

CHAPTER XVII.

AGRICULTURAL PRODUCTION.

NOTE.—Except where otherwise stated, the “agricultural” years hereinafter mentioned are taken as ending on the 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 despatch 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 despatch of 12th February, 1790, Phillip refers to the harvest at Rosehill at the end of December, 1789, as consisting of 200 bushels of wheat and 60 of barley, in addition to small quantities of oats, Indian corn, and flax. By the year 1791 there were 213 acres under crop in this locality. In 1792 a new settlement was formed at Toongabbie, about 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. The area under permanent artificially-sown grasses is excluded in all the States, except for the years 1860 to 1879 in the case of New South Wales, where the acreage cannot be separated. During those years, however, the area laid down under permanent grasses could not have been very large.

AREA UNDER CROP, 1860 TO 1922-23.

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	260,798	387,282	3,353	359,284	24,705	152,860	..	..	1,188,282
1870-1	426,976	692,840	52,210	801,571	54,527	157,410	..	..	2,185,534
1880-1	629,180	1,548,809	113,978	2,087,237	57,707	140,788	..	..	4,577,699
1890-1	852,704	2,031,955	224,993	2,093,515	69,678	157,376	..	..	5,430,221
1900-1	2,445,564	3,114,132	457,397	2,369,680	201,338	224,352	..	..	8,812,463
1910-11	3,386,017	3,952,070	667,113	2,746,334	855,024	286,920	960	..	11,893,338
1918-19	3,891,823	3,942,899	525,517	3,111,079	1,605,088	254,109	99	1,779	13,332,393
1919-20	3,771,463	4,000,815	563,762	3,058,770	1,628,163	270,955	365	2,109	13,296,407
1920-21	4,465,143	4,469,503	779,497	3,231,083	1,804,987	297,383	296	1,966	15,069,858
1921-22	4,445,828	4,530,312	804,507	3,378,764	1,901,680	293,708	283	1,942	15,357,024
1922-23	4,694,287	4,862,548	835,060	3,575,452	2,274,998	298,611	427	2,172	16,543,555

The progress of agriculture was uninterrupted from 1860 onwards, reaching its maximum in 1915-16, when 18,528,234 acres were cultivated. 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. In 1920-21 the area under wheat again began to expand, and during the last three seasons the total acreage under cultivation increased by more than 3,000,000 acres. This marked advance was mainly due to the expansion of the area under wheat, which still continues to be the most extensively-grown crop in Australia, the area thereunder for both grain and hay during 1922-23 amounting to nearly 70 per cent. of the total acreage under cultivation. The rapid extension of the wheat area since 1919-20, despite adverse climatic and market conditions in 1922, is a happy augury for the continuance of agricultural development in Australia. The maximum area cultivated in 1915-16 was the result of a special war effort, and the results obtained far exceeded those for any previous year.

(ii) *Relation to Population.* The decline in total area under cultivation per head of population reached its lowest point in 1919-20, but since that year the total has increased at a much faster rate than the population. Details for the past five seasons are as follows :—

AREA UNDER CROP PER 1,000 OF POPULATION, 1918-19 TO 1922-23.

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.
1918-19 ..	1,984	2,743	745	6,797	5,181	1,232	21	797	2,624
1919-20 ..	1,850	2,661	764	6,351	4,973	1,291	80	1,099	2,507
1920-21 ..	2,135	2,938	1,036	6,578	5,456	1,397	74	997	2,784
1921-22 ..	2,089	2,921	1,045	6,723	5,674	1,345	76	941	2,787
1922-23 ..	2,160	3,058	1,059	6,968	6,621	1,364	120	849	2,937

(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 1922-23 represented only about 1 acre in every 115. In Victoria the proportion was about 1 acre in every 12, in New South Wales 1 in 42, in Tasmania 1 in 56, in South Australia 1 in 68, in Western Australia 1 in 275, in Queensland 1 in 513, in the Federal Territory 1 in 277, and in the Northern Territory about 1 in 784,817.

PERCENTAGE OF AREA UNDER CROP ON TOTAL AREA, 1918-19 TO 1922-23.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Nor. Ter.	Fed. Cap. Ter.	Australia.
	%	%	%	%	%	%	%	%	%
1918-19 ..	1.965	7.010	0.122	1.279	0.257	1.515	..	0.296	0.700
1919-20 ..	1.904	7.113	0.131	1.257	0.261	1.615	..	0.351	0.698
1920-21 ..	2.255	7.982	0.182	1.328	0.239	1.772	..	0.327	0.792
1921-22 ..	2.245	8.054	0.187	1.389	0.304	1.751	..	0.323	0.807
1922-23 ..	2.370	8.645	0.195	1.470	0.364	1.780	..	0.361	0.869

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 with "area under crops." Statistics regarding the areas under such grasses are as shown hereunder :—

AREA UNDER SOWN GRASSES, 1918-19 TO 1922-23.

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.
1918-19	1,438,382	1,269,493	418,467	21,987	14,158	666,954	600	83	3,830,124
1919-20	1,542,446	1,062,244	449,019	18,107	16,672	667,390	500	871	3,757,249
1920-21	1,816,104	1,051,290	450,780	14,805	17,265	660,000	500	71	4,010,815
1921-22	2,005,444	1,032,104	459,914	20,890	18,441	781,000	550	71	4,318,414
1922-23	1,925,432	957,454	475,226	22,278	25,377	857,581	510	18	4,263,876

The increase in the area of the grass lands of Australia is due in large measure to the development of the dairying industry during recent years, referred to in the succeeding 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 1922–23.—

DISTRIBUTION OF CROPS, 1922–23.

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 ..	2,942,339	2,644,314	145,492	2,453,086	1,552,868	25,244	..	518	9,763,861
Oats ..	73,635	492,356	1,216	173,716	214,269	58,813	..	371	1,014,376
Maize ..	138,169	25,846	149,048	116	23	..	..	..	313,202
Barley—									
Malting ..	2,253	64,648	4,634	197,619	4,939	5,066	..	..	279,159
Other ..	1,646	38,125	658	17,664	4,304	640	..	..	63,037
Beans and Peas ..	275	12,287	68	5,311	1,071	22,811	..	..	41,823
Rye ..	1,379	1,291	4	241	560	673	..	..	4,148
Other Cereals ..	..	..	9	..	31	..	..	..	40
Hay ..	888,250	1,261,408	78,050	577,810	431,633	100,088	10	1,207	3,338,456
Green Forage ..	499,679	102,451	188,636	61,000	32,997	9,073	..	35	893,871
Grass Seed ..	..	2,224	1,066	62	..	523	..	..	3,875
Orchards and other Fruit Gardens ..	73,134	86,014	29,431	33,003	19,405	34,689	..	11	275,687
Vines—									
Productive ..	8,521	27,550	1,052	33,595	3,165	..	..	..	73,883
Unproductive ..	5,213	11,342	190	13,155	1,693	..	..	..	31,593
Market Gardens ..	7,743	14,108	1,838	1,438	2,698	540	..	18	28,383
Sugar-cane—									
Productive ..	5,879	..	140,850	..	..	..	..	..	146,729
Unproductive ..	8,704	..	61,453	..	..	..	..	..	70,157
Potatoes ..	22,556	61,741	7,649	5,749	3,621	34,407	..	12	135,735
Onions ..	107	6,954	138	364	80	22	..	..	7,665
Other root crops ..	985	3,162	2,124	468	217	3,257	200	..	10,413
Tobacco ..	2,658	890	179	..	..	..	..	..	3,727
Broom Millet ..	2,463	1,304	269	..	..	..	..	..	4,036
Pumpkins and Melons ..	2,457	1,549	6,543	220	705	..	10	..	11,484
Hops ..	..	194	..	2	..	1,545	..	..	1,741
Cotton ..	208	..	8,716	32	..	..	12	..	8,968
All other crops ..	6,034	2,790	5,747	801	719	1,220	195	..	17,506
Total Area ..	4,694,287	4,862,548	835,060	3,575,452	2,274,998	298,611	427	2,172	16,543,555

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 50,000 acres, the proportion of each in the various States and Territories to the total area under crop for the season 1922–23 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 same States the hay crop is second in importance. In Victoria and Western Australia, the oat crop occupies third position, while green forage ranks third in New South Wales, and barley in South Australia. In Queensland, the principal crops in the order of importance are sugar-cane, green forage, maize, and wheat, while in Tasmania hay, oats, orchards and fruit gardens, and potatoes occupy the leading positions.

As pointed out previously, wheat is the main crop in Australia, the area thereunder for grain and hay representing in 1922-23 about 70 per cent. of the total area under cultivation.

RELATIVE AREAS UNDER CROP, 1922-23.

Crop.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Nor. Ter.	Fed. Cap. Ter.	Australia.
	%	%	%	%	%	%	%	%	%
Wheat ..	62.68	54.38	17.42	68.61	68.26	8.45	..	23.85	59.02
Hay ..	18.92	25.94	9.35	16.16	18.97	33.52	2.34	55.57	20.18
Oats ..	1.57	10.13	0.14	4.86	9.42	19.70	..	17.08	6.13
Green Forage ..	10.65	2.11	22.59	1.71	1.45	3.04	..	1.61	5.40
Maize ..	2.94	0.53	17.85	0.00	0.00	..	..	..	1.89
Barley ..	0.08	1.77	0.63	6.02	0.41	1.91	..	..	2.07
Orchards and Fruit Gardens	1.56	2.11	3.52	0.92	0.85	11.62	..	0.51	1.67
Sugar-cane	0.31	..	24.23	..	..	..	..	..	1.31
Potatoes ..	0.48	1.27	0.92	0.16	0.16	11.52	..	0.55	0.82
Vineyards	0.29	0.80	0.15	1.31	0.21	..	..	..	0.64
All other ..	0.52	0.96	3.20	0.25	0.27	10.24	97.66	0.83	0.87
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, 1918-19 to 1922-23.—The acreage under each of the principal crops in Australia during the last five seasons is shown below :—

AREA OF CHIEF CROPS.—AUSTRALIA, 1918-19 TO 1922-23.

Crop.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
	Acres.	Acres.	Acres.	Acres.	Acres.
Wheat ..	7,990,165	6,419,160	9,072,167	9,719,042	9,763,861
Hay ..	2,692,904	3,125,582	3,233,189	2,994,519	3,338,456
Oats ..	768,152	1,068,296	936,996	733,406	1,014,376
Green Forage ..	586,440	1,401,280	406,954	452,508	893,871
Maize ..	286,812	265,469	284,283	305,186	313,202
Orchards and Fruit Gardens ..	264,751	271,894	278,551	281,149	275,687
Barley ..	254,869	267,309	334,747	298,910	342,196
Sugar-cane ..	171,024	159,037	174,001	197,293	216,886
Potatoes ..	111,169	113,900	140,195	149,144	135,735
Vineyards ..	70,058	73,326	81,165	92,414	105,476
All other Crops ..	136,049	131,154	127,610	133,453	143,809
Total ..	13,332,393	13,296,407	15,069,858	15,357,024	16,543,555

During the period under review the areas of the several crops, while reflecting seasonal and economic influences, have increased considerably, the most notable advance taking place in wheat. Of the other crops, barley, sugar-cane, and vineyards have made the most consistent progress since 1918-19.

§ 4. Wheat.

1. *Progress of Wheat-Growing.*—(i) *Area and Production.* Wheat is the principal crop, and the rapid development of wheat-growing during the past 30 years constitutes one of the most interesting features of Australian agriculture. Since 1895, when the area under wheat amounted to $3\frac{1}{2}$ million acres, an average of 230,000 acres have been added annually, until in 1922–23 no less than $9\frac{1}{2}$ million acres were cut for grain. The area and yield of wheat for grain are given below for each State for the last five years, and are shown from the year 1860 onwards in the graphs hereinafter :—

WHEAT.—AREA AND PRODUCTION, 1918–19 TO 1923–24.

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.
1918–19 ..	2,409,633	2,214,490	21,637	2,186,349	1,146,103	11,917	36	7,990,165
1919–20 ..	1,474,935	1,918,269	46,478	1,928,915	1,041,827	11,492	139	6,419,160
1920–21 ..	3,126,775	2,295,865	177,320	2,167,646	1,275,675	28,284	602	9,072,167
1921–22 ..	3,194,408	2,611,198	161,070	2,384,012	1,356,258	27,985	541	9,719,042
1922–23 ..	2,942,339	2,644,314	145,492	2,453,086	1,552,828	25,244	518	9,763,861
1923–24a ..	2,914,070	2,451,117	51,149	2,418,415	1,656,915	13,000	..	9,507,666
YIELD.								
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bush.	Bushels.
1918–19 ..	18,324,640	25,239,871	104,509	22,936,925	8,845,387	186,570	360	75,638,262
1919–20 ..	4,387,209	14,858,380	311,638	14,980,413	11,222,950	213,589	813	45,974,992
1920–21 ..	55,610,993	39,468,625	2,707,357	34,258,914	12,248,080	565,874	14,007	145,873,850
1921–22 ..	42,759,389	43,867,596	3,025,786	24,946,525	13,904,721	577,178	7,611	129,088,806
1922–23 ..	28,660,824	35,697,220	1,877,836	28,784,767	13,857,432	569,587	7,176	109,454,842
1923–24a ..	33,040,000	37,795,704	243,713	31,551,955	18,920,271	247,000	..	124,798,643

(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 principally 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, were responsible for a marked advance in 1920–21, and the area was further extended during the next two years, the total gain for Australia amounting since 1919–20 to $3\frac{1}{2}$ million acres.

Although final figures for 1923–24 for all the States are not yet available, the data to hand indicate the total area under wheat for grain in Australia at about 9,507,666 acres, a decrease of 256,000 acres on the 1922–23 figures, occasioned by unfavourable weather conditions at seeding time. The season was a bountiful one, and 124,798,643 bushels were harvested, yielding the very satisfactory average of $13\frac{1}{2}$ bushels to the acre.

The harvest of 179,065,703 bushels reaped in 1915–16 represents the maximum production of wheat in Australia. Yields exceeding 100,000,000 bushels have been garnered on eight occasions, all of which have occurred since 1913–14. The annual production of wheat during the seasons 1913–14 to 1922–23 averaged 108,048,757 bushels, and the amount by which this average may be exceeded depends to a great extent on seasonal conditions. Though increased areas were placed under wheat in 1922–23, conditions were not so propitious as in 1921–22, with the result that nearly 20,000,000 less bushels were harvested in 1922–23 than in 1921–22.

(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 1913-23 :—

WHEAT.—YIELD PER ACRE, 1918-19 TO 1922-23.

