–25 ..	73,972	85,358	31,738	33,319	18,520	33,992	5	276,904
1925–26 ..	74,532	82,665	33,520	32,276	18,355	33,891	6	275,245
1926–27 ..	74,682	83,215	35,145	31,570	18,512	33,322	5	276,451
1927–28 ..	76,999	81,397	36,206	30,983	18,393	33,834	14	277,826

(ii) *Varieties and Yield.* The varieties grown differ in various parts of the States, ranging from such fruits as the pineapple, paw-paw, mango, and guava of the tropics to the strawberry, the raspberry, and the currant of the colder parts of the temperate zone. The principal varieties grown in Victoria are the apple, peach, pear, orange, plum, and apricot. In New South Wales citrus fruits (oranges, lemons, etc.) occupy the leading position, although apples, peaches, plums, pears, cherries and bananas are extensively grown. In Queensland, the banana, the pineapple, the apple, the orange, the peach, the plum, and the coconut are the varieties most largely cultivated. In South Australia, in addition to the apple, orange, apricot, plum, peach, and pear, the almond and the olive are extensively grown. In Western Australia, the apple, orange, pear, plum, peach, apricot and fig are the chief varieties. In Tasmania the apple occupies nearly four-fifths of the fruit-growing area, but small fruits, such as the currant, raspberry, and gooseberry are extensively grown, while the balance of the area is taken up with the pear, apricot, plum, and cherry. The following table gives the acreage under the principal kinds of fruit, and the quantity and value of fruit produced. The acreages are exclusive of young trees not yet bearing. Although statistics of area are not collected annually in Victoria, the acreage under each class of fruit is estimated from data based on the triennial collection of the number of trees, subject to annual variations in the total area under orchards and fruit gardens.

ORCHARDS AND FRUIT GARDENS.—VARIETIES, YIELD, AND VALUE, 1927-28.

Fruit.		N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	Fed. Cap. Ter.	Australia.
Apples	.. acres	14,522	32,482	4,158	10,359	10,044	26,670	9	98,244
	bushels	1,254,074	3,712,350	103,893	1,352,264	409,058	4,673,000	650	11,505,289
	£	496,610	742,470	87,119	269,028	322,133	919,520	257	2,837,137
Apricots	.. acres	2,011	5,114	107	3,524	720	1,594	1	13,071
	bushels	149,271	416,277	3,575	189,004	52,247	156,141	..	966,515
	£	51,460	130,295	1,899	67,136	29,661	33,410	..	313,861
Bananas	.. acres	1,992	..	17,967	..	12	..	..	19,971
	bushels	112,054	..	2,147,560	..	681	..	..	2,260,295
	£	74,700	..	1,200,810	..	1,022	..	..	1,276,532
Cherries	.. acres	3,521	1,532	4	728	..	56	..	5,841
	bushels	70,807	47,795	74	48,792	..	2,240	2	169,710
	£	90,670	47,795	106	32,935	..	1,510	3	173,019
Lemons	.. acres	2,862	2,047	216	478	538	..	..	6,141
	bushels	345,369	112,570	18,946	35,596	59,207	..	..	571,688
	£	127,570	53,471	10,183	20,468	38,978	..	..	250,670
Nectarines and Peaches	acres	8,434	12,095	1,784	2,750	1,030	62	1	26,156
	bshls.	586,467	1,373,843	83,948	195,485	65,081	4,000	2	2,308,826
	£	325,270	446,221	55,825	58,688	46,317	840	1	933,162
Nuts	.. acres	530	543	1	1,558	..	..	..	2,632
	lbs.	149,505	123,233	100	708,848	..	..	..	981,686
	£	7,182	5,146	4	31,680	..	..	..	44,012
Oranges	.. acres	30,180	6,090	3,874	4,905	3,121	..	..	48,170
	bushels	2,235,268	276,407	243,037	377,433	218,940	..	..	3,351,085
	£	905,630	165,844	170,126	240,694	174,704	..	..	1,656,998
Pineapples	.. acres	91	..	4,204	..	..	..	..	4,295
	dozen	8,739	..	548,487	..	..	..	..	557,226
	£	4,370	..	197,646	..	..	..	..	202,016
Pears	.. acres	4,553	11,289	254	2,293	1,135	2,146	1	21,671
	bushels	261,667	1,058,481	9,877	213,688	86,885	174,000	6	1,804,604
	£	106,580	238,158	7,902	48,715	46,792	50,720	2	498,869
Plums	.. acres	6,682	5,281	1,289	3,099	941	612	2	17,906
	bushels	237,471	311,209	37,900	183,605	51,022	73,888	10	895,105
	£	100,000	63,302	30,004	44,264	37,576	14,260	3	289,409
Small fruits	.. acres	29	1,161	114	219	56	2,640	..	4,219
	cwt.	1,193	19,321	1,249	4,882	501	93,844	..	120,990
	£	4,893	55,224	7,959	9,654	2,937	138,540	..	219,207
Other fruits	.. acres	1,592	3,763	2,234	1,070	796	54	..	9,509
	£	86,505	124,617	88,332	19,213	21,144	2,520	..	342,331
Total acres	..	76,999	81,397	36,206	30,983	18,393	33,834	14	277,826
	£	2,381,440	2,072,543	1,857,915	842,475	721,264	1,161,320	266	9,037,223

