

AGRICULTURE.

TAKEN as a whole, Australasia may be said to be in the first phase of agricultural settlement; indeed, several States have not yet emerged from the pastoral stage. Nevertheless the value of agricultural produce, estimated at farm prices, is considerable, and amounts to over 50 per cent. of the value of the pastoral and dairy produce. The return from agriculture in each State for the season 1901-2 was approximately as shown below :—

State.	Total value of Crops.	Average Value of Produce per acre.	Proportion of Total Value.
	£	£ s. d.	per cent.
New South Wales	6,687,000	2 18 9	21·33
Victoria	8,625,000	2 18 2	27·51
Queensland	2,457,000	5 1 8	7·84
South Australia	3,712,000	1 13 2	11·84
Western Australia.....	861,000	3 19 5	2·75
Tasmania.....	1,493,000	6 8 5	4·76
Commonwealth	23,835,000	2 16 8	76·03
New Zealand	7,515,000	4 17 3	23·97
Australasia	31,350,000	3 2 11	100·00

From this estimate it would seem that the value of crops per acre cultivated is much larger in Queensland and Tasmania than in the other States, a fact which is due to the proportionately large area under sugarcane in the former State, while in Tasmania the area devoted to fruit and hops, and the larger returns of cereals, account for the high average per acre which that province shows; in Western Australia, where the greater part of the produce consumed is imported, prices are higher than in the eastern States, and the small area devoted to the plough returns on an average a better price per acre than in the States where agriculture has received greater attention. In point of gross value, Victoria occupies the first position among the members of the group, the produce of that province having a value considerably in excess of one-fourth of that of all Australasia. The high position occupied by Victoria is in great

measure due to the large return from gardens and orchards, the value of production from this source alone being upwards of £1,470,000, or more than double the return in New Zealand, and over three times higher than that of New South Wales. New Zealand also produces nearly one-fourth of the total, and New South Wales over one-fifth. The value of the principal crops, and the percentage of each to the total production, are given in the following statement :—

Name of Crop.	Value.	Proportion to Total.
	£	per cent.
Wheat	7,472,000	23·8
Maize	1,364,000	4·4
Barley	414,000	1·3
Oats	3,383,000	10·8
Hay	7,837,000	25·0
Grass seed	176,000	0·6
Potatoes	2,534,000	8·1
Grapes	1,071,000	3·4
Hops	54,000	0·2
Tobacco.....	10,000	.....
Sugar-cane	585,000	1·9
Orchards and Gardens	2,554,000	8·1
Green forage.....	1,121,000	3·6
Minor crops (other grain, root, &c.)...	2,775,000	8·8
Total.....	31,350,000	100·0

The principal crop is hay, which returned 25 per cent. of the total value, wheat coming next with 23·8 per cent. Minor crops returned large sum of £2,775,000—8·8 per cent.—to which, New Zealand alone contributed £2,219,000, the high value of the production in that province being due to the fact that there is an area of considerably over half a million acres devoted to the cultivation of turnips and other root crops, which are grown mostly as food for sheep.

The average value of agricultural produce per head of population in each of the Australasian provinces during the season 1901-2 is represented by the figures given below. It will be seen that South Australia shows the highest value, followed in order by New Zealand, Tasmania, Victoria, and New South Wales. Queensland occupies the lowest position with a value of less than half that of South Australia. Comparisons of this kind are however somewhat misleading, as the main

consideration is the extent of employment afforded by the industry and the return to the persons engaged therein.

State.	Average value per head.		
	£	s.	d.
New South Wales	4	17	6
Victoria	7	3	5
Queensland	4	13	6
South Australia	10	4	6
Western Australia	4	11	10
Tasmania	8	12	0
Commonwealth	6	5	4
New Zealand	9	12	11
Australasia	6	16	10

Below will be found the value of the agricultural production of the Commonwealth and New Zealand in the years 1871, 1881, and 1891. Comparing these figures with those for 1901 given above, it will be seen that while the total production of Australasia is now over £11,000,000 more than in 1881, the average value per head has declined nearly 6 per cent., and that, as compared with 1891, the value per head shows an increase of £1 2s. 4d. As subsequent tables will show, a decrease in prices, and not want of productiveness, was responsible for the decline in value since 1881. The fall in prices, especially the prices of wheat, was very rapid down to 1895; for the next three years there was a very material increase, in 1899 they fell again to the 1895 level, but in 1901 there was a more or less general increase.

State.	1871.	1881.	1891.
	£	£	£
New South Wales	2,220,000	3,830,000	3,584,500
Victoria	3,300,000	5,894,000	7,009,100
Queensland	650,000	1,283,000	1,414,000
South Australia	1,789,000	3,283,000	3,045,000
Western Australia	258,000	248,000	380,900
Tasmania	724,000	981,000	1,046,500
Commonwealth	8,941,000	15,519,000	16,480,000
New Zealand	1,955,000	4,650,000	5,518,000
Australasia } Total	10,896,000	20,169,000	21,998,000
Australasia } Per head ...	£ s. d. 5 12 8	£ s. d. 7 5 3	£ s. d. 5 14 6

Compared with the principal countries of the world, Australasia does not take a high position in regard to the gross value of the produce of its tillage, but in value per inhabitant it compares fairly well; indeed,

some of the provinces, such as South Australia, New Zealand, and Tasmania, show averages which surpass those of the leading agricultural countries. This may be partly seen from the following table, which gives approximately for 1891-95 the value of agricultural production in the principal countries of the world, with the average amount per head of population :—

Countries.	Value in millions.	Per head.	Countries.	Value in millions.	Per head.
United Kingdom	£ 126	£ 3·2	Holland	£ 18	£ 4·0
France	284	7·3	Belgium	29	4·6
Germany	262	5·1	Switzerland	9	3·0
Russia	370	3·5	United States	487	7·7
Austria	210	5·7	Canada	33	6·9
Italy	141	4·6	Cape Colony	2	1·3
Spain	94	5·5	Argentina	24	6·0
Portugal	18	4·0	Uruguay	2	2·7
Sweden	20	4·9			
Norway	3	1·7			
Denmark	19	8·6	Australasia (1901) ...	31	6·2

AREA UNDER CULTIVATION.