Season.	N.S.W.	Vic.	Q'land.	S. Aust.	W. Aust.	Tas.	Fed. Cap. Ter.	Australia.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1918-19 ..	7.60	11.40	4.83	10.49	7.72	15.66	10.00	9.47
1919-20 ..	2.98	7.75	6.71	7.77	10.77	18.58	5.85	7.16
1920-21 ..	17.79	17.19	20.91	15.80	9.60	20.01	23.27	16.08
1921-22 ..	13.39	16.80	18.37	10.46	10.41	20.62	14.07	13.28
1922-23 ..	9.74	13.50	12.91	11.73	8.92	22.56	13.85	11.21
Average 10 seasons, 1913-23	11.23	12.91	12.89	10.73	8.95	18.09	14.28	11.29

As the above figures show, there were considerable variations in the average yields, chiefly due to the vagaries of the seasons. For a series of years the yield in Australia generally averages 11 bushels to the acre, the average yield for the period 1860 to 1922-23 amounting to 10½ bushels. The excellence of the 1920-21 season is clearly reflected in the exceptional average of 16.08 bushels obtained in that year, an average which has been exceeded once only 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 8½ bushels in 1919-20 and 27 bushels in 1920-21. The State in which wheat-growing generally occupies the most important position relatively to population is South Australia, which in 1922-23 had a yield averaging 56 bushels per head. Queensland and Tasmania are the States in which the average production of wheat per head is least, the quantity raised being generally below that required for local consumption. Particulars for the past five seasons are as follows :—

WHEAT.—YIELD PER 1,000 OF POPULATION, 1918-19 TO 1922-23.

Season.	N.S.W.	Vic.	Q'land.	S. Aust.	W. Aust.	Tas.	Fed. Cap. Ter.	Australia.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1918-19 ..	9,342	17,559	148	50,115	28,554	919	161	14,885
1919-20 ..	2,153	9,884	423	31,105	34,278	1,017	424	8,667
1920-21 ..	26,594	25,828	4,928	69,749	37,024	2,659	-7,103	26,952
1921-22 ..	20,101	28,284	3,930	49,635	41,485	2,643	3,688	23,427
1922-23 ..	13,190	22,448	2,382	56,089	40,329	2,602	2,806	19,430

The normal annual consumption of wheat in Australia, exclusive of the requirements for seed, poultry and other live stock, is 318 lbs. (5.30 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 Denmark with a maximum of 46 bushels per acre to Tunis, with a minimum of 5½ bushels per acre. Australia, with approximately 12½, occupies a relatively subordinate position.

WHEAT.—YIELD PER ACRE, VARIOUS COUNTRIES, 1919-1922.

Country.	Average Yield in Bushels per acre.		Country.	Average Yield in Bushels per acre.	
	Average, 1919-1921.	1922.		Average, 1919-1921.	1922.
Denmark ..	46.37	38.97	Bulgaria ..	13.54	16.94
Netherlands ..	39.76	33.54	Rumania ..	13.35	14.06
Belgium ..	35.66	35.35	Spain ..	13.31	12.17
Switzerland ..	31.10	22.87	United States ..	13.10	13.98
United Kingdom ..	31.06	31.46	Jugo-Slavia ..	(b)13.06	11.35
New Zealand ..	30.88	30.44	Australia ..	12.73	11.21
Sweden ..	30.12	26.34	Canada ..	12.66	17.83
Germany ..	26.57	21.18	Argentine Republic	12.02	11.86
Egypt ..	24.89	24.14	India ..	11.42	12.98
Turkey in Asia ..	(e)22.12	(f)	Korea ..	11.23	8.68
Japan ..	21.82	22.48	Russia in Europe ..	(a)10.85	9.57
Turkey in Europe ..	(e)20.97	(f)	Uruguay ..	10.79	7.43
Czecho-Slovakia ..	20.33	22.02	Greece ..	10.27	10.74
France ..	19.92	18.61	French Morocco ..	9.49	6.24
Chile ..	17.75	18.53	Russia in Asia ..	(a)8.92	7.78
Hungary ..	(b)16.33	15.79	Union of South		
Lithuania ..	15.40	16.88	Africa ..	8.64	(d)10.35
Austria ..	15.34	16.15	Algeria ..	8.21	5.88
Poland ..	15.34	16.49	Portugal ..	8.07	8.71
Italy ..	14.97	14.07	Mexico ..	(e)6.24	9.60
China ..	(c)14.03	(f)	Tunis ..	5.41	4.17

(a) Average 1909-1913. (b) Average for two years. (c) Year 1914. (d) Year 1921.
(e) Single year. (f) Not available.

(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, 1919-1922.

Country.	Yield in Bushels (000 omitted).		Country.	Yield in Bushels (000 omitted).	
	Average, 1919-1921.	1922.		Average, 1919-1921.	1922.
United States ..	864.426	856.225	Poland ..	25.302	42.452
Russia in Europe ..	(a)663.896	158.419	Turkey in Europe	(c)24.212	(e)
China ..	(d)590.530	(e)	Chile ..	22.180	23.815
India ..	302.835	366.352	Algeria ..	21.447	18.233
Canada ..	255.773	399.793	French Morocco ..	19.193	12.894
France ..	249.165	243.317	Mexico ..	(b)14.594	13.626
Argentine Republic	188.034	189.047	Belgium ..	11.778	10.615
Italy ..	167.982	161.643	Greece ..	10.722	9.553
Russia in Asia ..	(a)151.112	45.322	Sweden ..	10.670	9.381
Turkey in Asia ..	(c)140.443	(e)	Korea ..	9.703	7.560
Spain ..	137.673	125.470	Portugal ..	9.324	9.782
Australia ..	106.979	109.455	Denmark ..	8.153	9.249
Germany ..	89.798	71.934	Uruguay ..	7.887	3.674
Rumania ..	68.968	92.023	Tunis ..	7.610	3.674
United Kingdom ..	66.649	65.248	New Zealand ..	7.330	8.395
Jugo-Slavia ..	(b)47.411	42.249	Union of South		
Hungary ..	(b)45.322	45.074	Africa ..	7.144	6.696
Egypt ..	32.953	36.648	Netherlands ..	6.629	5.236
Bulgaria ..	29.672	37.705	Austria ..	5.726	7.422
Japan ..	28.838	27.617	Switzerland ..	3.732	2.363
Czecho-Slovakia ..	26.805	33.621	Lithuania ..	2.562	3.274

(a) Average 1909-1913. (b) Average for two years. (c) Single year. (d) Year 1914.
(e) Not available.

NOTE.—The harvests reported above for 1922 relate to the year 1922 for the Northern, and 1922-23 for the Southern Hemisphere.

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

WHEAT.—WORLD'S PRODUCTION, 1909-13 TO 1922.

Years.		Area.	Yield.	Yield per acre.
		Acres.	Bushels.	Bushels.
Average, 1909-1913	..	197,186,000	3,020,332,000	15.32
1919	.. ..	213,989,000	2,793,991,000	13.06
1920	.. ..	208,552,000	2,896,506,000	13.89
1921	.. ..	216,213,000	3,122,480,000	14.44
1922	.. ..	216,213,000	3,126,154,000	14.46
Average, 1919-1922	..	213,742,000	2,984,691,000	13.96

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

The most striking feature in the world's wheat position has been the expansion of the area cultivated, followed by a decreased production owing to the reduced yields per acre. The decrease in the yields per acre was due to the fall in the European averages, and to the greater development of the extensive type of cereal cultivation in newer countries. The Australian contributions to the world's production during the past three years amounted to 3 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 1923.

Year.	Average for Year.	Highest Weekly Average.	Lowest Weekly Average.	Year.	Average for Year.	Highest Weekly Average.	Lowest Weekly Average.
	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>		<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>
1861	.. 55 4	61 6	50 0	1917	.. 75 9	83 10	70 3
1871	.. 56 8	60 0	52 6	1918	.. 72 10	74 5	71 2
1881	.. 45 4	55 2	40 9	1919	.. 72 11	73 4	72 5
1891	.. 37 0	41 8	32 3	1920	.. 80 10	90 11	72 6
1901	.. 26 9	27 8	25 8	1921	.. 71 6	89 10	44 0
1911	.. 31 8	33 4	30 0	1922	.. 47 10	56 3	37 5
1916	.. 58 5	75 10	46 3	1923	.. 42 2	49 3	37 6

(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, 1918-19 TO 1922-23.

Heading.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>
Price per bushel ..	5 1	5 6	9 0	5 9	5 5

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 1918-19 to 1922-23. For the sake of convenience, flour has been expressed at its equivalent in wheat, 1 ton of flour being taken as equal to 50 bushels of grain. In ordinary seasons the Australian imports of wheat and flour are negligible. During the past five years the exports ranged between 51,235,322 bushels in 1922-23 and 117,933,923 bushels in 1921-22, the net exports for the period averaging 86,901,829 bushels.

WHEAT AND FLOUR.—IMPORTS AND EXPORTS, AUSTRALIA, 1918-19 TO 1922-23.

Year.	Imports.			Exports.			Net Exports.
	Wheat.	Flour.	Total.	Wheat.	Flour.	Total.	
	Bushels.	Eq. Bushels. ^a	Bushels.	Bushels.	Eq. Bushels. ^a	Bushels.	
1918-19	50	2,750	2,800	44,563,597	24,169,750	68,733,347	68,730,547
1919-20	285	4,300	4,585	82,470,658	25,889,700	108,360,358	108,355,773
1920-21	1,170	3,850	5,020	76,791,883	11,486,250	88,278,133	88,273,113
1921-22	247	1,800	2,047	99,947,223	17,986,700	117,933,923	117,931,876
1922-23	15,288	2,200	17,488	31,510,272	19,725,050	51,235,322	51,217,834

(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 1918-19 to 1922-23. 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, 1918-19 TO 1922-23.

Country to which Exported.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.	Total for Five Years.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
United Kingdom	9,104,560	50,074,725	38,709,680	40,914,035	10,762,600	149,565,600
Italy ..	2,950,015	1,397,738	2,219,143	18,447,762	11,647,165	36,661,823
Egypt ..	11,741,477	2,265,283	10,477,463	3,286,433	38,783	27,809,439
France ..	674,363	13,010,455	8,921,645	3,341,835	1,284,924	27,233,222
India ..	4,306,312	1,522,593	25,623	15,035,429	..	20,889,957
Japan ..	1,407,775	6,381,738	7,332	7,497,943	3,711,211	19,005,999
Belgium ..	..	..	5,754,723	1,312,480	178,930	7,246,133
Union of South Africa ..	541,778	1,220,147	1,157,778	1,331,417	2,545,162	6,796,282
Germany ..	..	..	2,504,690	2,996,292	397	5,501,379
New Zealand ..	1,452,625	2,393,667	602,843	73,539	..	4,522,674
Norway ..	1,369,105	1,645,125	342,510	960,855	117,012	4,434,607
Canary Islands(^a) ..	..	624,425	3,532,793	236,807	..	4,394,025
United States ..	3,510,762	73,293	112	..	..	3,584,167
Netherlands ..	..	..	2,202,653	1,192,977	..	3,395,630
Sweden ..	2,134,500	523,065	..	..	412,547	3,070,112
Ceylon ..	2,142,212	52,645	303	257,098	993	2,453,251
Peru ..	660,318	131,023	..	697,205	167,110	1,655,656
Other Countries	2,567,795	1,154,736	332,592	2,365,116	643,500	7,063,739
Total ..	44,563,597	82,470,658	76,791,883	99,947,223	31,510,334	335,283,695

(a) For orders.

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

FLOUR.—EXPORTS, AUSTRALIA, 1918-19 TO 1922-23.

Country to which Exported.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.	Total for Five Years.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Egypt	129,992	92,537	61,502	108,550	127,072	519,653
United Kingdom	136,254	72,828	81,952	103,634	83,804	478,472
Netherlands East Indies	34,929	42,070	15,388	41,826	50,899	185,112
Union of South Africa	12,892	39,513	41,458	24,947	39,250	158,060
Malaya (British)	24,386	63,508	8,264	20,471	32,619	149,248
Philippine Islands	27,180	39,942	3,040	10,749	10,292	91,203
Hong Kong	17,898	36,506	368	10,003	6,318	71,093
Italy	35,804	..	..	..	112	35,916
Japan	1,258	24,876	480	6,555	1,664	34,833
France .. .. .	..	33,407	..	..	..	33,407
India	23,629	486	4	657	1,063	25,839
Mauritius	1,968	4,532	3,320	5,639	8,757	24,216
Ceylon	47	8,191	755	6,282	7,681	22,956
New Caledonia	3,804	3,999	3,202	3,532	3,517	18,054
Fiji	2,212	2,257	1,362	2,484	2,602	10,917
Portuguese East Africa .. .. .	..	632	2,477	3,542	3,475	10,126
China	880	1,199	77	4,391	260	6,807
United States	3,865	..	..	..	113	3,978
Papua	429	879	636	322	378	2,644
New Zealand	511	256	137	95	84	1,083
Other Countries	25,457	50,176	5,303	6,055	14,541	101,532
Total	483,395	517,794	229,725	359,734	394,501	1,985,149

For the five years under review the export of wheat to the United Kingdom amounted to 149,565,600 bushels, or 45 per cent. of the total export for the period, while the export of flour to the United Kingdom aggregated 478,472 tons, or 24 per cent. of the total export. The largest purchaser of Australian flour during the last quinquennium was Egypt, followed by the United Kingdom, Netherlands East Indies, South Africa, and Malaya (British).

(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 23 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 lbs.) of wheat are, approximately, 42 lbs. of flour, 9 lbs. of bran, and 9 lbs. of pollard, while the percentage of phosphoric acid contained in these products is as follows :—

Flour	0.32 per cent., or 0.13 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 482,024,109 bushels of wheat, 3,071,119 tons of flour, and 2,584,195 bushels of bran, pollard, and sharps. On the basis of the figures quoted above this export would contain no less than 251,423,224 lbs. of phosphoric acid, the value of which as a fertilizer would amount to more than one 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, 1914 TO 1922-23.

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.
1914 ..	713,845	174,180	2,400	537,265	26,863,250	.1081	5.405
1915 ..	541,810	7,633	2,160	532,017	26,600,850	.1070	5.350
1915-16 ..	577,038	146,618	2,650	427,770	21,388,500	.0861	4.305
1916-17 ..	869,975	290,572	2,885	576,518	28,825,900	.1172	5.860
1917-18 ..	985,761	374,062	9,810	601,889	30,094,450	.1208	6.040
1918-19 ..	1,046,268	483,340	6,437	556,491	27,824,550	.1095	5.475
1919-20 ..	1,050,228	517,708	4,590	527,930	26,396,500	.0995	4.975
1920-21 ..	801,511	229,648	3,375	568,488	28,424,400	.1050	5.250
1921-22 ..	911,452	359,698	2,284	549,470	27,473,500	.0997	4.986
1922-23 ..	985,479	394,457	1,831	589,191	29,459,550	.1046	5.230
Aggregate 10 years	8,483,367	2,977,916	38,422	5,467,029	273,351,450	.1060	5.299

WHEAT USED FOR SEED.—AUSTRALIA, 1913 TO 1922.