(iii) *Relation to Population.* The acreage of the orchards and fruit gardens of Australia in relation to population declined during the past five years. The Australian

figure for 1927–28 amounted to 0.045 acres per head, whilst the range amongst the States varied from 0.032 in New South Wales to 0.157 acres in Tasmania. Details for orchards and fruit gardens for the years 1923–24 to 1927–28 are as follows :—

ORCHARDS AND FRUIT GARDENS.—AREA PER 1,000 OF POPULATION, 1923–24 TO 1927–28.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	N. Ter.	Fed. Cap. Ter.	Australia.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1923–24 ..	33	53	37	64	53	156	..	4	48
1924–25 ..	33	52	38	62	51	156	..	2	47
1925–26 ..	32	49	39	59	49	156	..	2	46
1926–27 ..	32	49	40	56	49	155	..	1	45
1927–28 ..	32	47	40	54	47	157	..	2	45

2. **Imports and Exports of Fruit.**—(i) *General.* A considerable export trade in both fresh and dried fruits is carried on by Australia with oversea countries. The import trade in fresh fruits declined heavily during the past five years, owing to the imposition of a Customs duty of 1d. per lb. on imported bananas, which had hitherto been the chief item of fresh fruit imported into Australia. The imports of dried fruits at present consist mainly of dates from Iraq. The export trade in fresh and dried fruits, however, has greatly expanded during the past quinquennium, the value of the shipments during 1927–28 amounting to £3,421,358. Apples constitute the bulk of the fresh fruit exported, although the exports of citrus fruits and pears are fairly considerable, and experiments are being conducted in regard to the dispatch of other fruits. Shipments of raisins and currants have developed into large proportions since 1914–15, and are mainly responsible for the increase in the dried fruits exports. Other fruits in the dried state, notably apricots, are also receiving attention from overseas.

(ii) *Fresh Fruits.* Information with regard to the Australian oversea trade in fresh fruits is given hereunder :—

FRESH FRUITS.—IMPORTS AND EXPORTS, AUSTRALIA, 1923–24 TO 1927–28.

Year.	Oversea Imports.		Oversea Exports.		Net Exports.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	lbs.	£	lbs.	£	lbs.	£
1923–24 ..	3,473,300	47,343	78,927,000	870,260	75,453,700	822,917
1924–25 ..	3,228,200	32,009	101,348,900	1,089,544	98,120,700	1,057,535
1925–26 ..	3,228,900	35,154	149,673,100	1,553,651	146,444,200	1,518,497
1926–27 ..	5,086,900	56,932	75,776,600	805,573	70,689,700	748,641
1927–28	4,772,200	71,606	186,625,800	1,819,526	181,853,600	1,747,920

The value of the exports of apples in 1927–28 amounted to £1,636,000, and of citrus fruits to £47,754, viz., lemons, £4,594, and oranges, £43,160.

(iii) *Dried Fruits.* Particulars of oversea imports and exports of dried fruits for the last five years are as follows :—

DRIED FRUITS(a).—IMPORTS AND EXPORTS, AUSTRALIA, 1923–24 TO 1927–28.

Year.	Oversea Imports.		Oversea Exports.		Net Exports.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	lbs.	£	lbs.	£	lbs.	£
1923–24 ..	11,091,289	167,366	43,581,329	1,243,272	32,490,040	1,075,906
1924–25 ..	9,429,764	136,185	78,952,737	1,939,829	69,522,973	1,803,644
1925–26 ..	11,787,309	141,922	55,428,846	1,463,417	43,641,537	1,321,495
1926–27 ..	11,318,200	173,962	63,503,400	1,649,153	52,185.200	1,475,191
1927–28 ..	12,092,100	182,617	63,292,700	1,601,832	51,200,600	1,419,215

(a) Including raisins and currants referred to under Vineyards, § 15, 4.