The following figures, giving the total extent of land in cultivation in each of the Commonwealth States and New Zealand at different periods since the year 1861, will serve to illustrate the progress which agriculture has made. In this table, and in the others which follow, the years 1861, 1871, 1881, 1891, and 1901 embrace the period from the 1st April in each of those years to the 31st March in the following year :—

State.	1861.	1871.	1881.	1891.	1901.
	acres.	acres.	acres.	acres.	acres.
New South Wales.....	265,389	390,099	578,243	846,383	2,276,628
Victoria	410,406	851,354	1,435,446	2,116,654	2,965,681
Queensland	4,440	59,969	117,664	242,629	483,460
South Australia.....	400,717	837,730	2,156,407	1,927,689	2,236,552
Western Australia	24,705	51,724	53,353	64,209	216,824
Tasmania	163,385	155,046	148,494	168,121	232,550
Commonwealth	1,269,042	2,345,922	4,489,607	5,365,685	8,411,695
New Zealand	68,506	337,282	1,070,906	1,424,777	1,545,683
Australasia.....	1,337,548	2,683,204	5,560,513	6,790,462	9,957,378

Taking Australasia as a whole, it will be seen that the area under crop is now over seven times as large as it was in 1861. If, however, the land artificially grassed be included, the total will come to 22,592,000

acres, or nearly seventeen times the area in cultivation in 1861. A comparison of the acreage under crop on the basis of population, and may perhaps best serve to give an idea of the progress of agriculture, and this is shown in the table given below. South Australia still holds, as it has done for many years, the first position, followed at a long interval by Victoria and New Zealand.

State.	1861.	1871.	1881.	1891.	1901.
	acres.	acres.	acres.	acres.	acres.
New South Wales.....	0·7	0·8	0·8	0·7	1·7
Victoria	0·8	1·1	1·7	1·8	2·6
Queensland.....	0·1	0·5	0·5	0·6	1·0
South Australia.....	3·2	4·5	7·5	5·9	6·2
Western Australia	1·6	2·0	1·8	1·2	1·2
Tasmania	1·8	1·5	1·2	1·1	1·3
Commonwealth	1·1	1·4	2·0	1·6	2·2
New Zealand	0·7	1·3	2·1	2·2	2·1
Australasia.....	1·1	1·4	2·0	1·7	2·2

For the whole of Australasia the increase of agriculture as compared with population is shown in the following table:—

Increase of—	1861-71.	1871-81.	1881-91.	1891-1901
	per cent.	per cent.	per cent.	per cent.
Acreage under crop.....	100·6	107·2	22·1	47·6
Population	55·6	43·2	38·1	21·3

Although during the period of forty-one years the population of Australasia was nearly quadrupled, the area of land devoted to agriculture increased almost eightfold, and the rate of agricultural progress was more than twice that of the population. The chief progress was made during the twenty years from 1861 to 1881, and the ten years from 1891 to 1901. During the intervening period from 1881 to 1891 the population increased nearly twice as rapidly as the agricultural industry.

The progress in the seventies is what naturally might be expected, as the gold fever had altogether subsided about the end of the first period, and a large portion of the population was seeking employment of a more settled nature than was afforded by the gold-fields. It was not to be anticipated that the same rate of progress could be maintained, and the comparative decline in the eighties may be accounted for by the fact that most of the best land had been taken up. The earnest attempts of the State to assist the agriculturist in obtaining land on easy terms,

The position in which each of the principal agricultural products stood in relation to the total area under crop in Australasia, at various periods since the year 1861, may be ascertained from the following table. The figures should, however, be taken in conjunction with those giving the actual areas cultivated, for a decline in the proportion of land under any particular crop does not necessarily mean a falling-off in the area devoted to that product; on the contrary, in few instances has there been any actual retrogression. It is satisfactory to observe that there is a greater proportionate increase in the cultivation of the more valuable crops, and that, despite checks from causes due to unfavourable seasons, the area devoted to vines, sugar-cane, and "other crops" formed 15·3 per cent. of the whole in 1901, as compared with 8·6 per cent. in 1861:—

Product.	1861.	1871.	1881.	1891.	1901.
	per cent.	per cent.	per cent.	per cent.	per cent.
Wheat	53·6	51·4	60·7	55·0	52·7
Oats	10·6	13·5	7·9	8·4	8·7
Maize	4·6	5·3	3·0	4·3	3·3
Barley	2·2	2·3	1·9	1·4	1·0
Potatoes	4·2	3·0	1·8	2·0	1·4
Hay	16·2	11·9	15·1	16·0	17·6
Vines.....	0·5	0·7	0·3	0·7	0·6
Sugar-cane .....	.....	0·5	0·7	1·1	1·3
Other crops	8·1	11·4	8·6	11·1	13·4
Total	100·0	100·0	100·0	100·0	100·0

WHEAT.

With the exception of Queensland and Western Australia, all the States now produce sufficient wheat for their own requirements, and in good seasons there is a large and steadily increasing balance available for export, which finds a ready market in Great Britain, where Australian wheat is well and favourably known. For the season 1901-2, although a larger area was sown than at any previous period, protracted drought, coupled with unseasonable rainfall, had the effect of greatly curtailing

the production. Taking Australasia as a whole, there was a net export of breadstuffs, during 1901, equivalent to 24,770,592 bushels of grain, valued at £3,096,000.