Year.	Area for Grain and Hay.	Wheat for Seed Purposes.		
		Quantity.	Per Acre.	Per Head of Population.
	Acres.	Bushels.	Bushels.	Bushels.
1913 ..	10,661,430	9,747,000	.914	1.992
1914 ..	11,012,679	10,059,000	.913	2.023
1915 ..	14,414,024	13,041,000	.905	2.624
1916 ..	12,894,917	11,523,000	.894	2.343
1917 ..	10,910,669	9,713,000	.890	1.949
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
Aggregate for 10 years ..	109,975,223	100,915,000	.918	1.969

In addition to the above, the quantity of grain fed to poultry and other live stock must be taken into consideration. This varies from year to year according to the price of wheat, and from other causes, but data are not available on which to base an estimate of the quantities so consumed. 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 quantity milled, shows a substantial increase over the average for the previous year, this, however, being counter-balanced by a decline in the following year. The average quantity of flour consumed

per annum for the ten years under consideration was 0.1060 tons per head of population, which, expressed in equivalent terms in wheat, represents 5.299 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 1.969 bushels per head of population, and 0.918 bushels or 55 lbs. per acre sown.

6. Value of the Wheat Crop.—The estimated value of the wheat crop in each State and in Australia during the season 1922-23 is shown below :—

WHEAT.—VALUE OF CROP, (a) 1922-23.

Particulars.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Fed. Cap. Ter.	Australia.
	£	£	£	£	£	£	£	£
Aggregate value..	7,881,730	9,370,520	492,932	7,076,159	3,493,228	142,397	1,970	28,458,936
Value per acre ..	£2/13/7	£3/10/10	£3/7/9	£2/17/8	£2/5/0	£5/12/10	£3/16/1	£2/18/4

(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 1923-24 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 59.02 per cent., oats represented only 6.13 per cent. of the area under crop in Australia. The progress in cultivation of oats for the last five years is shown in the table hereunder, and more fully in the graphs hereinafter :—

OATS.—AREA AND YIELD, 1918-19 TO 1922-23.

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.
1918-19	86,421	342,867	298	160,823	141,459	36,231	53	768,152
1919-20	75,893	559,547	363	192,153	191,931	48,185	224	1,068,296
1920-21	77,537	443,636	4,690	167,001	193,486	50,474	172	936,996
1921-22	69,619	318,681	2,274	125,148	162,866	54,642	176	733,406
1922-23	73,635	492,356	1,216	173,716	214,269	58,813	371	1,014,376
YIELD.								
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1918-19	1,272,411	5,274,984	3,632	1,540,603	1,499,689	848,420	1,341	10,441,080
1919-20	583,503	6,603,067	2,871	1,634,239	2,486,918	1,242,258	3,255	12,556,111
1920-21	1,640,552	10,907,191	103,933	2,331,067	2,022,031	1,514,155	2,148	18,521,077
1921-22	1,168,406	6,082,258	34,409	1,297,646	2,019,603	1,543,617	1,494	12,147,433
1922-23	1,243,198	8,093,459	19,499	1,681,783	2,261,863	1,674,751	7,602	14,982,155

The oat crop exhibited little variation during the past decennium, ranging on the average around 13,000,000 bushels. The demand for the grain for making 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 is marketed through live stock and more remunerative prices thereby realized than those now offering on the local market.

The principal oat-growing State is Victoria, which produces more than half the total quantity of oats grown in all States. For Australia as a whole the record yield of oats was obtained in 1920-21, when 18,521,077 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 1913-23 are given in the succeeding table :—

OATS.—AVERAGE YIELD PER ACRE, 1918-19 TO 1922-23.

Season.	N.S.W.	Vic.	Q'land.	S. Aust.	W. Aust.	Tas.	Fed. Cap. Ter.	Australia.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1918-19	14.72	15.38	12.19	9.58	10.60	23.42	25.30	13.59
1919-20	7.71	11.80	7.91	8.50	12.96	25.78	14.53	11.75
1920-21	21.16	24.59	22.16	13.96	10.45	30.00	12.49	19.77
1921-22	16.78	19.09	15.13	10.37	12.40	28.25	8.49	16.56
1922-23	16.88	16.44	16.04	9.68	10.56	28.48	20.49	14.77
Average for 10 seasons 1913-23	16.45	17.27	16.43	10.46	11.37	25.44	16.77	15.49

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 1915-16, amounting to 22.92 bushels per acre.

(iii) *Relation to Population.* The State in which oat production occupies the most important position in relation to population is Tasmania, the yield for that State representing about 6.39 bushels per head during the last five years, as compared with 2.54 bushels per head for Australia as a whole. Particulars for the seasons 1918-19 to 1922-23 are furnished in the succeeding table :—

OATS.—YIELD PER 1,000 OF POPULATION, 1918-19 TO 1922-23.

Season.	N.S.W.	Vic.	Q'land.	S. Aust.	W. Aust.	Tas.	Fed. Cap. Ter.	Australia.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1918-19	649	3,670	5	3,366	4,841	4,181	601	2,055
1919-20	286	4,393	4	3,393	7,595	5,917	1,696	2,367
1920-21	785	7,138	138	4,746	6,112	7,114	1,089	3,422
1921-22	549	3,922	45	2,582	6,026	7,067	724	2,205
1922-23	572	5,090	25	3,277	6,583	7,650	2,973	2,660

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, 1919-1922.

Country.	Yield in Bushels (000 omitted).		Country.	Yield in Bushels (000 omitted).	
	Average, 1919-1921.	1922.		Average, 1919-1921.	1922.
United States ..	967,952	972,400	Netherlands ..	17,311	13,660
Russia in Europe ..	(a)784,906	255,656	Turkey in Asia ..	(d)17,250	(e)
Canada ..	382,873	417,550	Jugo-Slavia ..	(b)16,460	14,041
Germany ..	261,565	221,317	Australia ..	14,409	14,982
France ..	187,518	230,614	Austria ..	12,957	14,653
United Kingdom ..	178,615	159,261	Lithuania ..	12,718	23,154
Poland ..	94,835	138,098	Norway ..	11,506	10,704
Russia in Asia ..	(a)86,149	28,874	Latvia ..	(b) 9,853	14,537
Sweden ..	58,421	63,163	Japan ..	8,830	10,749
Czecho-Slovakia ..	47,958	57,242	Algeria ..	7,449	4,456
Rumania ..	42,008	73,659	Turkey in Europe ..	(d)7,411	(e)
Denmark ..	40,143	46,723	Estonia ..	6,551	8,046
Argentine Republic	29,961	43,980	New Zealand ..	6,157	4,875
Spain ..	28,348	24,971	Union of South		
Italy ..	25,785	24,372	Africa ..	5,760	(c)6,482
Belgium ..	25,720	28,627	Bulgaria ..	5,187	7,315
Finland ..	20,493	22,559	Portugal ..	4,368	10,135
Hungary ..	(b)17,709	17,815			

(a) Average 1909-1913. (b) Average for two years. (c) Year 1921. (d) Single year. (e) Not available.

(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, 1919-1922.

Country.	Average Yield in Bushels per acre.		Country.	Average Yield in Bushels per acre.	
	Average, 1919-1921.	1922.		Average, 1919-1921.	1922.
Turkey in Asia ..	(d)45.41	(e)	Austria ..	20.48	20.82
Netherlands ..	44.48	34.84	Finland ..	20.06	22.82
Belgium ..	44.09	39.91	Rumania ..	19.69	22.35
Denmark ..	37.65	41.77	Estonia ..	18.91	20.17
United Kingdom ..	37.62	36.30	Russia in Europe ..	(a)18.66	15.73
New Zealand ..	37.09	39.58	Lithuania ..	18.06	30.11
Germany ..	34.10	27.97	Spain ..	17.87	16.49
Norway ..	33.62	35.59	Latvia ..	(b)17.07	21.52
Sweden ..	33.23	35.12	Bulgaria ..	16.21	20.80
Japan ..	(b)32.54	34.96	Jugo-Slavia ..	(b)16.20	14.28
Czecho-Slovakia ..	27.13	28.39	Australia ..	15.78	14.77
Poland ..	25.18	23.49	Russia in Asia ..	(a)15.01	14.13
Canada ..	24.00	28.72	Argentine Republic	13.89	16.80
France ..	23.44	27.16	Algeria ..	13.47	7.64
United States ..	23.05	23.90	Union of South		
Turkey in Europe ..	(d)22.93	(e)	Africa ..	9.66	(c)12.22
Italy ..	22.18	20.08	Portugal ..	9.18	21.04
Hungary ..	(b)20.99	21.77			

(a) Average 1909-1913. (b) Average for two years. (c) Year 1921. (d) Single year. (e) Not available.

3. *Price of Oats.*—The average wholesale prices of oats in the markets of the several capitals for the year 1922 are given in the following table:—

OATS.—AVERAGE WHOLESALE PRICES, 1922.

Particulars.	Sydney.(a)	Melbourne.	Brisbane.	Adelaide.	Perth.	Hobart.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Average price per bushel ..	4 5	3 5½	2 9	2 10	3 4	3 3

(a) Year ended 30th June, 1923.

4. **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, and in 1922–23. The quantities and values of oats imported into and exported from Australia during the years 1918–19 to 1922–23 are given hereunder :—

OATS.—IMPORTS AND EXPORTS, AUSTRALIA, 1917–18 TO 1921–22.

Year.	Imports.		Exports.		Net Exports.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Bushels.	£	Bushels.	£	Bushels.	£
1918–19 ..	41,728	9,713	149,413	35,326	107,685	25,613
1919–20 ..	146,700	41,759	290,323	83,175	143,623	41,416
1920–21 ..	139,728	30,057	865,588	143,874	725,860	113,817
1921–22 ..	14,880	2,569	325,792	49,980	310,912	47,411
1922–23 ..	557,523	90,255	35,895	7,506	—521,628	—82,749

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, Java, and the United Kingdom.

5. **Oatmeal, etc.**—Oatmeal, etc., is imported into Australia principally from the United Kingdom, the United States of America, and New Zealand. The total importations of oatmeal, wheatmeal, and rolled oats during 1922–23 amounted to 35,790 lbs., and represented a value of £722, while the exports amounted to 464,018 lbs., valued at £4,484, and were shipped mainly to Papua, New Zealand, and Pacific Islands.

6. **Value of Oat Crop.**—The estimated value of the oat crop of the several States of Australia for the season 1922–23 is as follows :—

OATS.—VALUE OF CROP, (a) 1922–23.

Particulars.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Fed. Cap. Ter.	Australia.
	£	£	£	£	£	£	£	£
Aggregate value..	274,510	1,517,524	2,681	287,299	379,333	314,016	1,650	2,777,043
Value per acre ..	£3/14/7	£3/1/8	£2/4/1	£1/13/1	£1/15/5	£5/6/9	£4/8/11	£2/14/9

(a) Exclusive of the value of straw.

§ 6. Maize.

1. **States Growing Maize.**—The only States in which maize is extensively grown for grain are those of New South Wales and Queensland, the area so cropped in these two States during the season 1922–23 being 287,217 acres, or nearly 92 per cent. of the total for Australia. Of the balance, Victoria contributed 25,846 acres, South Australia 116 acres, and Western Australia 23 acres. The climate of Tasmania prevents the growing of maize for grain. In all the States, maize is grown to a greater or less extent as 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 by 25,000 acres during the past decennium. While increases in area were recorded in both Queensland and Victoria, the decline of nearly 50,000 acres in New South Wales was responsible for the reductions in the total for Australia. The maximum area sown to maize was 414,914 acres, as far back as 1910-11. This area was considerably in excess of the average planted during the last ten years, which amounted to 314,238 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 hereinafter.

MAIZE.—AREA AND YIELD, 1918-19 TO 1922-23.

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.
1918-19	114,582	22,559	149,505	112	39	15	..	236,812
1919-20	136,509	23,474	105,260	165	11	50	..	265,469
1920-21	144,105	24,149	115,805	199	19	6	..	284,283
1921-22	146,687	23,227	135,034	186	43	9	..	305,186
1922-23	138,169	25,846	149,048	116	23	..	..	313,202
YIELD.								
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1918-19	2,091,921	711,679	4,105,974	1,756	623	200	..	6,912,153
1919-20	4,052,025	878,922	1,830,664	1,810	84	500	..	6,764,005
1920-21	4,176,000	1,065,880	2,012,864	3,738	240	60	..	7,258,782
1921-22	3,976,300	951,960	2,907,754	3,792	540	92	..	7,840,438
1922-23	3,287,500	879,915	3,217,848	2,716	335	..	..	7,388,314

The maximum production of maize in Australia was recorded in 1910-11, when the harvest exceeded 13,000,000 bushels. This figure has not been approached in recent years, the average for the past decade amounting to 8,000,000 bushels.

The expansion of maize-growing is hindered by unstable local markets, and by the development of dairying with its consequent increase in permanent pastures. It is, however, believed that the cereal will eventually become an important crop in Australia. Its suitability in crop rotation, coupled with the advance of closer settlement and irrigation, will doubtless lead to an extension in its cultivation. Moreover, the value of the grain for fattening stock is becoming more generally recognized, and the establishment of new industries which utilize it is creating a demand for an increased supply.

(ii) *Average Yield.* The following table gives particulars of the average yield per acre of the maize crops of the States for the seasons 1918-19 to 1922-23, and also for the decennium 1913-23 :—

MAIZE.—AVERAGE YIELD PER ACRE, 1918-19 TO 1922-23.

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.
1918-19 ..	18.26	31.55	27.46	15.68	15.97	13.33	..	24.10
1919-20 ..	29.68	37.44	17.39	10.97	7.64	10.00	..	25.48
1920-21 ..	28.98	44.14	17.38	18.78	12.63	10.00	..	25.53
1921-22 ..	27.11	40.99	21.53	20.39	12.56	10.22	..	25.69
1922-23 ..	23.79	34.04	21.59	23.41	14.57	..	..	23.59
Average for 10 seasons 1913-23	25.64	43.20	21.25	16.20	12.24	13.78	15.53	24.81

With the exception of Canada, the average yield of maize per acre in Victoria is the largest 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 $1\frac{1}{2}$ bushels per head of population, while the average for Queensland, the State in which the production per head is highest, amounted to $3\frac{1}{2}$ bushels. Details for the several States during the past five seasons are as follows:—

MAIZE.—YIELD PER 1,000 OF POPULATION, 1918-19 TO 1922-23.

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.
1918-19 ..	1,067	495	5,820	4	2	43	..	1,360
1919-20 ..	1,988	585	2,482	4	..	110	..	1,275
1920-21 ..	1,997	697	2,676	8	1	15	..	1,341
1921-22 ..	1,869	614	3,776	8	2	25	..	1,423
1922-23 ..	1,513	553	4,082	5	1	..	..	1,312

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 100,000,000 acres are planted annually, and 3,000,000,000 bushels are reaped, representing nearly 70 per cent. of the world's production. Of the huge quantities raised in that country, more than 85 per cent. is fed to live stock on farms, while 10 per cent. is used for human food, and only a very small fraction, about $1\frac{1}{2}$ per cent., enters into international trade. The yields of the various countries are as follow:—

MAIZE.—PRODUCTION IN VARIOUS COUNTRIES, 1919-1922.