(iv) *Jams and Jellies.* Jams and jellies were exported in large quantities during the war years, and in 1918–19 the record shipment of 79,277,560 lbs., valued at £1,847,970, was dispatched from Australia. Since that year, however, the trade has been lost, the value of the exports in 1927–28 amounting to only £68,949. Particulars relative to imports and exports during each of the last five years are as follows :—

JAMS AND JELLIES.—IMPORTS AND EXPORTS, AUSTRALIA, 1923–24 TO 1927–28.

Year.	Oversea Imports.		Oversea Exports.		Net Exports.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	lbs.	£	lbs.	£	lbs.	£
1923–24 ..	138,219	7,597	2,680,047	85,062	2,541,828	77,465
1924–25 ..	226.253	10,810	2,470,431	74,464	2,244,178	63,654
1925–26 ..	190,302	8,813	2,665,243	82,447	2,474,941	73,634
1926–27 ..	357,838	15,004	2,422,988	72,354	2,065,150	57,350
1927–28 ..	438,427	18,408	2,296,941	68,949	1,858,514	50,541

(v) *Preserved Fruit.* Details concerning the quantities and values of preserved fruit imported into Australia 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 preserved or partly preserved in liquid, or pulped, imported into Australia during 1927–28 was £226,053. Particulars in respect of exports are available, and the following shipments were sent overseas in 1927–28 :—Apricots, 3,479,707 lbs., £65,854 ; peaches, 13,930,344 lbs., £271,989 ; pears, 3,622,486 lbs., £86,368 ; pineapples, 38,059 lbs., £697 ; and other, 824,125 lbs., £21,126, or a total shipment of £446,034.

§ 17. Minor Crops.

1. **General.**—In addition to the crops previously dealt with, 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 included under the headings—Market Gardens,

Pumpkins and Melons, Nurseries, Grass Seed, Tobacco, and Millet. Cotton-growing has recently received considerable attention in the tropical portions of Australia, and the prospects of establishing this industry are hopeful. The decline in area under cultivation from 82,409 acres in 1924–25 to 28,885 acres in 1927–28 was due to poor seasons and difficulty in marketing the product. The total area in Australia during the season 1927–28 devoted to crops not dealt with in previous sections was 124,757 acres, the major portion of which consisted of cotton and market gardens.

2. **Market Gardens.**—Under this head are included all areas on which mixed vegetables are grown. Where considerable areas are devoted to the production of one vegetable, such for instance as the potato, the onion, the melon, the tomato, etc., the figures are usually not included with market gardens, but are shown either under some specific head, or under some general head as "Other Root Crops," or "All Other Crops." The area under market gardens during each of the last five seasons is given hereunder :—

MARKET GARDENS.—AREA, 1923–24 TO 1927–28.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	N. Ter.	Fed. Cap. Ter.	Aus-tralia.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1923–24 ..	8,526	16,212	1,719	1,448	2,259	478	..	17	30,659
1924–25 ..	8,824	14,620	1,619	1,577	2,913	576	..	13	30,142
1925–26 ..	8,973	16,609	1,017	1,517	2,725	587	..	12	31,440
1926–27 ..	8,184	17,751	1,096	1,320	2,872	599	..	46	31,868
1927–28 ..	7,729	18,984	1,083	1,303	2,647	732	..	32	32,510

3. **Grass Seed.**—The total area under this crop during 1927–28, exclusive of New South Wales, for which State complete figures as to area are not available, was 4,888 acres, of which 788 acres were in Victoria, 496 acres in Tasmania, 2,974 acres in Queensland, and 630 acres in South Australia. The total yield for 1927–28, including New South Wales, was 61,875 bushels, valued at £66,845. In addition to the areas planted above, 1,962 acres were sown to canary seed in Queensland during 1927–28, and furnished a yield of 11,109 bushels, valued at £11,109.