The subjoined table shows the progress of wheat-growing during the period of the last forty-one years :—

State.	1861.	1871.	1881.	1891.	1901.
	acres.	acres.	acres.	acres.	acres.
New South Wales	123,468	154,030	221,888	356,666	1,392,070
Victoria	196,922	334,609	926,729	1,332,683	1,754,417
Queensland	392	3,024	10,958	19,306	87,232
South Australia	310,636	692,508	1,758,781	1,552,423	1,743,452
Western Australia	13,584	25,697	21,951	26,866	93,707
Tasmania	58,823	63,332	51,757	47,584	44,084
Commonwealth.....	703,825	1,273,200	3,002,064	3,335,528	5,114,962
New Zealand	29,531	108,720	365,715	402,273	163,462
Australasia	733,356	1,381,920	3,367,779	3,737,801	5,278,424

It will be seen that, during the twenty years extending from 1861 to 1881, all the States, with the exception of Tasmania, made considerable additions to the area under wheat, the increase for the whole of Australasia being 2,634,423 acres, or an advance of 359 per cent. From 1881 to 1901 the extension of this form of cultivation has not been so general, most of the increase in area having taken place during the last few seasons, in consequence of the rise in the prices of wheat which was taken advantage of by the agriculturists of all the States, excepting South Australia and Tasmania, where there were decreases in acreage, although this was partly due to the unfavourable seasons. In New Zealand, the adverse weather conditions were responsible for a falling off in the area cut for grain amounting to over 200,000 acres. In Australasia, as a whole, the increase in area since 1881 amounts to 1,910,645 acres—but while New South Wales shows an extension of cultivation during the period amounting to 1,170,182 acres, and Victoria an increase of 827,688 acres, the total increase was considerably reduced by the falling off mentioned above. At present more than one-half of the land in cultivation is devoted to wheat-growing, and in an ordinary season the produce of 750,000 acres is available for export to Europe.

The production of wheat during the period covered by the preceding table was as follows :—

State.	1861.	1871.	1881.	1891.	1901.
	bushels.	bushels.	bushels.	bushels.	bushels.
New South Wales	1,606,034	2,229,642	3,405,966	3,963,668	14,808,705
Victoria	3,607,727	4,500,795	8,714,377	13,629,370	12,127,382
Queensland	5,880	36,288	39,612	392,309	1,692,222
South Australia	3,410,756	3,967,079	8,087,032	6,436,488	8,012,762
Western Australia	160,155	345,368	153,657	288,810	933,101
Tasmania	1,380,913	847,962	977,365	930,841	963,667
Commonwealth.....	10,171,465	11,927,134	21,378,009	25,641,486	38,537,834
New Zealand.....	772,531	2,448,203	8,297,890	10,257,738	4,046,589
Australasia	10,943,996	14,375,337	29,675,899	35,899,224	42,584,423

The severe drought which prevailed over the greater part of Australasia caused the wheat crop of 1901 to fall far below expectations, and it is estimated that the harvest was affected to the extent of over seventeen million bushels. In New Zealand the dry weather was succeeded by heavy rains, which lasted in some districts right through the harvest, and rendered the grain unfit for milling.

The greatest increase in production is shown by New South Wales, which in 1901 produced nearly eleven million bushels more than in 1891, and from the following statement, which gives the proportion of the total crop produced by each State in 1881, 1891, and 1901, the progress made by New South Wales will be evident, for whereas in 1881 and 1891 it only produced 11 per cent. of the total crop, in 1901 it produced nearly 35 per cent. Victoria and New Zealand show the largest declines, the proportions falling from 38 per cent. and 28·6 per cent. in 1891 to 28·5 per cent. and 9·5 per cent. respectively in 1901 :—

State.	1881.	1891.	1901.
	per cent.	per cent.	per cent.
New South Wales	11·5	11·0	34·8
Victoria	23·4	38·0	28·5
Queensland	0·1	1·1	3·9
South Australia	27·2	17·9	18·8
Western Australia	0·5	0·8	2·2
Tasmania.....	3·3	2·6	2·3
New Zealand	28·0	28·6	9·5
Australasia.....	100·0	100·0	100·0

As producers of wheat, these States are of little account when viewed in comparison with the great wheat-producing countries of the world, Australasian grown wheat forming only 2·2 per cent. of the world's wheat crop. According to the estimate published by the United States Department of Agriculture, the production of wheat in Europe, America, Asia, and Africa in 1900 was 2,477,688,000 bushels, which, with the 54,879,000 bushels yielded by Australasia, gives the world's production as 2,532,567,000 bushels. The figures for each country are appended, the production being represented in Imperial bushels:—

Country.	Bushels.	Country.	Bushels.
Europe—		Africa—	
Russia	312,000,000	Algeria	18,000,000
France	296,000,000	Egypt	12,000,000
Hungary	144,800,000	Tunis	8,000,000
Germany	156,000,000	Cape Colony	4,000,000
Italy	116,000,000		
Spain	102,000,000	Total	42,000,000
United Kingdom	54,400,000		
Austria	40,800,000	America—	
Roumania	54,000,000	United States	544,000,000
Bulgaria	40,000,000	Argentine Republic..	72,000,000
Turkey	32,000,000	Canada	48,000,000
Belgium	12,000,000	Mexico	16,000,000
Servia	12,000,000	Chili	8,000,000
Portugal	4,000,000	Uruguay	16,000,000
Sweden and Norway..	4,000,000		
Holland	4,000,000	Total	704,000,000
Switzerland	4,000,000		
Denmark	4,000,000	Australasia—	
Greece	6,000,000	Victoria	17,847,000
Total	1,398,000,000	New South Wales ...	16,174,000
		New Zealand	6,527,000
Asia—		South Australia	11,253,000
India	184,000,000	Tasmania	1,110,000
Russia in Asia	48,000,000	Western Australia ...	774,000
Turkey	56,000,000	Queensland	1,194,000
Japan	19,388,000		
Persia	24,000,000	Total	54,879,000
Cyprus	2,300,000		
Total	333,688,000	Grand Total	2,532,567,000

The yield of wheat per acre during the season 1901-2 ranged from 4·6 bushels in South Australia to 24·8 bushels in New Zealand, and, with the exception of Victoria, Western Australia, and New Zealand, was

above the average for the last ten years. The average yield per acre for each State for 1901 and during the ten years 1892-1901 are shown below :—