Country.	Yield in Bushels (000 omitted).		Country.	Yield in Bushels (000 omitted).	
	Average, 1919-1921.	1922.		Average, 1919-1921.	1922.
United States ..	2,874,304	2,890,688	Philippine Islands	15,172	14,651
Argentine Republic	221,761	153,142	France ..	11,924	12,675
Brazil ..	187,953	(g)180,579	Portugal ..	10,949	(g)11,374
Rumania ..	111,440	110,553	Belgian Congo ..	10,704	(f)10,712
China ..	(d)103,875	(h)	Salvador ..	(b)7,836	(f)10,662
India ..	91,307	(g)96,240	Greece ..	7,820	(g)7,874
Italy ..	89,157	76,796	Australia ..	7,288	7,388
Jugo-Slavia ..	(b)87,463	89,136	Columbia ..	(e)6,538	(h)
Mexico ..	(c)82,519	68,261	Czecho-Slovakia ..	6,509	9,884
Russia in Europe ..	(a)70,222	67,426	Indo-China ..	(i)6,286	(f)5,733
Egypt ..	65,399	(g)61,654	Japan ..	6,208	(g)6,895
Dutch East Indies	55,375	47,500	Uruguay ..	5,773	8,628
Union of South Africa ..	41,496	50,390	Peru ..	(b)4,724	(h)
Hungary ..	(b)40,933	32,494	Guatemala ..	4,448	5,412
Spain ..	26,048	26,832	French Morocco ..	4,307	4,564
Turkey in Europe ..	(c)22,204	(h)	Madagascar ..	3,867	(g)4,240
Turkey in Asia ..	(c)22,036	(h)	Rhodesia ..	3,576	5,179
Bulgaria ..	20,900	15,479	Korea ..	(a)2,257	2,902
Russia in Asia ..	(a)15,793	(h)	Austria ..	2,255	3,477
Canada ..	15,396	13,798	Poland ..	(b)674	2,776

(a) Average 1909-1913. (b) Average for two years. (c) Single year. (d) Year 1914. (e) Year 1915. (f) Year 1920. (g) Year 1921. (h) Not available. (i) Average 1914-1918.

(ii) *Yield per Acre.* The average yield per acre of maize in Australia during 1922 was 23.6 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, 1919-1922.

Country.	Average Yield per acre in Bushels.		Country.	Average Yield per acre in Bushels.	
	Average, 1919-1921.	1922.		Average, 1919-1921.	1922.
Canada ..	54.14	43.34	Russia in Europe	(a)17.25	12.47
Peru ..	(b)36.30	(h)	Greece ..	16.58	(g)15.93
Egypt ..	33.74	(g)29.56	Columbia ..	(e)15.74	(h)
United States ..	29.41	28.22	Portugal ..	15.23	(g)15.93
Madagascar ..	29.12	(g)18.87	Salvador ..	14.70	(f)17.12
Turkey in Europe	(c)28.81	(h)	Bulgaria ..	14.67	11.79
Argentine Republic	28.17	19.51	Korea ..	(a)14.43	(f)12.79
Australia ..	25.57	23.59	France ..	14.38	16.05
Czecho-Slovakia ..	24.84	25.24	Poland ..	(b)13.99	15.18
Italy ..	24.02	20.15	Mexico ..	(c)13.54	15.93
Japan ..	22.92	(g)24.79	China ..	(d)13.22	(h)
Turkey in Asia ..	(c)21.25	(h)	India (British) ..	13.01	(g)15.19
Austria ..	21.24	23.44	Russia in Asia ..	(a)13.00	(h)
Rhodesia ..	19.81	23.54	Dutch East Indies	12.43	12.22
Brazil ..	(h)	(f)33.51	Philippine Islands	12.15	10.78
Hungary ..	(b)19.57	18.94	Union of South Africa	(b)10.38	(f)12.50
Jugo-Slavia ..	(b)19.16	18.10	Uruguay ..	9.94	11.18
Rumania ..	18.55	13.14	Guatemala ..	8.68	11.91
Indo-China ..	(i)18.29	(f)14.34	French Morocco ..	8.21	8.52
Spain ..	17.27	23.14			

(a) Average 1909-1913. (b) Average for two years. (c) Single year. (d) Year 1914. (e) Year 1915. (f) Year 1920. (g) Year 1921. (h) Not available. (i) Average 1914-1918.

4. 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, 1918-19 TO 1922-23.

Particulars.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
	s. d.	s. d.	s. d.	s. d.	s. d.
Average price per bushel ..	6 11½	8 11	6 6	5 2	6 1

5. Oversea Imports and Exports.—The Australian oversea trade in maize is practically insignificant, imports or exports depending on the success or failure of the local crop. During the past five years, owing to drougthy conditions, the average annual import amounted to 418,032 bushels. Details of imports and exports for the years 1918-19 to 1922-23 are as follow :—

MAIZE.—IMPORTS AND EXPORTS, AUSTRALIA, 1918-19 TO 1922-23.

Year.	Imports.		Exports.		Net Imports.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Bushels.	£	Bushels.	£	Bushels.	£
1918-19 ..	255,605	73,774	84,119	20,804	171,486	52,970
1919-20 ..	494,278	158,361	6,632	3,001	487,646	155,360
1920-21 ..	96,536	40,097	77,489	27,162	19,047	12,935
1921-22 ..	45,066	9,791	36,320	9,023	8,746	768
1922-23 ..	1,198,673	264,758	8,426	2,736	1,190,247	262,022

The principal countries to which maize is exported from Australia are New Zealand and the Pacific Islands, while South Africa supplies the bulk of the imports.

6. Prepared Maize.—A small quantity of corn-flour is imported annually into Australia, the principal countries of supply being the United Kingdom and the United States of America. During the year 1922-23 the imports amounted to 970,580 lbs., and represented a value of £10,660. The exports from Australia are small, and totalled only 67,896 lbs., valued at £1,447 in 1922-23.

7. Value of Maize Crop.—The value of the Australian maize crop for the season 1922-23 has been estimated at £2,083,728, made up as follows :—

MAIZE.—VALUE OF CROP, 1922-23.

Particulars.	N.S.W.	Vic.	Q'land.	S. Aust.	W. Aust.	Australia.
	£	£	£	£	£	£
Aggregate value	1,041,020	263,975	777,647	951	135	2,083,728
Value per acre	£7/10/8	£10/4/3	£5/4/4	£8/4/0	£5/17/5	£6/13/1

§ 7. Barley.

1. Progress of Cultivation.—(i) *Area and Yield.* The area under barley in Australia has fluctuated very considerably, but results for the past ten years show a marked rise. The average annual area sown for the decennium 1913 to 1923 amounted to 247,889 acres, which was nearly double the average of the previous ten-yearly period, i.e., 125,220 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 1922-23, the area under barley in South Australia accounted for nearly 63 per cent. of the Australian acreage. Victoria was next in importance with 30 per cent., leaving a small margin of about 7 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 sub-section. 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 hereinafter :—

BARLEY.—AREA AND YIELD, 1918-19 TO 1922-23.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	Australia.
AREA.							
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1918-19 ..	7,980	100,198	1,316	130,357	7,982	7,036	254,869
1919-20 ..	5,354	85,323	3,275	157,897	9,167	6,293	267,309
1920-21 ..	5,969	93,954	15,908	202,079	10,686	6,151	334,747
1921-22 ..	5,031	100,127	7,730	170,887	7,894	7,241	298,910
1922-23 ..	3,899	102,773	5,292	215,283	9,243	5,706	342,196
YIELD.							
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1918-19 ..	86,313	2,028,635	8,824	2,417,349	81,451	141,149	4,763,721
1919-20 ..	38,892	1,528,654	34,892	2,448,936	116,037	120,516	4,287,927
1920-21 ..	123,290	2,495,762	317,511	3,946,062	111,405	161,346	7,155,376
1921-22 ..	83,950	2,336,246	133,885	3,278,787	85,857	166,960	6,085,685
1922-23 ..	55,520	2,442,041	93,693	3,697,849	107,804	152,028	6,548,935

The States where the annual production of barley averaged over 1,000,000 bushels for the past decade were South Australia and Victoria, the yields being respectively 2,265,213 and 1,874,977 bushels, the higher return in the latter State tending to diminish the advantage held by South Australia in regard to acreage.

(ii) *Malting and other Barley.* (a) *Year 1922-23.* In recent years the statistics of all the States have distinguished between "malting" and "other" barley. Particulars for the season 1922-23 are as follows:—

BARLEY, MALTING AND OTHER.—AREA AND YIELD, 1922-23.

Particulars.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	Australia.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Malting barley..	2,253	64,648	4,634	197,619	4,939	5,066	279,159
Other barley ..	1,646	38,125	658	17,664	4,304	640	63,037
Total ..	3,899	102,773	5,292	215,283	9,243	5,706	342,196
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
Malting barley..	29,860	1,525,744	82,979	3,450,120	58,382	136,059	5,283,144
Other barley ..	25,660	916,297	10,714	247,729	49,422	15,969	1,265,791
Total ..	55,520	2,442,041	93,693	3,697,849	107,804	152,028	6,548,935

The cultivation of malting barley is a special industry to meet the demands of the local brewing trade. Its expansion, however, appears to be restricted, although of late years the exports have increased. Taking Australia as a whole, more than 80 per cent. of the area under barley in 1922-23 was sown with the malting variety. The proportion varies considerably 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, 1918-19 TO 1922-23.

Season.	Acres.			Bushels.			Average Bushels per Acre.		
	Malting.	Other.	Total.	Malting.	Other.	Total.	Malting.	Other.	Total.
1918-19 ..	179,186	75,683	254,869	3,419,863	1,343,858	4,763,721	19.09	17.76	18.69
1919-20 ..	204,752	62,557	267,309	3,352,027	935,900	4,287,927	16.37	14.96	16.04
1920-21 ..	249,908	84,839	334,747	5,248,861	1,906,515	7,155,376	21.00	22.47	21.38
1921-22 ..	218,662	80,248	298,910	4,430,599	1,655,086	6,085,685	20.26	20.62	20.36
1922-23 ..	279,159	63,037	342,196	5,283,144	1,265,791	6,548,935	18.93	20.08	19.14
Average 10 seasons 1913-23	177,039	70,850	247,889	3,282,802	1,314,186	4,596,988	18.54	18.55	18.54

During the past ten seasons the area and production of malting barley have represented more than twice 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 practically identical.

(iii) *Average Yield.* The average yield of barley per acre varies considerably in the different States, being as a rule highest in Tasmania and Victoria, and lowest in Western Australia. Details for each State during the past five seasons, and for the decennium 1913-23, are given in the following table:—

BARLEY.—YIELD PER ACRE, 1918-19 TO 1922-23.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Australia.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1918-19	10.82	20.25	6.71	18.54	10.20	20.06	18.69
1919-20	7.26	17.92	10.65	15.51	12.66	19.15	16.04
1920-21	20.66	26.56	19.96	19.53	10.43	26.23	21.38
1921-22	16.69	23.33	17.32	19.19	10.88	23.06	20.36
1922-23	14.24	23.76	17.70	17.18	11.66	26.64	19.14
Average for 10 seasons 1913-23	14.29	21.61	17.01	17.19	11.10	21.83	18.54

(iv) *Relation to Population.* During the last five seasons the quantity of barley produced in Australia averaged 1 bushel per head of population. For the season 1922-23 the production ranged from $7\frac{1}{2}$ bushels per head in South Australia to $1\frac{1}{2}$ lbs. per head in New South Wales. Details for the years 1918-19 to 1922-23 are as follows:—

BARLEY.—PRODUCTION PER 1,000 OF POPULATION, 1918-19 TO 1922-23.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	Australia.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1918-19	44	1,411	13	5,282	263	696	937
1919-20	19	1,017	47	5,085	354	574	808
1920-21	59	1,633	422	8,034	337	758	1,322
1921-22	39	1,506	174	6,524	256	764	1,104
1922-23	26	1,536	119	7,206	314	694	1,163

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 figure being added for the purpose of comparison:—

BARLEY.—PRODUCTION IN VARIOUS COUNTRIES, 1919-22.

Country.	Yield in Bushels (000 omitted).		Country.	Yield in Bushels (000 omitted).	
	Average, 1919-1921.	1922.		Average, 1919-1921.	1922.
Russia in Europe ..	(a)449,081	107,146	Turkey in Europe	(c)16,724	(f)
China	(d)163,127	(f)	Jugo-Slavia ..	(b)12,757	10,102
United States ..	149,214	178,662	Sweden	11,518	13,277
India (British) ..	126,874	140,134	Egypt	10,393	10,854
Turkey in Asia ..	(c)111,069	(f)	Bulgaria	8,705	11,464
Japan	88,210	83,653	Italy	7,859	7,923
Spain	83,710	74,433	Mexico	(e)6,741	(f)
Germany	78,921	70,884	Tunis	6,609	1,764
United Kingdom ..	59,163	53,312	Syria	(b)6,544	8,047
Canada	57,410	68,989	Lithuania ..	5,854	10,296
Rumania	46,240	90,028	Australia ..	5,840	6,549
Poland	39,240	57,177	Greece	5,782	6,817
Korea	36,356	31,573	Finland	5,361	4,375
Russia in Asia ..	(a)35,323	(f)	Norway	4,779	4,303
Czecho-Slovakia ..	34,009	44,498	Latvia	(b)4,585	6,499
France	32,956	39,273	Austria	4,393	5,375
French Morocco ..	31,090	26,141	Estonia	4,238	6,403
Denmark	24,569	29,216	Chile	4,206	5,165
Hungary	(b)20,679	20,041	Belgium	4,137	3,301
Algeria	20,290	19,013	Argentine Republic	3,910	7,350

(a) Average 1909-1913.

(b) Average for two years.