4. **Tobacco.**—Tobacco-growing has undergone marked fluctuations, although at one time it promised to occupy an important place amongst the agricultural industries of Australia. Thus, as early as the season 1888–89, the area under this crop amounted to as much as 6,641 acres, of which 4,833 were in New South Wales, 1,685 in Victoria, and 123 in Queensland. This promise of importance was, however, not fulfilled, and after numerous fluctuations, in the course of which the Victorian area rose in 1895 to over 2,000 acres, and that in Queensland to over 1,000 acres, the total area for the season 1920–21 had declined to 1,345 acres. Since that date the area has again fluctuated, but with an upward tendency, and in 1927–28, 2,133 acres were planted, of which 803 were in New South Wales, 1,176 in Victoria, 135 in Queensland, 17 in South Australia, and 2 in Western Australia. Greater attention is now being paid to the proper treatment of the leaf, and flue-curing is becoming more general. 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 Australia furnish an indication of the extensive local market which exists for an article grown and prepared to meet the requirements of consumers. The value of the net importations of tobacco into Australia during the year 1927–28 amounted to £2,477,251, comprising unmanufactured tobacco £2,167,444, cigars £135,336, cigarettes £450,001, and snuff £1,029, while manufactured tobacco revealed a balance in favour of exports amounting to £276,559. Important proposals for the development of the tobacco-growing industry in Australia have recently been formulated. The British-Australasian Tobacco Co. and the Commonwealth Government have entered into an agreement whereby the sum of £90,000 is to be spent to carry out exhaustive

tests to determine the capabilities of Australia to produce enough tobacco for her own requirements. The terms of the agreement are that over a first period of three years the company shall contribute a sum of £20,000 for investigation and field-testing, and that the Commonwealth and State Governments shall provide £10,000. If at the expiration of this period the work has progressed satisfactorily enough to warrant further expenditure, the company will contribute an additional £30,000, and the Governments £30,000 for expenditure over a further period. A sum of £90,000 will thus be made available as necessary, and of this sum the company is finding £50,000. The company has also consented to buy for the three seasons, 1927, 1928 and 1929, tobacco crops properly graded of lemon-coloured tobacco at 2s. 6d. a pound, bright mahogany at 2s. a pound, and dark mahogany at 1s. 6d. a pound, and has offered a bonus of 6d. per lb. for the purpose of stimulating the production of the first two varieties. An executive committee has been formed, and the Federal Director is now engaged in carrying out the investigations.

5. **Pumpkins and Melons.**—The total area under this crop in Australia during 1927–28 was 21,739 acres, of which 3,796 acres were in New South Wales, 1,401 acres in Victoria, 15,760 acres in Queensland, 451 acres in Western Australia, and 331 acres in South Australia. The production in all the States amounted to 77,909 tons.

6. **Hops.**—Hop-growing in Australia is practically confined to Tasmania and some of the cooler districts of Victoria, the total area for the season 1927–28 being 1,598 acres, of which 1,303 acres were in Tasmania, 294 acres in Victoria, and 1 acre in South Australia. The Tasmanian area, though still small, has increased considerably during the past twenty years, the total for the season 1901–2 being only 599 acres. In Victoria the area, which in 1901–2 was 307 acres, dwindled to 71 acres in 1918–19, then rose to 312 acres in 1925–26 and dropped to 294 in 1927–28. The cultivation of hops was much more extensive in Victoria some 40 years ago than at present, the area in 1883–84 being no less than 1,758 acres. During the year 1927–28 the exports of hops exceeded the imports by 485,938 lbs., the excess value being £15,940.

7. **Flax.**—For over twenty years flax has been grown intermittently in the Gippsland district of Victoria, and attempts have been made to introduce its cultivation into Tasmania and New South Wales, but without success. About the end of the year 1917 the shortage of flax fibre in the world had become acute, and endeavours were made by the Commonwealth Government to encourage the cultivation of flax. The acreage in Victoria increased from 419 acres in 1917–18 to 1,611 acres in 1919–20, but the area had declined in 1927–28 to 136 acres. Flax products to the value of more than £1,500,000 are annually imported into Australia, and, as it has been demonstrated that flax can be grown to perfection here, good prospects exist for the ultimate establishment of a local industry.

8. **Millet.**—Millet figures in the statistical records of three of the States. The total area devoted thereto in 1927–28 was 7,422 acres, of which 4,047 acres were in New South Wales, 2,059 in Victoria, 1,306 in Queensland, and 10 in the Northern Territory. The particulars here given relate to millet grown for grain and fibre, the quantity for green forage being dealt with in the section relating thereto.

9. **Nurseries.**—In all the States fairly large areas are occupied as nurseries for raising plants, trees, etc. Statistics of the area under flowers, fruit trees, etc., are available for New South Wales, Victoria, South Australia, and Western Australia. During 1927–28 the areas in those States were 671, 906, 120, and 125 acres respectively.