State.	Average Yield per acre.	
	1901.	1892-1901.
	bushels.	bushels.
New South Wales	10·6	10·1
Victoria	6·9	7·7
Queensland	19·4	15·2
South Australia	4·6	4·4
Western Australia	9·9	10·5
Tasmania	21·9	19·4
Commonwealth	7·5	7·3
New Zealand	24·8	25·7
Australasia	8·1	8·5

A yield of 8·5 bushels per acre is a very small one when compared with the following results obtained in some of the principal wheat-growing countries of the world. The averages shown are mostly based on the yields during the six years 1894-99 :—

Country.	Average Yield per acre.	Country.	Average Yield per acre.
	bushels.		bushels.
United Kingdom	31·2	United States	13·0
Germany.....	26·1	India	12·1
France.....	18·9	Russia	9·3
Hungary.....	16·8	Argentine Republic ...	9·3

A bare statement of averages, however, is somewhat misleading. In South Australia, for example, it is found that owing to favourable conditions of culture a yield of 7 bushels is financially as satisfactory a crop as one of 15 bushels in New South Wales or of 20 bushels in New Zealand. In these States the yield could be greatly increased if cultivation of a more scientific character were adopted. Progress in this direction is being made yearly, however; but not to the extent which should prevail, although the tendency in former years simply to put the seed in the ground and await results has been outgrown.

The total value of the wheat crop for 1901-2 and the value of the return per acre in each State and in New Zealand are shown below :—

State.	Value of Production.	Value per Acre.
	£	£
New South Wales	2,525,900	1 16 3
Victoria	2,071,800	1 3 7
Queensland	333,400	3 17 7
South Australia	1,502,400	0 17 3
Western Australia.....	211,100	2 5 0
Tasmania	180,700	4 2 0
Commonwealth	6,830,300	1 6 8
New Zealand	741,900	4 10 9
Australasia	7,572,200	1 8 8

The very high value returned in New Zealand is due to the heavy yield of grain, the area under cultivation being small and specially selected; the values in Tasmania and Queensland also appear high for similar reasons, while in Western Australia the value of production was increased by the high prices obtained for wheat during portion of the year.

A detailed table of the value of the yield per acre during each of the last twelve years is shown below for the three principal wheat-growing states—New South Wales, Victoria, and South Australia. The values are estimated on the basis of the market rates ruling in February and March of each year. It will be seen that a considerable decline took place between 1891 and 1895, due for the most part to the fall in prices rather than to any decrease of production. The effect of the rise in prices is seen in the more satisfactory results in New South Wales during the seasons ending March, 1896, 1897, and 1898; for Victoria and South Australia the drought is largely responsible for the low values in those years :—

Year ending March.	Average Yield per acre.			Value of Average Yield per acre.		
	New South Wales.	Victoria.	South Australia.	New South Wales.	Victoria.	South Australia.
	bushels.	bushels.	bushels.	£ s. d.	£ s. d.	£ s. d.
1891	10·9	11·1	5·6	2 0 10	1 19 9	0 19 7
1892	11·1	10·3	4·3	2 2 6	2 2 3	0 17 11
1893	15·1	11·0	6·1	2 5 2	1 14 0	0 19 3
1894	11·0	10·4	7·9	1 10 1	1 0 1	0 18 4
1895	10·9	8·3	4·9	1 4 6	0 13 6	0 8 0
1896	8·7	4·0	4·2	1 17 0	0 17 9	0 19 10
1897	10·2	4·5	1·7	2 3 5	1 3 8	0 8 7
1898	10·6	6·4	2·6	2 4 2	1 6 2	0 11 3
1899	7·0	9·1	4·9	0 19 0	0 19 9	0 13 7
1900	9·5	7·0	4·6	1 5 0	0 18 9	0 12 4
1901	10·6	8·9	5·9	1 6 9	1 1 0	0 16 2
1902	10·6	6·9	4·6	1 16 3	1 3 7	0 17 3

The rates just given, as well as elsewhere in this chapter, represent farm prices, and not values at the place of consumption.

The average consumption of wheat per head of population in each of the six States and in New Zealand for the last decade was as stated below. The large proportion of adult male population in Western Australia accounts for the high figures for that province:—

	Bushels.
New South Wales	5·9
Victoria	5·2
Queensland	5·6
South Australia	6·3
Western Australia	8·6
Tasmania	7·2
New Zealand	7·7

For the whole of Australasia, the average consumption was 6·2 bushels per head, which is larger than the quantity consumed in any other part of the world for which records are available, with the exception of France and Canada.

The following table shows the net imports or exports of wheat and flour of each of the States during the year 1901, 1 ton of flour being taken as equal to 50 bushels of grain. The exporting States are New South Wales, Victoria, South Australia, New Zealand, and Tasmania. Since 1896, New South Wales has almost been able to supply the wheat required for the food of its inhabitants, and in 1901 exported over 7,700,000 bushels. During the last few years Tasmania also produced enough wheat for home consumption, and had a small surplus, available for export:—

State.	Net Imports.	Net Exports.
	bushels.	bushels.
New South Wales	7,702,072	7,702,072
Victoria	10,183,350	10,183,350
Queensland	1,820,525	.....
South Australia .....	.....	9,565,910
Western Australia	884,709	.....
Tasmania .....	.....	24,494
Commonwealth .....	.....	24,770,592
New Zealand .....	.....	2,363,130
Australasia .....	.....	27,133,722

The records for the six States which form the Commonwealth show that since 1879 there were only four years during which they were forced to import wheat from places outside their boundaries. These years were 1886, 1889, 1896, and 1897. In the first-named year the wheat crop was a partial failure in Victoria and South Australia, and almost a complete failure in New South Wales and Queensland. In 1889 there was a general failure in New South Wales and Victoria. In 1896 the crop failed in Victoria, and in the following year, that State for the first time in twenty-two years was compelled to import wheat, the net import, however, being only 61,160 bushels. The following statement gives the figures for the Commonwealth for the twenty years since 1882 :—