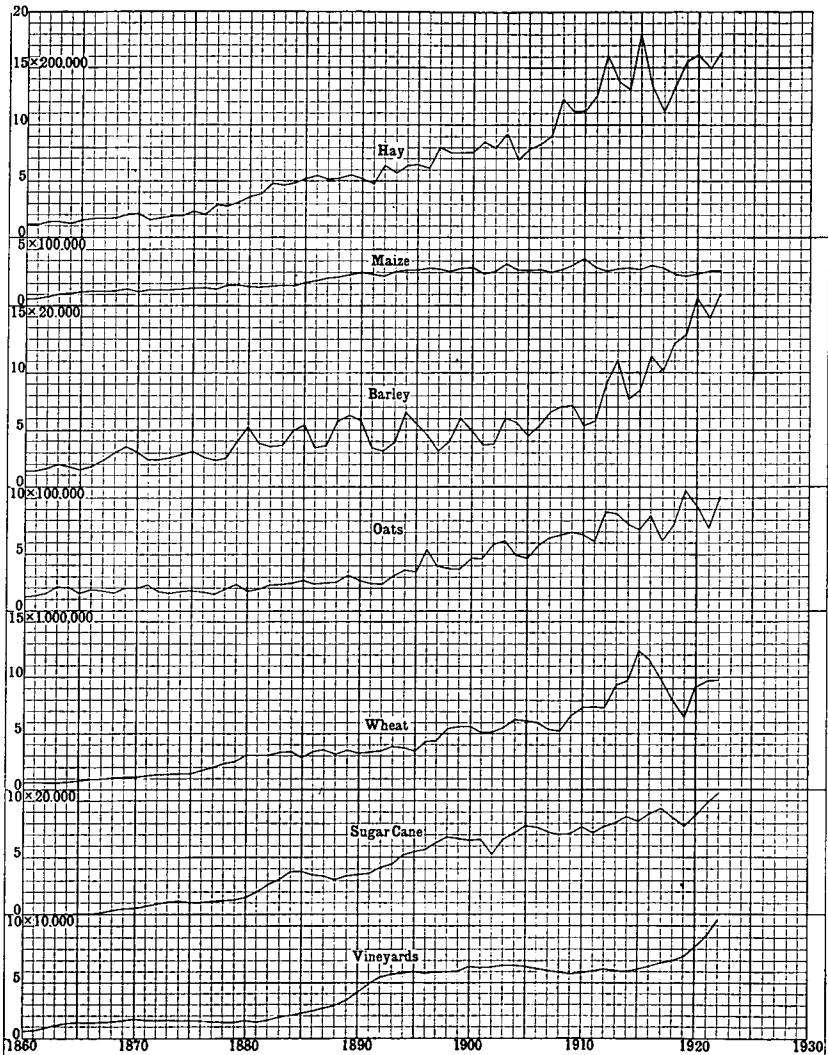
(c) Single year.

(d) Year 1914.

(e) Average for three years.

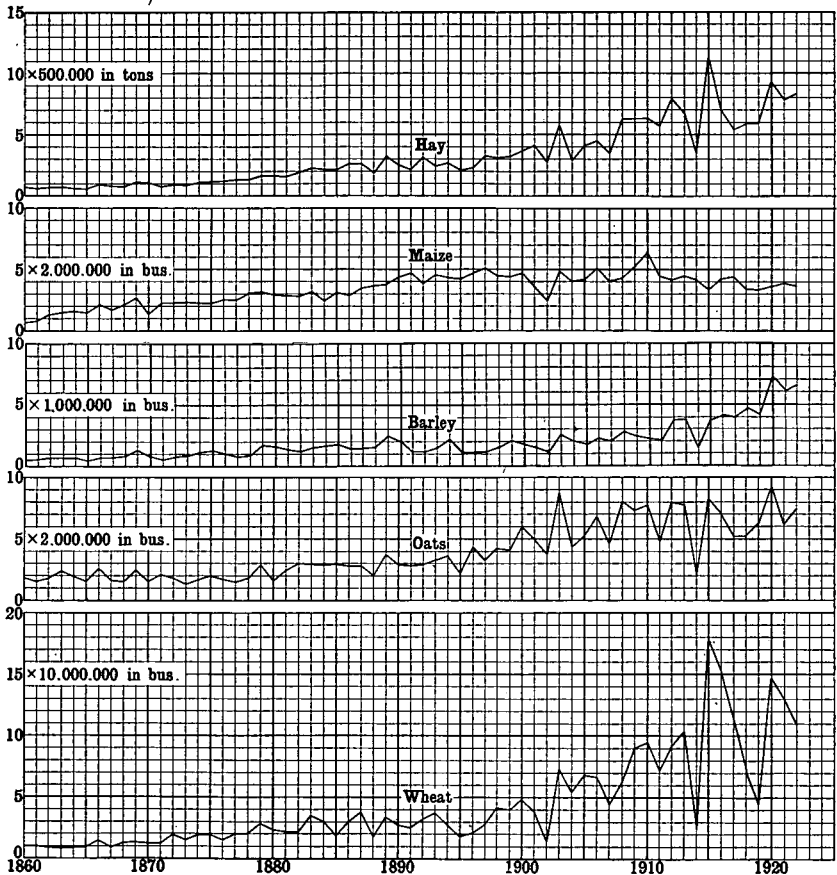
(f) Not available.

AREA UNDER PRINCIPAL CROPS—AUSTRALIA, 1860 TO 1922-23.



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 1922-23.



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.

(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 46.92 bushels in Belgium to 4.70 bushels in Mexico:—

BARLEY.—AVERAGE YIELD PER ACRE IN VARIOUS COUNTRIES, 1919-1922.

Country.	Yield in Bushels per acre.		Country.	Yield in Bushels per acre.	
	Average. 1919-1921.	1922.		Average. 1919-1921.	1922.
Belgium ..	46.92	41.08	Austria ..	17.83	17.17
Denmark ..	37.99	43.82	Korea ..	17.51	(f)18.71
Turkey in Asia ..	(c)31.56	(g)	Hungary ..	(b)16.88	17.74
United Kingdom ..	31.13	31.51	China ..	(d)16.80	(g)
Chile ..	30.87	35.25	Bulgaria ..	16.72	21.47
Norway ..	30.66	32.59	Russia in Europe	(a)16.01	14.27
Turkey in Europe	(c)30.20	(g)	Estonia ..	15.77	19.33
Japan ..	29.96	30.47	Italy ..	15.59	13.75
Egypt ..	28.58	31.08	Rumania ..	14.95	21.09
Sweden ..	28.56	31.08	Lithuania ..	14.84	24.71
Germany ..	27.55	24.90	Greece ..	14.50	17.05
Czecho-Slovakia ..	24.20	26.69	Jugo-Slavia ..	(b)13.89	10.74
France ..	21.61	22.93	Latvia ..	(b)13.65	16.79
Canada ..	21.55	26.54	French Morocco ..	13.13	10.26
United States ..	20.83	24.18	Russia in Asia ..	(a)12.13	9.46
Poland ..	20.62	20.24	Algeria ..	10.08	6.63
Australia ..	19.44	19.13	Argentine Republic	6.15	12.25
Finland ..	18.90	15.81	Tunis ..	6.08	2.93
India (British) ..	18.80	19.05	Mexico ..	(e)4.70	(g)
Spain ..	18.05	18.23	Syria ..	(g)	12.14

(a) Average 1909-1913. (b) Average for two years. (c) Single year. (d) Year 1914.
(e) Average for three years. (f) Year 1921. (g) Not available.

3. *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, 1918 TO 1922.

Particulars.	1918.	1919.	1920.	1921.	1922.
	s. d.	s. d.	s. d.	s. d.	s. d.
Malting barley ..	5 9	5 9½	7 3	4 5	4 1½
Cape barley ..	4 0	4 6½	6 3	3 5	3 0

4. *Imports and Exports.*—Although the Australian oversea trade in barley is not large, increased quantities were shipped overseas during the past four years. The grain was mainly consigned to the United Kingdom and Belgium, South Australia being the principal exporting State. Particulars of the Australian overseas imports and exports for the years 1918-19 to 1922-23 are contained in the following table:—

BARLEY.—IMPORTS AND EXPORTS, AUSTRALIA, 1918-19 TO 1922-23.

Year.	Imports.		Exports.		Net Exports.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Bushels.	£	Bushels.	£	Bushels.	£
1918-19	456	203	176,478	49,573	176,022	49,370
1919-20	438	236	1,075,446	364,809	1,075,008	364,573
1920-21	20	45	3,209,734	778,615	3,209,714	778,570
1921-22	7,052	1,891	1,935,830	396,883	1,928,778	394,992
1922-23	34	18	2,213,184	432,326	2,213,150	432,308

During some years there is an export of Australian pearl and Scotch barley, the total for 1922-23 reaching 92,242 lbs., valued at £686. The trade for the year was mainly with the South African Union.

5. 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 continuously declined, 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 1918-19 to 1922-23 are given hereunder :—

MALT.—IMPORTS AND EXPORTS, AUSTRALIA, 1918-19 TO 1922-23.

Year.	Imports.		Exports.		Net Exports.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Bushels.	£	Bushels.	£	Bushels.	£
1918-19 .. ..	..	1	..	..	..	— 1
1919-20 .. ..	..	..	..	..	..	..
1920-21	5	8	139,908	80,575	139,903	80,567
1921-22	40	43	7,553	3,238	7,513	3,195
1922-23	28	63	4,618	2,006	4,590	1,943

NOTE.—The minus sign — signifies net imports.

6. Value of Barley Crop.—The estimated values of the barley crop of Australia for the seasons 1918-19 to 1922-23 were £1,221,863, £1,360,411, £1,522,915, £1,139,736, and £1,220,703. The extent to which the several States have contributed to the total in 1922-23 is shown in the following table :—

BARLEY.—VALUE OF CROP (a), 1922-23.

Particulars.	N.S.W.	Vic.	Q'land.	S. Aust.	W. Aust.	Tas.	Australia.
Total value ..	£11,270	£450,229	£15,091	£681,751	£23,422	£38,940	£1,220,703
Value per acre ..	£2/17/10	£4/7/7	£2/17/0	£3/3/4	£2/10/8	£6/16/6	£3/11/4

(a) Exclusive of the value of straw.

§ 8. 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 1922-23 was 41,823 acres, giving a yield of 758,310 bushels, or an average of 18.13 bushels per acre, being greater than the average yield for the decennium ended 1922-23, which was 15.79 bushels per acre. The States in which the greatest area is devoted to beans and peas are Tasmania, Victoria and South Australia. The total area under rye in Australia during the season 1922-23 was 4,148 acres, yielding 47,942 bushels, and giving an average of 11.56 bushels per acre. This was higher than the average for the past ten seasons, which was 10.94 bushels per acre. Over 39 per cent. of the rye grown during the season was produced in New South Wales, and 33 per cent. in Victoria. In addition to these grain crops a small area of rice has for some years been cultivated in Queensland and the Northern Territory. The results obtained, however, have not up to the present been very satisfactory. Should rice-growing be seriously taken up in Australia, it is probable that large tracts of country in the northern parts of Queensland and Western Australia, and in the Northern Territory, will be found well suited to its cultivation.

§ 9. Potatoes.

1. *Progress of Cultivation.*—(i) *Area and Yield.* The principal potato-growing State is Victoria, which possesses peculiar advantages for the growth of the 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, 1918-19 TO 1922-23.

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.
1918-19 ..	20,877	51,620	6,434	3,275	3,936	25,023	2	111,169
1919-20 ..	20,036	53,918	4,432	3,411	3,585	28,511	7	113,900
1920-21 ..	27,667	62,687	8,770	4,811	4,254	32,000	6	140,195
1921-22 ..	29,491	63,895	9,553	5,795	3,612	36,795	3	149,144
1922-23 ..	22,556	61,741	7,649	5,749	3,621	34,407	12	135,735
YIELD.								
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1918-19 ..	30,353	137,533	11,083	13,219	11,697	56,528	3	260,416
1919-20 ..	49,962	145,888	7,844	11,020	13,240	66,225	24	294,203
1920-21 ..	63,234	171,628	19,068	17,057	13,368	88,679	22	373,056
1921-22 ..	57,825	173,660	16,794	18,573	13,605	107,624	10	388,091
1922-23 ..	35,694	148,354	10,517	17,356	15,198	101,201	32	328,352

(a) Includes 2 acres in Northern Territory.

The production of potatoes in Australia decreased by about 32,000 tons during the past decade, the decline being confined to New South Wales and Tasmania. The average yield during the last ten years amounted to 346,997 tons, which is considerably below the maximum production of 507,153 tons 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 2.52 tons per acre. The lowest average yield is that obtained in Queensland with an average of 1.82 tons for the same period.

Particulars for each State for the seasons 1918-19 to 1922-23, and also for the past decennium, are given hereunder :—

POTATOES.—YIELD PER ACRE, 1918-19 TO 1922-23.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Fed. Cap. Ter.	Australia.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1918-19 ..	1.45	2.66	1.72	4.04	2.97	2.26	1.50	2.34
1919-20 ..	2.49	2.71	1.77	3.23	3.69	2.32	3.43	2.58
1920-21 ..	2.29	2.74	2.17	3.55	3.14	2.77	3.67	2.66
1921-22 ..	1.96	.72	1.76	3.21	3.77	2.92	3.33	2.60
1922-23 ..	1.58	2.40	1.37	3.02	4.20	2.94	2.67	2.42
Average for 10 seasons 1913-23	2.06	2.67	1.82	3.16	3.21	2.57	2.39	2.52

The decline in the average yield per acre in Australia was responsible for the decreased production during the last ten years. This decline was in evidence in the chief producing States, and for Australia as a whole averaged 7 cwts. per acre. In Tasmania, where the decrease was highest, the average yield diminished by 1½ tons during the past decennium. The comparatively low yield per acre is due to neglect of rotation with a leguminous crop, and to failure to apply sufficient quantities of manure, both of which matters receive careful attention in Europe, where 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 136 lbs. In Tasmania, where this crop is of far greater importance in relation to population than is the case in any other State, the production per head in 1906-7 was nearly a ton, while for the past five seasons it has averaged about 7½ cwt. Details for the seasons 1918-19 to 1922-23 are as follows :—

POTATOES.—PRODUCTION PER 1,000 OF POPULATION, 1918-19 TO 1922-23.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Fed. Cap. Ter.	Australia.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1918-19 ..	15	96	16	29	38	279	1	51
1919-20 ..	25	97	11	23	40	315	12	55
1920-21 ..	30	112	25	35	40	417	11	69
1921-22 ..	27	112	22	37	41	493	5	70
1922-23 ..	16	93	13	34	44	462	13	58

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

a shortage in some 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, 1918-19 TO 1922-23.

Year.	Imports.		Exports.		Net Exports.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Tons.	£	Tons.	£	Tons.	£
1918-19	308	3,570	6,742	50,308	6,434	46,738
1919-20	2,614	41,391	1,455	22,954	1,159	18,437
1920-21	56	746	1,130	13,222	1,074	12,476
1921-22	59	499	2,540	21,611	2,481	21,112
1922-23	72	957	2,061	23,599	1,989	22,642

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 1922-23 is given in the following table, together with the value per acre :—

POTATOES.—VALUE OF CROP, 1922-23.

Particulars.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Fed. Cap. Ter.	Australa.
Total value ..	£379,250	£1,261,009	£77,826	£166,721	£149,510	£870,328	£340	£2,904,984
Value per acre	£16/16/3	£20/8/6	£10/3/6	£29/0/0	£41/5/10	£25/5/11	£28/6/8	£21/8/0

§ 10. Other Root and Tuber Crops.

1. Nature and Extent.—Root crops, other than potatoes, are not extensively grown in Australia, the total area devoted to them for the season 1922-23 being only 18,078 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 1922-23 was 7,665 acres, giving a yield of 48,424 tons, and averaging 6.32 tons per acre. The area devoted in 1922-23 to root crops other than potatoes and onions, viz., 10,413 acres, yielded 68,772 tons, and gave an average of 6.60 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 3,853 tons, valued at £59,401, were imported, principally from New Zealand, Japan, and the United States, while during the same period, the exports totalled 22,083 tons, valued at £244,050, and were shipped mainly to New Zealand, the Pacific Islands, the Philippines, and the United States of America.