10. *Cotton.*—The cultivation of cotton was begun in Queensland in 1860, and ten years later the area cropped had increased from fourteen to upwards of fourteen thousand acres. The re-appearance of American cotton in the European market on the conclusion of the Civil War gave a severe setback to the new industry, and the area declined continuously till 1888, when only 37 acres were planted. The industry was resuscitated soon after, and manufacturing was undertaken on two separate occasions at Ipswich, but operations were at no time very extensive, and low prices over a term of years checked development. Added interest was shown in the crop in 1903, and in 1913 the Queensland Government made an advance of 1½d. per lb. on seed cotton, and ginned it on owner's account, the final return being equal to about 1⅝d. per lb.

Rising prices for the staple enabled the Government to offer the substantial guarantee of 5½d. per lb. for seed cotton of good quality for the three years ended 31st July, 1923, and as the result considerable activity was displayed in the industry, the area picked rising from 166 acres in 1920 to 50,186 in 1924. Government guarantees were continued until 1926, when the Commonwealth Government granted a bounty of 1½d. per lb. on the better grades and ¾d. on the lower grades of seed cotton grown in Australia. In addition to this direct assistance to the cotton-growing industry, the Government subsidized the cotton-manufacturing industry by granting a graduated bounty varying from ½d. to 1s. per lb. on all cotton yarn manufactured in Australia which contained 50 per cent. of home-grown cotton. The object of this policy is to foster and establish the primary and secondary industries concurrently, thus creating a home market for the raw cotton produced.

The area under cultivation and the yield in Queensland since the year 1919 are shown hereunder :—

COTTON.—AREA AND YIELD, QUEENSLAND, 1919 TO 1929.

Year.	Area.(*a*)	Yield of Unginned Cotton.
	Acres.	lbs.
1919	72	27,470
1920	166	57,065
1921	1,944	940,126
1922	8,716	3,956,635
1923	40,821	12,543,770
1924	50,186	16,416,170
1925	40,062	19,537,274
1926	18,743	9,059,907
1927	14,975	7,060,756
1928	23,500	12,218,036
1929 (*b*)	25,000	8,000,000

(*a*) Area harvested. (*b*) Estimated.

Consequent upon the lapse of the Government guarantees and the change over to the bounty system, a cotton pool was formed in Queensland under the Primary Products Pools Act and a cotton board was elected to control the handling, financing, and marketing of all cotton grown in the State. The whole of the output in 1927 was sold to Australian spinners on the basis of import parity prices, the net return to growers, including the bounty, being 5d. per lb. for top grade seed cotton. The bulk of this crop was left in the hands of the spinners and a market for the 1928 output was therefore sought overseas. Of the quantity exported, 97 per cent. was shipped to the United Kingdom, and the prices realized, coupled with the Commonwealth bounty, yielded a return sufficiently high to make cultivation profitable on land yielding a fair crop.

11. **Coffee.**—Queensland is the only State in which coffee-growing has been extensively tried, but the results have not been satisfactory. The area under crop reached its highest point in the season 1901–2 with 547 acres. In subsequent seasons the area fluctuated somewhat, but on the whole with a downward tendency, and in 1927–28 only 24 acres were recorded with a yield of 6,578 lbs.

12. **Other Crops.**—Amongst miscellaneous small crops grown in the several States may be mentioned tomatoes, rhubarb, artichokes, arrowroot, chicory, and flowers.

§ 18. Bounties.

1. **General.**—The Bounties Acts and Amendments passed by the Federal Parliament with the object of encouraging the manufacture and production of certain articles in Australia, include among the items on which bonuses were payable since 1923–24 the following agricultural products :—Cotton, wine, and canned fruits. In the table hereunder are shown the amounts which have been paid in respect of all bounties in operation during the years 1924–25 to 1928–29 :—

BOUNTIES.—AMOUNTS PAID, 1924–25 TO 1928–29.