Year.	Wheat Crop.	Net Export of Breadstuffs.	Year.	Wheat Crop.	Net Export of Breadstuffs.
	bushels.	bushels.		bushels.	bushels.
1882	21,378,009	5,751,130	1892	25,675,265	4,126,538
1883	21,492,505	4,742,290	1893	32,759,693	8,829,941
1884	35,714,456	17,130,843	1894	36,929,947	11,916,782
1885	30,559,060	11,583,644	1895	30,855,812	6,774,377
1886	20,165,988	(—) 603,532	1896	19,557,726	(—) 4,347,168
1887	28,899,220	4,265,924	1897	20,880,479	(—) 3,641,306
1888	35,930,697	10,643,673	1898	28,241,409	1,341,596
1889	19,757,509	(—) 2,107,136	1899	41,417,853	11,581,198
1890	34,039,289	8,836,170	1900	48,353,402	13,965,610
1891	27,118,259	10,646,298	1901	38,537,834	24,770,592

(—) denotes excess of imports.

In ordinary seasons Australasia ranks about sixth amongst the exporting countries; still, its contribution to the world's markets does not form more than one-thirtieth of the demand, and it cannot, therefore, be said to form a factor of any consequence in the trade.

The United Kingdom is the largest importer of wheat, and the British demand largely influences the price throughout the world. The average London prices per quarter of 8 bushels during the last decennial period were as follow :—

Year.	Price per quarter.	Year.	Price per quarter.
	s. d.		s. d.
1892	30 3	1897	30 2
1893	26 4	1898	34 0
1894	22 10	1899	25 8
1895	23 1	1900	26 11
1896	26 2	1901	26 8

OATS.

The cultivation of oats, which come next to wheat in importance as a grain crop, is increasing in Australasia, as the following figures show:—

State.	1861.	1871.	1881.	1891.	1901.
	acres.	acres.	acres.	acres.	acres.
New South Wales.....	7,224	13,795	16,348	12,958	32,245
Victoria	91,061	175,944	146,995	190,157	329,150
Queensland	69	131	88	715	1,535
South Australia	1,638	3,586	3,023	12,637	34,660
Western Australia	507	1,474	827	1,301	9,641
Tasmania	29,022	29,631	27,535	28,360	54,089
Commonwealth.....	129,521	224,561	194,816	246,128	461,320
New Zealand.....	15,872	139,185	243,387	323,508	405,924
Australasia.....	145,393	363,746	438,203	569,636	867,244

During 1900 there was a considerable increase in cultivation of oats, owing to the demand for this cereal created by the South African war. The colony of New Zealand furnishes considerably more than one-half of the production. In New South Wales the cultivation has been comparatively neglected; in Victoria and Tasmania, however, it is next to wheat in importance; whilst in Queensland, South Australia, and Western Australia the climate is ill-adapted to the cultivation of oats, and the yield is small and counts for very little in the total production of the grain. The total yield in each state for the period covered by the preceding table was as follows:—

State.	1861.	1871.	1881.	1891.	1901.
	bushels.	bushels.	bushels.	bushels.	bushels.
New South Wales ...	152,426	280,887	356,566	276,259	687,179
Victoria	2,136,430	3,299,889	3,612,111	4,412,730	6,724,900
Queensland .....	.....	.....	1,121	16,669	42,208
South Australia ...	33,160	38,894	32,219	80,876	469,254
Western Australia...	8,162	28,330	8,270	18,539	158,638
Tasmania	751,475	593,477	783,129	873,173	1,702,659
Commonwealth ...	3,081,653	4,241,477	4,793,416	5,678,246	9,784,838
New Zealand	512,665	3,726,810	6,924,848	11,009,020	15,045,233
Australasia	3,594,318	7,968,287	11,718,264	16,687,266	24,830,071

The average yield per acre in each State in 1901, and during the ten years 1892-1901 are shown below :—

State.	Average yield per acre.	
	1901.	1892-1901.
	bushels.	bushels.
New South Wales	17·7	19·7
Victoria	20·4	20·1
Queensland	27·5	19·0
South Australia	13·5	9·8
Western Australia	16·5	16·6
Tasmania	31·5	29·0
Commonwealth	21·2	20·5
New Zealand	37·1	34·7
Australasia	28·6	27·6

In all the provinces which grow oats to any extent the yield last year was above the decennial average. New Zealand had the very high average of 37 bushels per acre, which compares very favourably with the averages which prevailed during 1894-99 in the following principal oat-growing countries of the world :—

Country.	Average yield per acre.	Country.	Average yield per acre.
	bushels.		bushels.
United Kingdom ...	40·0	United States	23·7
Germany	35·6	France	26·0
Canada	31·1	Austria	22·7
Hungary	27·4	Russia, in Europe.	15·5

The total value of the oats crop and the return per acre, in each of the Commonwealth States and New Zealand, for the season 1901-2, will be found below :—

State	Value.	Value per acre.
	£	£ s. d.
New South Wales	91,600	2 16 10
Victoria	896,700	2 14 6
Queensland	6,000	3 18 2
South Australia	62,600	1 16 1
Western Australia	30,400	3 3 1
Tasmania	227,000	4 3 9
Commonwealth	1,314,300	2 16 11
New Zealand	2,068,700	5 1 11
Australasia	3,383,000	3 18 0

The high values per acre shown by New Zealand and Tasmania were caused by an increase in the local quotations, consequent on the demands from the drought-stricken States. Large quantities of oats and oaten hay were also exported during 1901 to South Africa by the two provinces mentioned.