§ 11. Hay.

1. *Nature and Extent.*—(i) *Area and Yield.* As already stated, the most important crop of Australia is that of wheat grown for grain. Next to this in importance is the hay crop, which for the season ended 1922-23 averaged over 20 per cent. of the area under crop in Australia. In most European countries the hay crop 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 made also, 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, 1918-19 TO 1922-23.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	N. Ter.	Fed. Cap. Ter.	Aus-tralia.
AREA.									
1918-19	813,379	984,479	54,772	501,731	249,796	87,136	30	1,581	2,692,904
1919-20	936,729	1,116,998	48,843	590,835	327,498	102,908	100	1,671	3,125,582
1920-21	853,109	1,333,397	94,212	570,865	266,824	113,618	10	1,154	3,233,189
1921-22	749,738	1,159,135	98,155	559,285	335,561	91,443	12	1,190	2,994,519
1922-23	888,250	1,261,408	78,050	577,810	431,633	100,088	10	1,207	3,338,456
YIELD.									
1918-19	751,247	1,113,861	92,230	567,941	250,014	115,896	30	2,383	2,893,602
1919-20	578,232	1,242,489	41,804	598,954	379,025	143,053	500	2,354	2,986,411
1920-21	1,372,801	1,984,854	116,709	769,050	264,244	176,798	20	1,855	4,686,331
1921-22	1,027,833	1,548,453	138,675	680,201	368,720	136,991	25	1,291	3,902,189
1922-23	1,059,529	1,665,089	101,069	697,189	457,371	167,282	10	1,450	4,148,989

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 2,925,048 acres.

(ii) *Average Yield.* The States in which the highest average yields per acre have been obtained during the last decennium are Tasmania and Queensland, in 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 13 cwt. per acre in 1914-15; while the highest was that of 31½ cwt. in 1915-16, followed closely by 29 cwt. obtained

in 1920-21. The average for the decennium was 24½ cwt. Particulars for the several States for the seasons 1918-19 to 1922-23, and the average for the last ten years, are given hereunder :—

HAY.—YIELD PER ACRE, 1918-19 TO 1922-23.

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.
1918-19	0.92	1.13	1.68	1.13	1.00	1.33	1.00	1.51	1.07
1919-20	0.62	1.11	0.86	1.01	1.16	1.39	5.00	1.41	0.96
1920-21	1.61	1.49	1.24	1.35	0.99	1.56	2.00	1.61	1.45
1921-22	1.37	1.34	1.41	1.22	1.10	1.50	2.08	1.08	1.30
1922-23	1.19	1.32	1.29	1.21	1.06	1.67	1.00	1.20	1.24
Average for 10 seasons 1913-23	1.17	1.31	1.32	1.16	1.02	1.39	2.51	1.40	1.22

(iii) *Relation to Population.* During the past five seasons the Australian hay production per head of population has varied between 11½ cwt. in 1919-20 and 17½ cwt. in 1920-21; averaging nearly 14 cwt. per head for the period. Hay production per head of population is highest in South Australia. Details for the seasons 1918-19 to 1922-23 are given hereunder :—

HAY.—YIELD PER 1,000 OF POPULATION, 1918-19 TO 1922-23.

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.
1918-19	383	775	131	1,241	807	571	6	1,068	569
1919-20	284	827	57	1,244	1,158	681	110	1,227	563
1920-21	657	873	155	1,566	799	831	5	941	866
1921-22	483	998	180	1,353	1,100	627	7	625	708
1922-23	488	1,047	128	1,359	1,331	764	3	567	737

(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, 1918-19 TO 1922-23.

Varieties.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
	Acres.	Acres.	Acres.	Acres.	Acres.
NEW SOUTH WALES—					
Wheaten	612,771	716,341	520,417	467,068	597,959
Oaten	152,057	171,113	259,022	203,074	216,136
Barley	1,238	1,718	1,832	899	1,265
Lucerne	46,336	46,542	70,995	77,527	72,337
Other	977	1,015	843	1,170	553
Total	813,379	936,729	853,109	749,738	888,250

HAY.—VARIETIES GROWN, 1918-19 TO 1922-23—*continued.*

Varieties.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
	Acres.	Acres.	Acres.	Acres.	Acres.
VICTORIA—					
Wheaten	274,320	417,221	165,502	130,181	213,219
Oaten	691,808	681,179	1,140,578	1,001,256	1,021,216
Lucerne, etc.	18,351	18,598	27,317	27,698	26,973
Total	984,479	1,116,998	1,333,397	1,159,135	1,261,408
QUEENSLAND—					
Wheaten	1,902	11,710	14,024	13,837	8,834
Oaten	1,803	2,488	19,229	12,480	4,542
Lucerne	48,264	29,348	53,059	67,183	60,042
Other	2,803	5,297	7,900	4,655	4,632
Total	54,772	48,843	94,212	98,155	78,050
SOUTH AUSTRALIA—					
Wheaten	358,068	450,371	329,543	325,769	359,834
Oaten	138,507	134,775	231,446	225,878	208,769
Lucerne	2,106	2,167	3,938	4,145	4,973
Other	3,050	3,522	5,938	3,493	4,234
Total	501,731	590,835	570,865	559,285	577,810
WESTERN AUSTRALIA—					
Wheaten	190,399	234,772	169,264	222,209	307,142
Oaten	58,551	91,152	96,228	111,386	123,232
Lucerne	137	206	146	125	142
Other	709	1,368	1,186	1,841	1,117
Total	249,796	327,498	266,824	335,561	431,633

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 1923 amounted to 3,484,000 tons from 2,229,354 acres, while from permanent grasses a yield of 5,113,000 tons of hay was obtained from 4,509,700 acres, giving a total of 8,597,000 tons from 6,739,054 acres, or about 25½ 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 1922-23, 136 tons were imported, while the exports amounted to 2,906 tons, valued at £19,653, the principal purchases being made by the Philippine Islands, Malaya (British) and India.

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 1922-23 :—

HAY.—VALUE OF CROP, 1922-23.

Particulars.	N.S.W.	Vic.	Q'land.	S. Aust.	W. Aust.	Tas.	Nor. Ter.	Fed. Cap. Ter.	Australia.
	£	£	£	£	£	£	£	£	£
Total Value ..	10,654,350	7,909,172	548,462	2,597,029	1,627,480	652,400	50	14,880	24,003,823
Value per acre	£11/19/11	£6/5/5	£7/0/7	£4/9/11	£3/15/5	£6/10/4	£5/0/0	£12/6/7	£7/3/10

§ 12. 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 during the season 1922-23 was 893,871 acres, to which New South Wales contributed nearly 60 per cent., or 499,679 acres, the bulk of which consisted of wheat deemed unsuitable for the production of 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, 1918-19 TO 1922-23.

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.
1918-19	331,079	73,641	90,635	56,067	28,141	6,827	..	50	586,440
1919-20	1,007,478	89,802	157,568	114,126	27,007	5,271	..	28	1,401,280
1920-21	112,003	79,524	142,554	40,678	26,620	5,575	..	..	406,954
1921-22	128,965	89,410	147,135	50,121	27,396	9,481	..	..	452,508
1922-23	499,679	102,451	188,636	61,000	32,997	9,073	..	35	893,871

(ii) *Relation to Population.* Particulars of the area under green forage per 1,000 of the population for the seasons 1918-19 to 1922-23 are given hereunder :—

GREEN FORAGE.—AREA PER 1,000 OF POPULATION, 1918-19 TO 1922-23.

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.
1918-19 ..	169	51	128	113	91	34	..	22	115
1919-20 ..	494	60	214	237	82	25	..	15	264
1920-21 ..	54	52	190	83	80	26	..	..	75
1921-22 ..	61	58	191	100	82	43	..	..	82
1922-23 ..	230	64	239	119	96	41	..	14	159

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 1922-23 may be taken approximately as £2,501,565, or about £2 16s. 0d. per acre.

§ 13. Sugar-cane and Sugar-beet.

1. **Sugar-cane.**—(i) *Area.* Sugar-cane is grown for sugar-making purposes in two of the States of Australia, viz., Queensland and New South Wales, and much more extensively in the former than in the latter. Thus, of a total area of 216,886 acres under sugar-cane in Australia for the season 1922-23, there were 202,303 acres, or about 93½ 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 1862-3. 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 1895-6 with a total of 32,927 acres. Thenceforward with slight variations it gradually fell to 14,583 acres in 1922-23. In Queensland, although fluctuations in area are manifest, the general trend has been upwards, the acreage under cane for the season 1922-23 being the highest on record. The area under sugar-cane in Australia from 1918-19 is given in the following table, and particulars for earlier years may be seen from the accompanying graphs :—

SUGAR-CANE.—AREA, 1918-19 TO 1922-23.

Season.	New South Wales.		Queensland.		Australia.		
	Productive.	Unproductive.	Productive.	Unproductive.	Productive.	Unproductive.	Total.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1918-19 ..	4,566	5,924	111,572	48,962	116,138	54,886	171,024
1919-20 ..	4,827	5,741	84,877	63,592	89,704	69,333	159,037
1920-21 ..	5,519	5,863	89,142	73,477	94,661	79,340	174,001
1921-22 ..	5,400	7,380	122,956	61,557	128,356	68,937	197,293
1922-23 ..	5,879	8,704	140,850	61,453	146,729	70,157	216,886

(ii) *Productive and Unproductive Cane.* The areas given in the preceding table represent sugar-cane grown for purposes other than 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, but both records were obtained in the latest season under review, i.e., 1922-23.

(iii) *Yield of Cane and Sugar.* Queensland statistics of the production of sugar-cane are not available for dates prior to the season 1897-8. In that season the total for Australia was 1,073,883 tons, as against the maximum production of 2,879,092 tons in 1917-18. The second highest yield was in the season 1921-22, with a total of 2,436,890 tons. The average production of cane during the decennium ended 1922-23 was 1,964,201 tons. The three highest yields of sugar were in 1917-18, 1922-23, and 1921-22, the quantities

being 327,589 tons, 306,365 tons, and 300,004 tons respectively. The decennial average was 235,529 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, 1918-19 TO 1922-23.

Season.	New South Wales.		Queensland.		Australia.	
	Cane.	Sugar.	Cane.	Sugar.	Cane.	Sugar.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1918-19 ..	105,234	12,278	1,674,829	189,978	1,780,063	202,256
1919-20 ..	91,321	10,837	1,258,760	162,136	1,350,081	172,973
1920-21 ..	131,313	15,124	1,339,455	167,401	1,470,768	182,525
1921-22 ..	149,474	17,806	2,287,416	282,198	2,436,890	300,004
1922-23 ..	147,992	18,580	2,167,990	287,785	2,315,982	306,365

The cane cut in 1923 was approximately 2,193,000 tons. The season, particularly in the southern districts, was very dry, but the sugar content was high, as is usually the case in dry seasons, and 288,000 tons of sugar were obtained from crushing. In accordance with the agreement made by the Commonwealth Government respecting the yields for the three years 1920, 1921, and 1922, the sugar industry progressed considerably. The guaranteed price induced mill-owners to make considerable additions to plant, thereby increasing the efficiency of the mills, while farmers in nearly every district put new areas under cane, using in many cases land that had lain unproductive for years.

A preliminary estimate of the production of sugar in 1924 places the amount at 370,000 tons.

Large quantities of molasses are produced as a by-product in the sugar mills; details for a series of years of the quantity produced and proportions used for distilling, fuel, manure and other purposes will be found in Chapter XXII.—“Manufacturing.”

(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 26.59 tons for the former and 17.49 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, and 1917-18. The climatic conditions affecting the tremendous length of coastline 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 12.20 tons per acre in 1915-16 to 24.88 tons in 1917-18.

The greatest production of sugar per acre crushed in Australia during the past quinquennium 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 3.11 tons in New South Wales, and 2.10 tons in Queensland.

(v) *Quality of Cane.* The quantity of cane required to produce a ton of sugar varies not only with the district in which the cane is grown, but also with the season, and for the decennium ended 1922-23 averaged 8.34 tons, the average production of sugar being approximately 11.98 per cent. of the weight of cane crushed. The systematic study of beet culture in European countries has shown that by suitable methods the sugar contents of the root can be greatly increased, and it is believed that a similar improvement can be effected in the yield from sugar-cane.

SUGAR-CANE AND SUGAR.—YIELD PER ACRE, 1918-19 TO 1922-23.

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.
1918-19	23.05	2.69	8.57	15.01	1.70	8.82	15.33	1.74	8.80
1919-20	18.92	2.25	8.43	14.83	1.91	7.76	15.05	1.93	7.81
1920-21	23.79	2.74	8.68	15.03	1.88	8.00	15.54	1.93	8.06
1921-22	27.68	3.30	8.40	18.60	2.30	8.11	18.99	2.34	8.12
1922-23	25.17	3.16	7.97	15.39	2.04	7.53	15.78	2.09	7.56
Average 10 seasons 1913-23	26.59	3.11	8.54	17.49	2.10	8.32	17.95	2.15	8.34

The Bureau of Sugar Experiment Stations established in Queensland is rendering excellent service to the sugar industry in that State, by advocating and demonstrating better methods of cultivation, the use of green manures, lime, and fertilizers, together with the introduction and distribution of improved varieties of sugar cane. The results of its activities may be seen in the improved yield of cane and sugar per acre during recent years, and the gain in the sugar content of the cane. The amount of cane required to make one ton of sugar decreased from 9.00 tons to 8.32 tons during the past decennium, while the season 1922 shows the lowest figure yet recorded, viz., 7.53 tons.

(vi) *Relation to Population.* The production of sugar in Australia during the five years 1918-19 to 1922-23 was not sufficient to supply local requirements, the average production during the period amounting to 96½ lbs. per head of population, while the consumption was estimated to average 117 lbs. per head. Details for the period 1918-19 to 1922-23 are as follows :—

SUGAR.—PRODUCTION PER HEAD OF POPULATION, 1918-19 TO 1922-23.

State.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
	lbs.	lbs.	lbs.	lbs.	lbs.
New South Wales ..	14	12	16	19	19
Queensland	603	492	498	821	818
Australia	89	73	76	122	122

If preliminary figures of the output for the years 1923 and 1924 be taken, the production during the five seasons ended 1924-25 will meet local requirements.

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, 1918-19 TO 1922-23.

Particulars.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
Area harvested .. acres	1,009	1,090	1,180	1,600	2,045
Production .. tons	12,290	13,195	7,147	16,577	20,444
Average per acre ..	12.18	12.11	6.06	10.36	10.00
Sugar produced ..	1,263	1,551	833	1,872	2,784

During the 1922-23 season growers were paid 42s. 6d. per ton for their beets. Weather conditions were suitable, and the sugar content of the beets was high. A profit of £13,290 was realized by the Sugar-beet Factory as the result of the year's transactions.