Articles on which Bounty was Paid.	Rate of Bounty Payable.	Date of Expiry of Bounty.	Amount Paid.				
			1924–25.	1925–26.	1926–27.	1927–28.	1928–29.
			£	£	£	£	£
Shale Oil Bounties Act—							
Crude Shale Oil, as prescribed, produced in Australia from Mined Kerosene Shale ..	3½d. per gal., up to 3,500,000 gals. 2d. per gal., 3,500,000 to 5,000,000 gals. 1½d. per gal., 5,000,000 to 8,000,000 gals. 1½d. each additional gal.	31st Aug., 1929	335	..	705	428	..
Iron and Steel Products Bounty Act—							
Fencing Wire, Galvanized Sheets .. Wire Netting, Traction Engines .. Manufactured from Materials produced and manufactured in Australia	£2 12s. per ton	..	71,948	97,387	98,389	104,485	121,839
	£2 12s. „ (a)	..	44,545	49,221	67,915	65,128	102,650
	£3 8s. „ .. According to capacity, £40—£90 per tractor ..	..	90,340	95,127	90,299	73,873	73,945
		..	500	270	250	140	7,109
Sulphur Bounty Act—							
Sulphur from Australian Pyrites and other Sulphide Ores or Concentrates ..	£2 5s. per ton ..	..	47,140	38,549	34,339	57,377	52,009
Meat Export Bounties Act—							
Standard and Canned Beef slaughtered and exported within prescribed dates	Standard beef, ½d. per lb. .. Canned beef, ½d. per lb.	..	1,039	..	..	..	..
Export of Live Cattle for slaughter during prescribed period	Live cattle, 10s. per head ..	..	3,991	919	..	..	..
Wine Export Bounty Act—							
Fortified Wine, containing not less than 34 per centum of proof spirit, exported from the Commonwealth from 1st September, 1924, to 31st August, 1930	4s. per gallon to 31st August, 1927 1s. 9d. per gallon from 1st September, 1927, to 8th March, 1928 1s. per gallon from 9th March, 1928	..	28,417	217,109	442,410	482,843	76,455

(a) Amount of bounty raised to £3 12s. per ton from 1st January, 1928.

BOUNTIES.—AMOUNTS PAID, 1924-25 TO 1928-29—*continued.*

Articles on which Bounty was Paid.	Rate of Bounty Payable.	Date of Expiry of Bounty.	Amount Paid.				
			1924-25.	1925-26.	1926-27.	1927-28.	1928-29.
			£	£	£	£	£
Canned Fruit Bounty Act—							
Apricots, Peaches, Pears, and Pineapples canned within prescribed dates ..	9d. to 1s. per dozen tins each containing 30 ozs. net ..	..	64,752	10,963	..	4,731	..
Such canned fruit exported from the Commonwealth during prescribed period ..	1s. to 1s. 9d. per dozen tins, each containing 30 ozs. net. ..	..					
Cotton Bounty Act—							
Seed Cotton grown in Australia and delivered and graded as prescribed ..	1½d. per lb. higher grades ½d. per lb. lower grades	15th Aug., 1931	..	..	7,038	81,454	64,930
Cotton Yarn manufactured in Australia	½d. to 12d. per lb. according to count	..	..	..	30,002	24,846	33,638
Papua and New Guinea Bounties Act—							
Cocoa and coffee beans (*a*) produced in these Territories imported into the Commonwealth for home consumption	1½ per lb. ..	31st Dec., 1936	..	..	..	194	1,641
Total	.. ..	..	353,007	509,545	771,347	895,499	534,216

(*a*) Other goods are scheduled in this Act, but no importations of them were made.

§ 19. Fertilizers.

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

2. **Fertilizers 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 fertilizers. A list of these Acts and their main features will be found in Year Book No. 12 (page 378).

3. **Imports.**—The local production of artificial manures has greatly increased in recent years, and the home requirements of prepared fertilizers can now be supplied by Australian manufacturers. Imports of fertilizers are also expanding, but the bulk of the inward shipments consists of rock phosphates, which form the raw material for the home manufactured superphosphate, a fertilizer which has proved eminently suitable for the growing of cereals in Australian soils. During 1927-28 the value of rock phosphates imported represented more than 82 per cent. of the total importation of fertilizers. Nauru and Gilbert and Ellice Islands Colony in equal proportions supplied practically the whole of the shipments. Sodium nitrate is wholly obtained from Chile.

The imports of artificial manures during the last five years are given in the following table. Although considerable quantities of manufactured superphosphates were annually imported up till 1914–15, the importations of this fertilizer have now practically ceased.

FERTILIZERS.—IMPORTS, AUSTRALIA, 1923–24 TO 1927–28.