The net import or export of oats by each of the states is given in the following table. New Zealand was the only province which exported this cereal to any considerable extent in 1901, although Tasmania and Victoria also exported fairly large quantities. Owing to the war in South Africa, a large demand for oats as horse-feed was created, and for the year ended 31st March, 1902, no less than 6,930,791 bushels of oats, valued at £616,000, were exported to that country by New Zealand alone. New Zealand also exported 386,303 bushels to the United Kingdom :—

State.	Net Imports.	Net Exports.
	bushels.	bushels.
New South Wales	951,577	.....
Victoria .....	.....	2,578,568
Queensland	163,023	.....
South Australia .....	.....	45,502
Western Australia	331,353	.....
Tasmania .....	.....	589,792
Commonwealth .....	.....	1,767,909
New Zealand .....	.....	10,514,606
Australasia .....	.....	12,282,515

According to a carefully-compiled estimate of the average production of oats throughout the world, issued by the Agricultural Department of the United States, the commercial supply of this grain in 1900 is represented by the following condensed results :—

	Bushels.
Europe	2,100,061,000
North America	922,738,000
Asia	40,905,000
Africa	6,500,000
Australasia	25,293,000
Total	3,095,497,000

MAIZE.

Maize is, next to sugar-cane, the principal crop grown in Queensland, and is one of the most important products of New South Wales. In the other States the climate is not suited to its growth, and the cultivation of the cereal extends to only about 23,000 acres. The following

figures show that fair progress has been made since 1861 in the area devoted to this crop :—

State.	1861.	1871.	1881.	1891.	1901.
	acres.	acres.	acres.	acres.	acres.
New South Wales	57,959	119,956	117,478	174,577	167,733
Victoria	1,714	1,709	1,783	8,230	10,020
Queensland	1,914	20,329	46,480	101,593	116,983
Other States.....	91	113	36	23	530
Commonwealth	61,678	142,107	165,777	284,428	295,266
New Zealand	770	.....	3,177	5,447	12,503
Australasia ...	62,448	142,107	168,954	289,875	307,769

The production in the same years was as follows :—

State.	1861.	1871.	1881.	1891.	1901.
	bushels.	bushels.	bushels.	bushels.	bushels.
New South Wales	1,727,434	4,015,973	4,330,956	5,721,706	3,844,993
Victoria	20,788	30,833	81,007	461,447	615,472
Queensland	42,100	508,000	1,313,655	3,077,915	2,569,118
Other States	367	2,000	648	483	5,611
Commonwealth	1,790,689	4,556,806	5,726,266	9,261,551	7,035,194
New Zealand	31,570	.....	127,257	238,746	571,834
Australasia ...	1,822,259	4,556,806	5,853,523	9,500,297	7,607,028

It will be seen from the tables given above that although there has been an increase in acreage amounting to nearly 18,000 acres since 1891, the production declined by about 1,894,000 bushels, the falling off being accounted for by the unfavourable season.

The following table shows the average yield of each State and of Australasia for 1901, and for the ten years ended 1901 :—

State.	Average yield per acre.	
	1901.	1892-1901.
	bushels.	bushels.
New South Wales	22·9	29·1
Victoria	61·4	60·7
Queensland	22·0	22·7
Western Australia	10·6	10·6
Commonwealth	23·8	27·6
New Zealand	45·7	41·6
Australasia	24·7	28·2

The averages for Victoria and New Zealand are of little value, as the area under maize in those provinces is small and very favourably situated; while Western Australia, during the whole ten years, had but 530 acres under cultivation, producing 5,611 bushels.

The total value of the crop for the season 1901-2, and the average return per acre, will be found below :—

State.	Total value of crop.	Average value per acre.
	£ . .	£ s. d.
New South Wales	846,800	5 0 11
Victoria	76,900	7 13 6
Queensland	353,300	3 0 4
Other colonies.....	1,300	2 9 1
Commonwealth	1,278,300	4 6 7
New Zealand	85,800	6 17 3
Australasia	1,364,100	4 8 8

The high average value per acre of maize produced in Victoria and New Zealand is due to the fact that the area under this crop is specially selected, and, consequently, yields a larger average return than in the other States.

The net import or export of maize by each State during 1901 was as follows :—

State.	Net Imports.	Net Exports.
	bushels.	bushels.
New South Wales	210,569	.....
Victoria .....	.....	115,475
Queensland	114,628	.....
South Australia	5,475	.....
Western Australia.....	10,984	.....
Tasmania	63	.....
Commonwealth	226,244	.....
New Zealand .....	.....	124,447
Australasia	101,797	.....

It is rather curious that the only States which import maize to any extent are New South Wales and Queensland, where it is principally grown. In Australasia corn does not enter into consumption as an article of food, as it does in other countries, and particularly in America, which produces and consumes more than 80 per cent. of the whole maize crop of the world, as the following figures for 1900—compiled on the authority of the Department of Agriculture in the United States—will show :—

	bushels.
North America.....	2,210,500,000
South America.....	90,000,000
Europe.....	391,358,000
Africa.....	33,207,000
Australasia.....	10,025,000
Total.....	2,735,090,000

BARLEY.

Of the cereal productions of Australasia, barley is grown on the smallest acreage. The area under this crop at different periods was as follows :—

State.	1861.	1871.	1881.	1891.	1901.
	acres.	acres.	acres.	acres.	acres.
New South Wales.....	2,924	3,461	6,427	4,459	6,023
Victoria.....	3,419	16,772	48,652	45,021	32,423
Queensland.....	13	971	256	739	11,775
South Australia.....	10,637	17,225	11,953	11,461	15,517
Western Australia.....	2,412	5,083	3,679	3,738	2,719
Tasmania.....	7,279	4,275	4,597	2,650	6,104
Commonwealth.....	26,684	47,787	75,564	68,068	74,561
New Zealand.....	3,457	13,305	29,808	24,268	26,514
Australasia.....	30,141	61,092	105,372	92,336	101,075

For the same years the production was as stated below :—

State.	1861.	1871.	1881.	1891.	1901.
	bushels.	bushels.	bushels.	bushels.	bushels.
New South Wales.....	41,054	55,284	135,218	93,446	106,361
Victoria	68,118	335,506	927,566	830,741	693,851
Queensland.....	158	11,836	3,207	21,302	277,037
South Australia.....	168,137	164,161	137,165	107,183	243,362
Western Australia	2,412	5,083	36,790	48,594	35,841
Tasmania	169,381	76,812	102,475	71,686	167,485
Commonwealth.....	449,260	648,682	1,342,421	1,172,952	1,523,937
New Zealand	96,658	287,646	664,093	688,683	855,993
Australasia.....	545,918	936,328	2,006,514	1,861,635	2,379,930