(ii) *Encouragement of Beet-growing.* During recent years an effort has been made to revive the sugar-beet industry in Victoria. The State Government is proceeding with a comprehensive irrigation scheme at Maffra, where the sugar-beet factory is situated. When completed, this scheme will make available for beet-growing large areas of land hitherto unsuitable. In view of the prospective expansion of the area under beet the State Government has decided to remodel the plant, and the preliminary arrangements in connexion with this work are now in hand. A sum of £65,000 has been voted for the purpose. 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.—Particulars of the purchase by the Commonwealth Government of the Australian sugar output from 1915 onwards, together with the agreement made between the Commonwealth and Queensland Governments covering the three seasons ended 1922, will be found on page 277 of Year Book No. 15, 1922.

On the termination of the 1922 sugar season in June, 1923, the Commonwealth Government announced that the agreement fixing the price of raw sugar at £30 6s. 8d. per ton would not be renewed. The embargo against the importation of black-grown sugar was to be continued for a further period of two years from date, on condition that a pool, free from Commonwealth Government control, would be formed to buy raw sugar for the ensuing season at not more than £27 per ton, and to arrange with the Colonial Sugar Refining Company and the Millaquin Company for refining and distribution. Allowing three months for the disposal of the 57,500 tons of carry-over sugar, the retail price was to be reduced in October, 1923, to 4½d. per lb., while special concessions were to be made to manufacturers using sugar in goods for export.

The price of raw sugar in the 1924-25 season was to be fixed by a competent tribunal after investigation, such price not to exceed £27 per ton. The embargo was to be definitely withdrawn on 30th June, 1925, and after that date the sugar industry was to be protected from unfair competition by means of the Customs Tariff.

In terms of the Commonwealth Government's proposals a tribunal was appointed in April, 1924, and after investigation, determined that the present price of £27 per ton for raw sugar should be continued for the 1924-25 season.

5. Imports and Exports of Sugar.—The production of sugar in Australia during the five years ended 1922-23 was not sufficient to supply the growing requirements of Australian consumption. It was found necessary to import annually on the average some 55,400 tons, valued at £2,331,399, the principal countries engaged in supplying this commodity being 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, 1918-19 TO 1922-23.

Year.	Oversea Imports.		Oversea Exports.		Net Imports.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Tons.	£	Tons.	£	Tons.	£
1918-19	52,569	1,052,124	2,029	52,136	50,540	999,988
1919-20	112,805	4,359,203	2,825	83,729	109,980	4,275,474
1920-21	116,274	6,560,373	4,190	220,965	112,084	6,339,408
1921-22	6,888	174,850	1,918	60,145	4,970	114,705
1922-23	4,551	87,317	5,127	159,897	-576	-72,580

Note.—The minus sign (—) signifies net exports.

§ 14. 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 which initiated the colonization of Australia 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 the progress of the industry in these States has been negligible. 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, 1918-19 TO 1922-23.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Australia.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1918-19	8,740	26,072	1,287	31,023	2,936	There are no vineyards in Tasmania.	70,058
1919-20	8,923	27,441	1,203	32,784	2,975		73,326
1920-21	10,783	29,255	1,256	36,661	3,210		81,165
1921-22	12,583	33,175	1,281	41,424	3,951		92,414
1922-23	13,734	38,892	1,242	46,750	4,858		105,476

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 the result of satisfactory annual increases, the 1904-5 figure was soon exceeded, and the total for 1922-23 was the highest recorded.

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 being taken in various ways to bring the Australian wines under notice, and it may be confidently expected that when their qualities are duly recognized the wine production of Australia will increase. Particulars of the quantity of wine produced in the several States during the past five seasons are given in the table hereunder :—

WINE.—PRODUCTION, 1918-19 TO 1922-23.

Season.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Australia.
	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.	No production of wine in Tasmania.	Gallons.
1918-19 ..	555,770	1,349,309	44,491	6,544,125	199,142		8,692,837
1919-20 ..	717,893	1,634,680	48,495	5,085,939	162,397		7,649,404
1920-21 ..	674,188	2,222,305	71,403	7,893,345	152,979		11,014,220
1921-22 ..	627,105	1,355,066	57,793	6,370,310	152,299		8,562,573
1922-23 ..	771,206	1,717,490	53,171	8,653,579	232,347		11,427,793

(iii) *Relation to Population.* In relation to population the areas of the vineyards of the several States show an upward tendency during the last five years, the Australian total increasing from 14 to 19 acres per 1,000 of the population during the period. Details for the seasons 1918-19 to 1922-23 are given in the succeeding table :—

VINEYARDS.—AREA PER 1,000 OF POPULATION, 1918-19 TO 1922-23.

Season.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Australia.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1918-19 ..	4	18	2	68	9	..	14
1919-20 ..	4	18	2	68	9	..	14
1920-21 ..	5	19	2	75	10	..	15
1921-22 ..	6	21	2	82	12	..	17
1922-23 ..	6	24	2	91	14	..	19

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, 1918-19 TO 1922-23.

Year.	Quantity.			Value.		
	Sparkling.	Other.	Total.	Sparkling.	Other.	Total.
	Gallons.	Gallons.	Gallons.	£	£	£
1918-19 ..	7,551	30,464	38,015	16,226	21,121	37,347
1919-20 ..	34,383	57,211	91,594	118,164	50,112	168,276
1920-21 ..	39,665	63,824	103,489	135,169	58,248	193,417
1921-22 ..	7,398	37,814	45,212	20,781	35,830	56,611
1922-23 ..	15,368	43,199	58,567	41,305	32,692	73,997

(ii) *Exports.* The principal countries to which wine is exported from Australia are the United Kingdom and New Zealand, a small but fairly regular export trade being also carried on with India, Ceylon, and the Pacific Islands. Details concerning the exports of wine from Australia during the past five years are given in the following table :—

WINE.—EXPORTS, AUSTRALIA, 1918-19 TO 1922-23.

Year.	Quantity.			Value.		
	Sparkling.	Other.	Total.	Sparkling.	Other.	Total.
	Gallons.	Gallons.	Gallons.	£	£	£
1918-19 ..	7,970	695,536	703,506	16,883	184,285	201,168
1919-20 ..	6,112	795,049	801,161	12,482	221,741	234,223
1920-21 ..	9,669	1,098,678	1,108,347	19,105	291,856	310,961
1921-22 ..	2,177	602,853	605,030	5,451	155,487	160,938
1922-23 ..	2,607	703,710	706,317	5,626	159,368	164,994

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, while, particularly in Victoria and South Australia, the drying of raisins and currants is also carried on. The quantities of table grapes grown in the several States during the past five seasons are as follows :—

TABLE GRAPES.—PRODUCTION, 1918-19 TO 1922-23.

Season.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Australia.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1918-19 ..	2,415	2,052	614	1,745	1,892	..	8,718
1919-20 ..	2,678	3,502	613	1,129	2,161	..	10,083
1920-21 ..	2,660	2,471	649	955	2,088	..	8,823
1921-22 ..	2,914	3,075	602	1,027	1,894	..	9,512
1922-23 ..	3,513	3,304	570	1,314	2,344	..	11,045

(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, 1918-19 TO 1922-23.

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.
1918-19 ..	3,496	2,450	135,060	68,234	29,662	59,834	2,163	2,157	170,381	132,675
1919-20 ..	7,084	2,465	211,307	55,661	58,502	80,400	3,923	5,090	280,816	143,616
1920-21 ..	4,445	2,469	116,887	62,919	39,534	65,307	7,308	5,856	168,177	136,551
1921-22 ..	6,696	4,189	190,451	75,042	66,083	76,534	6,790	6,371	270,020	162,136
1922-23 ..	11,253	5,768	285,520	98,081	69,261	96,807	6,748	9,250	372,782	209,906
Average 10 seasons 1913-23	7,892		159,852	64,136	47,164	62,142	3,239	3,563	347,988	

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,
1918-19 TO 1922-23.**

Year.	Oversea Imports.		Oversea Exports.		Net Exports.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
RAISINS.						
	lbs.	£	lbs.	£	lbs.	£
1918-19..	28,818	927	3,111,055	95,523	3,082,237	94,596
1919-20..	42,169	2,201	8,839,839	359,561	8,797,670	357,360
1920-21..	14,997	1,366	11,816,126	520,293	11,801,129	518,927
1921-22..	219,499	12,021	13,206,052	550,838	12,986,553	538,817
1922-23..	81,018	5,292	19,240,729	721,641	19,159,711	716,349
CURRANTS.						
1918-19..	19,909	505	3,470,803	100,326	3,450,894	99,821
1919-20..	2,877	120	7,947,811	246,382	7,944,934	426,262
1920-21..	3,573	300	5,994,580	208,743	5,991,007	208,443
1921-22..	3,577	102	10,941,175	344,238	10,937,598	344,136
1922-23..	3,236	90	14,502,772	404,184	14,499,536	404,094

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 £3,528,805, the average annual excess for the quinquennium being £705,761.

§ 15. Orchards and Fruit Gardens.

1. Progress of Cultivation.—(i) *Area.* Fruit-growing has made rapid progress in Australia during recent years, the area devoted thereto having increased in the past ten years by no less than 84,025 acres. The States in which the increase is most marked are :—Victoria, 26,711 acres ; New South Wales, 17,967 acres ; Tasmania, 14,970 acres ; and Queensland, 9,395 acres. During the same period the South Australian fruit-growing area increased by 8,500 acres, while that in Western Australia exhibited an increase of 6,463 acres. The total area under orchards and fruit gardens in the several States is given in the following table :—

ORCHARDS AND FRUIT GARDENS.—AREA, 1918-19 TO 1922-23.

Season.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Fed. Cap. Ter.	Australia.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1918-19 ..	67,432	85,130	24,250	30,085	20,412	37,424	18	264,751
1919-20 ..	72,802	86,336	24,636	30,617	19,815	37,687	1	271,894
1920-21 ..	75,904	87,768	26,927	31,364	19,570	37,013	5	278,551
1921-22 ..	75,746	89,491	28,035	32,295	19,012	36,565	5	281,149
1922-23 ..	73,134	86,014	29,431	33,003	19,405	34,689	11	275,687

(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, plum, orange, and apricot. In New South Wales, citrus fruits (orange, lemon, etc.) occupy the leading position, although apples, peaches, plums, pears and bananas are extensively grown. In Queensland, the banana, the pineapple, the orange, the apple, the peach, and the coconut are the varieties most largely cultivated. In South Australia, in addition to the apple, orange, apricot, peach, plum, and pear, the almond and the olive are extensively grown. In Western Australia, the apple, orange, pear, peach, plum, 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 AND YIELD, 1922-23.

Fruit.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	Fed. Cap. Ter.	Australia.
Apples .. acres	8,511	27,143	2,193	8,944	7,937	25,630	11	80,369
bushels	722,697	2,089,017	115,928	384,375	758,998	3,127,509	825	7,199,349
£	250,410	539,663	64,243	101,816	262,487	776,360	290	1,995,269
Apricots .. acres	1,486	4,117	86	2,566	522	1,450	..	10,227
bushels	163,382	290,876	2,948	268,152	40,224	112,823	..	878,405
£	68,400	94,535	2,616	92,787	19,861	20,210	..	298,409
Bananas .. acres	3,300	..	10,797	..	8	..	..	14,105
bushels	350,289	..	1,618,848	..	488	..	..	1,969,625
£	210,170	..	449,680	..	975	..	..	660,825
Lemons .. acres	2,215	1,186	360	415	378	..	..	4,554
bushels	231,396	109,347	24,012	53,483	45,713	..	..	463,951
£	63,630	43,738	12,006	16,045	12,571	..	..	147,990
Nectarines and bshls. { acres	7,048	9,361	2,210	2,695	993	70	..	22,377
bshls. {	709,240	981,701	90,472	231,926	71,447	5,709	27	2,115,105
Peaches .. acres	313,110	314,655	47,732	79,566	37,555	1,140	10	793,768
Oranges .. acres	18,095	3,292	2,543	3,603	2,415	..	..	29,948
bushels	1,743,938	259,330	282,174	411,508	201,809	..	..	2,898,759
£	760,330	142,631	142,263	164,603	73,213	..	..	1,283,040
Pineapples .. acres	36	..	4,195	..	..	..	..	4,231
dozen	4,863	..	895,372	..	..	..	..	900,235
£	2,430	..	179,074	..	..	..	..	181,504
Pears .. acres	2,827	8,605	274	1,861	1,054	1,930	..	16,551
bushels	203,334	666,631	8,822	125,353	106,827	204,297	10	1,315,274
£	75,866	133,326	6,065	38,443	29,823	73,000	4	356,527
Plums .. acres	3,367	4,343	1,008	1,840	689	540	..	11,787
bushels	242,794	258,117	33,743	123,211	61,406	58,765	10	778,046
£	91,576	40,869	28,119	38,538	21,364	11,260	4	231,730
Other fruits .. acres	3,184	6,924	2,518	3,614	726	2,740	..	19,706
£	173,228	188,454	92,684	91,958	24,664	146,780	12	717,780
Total .. acres	50,069	64,971	26,184	25,538	14,722	32,360	11	213,855
£	2,009,150	1,497,871	1,024,482	623,756	482,513	1,028,750	320	6,666,842

(iii) *Relation to Population.* The acreage of the orchards and fruit gardens of Australia in relation to population has shown a tendency to decrease during the past five years. The Australian figure for 1922-23 amounted to .040 acres per head,

whilst the range amongst the States varied from .034 in New South Wales to .158 acres in Tasmania. Details for orchards and fruit gardens for the years 1918-19 to 1922-23 are as follows :—

**ORCHARDS AND FRUIT GARDENS.—AREA PER 1,000 OF POPULATION,
1918-19 TO 1922-23.**

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.
1918-19 ..	34	59	34	66	66	184	..	8	52
1919-20 ..	36	57	33	64	61	180	..	0.5	51
1920-21 ..	36	57	36	64	59	174	..	3	51
1921-22 ..	36	58	36	64	57	167	..	2	51
1922-23 ..	34	54	37	64	56	158	..	4	49

2. Imports and Exports of Fruit.—(i) *General.* A considerable export trade in both fresh and dried fruits is carried on by Australia with overseas countries. The import trade in fresh fruits declined heavily during the past two 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, while the imports of dried fruits at present consist mainly of dates from Mesopotamia. The export trade, however, has greatly expanded during the past quinquennium, the value of the exports during 1922-23 amounting to £2,272,434. Apples constitute the bulk of the fresh fruits exported, although the export of citrus fruits is growing rapidly, 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 and peaches, are receiving attention from overseas, and in 1922-23 more than £100,000 was realized from these products.

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

FRESH FRUITS.—IMPORTS AND EXPORTS, AUSTRALIA, 1918-19 TO 1922-23.