Fertilizer.		1923–24.	1924–25.	1925–26.	1926–27.	1927–28.
Bonedust	cwt.	542	..	..	100	(a)
"	£	164	..	..	58	(a)
Guano	cwt.	821,938	893,478	1,829	20,826	500
"	£	90,415	98,515	1,061	1,238	242
Superphosphates	cwt.	1,270	1,200	1,035	1,201	1,400
"	£	806	785	517	573	937
Rock phosphates	cwt.	4,697,574	5,751,583	6,463,733	10,171,652	9,220,120
" "	£	678,446	739,588	799,273	1,109,414	915,840
Soda nitrate	cwt.	74,990	182,846	187,284	100,567	175,074
" "	£	45,358	104,729	105,384	60,951	91,885
Other	cwt.	138,897	186,209	172,993	187,773	237,354
"	£	74,403	79,616	80,900	87,281	103,634
Total	cwt.	5,735,211	7,015,316	6,826,874	10,482,119	9,634,448
	£	889,592	1,023,233	987,135	1,259,515	1,112,538

(a) Now included with Other Fertilizers.

4. Exports.—The subjoined table shows the exports of artificial manures for the years 1923–24 to 1927–28. Practically the whole of these fertilizers are manufactured locally, and are shipped mainly to New Zealand, Japan, Java, and the Pacific Islands :—

FERTILIZERS.—EXPORTS, AUSTRALIA, 1923–24 TO 1927–28.

Fertilizer.		1923–24.	1924–25.	1925–26.	1926–27.	1927–28.
Bonedust	cwt.	49,966	13,942	10,012	2,668	74
"	£	22,327	6,079	3,664	1,220	46
Superphosphates	cwt.	22	57	149	21	33
"	£	7	18	49	18	14
Rock phosphates	cwt.	20	..	62	200	..
" "	£	10	..	24	58	..
Soda nitrate	cwt.	405	2,529	1,445	398	7
" "	£	315	1,851	1,241	311	7
Ammonia sulphate	cwt.	93,157	111,594	141,866	99,928	71,911
" "	£	69,491	73,665	88,745	61,478	42,229
Other	cwt.	31,431	45,098	124,263	39,718	29,464
"	£	11,824	13,916	47,011	16,237	12,861
Total	cwt.	175,001	173,220	277,797	142,933	101,489
	£	103,974	95,529	140,734	79,322	55,157

5. Statistics of Use of Fertilizers.—Statistics regarding the use of manures are collected in all the States, and the particulars for 1927–28 are as follows :—

FERTILIZERS USED IN EACH STATE, 1927–28.

State or Territory.	Total Area of Crops.	Area Manured.		Manure Used.	
		Aggregate.	Percentage on Total Area of Crops.	Natural (Stable Yard, etc.).	Artificial.
	Acres.	Acres.	%	Loads.	Tons.
New South Wales ..	4,998,272	3,408,412	68.19	168,912	112,017
Victoria	4,942,258	a5,148,144	b97.17	140,410	a240,715
Queensland	1,066,612	84,118	7.89	63,660	21,855
South Australia ..	4,192,167	3,825,245	91.25	64,365	157,183
Western Australia ..	3,720,100	a3,885,648	c98.64	63,530	a169,552
Tasmania	296,875	255,154	85.95	15,350	24,427
Northern Territory ..	570	..	..	..	..
Fed. Cap. Territory ..	2,539	1,105	43.52	14	33
Total	19,219,393	16,607,826	86.41	516,241	725,782

(a) Includes area under sown grasses and manure used. (b) 1926 figure. (c) 1923 figure.

Similar particulars in respect of Australia as a whole during the past five years are as shown below :—

FERTILIZERS USED IN AUSTRALIA, 1923–24 TO 1927–28.

Year.	Total Area of Crops.	Area Manured.		Manure Used.	
		Aggregate.	Percentage on Total Area of Crops.	Natural (Stable Yard, etc.).	Artificial.
	Acres.	Acres.	%	Loads.	Tons.
1923–24	16,531,186	12,084,583	73.10	590,900	488,601
1924–25	17,278,191	13,031,329	75.14	534,702	529,027
1925–26	16,793,578	13,387,111	78.98	625,099	576,786
1926–27	17,772,499	14,770,498	83.11	562,055	642,511
1927–28	19,219,393	16,607,826	86.41	516,241	725,782

The percentage of the area manured on the total area cultivated has advanced from 73.10 to 86.41 during the past five years, while the use of artificial manures has increased by more than 237,181 tons during the same period.