The average yield of barley per acre in each State for 1901, and for the ten years ended 1901, is given in the following table :—

State.	Average Yield per Acre.	
	1901.	1892-1901.
	bushels.	bushels.
New South Wales	17·7	16·4
Victoria	21·4	17·5
Queensland	23·5	19·1
South Australia	15·7	12·6
Western Australia	13·2	13·2
Tasmania	27·4	20·3
Commonwealth	20·4	16·9
New Zealand	32·3	30·0
Australasia	23·5	20·6

As in the case of the other three cereals which have just been dealt with, New Zealand had a far larger yield of barley per acre than any of the Commonwealth States, and compares favourably with the following countries, which averaged during 1894-99—United Kingdom, 32·7 bushels per acre; Germany, 30·3; United States, 21·8; and France, 20·3 bushels per acre. Barley is not cultivated in these States to the

extent it deserves, and to the total production of 919,224,000 bushels by the world in 1900 Australasia contributed only a little over 2½ million bushels. In fruitful seasons Australasia produces sufficient barley, exclusive of that required for malt, for home requirements, and a small surplus for export; but if the combined trade in barley and malt be considered, all the provinces, with the exception of Victoria, Tasmania, and New Zealand, are dependent upon external sources. The trade in barley and malt for the Commonwealth and New Zealand in 1901 was as follows:—

State.	Barley.		Malt.	
	Net Imports.	Net Exports.	Net Imports.	Net Exports.
	bushels.	bushels.	bushels.	bushels.
New South Wales	74,743	.....	497,229	.....
Victoria .....	.....	44,116	.....	174,760
Queensland	4,234	.....	111,065	.....
South Australia .....	.....	1,035	1,469	.....
Western Australia	38,846	.....	88,105	.....
Tasmania .....	.....	5,296	.....	6,774
Commonwealth	67,376	.....	516,334	.....
New Zealand .....	.....	119,709	.....	135,011
Australasia .....	.....	52,333	381,323	.....

The total value of the barley crop and the average return of this cereal per acre during the season 1901-2 will be found below:—

State.	Total value of barley crop.	Average value per acre.
	£	£ s. d.
New South Wales	13,900	2 6 2
Victoria	147,800	4 11 2
Queensland	58,200	4 18 10
South Australia	48,700	3 2 9
Western Australia	5,000	1 16 9
Tasmania	23,000	3 15 4
Commonwealth	296,600	3 19 7
New Zealand	117,700	4 8 9
Australasia	414,300	4 2 0

POTATOES.

The cultivation of the potato is not confined to any particular State. Victoria, New Zealand, and New South Wales have the largest areas under this crop, but New Zealand shows the largest production. The largest area under this crop was grown in 1899, when no less than 176,381 acres were cultivated. Of this area New South Wales, Victoria, and New Zealand supplied 127,421 acres as against 96,409 acres in 1900. The decrease is accounted for chiefly by the two States last mentioned, where this crop was abandoned to a certain extent in favour of oats for which a large demand was created by the South African war. The following table shows the acreage under potatoes in each State :—

State.	1861.	1871.	1881.	1891.	1901.
	acres.	acres.	acres.	acres.	acres.
New South Wales	10,040	14,770	15,943	22,560	26,158
Victoria	27,174	39,064	39,129	57,334	40,058
Queensland	512	3,121	5,086	9,173	13,338
South Australia	2,612	3,156	6,136	6,892	6,248
Western Australia	277	494	278	532	1,829
Tasmania	9,349	8,154	9,670	16,393	25,444
Commonwealth...	49,964	68,759	76,242	112,884	113,075
New Zealand.....	7,292	11,933	22,540	27,266	31,259
Australasia	57,256	80,692	98,782	140,150	144,334

As in the case of the area so in production the highest was in 1899 when it amounted to 629,275 tons. Of this New South Wales, Victoria, and New Zealand contributed 476,842 tons, as against 371,435 tons in 1901. The production for each State was as follows :—

State.	1861.	1871.	1881.	1891.	1901.
	tons.	tons.	tons.	tons.	tons.
New South Wales	30,942	44,758	44,323	62,283	39,146
Victoria	59,364	125,841	134,290	109,786	125,474
Queensland	1,080	6,585	11,984	25,018	39,530
South Australia	7,726	10,989	18,154	27,824	15,059
Western Australia	817	1,457	556	1,596	5,665
Tasmania	47,428	22,608	33,565	63,100	114,704
Commonwealth...	147,357	212,238	242,872	289,607	339,578
New Zealand.....	37,554	42,130	121,890	162,046	206,815
Australasia	184,911	254,368	364,762	451,653	546,393

The average production of potatoes per acre is next given, for 1901, and for the ten years ended 1901. New Zealand, it will be seen, shows a considerably larger return than any of the other provinces :—

State.	Average Yield per Acre.	
	1901.	1892-1901.
	tons.	tons.
New South Wales	1·5	2·4
Victoria	3·2	3·3
Queensland	3·0	2·9
South Australia	2·4	2·3
Western Australia	3·1	3·1
Tasmania	4·5	3·3
Commonwealth	2·1	2·9
New Zealand	6·6	6·1
Australasia	3·1	3·6

Only three of the States are in a position to export potatoes in any quantity—Tasmania, Victoria, and New Zealand. The surplus in Victoria, though at one time considerable, has now very much decreased. The following were the imports or exports of potatoes by each State and New Zealand in 1901 :—

State.	Net Imports.	Net Exports.
	tons.	tons.
New South Wales	42,628	.....
Victoria .....	.....	8,961
Queensland	14,486	.....
South Australia	5,198	.....
Western Australia	10,541	.....
Tasmania .....	.....	49,861
Commonwealth	14,031	.....
New Zealand .....	.....	21,984
Australasia .....	.....	7,953

The total value of the potato crop and the average return per acre for 1901-2 will be found below :—

State.	Value of crop.	Average value per acre.
	£	£ s. d.
New South Wales	226,700	8 13 5
Victoria	480,700	12 0 0
Queensland	158,100	11 17 1
South Australia	56,500	8 17 8
Western Australia	51,000	22 8 4
Tasmania	430,100	16 18 1
Commonwealth	1,403,100	12 8 2
New Zealand	723,800	23 3 1
Australasia	2,126,900	14 14 9

These values are remarkably high, the average return in a normal year for the whole of Australasia being not more than £8 an acre. The ruling prices in 1901 were, however, far in excess of those realised for some considerable time, and this is especially the case as regards Western Australia.