Year.	Oversea Imports.		Oversea Exports.		Net Exports.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	lbs.	£	lbs.	£	lbs.	£
1918-19..	13,656,500	90,034	20,809,100	188,381	7,152,600	98,347
1919-20..	8,330,500	95,560	42,722,200	466,910	34,391,700	371,350
1920-21..	11,555,200	130,471	51,686,200	535,525	40,131,000	405,054
1921-22..	2,385,800	29,907	97,343,800	973,726	94,958,000	943,819
1922-23..	2,390,600	28,103	108,391,900	1,040,310	106,001,300	1,012,207

The value of the exports of apples in 1922-23 amounted to £843,543, and of citrus fruits to £127,086.

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

DRIED FRUITS (a).—IMPORTS AND EXPORTS, AUSTRALIA, 1918-19 TO 1922-23.

Year.	Oversea Imports.		Oversea Exports.		Net Exports.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	lbs.	£	lbs.	£	lbs.	£
1918-19..	1,806,333	53,594	8,524,587	253,040	6,718,254	199,446
1919-20..	9,444,713	234,811	18,034,391	643,670	8,589,678	408,859
1920-21..	7,362,341	168,076	19,598,672	806,134	12,236,331	638,058
1921-22..	6,036,379	132,392	25,955,733	969,457	19,919,354	837,065
1922-23..	10,957,699	189,397	36,047,962	1,232,124	25,090,263	1,042,727

(a) Including raisins and currants referred to under Vineyards, § 14, 4.

(iv) *Jams and Jellies.* The overseas trade in jams and jellies expanded considerably 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, there has been a heavy decline, and the value of the exports contracted to £79,396 in 1922-23. Particulars relative to imports and exports during each of the last five years are as follows:—

JAMS AND JELLIES.—IMPORTS AND EXPORTS, AUSTRALIA, 1918-19 TO 1922-23.

Year.	Oversea Imports.		Oversea Exports.		Net Exports.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	lbs.	£	lbs.	£	lbs.	£
1918-19..	78,329	2,294	79,277,560	1,847,970	79,199,231	1,845,676
1919-20..	179,480	9,913	44,793,409	1,218,997	44,613,929	1,209,084
1920-21..	379,401	14,543	16,535,335	550,403	16,155,934	535,860
1921-22..	184,993	8,437	5,640,579	164,046	5,455,586	155,609
1922-23..	151,572	8,253	2,605,554	79,396	2,453,982	71,143

(v) *Preserved Fruit.* Details concerning the quantities and values of preserved fruit imported into and exported from 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 1922-23 was £100,281, and the corresponding value of exports was £151,863.

§ 16. Minor Crops.

1. *General.*—In addition to the leading crops previously dealt with in some detail, there are many others which, owing either to their nature, or to the fact that their cultivation has advanced but little beyond the experimental stage, do not occupy so prominent a position. Some of the more important of these are included under the headings—Market Gardens, Pumpkins and Melons, Nurseries, Grass Seed, Tobacco, Flax, Hops, and Millet. Cotton-growing has recently received considerable attention in the tropical portions of Australia, and the prospects of establishing this industry on a large scale are very favourable. The total area in Australia during the season 1922-23, devoted to crops not dealt with in previous sections, was 79,720 acres, of which market gardens accounted for 28,383 acres, or nearly 36 per cent.

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, 1918-19 TO 1922-23.

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.
1918-19 ..	10,004	11,594	1,814	1,405	2,237	389	..	39	27,482
1919-20 ..	9,833	12,633	1,752	1,343	2,410	367	..	39	28,377
1920-21 ..	9,888	12,201	2,018	1,471	2,269	386	..	27	28,260
1921-22 ..	8,217	14,304	1,965	1,486	2,274	681	..	27	28,954
1922-23 ..	7,743	14,108	1,838	1,438	2,698	540	..	18	28,383

3. **Grass Seed.**—The total area under this crop during 1922-23, exclusive of New South Wales, for which State no figures as to area are available, was 3,875 acres, of which 2,224 acres were in Victoria, 1,066 acres in Queensland, and 523 acres in Tasmania. The total yield for 1922-23, including New South Wales, was 41,118 bushels, valued at £31,314.

4. **Tobacco.**—Tobacco-growing has experienced 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. This area has, however, been increased to 3,727 acres during the past two seasons, the principal expansion occurring in New South Wales, where 2,658 acres were cultivated in 1922-23 and 27,122 cwt. of good quality leaf was produced. The areas planted in Victoria and Queensland amounted to 890 and 179 acres respectively. Greater attention is now being paid to the proper treatment of the leaf, and flue-curing is becoming more general. Most of the leaf so treated in New South Wales during the past season averaged over 2s. per lb. 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 1922-23 amounted to £1,549,417, comprising unmanufactured tobacco £1,896,724, cigars £97,967, cigarettes £117,824, and snuff £1,262, while manufactured tobacco showed a balance in favour of exports amounting to £564,360.

5. **Pumpkins and Melons.**—The total area under this crop in Australia during 1922-23 was 11,484 acres, of which 2,457 acres were in New South Wales, 1,549 acres in Victoria, 6,543 acres in Queensland, 705 acres in Western Australia, 220 acres in South Australia, and 10 acres in the Northern Territory. The production in all the States amounted to 38,430 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 1922-23 being 1,741 acres, of which 1,545 acres were in Tasmania, 194 acres in Victoria, and 2 acres 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. On the other hand the Victorian area, which in 1901-2 was 307 acres, had diminished to 194 acres in 1922-23, although increased acreages have been planted during each of the last three years. 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 1922-23 the imports of hops exceeded the exports by 727,276 lbs., the excess value being £51,497.

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 a serious endeavour was 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 1922-23 to 590 acres which yielded 3,450 bushels of seed and 435 cwt. of fibre. An area of 125 acres was planted in New South Wales during 1922-23.

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, a good prospect exists 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 1922-23 was 4,036 acres, of which 2,463 acres were in New South Wales, 1,304 in Victoria, and 269 in Queensland. 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 1922-23 the areas in those States were 717, 996, 185, and 131 acres respectively.

10. **Cotton.**—The cultivation of cotton commenced 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 set-back to the new industry, and the area continuously declined 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 not at any 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 1½d. per lb.

Considerable interest has recently been manifested in cotton-growing, mainly as a result of the encouragement of the industry by the fixed advance of 5½d. per lb. for seed cotton of good quality for the three years ended 31st July, 1923. The Australian Cotton-Growing Association by establishing modern ginning-plants at convenient centres has also contributed to the flourishing condition of the industry.

The Department of Agriculture has introduced improved long-staple upland varieties, with a view to the production of cotton which will return a good aggregate yield and command also the highest price, while the Queensland Government, acting on expert advice, at first prohibited the growing of ratoon cotton, and ordered the destruction of the old shrubs and debris in the field, but has now relaxed the prohibition on the

following conditions :—All growers of ratoon cotton must be registered. The Government guarantee will not apply to it, but reasonable advances may be made from time to time. It must be ginned and marketed separately, and there is a heavy penalty for mixing it with plant cotton. A close season will obtain, and all stalks and debris must be destroyed.

The cotton plant requires sufficient moisture and warmth for germination, and sowings in the latter part of September or in October are mostly favoured by Queensland growers. Cotton planted in such months should, in normal seasons, commence opening up during the latter part of March and continue on until the end of June. Particulars of the cotton crop in Queensland during the last six years are as follows :—

COTTON.—AREA AND YIELD, QUEENSLAND, 1919 TO 1924.

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 (b)	..	..	..	..	..	40,000	11,784,510
1924 (b)	..	..	..	..	..	(c)	14,000,000

(a) Area harvested.

(b) Estimated.

(c) Not available.

The figures given above show the development which has taken place during the past four years, and present indications point to the ultimate establishment of cotton-growing on a large scale in Australia.

The guarantee for the 1924 crop has been fixed at 5d. per lb. for cotton of less than 1½ inch staple, and at 5½d. per lb. for cotton of a longer staple.

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 1922-23 only 21 acres were recorded, with a yield of 9,368 lbs.

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

§ 17. Bounties on Agricultural Products.

1. **General.**—The Bounties Acts of 1907 and 1912, passed by the Federal Parliament with the object of encouraging the manufacture and production of certain articles in Australia, included among the items on which bonuses were payable the following agricultural products :—Cotton, fibres, rice, coffee, tobacco, and dried fruits, except currants and raisins. The rates and dates of expiry of the bounties were shown in previous issues of the Year Book. Though the bonuses were fairly liberal, they were not availed of to any great extent. An Act was passed early in 1924 to provide for the payment of bounties on the production of canned apricots, peaches, pears and pineapples during 1924, and on the export thereof before 28th February, 1925.

§ 18. 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 necessity 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 during the last few years, but considerable quantities are still imported. Imports of fertilizers have increased over 100 per cent. since 1901. The chief items, as regards both quantity and value, are phosphates, a fertilizer which has proved itself very suitable for the growing of cereals in Australian soils. During 1922-23 the values of rock phosphates imported represented over 65 per cent. of the total importation of fertilizers. Nauru, with 55 per cent., was the largest contributor, Gilbert and Ellice Islands Colony coming next with 32½ per cent., while the remainder was supplied by Christmas Island. Practically all of the soda nitrate came from Chile.

The imports of artificial manures during the last five years are given in the following table. Apart from small parcels in 1921-22 and 1922-23, no importations of manufactured superphosphates were made during the last five years, although considerable quantities were annually imported up till 1914-15.

FERTILIZERS.—IMPORTS, AUSTRALIA, 1918-19 TO 1922-23.

Fertilizer.				1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
Bonedust	..	..	cwt.	2,004	1,508	1,260	910	..
"	..	..	£	785	1,420	652	556	..
Guano	..	..	cwt.	137,008	535,688	1,129,240	704,039	857,411
"	..	..	£	17,304	61,021	124,193	72,892	97,526
Superphosphates	..	..	cwt.	..	..	..	1,034	1,007
"	..	..	£	..	..	..	1,145	660
Rock Phosphates	..	..	cwt.	2,811,812	2,585,163	4,756,140	3,255,808	3,390,089
"	..	..	£	334,036	330,544	721,608	553,109	516,059
Soda Nitrate	..	..	cwt.	38,483	130,914	99,660	50,214	143,274
"	..	..	£	30,767	84,398	84,532	38,409	96,083
Other	..	..	cwt.	520	61,454	169	42,063	175,778
"	..	..	£	488	75,116	1,792	33,561	80,720
Total				2,989,827	3,314,727	5,986,469	4,054,068	4,567,559
				£ 383,380	552,499	932,777	699,672	791,048

4. Exports.—The subjoined table shows the exports of artificial manures for the years 1918-19 to 1922-23. 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, 1918-19 TO 1922-23.

Fertilizer.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
Bonedust cwt.	34,722	131,710	59,680	33,311	54,385
" £	18,516	74,036	40,926	18,517	24,400
Guano cwt.	8,669	601	..	..	..
" £	2,775	181	..	..	..
Superphosphates .. cwt.	345,493	264,174	472,860	26,727	73
" £	95,623	67,288	153,060	6,284	35
Rock phosphates .. cwt.	44,032	72,462	186,260	12,900	..
" £	6,773	11,775	25,763	1,960	..
Soda nitrate cwt.	60	28,223	2,720	5,790	600
" £	84	28,673	3,640	5,717	715
Ammonia sulphate .. cwt.	196,954	167,420	123,720	155,414	68,799
" £	350,098	226,289	160,017	105,472	58,571
Other cwt.	21,486	158,661	41,320	24,525	34,323
" £	11,008	108,926	25,190	11,956	15,816
Total cwt.	651,416	823,251	886,560	258,667	158,180
" £	484,877	517,168	408,596	149,906	99,537

5. Statistics of Use of Fertilizers.—Statistics regarding the use of manures are collected in all the States, and the particulars for 1922-23 are as follows:—

FERTILIZERS USED IN EACH STATE, 1922-23.

State.	Total Area of Crops.	Area Manured.		Manure Used.	
		Aggregate.	Percentage of Total Area of Crops.	Natural (Stable Yard, etc.).	Artificial.
	Acres.	Acres.	%	Loads.	Tons.
New South Wales ..	4,694,287	2,409,725	51.33	181,656	62,145
Victoria	4,862,548	4,148,780	85.32	173,343	172,897
Queensland	835,060	42,677	5.11	60,396	11,673
South Australia ..	3,575,452	3,101,593	86.75	111,893	114,158
Western Australia ..	2,274,998	2,231,738	98.10	63,789	86,000
Tasmania	298,611	196,921	65.95	25,527	16,789
Northern Territory ..	427	40	9.37	200	..
Fed. Cap. Territory ..	2,172	357	16.44	..	11
Total	16,543,555	12,131,831	73.33	616,804	463,673

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

FERTILIZERS USED IN AUSTRALIA, 1918-19 TO 1922-23.

Year.	Total Area of Crops.	Area Manured.		Manure Used.	
		Aggregate.	Percentage of Total Area of Crops.	Natural (Stable Yard, etc.).	Artificial.
	Acres.	Acres.	%	Loads.	Tons.
1918-19	13,332,393	9,292,358	69.70	555,222	313,444
1919-20	13,296,407	9,278,296	69.78	562,545	329,489
1920-21	15,069,858	10,290,633	68.29	556,514	375,600
1921-22	15,357,024	10,999,259	71.62	582,725	408,742
1922-23	16,543,555	12,131,831	73.33	616,804	463,673

The percentage of the area manured on the total area cultivated has advanced from 69.70 to 73.33 during the past five years, while the use of artificial manures has increased by 150,000 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.

§ 19. 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 1918-19 to 1922-23 are given in the following table :—

ENSILAGE MADE, 1918-19 TO 1922-23.

State or Territory.	1918-19.		1919-20.		1920-21.		1921-22.		1922-23.	
	Holdings.	Ensilage Made.	Holdings.	Ensilage Made.	Holdings.	Ensilage Made.	Holdings.	Ensilage Made.	Holdings.	Ensilage Made.
	(a) No.	(a) Tons.	(a) No.	(a) Tons.	(a) No.	(a) Tons.	(a) No.	(a) Tons.	(a) No.	(a) Tons.
New South Wales ..	60	6,292	112	13,328	118	15,633	166	24,174	116	12,191
Victoria ..	95	8,249	74	6,072	99	9,702	107	5,873	103	5,674
Queensland ..	45	3,541	72	4,318	164	7,600	96	6,575	65	5,300
South Australia ..	16	1,083	15	1,435	25	1,616	26	1,849	26	2,595
Western Australia ..	11	441	5	211	12	390	7	381	12	331
Tasmania ..	7	180	7	275	11	490	10	544	12	437
Northern Territory ..	1	50	..	..	..	..	..	..	..	..
Total ..	235	19,836	285	25,639	429	35,431	412	39,396	334	26,528

(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. A substantial increase took place in 1915-16, both in the holdings on which ensilage was made and in the quantity produced, but during the next three years the production declined, particularly in Victoria. From 1918-19 on satisfactory increases were recorded until 1922-23, when nearly 13,000 less tons were made than in the previous year, New South Wales being mainly responsible for the reduction.

§ 20. 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 as 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 nature 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.