6. Local Production of Fertilizers.—Statistics relative to the local production of fertilizers are incomplete, and detailed returns for fertilizer factories other than bone mills are not available. The number of firms engaged in the manufacture of artificial manures in Australia at latest available date was 104, made up as follows :—New South Wales, 20 ; Victoria, 30 ; Queensland, 24 ; South Australia, 11 ; Western Australia, 11 ; and Tasmania, 8. The production of superphosphates in Australia during 1927–28 amounted to 871,396 tons, the largest producing States being Victoria and Western Australia.

§ 20. Ensilage.

1. Government Assistance in Production.—The Government of Victoria, recognizing that defective methods of making ensilage were often adopted, has for some years been making special efforts to educate the farming community by lectures, the issue of bulletins, etc. The Government also undertakes the erection of different types of silos on very liberal terms, repayment extending over a series of years. Experts erect the silos and give practical lessons in regard to cutting and packing the silage. The New South Wales Government also gives advice in the " Agricultural Gazette," and issues special bulletins dealing with the subject, while silos have been erected at the various experimental farms.

2. **Quantity Made.**—Particulars concerning the number of holdings on which ensilage was made, and the quantity made during the seasons 1923–24 to 1927–28, are given in the following table:—

ENSILAGE MADE, 1923–24 TO 1927–28.

State or Territory.	1923–24.		1924–25.		1925–26.		1926–27.		1927–28.	
	Holdings.	Ensilage Made.	Holdings.	Ensilage Made.	Holdings.	Ensilage Made.	Holdings.	Ensilage Made.	Holdings.	Ensilage Made.
	(a) No.	Tons.	(a) No.	Tons.	(a) No.	Tons.	(a) No.	Tons.	(a) No.	Tons.
New South Wales ..	152	19,292	269	35,145	241	30,457	407	48,718	473	50,464
Victoria	61	3,649	106	6,667	113	6,092	94	6,132	75	6,037
Queensland	71	4,833	104	8,195	67	4,654	50	4,728	76	5,420
South Australia ..	24	2,838	20	2,067	28	2,857	23	2,405	17	2,415
Western Australia ..	20	1,596	29	2,287	43	3,325	72	5,642	72	5,147
Tasmania	9	372	10	301	3	170	8	488	12	526
Northern Territory ..	..	..	1	5	1	5	..	..	..	..
Total ..	337	32,580	539	54,667	496	47,560	654	68,113	725	70,009

(a) No. of holdings on which ensilage was made.

Following the drought of 1902–3 greater attention was paid to the making of ensilage, and during the four seasons ended 1909–10 there was an increase both in the number of holdings on which ensilage was made and in the quantity produced. The following five seasons, however, showed a falling off, but the reduction was due to the fact that stocks had not been drawn upon to any great extent during the previous seasons. The accumulated stocks proved of great value during the 1914 drought, though far below what would have been the case if more attention had been paid to production during the previous years when there was a surplus of green forage. The quantities made since that date have fluctuated considerably, with the output in 1927–28, viz., 70,009 tons, the highest for the period.

§ 21. Agricultural Colleges and Experimental Farms.

1. **General.**—In most of the States agricultural colleges and experimental farms have been established with a view to the promotion of more scientific methods in agriculture, stock-breeding and dairying. In the 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 fertilizers are made, manures are tested, and elementary veterinary science, etc., are taught, while general experimental work is carried on with cereal and other crops, not merely for the purpose of showing that it is practicable to produce certain crops in a given place, but also to show how it is possible to make farming pay in the 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 carpentering, blacksmithing, and other trades.

Travelling expert lecturers visit the various agricultural and dairying centres, and there is a wide distribution of periodical agricultural gazettes and bulletins.

2. **Particulars of Agricultural Colleges and Experimental Farms.**—In previous issues of this volume detailed information was given regarding agricultural colleges, experimental farms, and agricultural education generally. See Year Book No. 11, pp. 393–5.

3. **Particulars respecting Agricultural and Stock Departments.**—A synopsis of the activities and operations of the Agricultural and Stock Departments of the several States on 30th June, 1920, will be found in Year Book No. 14, pages 1180 to 1191. The main features of organization are set out under their respective headings as regards staff, expenditure, work undertaken in agricultural colleges, technical schools, experimental farms and orchards and vineyards. The subject of lectures and other forms of agricultural instruction by experts is dealt with, as well as such matters as the distribution of plants, and the special steps taken to disseminate information amongst agriculturists, and to facilitate the marketing of products.