HAY.

Considerable quantities of wheat, oats, barley, and lucerne are grown for the purpose of being converted into hay, but the area cut varies, of course, according to the season. The area cut for hay has largely increased since 1881, as will be seen from the table appended :—

State.	1861.	1871.	1881.	1891.	1901.
	acres.	acres.	acres.	acres.	acres.
New South Wales	45,175	51,805	146,610	163,863	442,163
Victoria	74,681	103,206	212,150	369,498	659,239
Queensland	280	3,828	16,926	30,655	63,055
South Australia	62,874	97,812	333,467	304,171	369,796
Western Australia	6,676	*14,342	24,445	28,534	92,964
Tasmania	31,803	31,578	34,790	45,445	61,495
Commonwealth ...	221,489	302,571	768,388	942,166	1,688,712
New Zealand	+27,160	30,717	68,423	46,652	62,984
Australasia	248,649	333,288	836,811	988,818	1,751,696

* In 1869. † In 1867.

In New Zealand, for all the years except the last, the areas shown only include the extent of sown grasses cut for hay. It is not possible

to quote for the earlier years the area under wheat, oats, &c., cut for this purpose. Similarly, the production shown below for those years only includes the quantity of grass cut :—

State.	1861.	1871.	1881.	1891.	1901.
	tons.	tons.	tons.	tons.	tons.
New South Wales.....	57,363	77,460	198,532	209,417	472,621
Victoria	92,497	144,637	238,793	505,246	884,369
Queensland	459	6,278	19,640	58,842	122,039
South Australia.....	78,886	98,266	240,827	193,317	346,467
Western Australia	6,609	14,288	24,445	28,534	91,517
Tasmania	59,851	30,891	44,957	66,996	109,383
Commonwealth...	295,665	371,820	767,194	1,062,352	2,026,396
New Zealand.....	36,666	35,674	89,081	67,361	94,476
Australasia.....	332,331	407,494	856,275	1,129,713	2,120,872

The average yield of hay per acre will be found in the next table, the periods covered being the year 1901 and the ten years which closed with 1901 :—

State.	Average yield per acre.	
	1901.	1892-1901.
	tons.	tons.
New South Wales	1.1	1.0
Victoria	1.3	1.2
Queensland	1.9	1.9
South Australia	0.9	0.8
Western Australia	1.0	1.0
Tasmania	1.8	1.1
Commonwealth	1.2	1.1
New Zealand	1.9	1.9
Australasia	1.3	1.1

The greater portion of the hay is produced from wheat, although in New South Wales, Victoria, Queensland, and New Zealand there are large areas under oaten and lucerne hay, which are in great demand

and readily sell at remunerative prices ; in fact, so profitable is the return from oaten hay, that in New South Wales and Queensland the cultivation of oats for threshing is practically neglected for the sake of hay. For the most part, hay is grown in each province in quantities sufficient for its own requirements, New South Wales, Queensland, and Western Australia ordinarily being the only States which import to any extent.

The net import or export of hay and chaff by each State and New Zealand during the year 1901 was as follows :—

State.	Net Imports.	Net Exports.
	tons.	tons.
New South Wales	14,665	.....
Victoria .....	.....	96,786
Queensland	11,073	.....
South Australia .....	.....	23,900
Western Australia	1,250	.....
Tasmania .....	.....	5,892
Commonwealth .....	.....	99,590
New Zealand .....	.....	836
Australasia .....	.....	100,426

The value of the return from hay in 1901-2 was higher than that of any other crop ; the value in each State and the return per acre will be found below :—

State.	Total Value of Hay Crop.	Average Value per Acre.
	£	£ s. d.
New South Wales	1,887,000	4 5 4
Victoria	3,095,000	4 13 9
Queensland	427,000	6 15 5
South Australia	1,468,000	3 19 5
Western Australia	412,000	4 8 7
Tasmania	323,000	5 6 8
Commonwealth	7,617,000	4 10 2
New Zealand	220,000	3 6 8
Australasia ..	7,837,000	4 9 6

The above averages are higher than those realised for some years past, the increase being accounted for by the enhanced prices realised for all descriptions of fodder owing to the unfavourable season experienced over a great part of Australasia.

GREEN FORAGE AND SOWN GRASSES.

The cultivation of maize, sorghum, barley, oats, and other cereals for green food in addition to lucerne and grass is confined chiefly to the districts where dairy farming is carried on. The agricultural returns of some of the States do not admit of a distribution being made between these forms of cultivation prior to 1887. The following table shows the area under such green food in 1887, 1891, and 1901, and it will be seen that there have been large developments in most of the States, especially in New South Wales.

The return from the cultivation of green forage in all the States during the season 1901-1902 is estimated at £1,003,000, or nearly £3 an acre.

State.	Green Food.			Sown Grasses.		
	1887.	1891.	1901.	1887.	1891.	1901.
	acres.	acres.	acres.	acres.	acres.	acres.
New South Wales..	20,403	32,138	110,215	192,678	333,238	467,839
Victoria	6,036	9,202	32,795	154,612	174,982	162,954
Queensland	9,582	10,727	39,793	13,619	20,921	34,679
South Australia ...	10,079	6,416	13,695	23,217	17,519	23,510
Western Australia .....	.....	238	1,024	.....	.....	11,132
Tasmania	1,246	1,101	4,082	184,653	208,596	314,422
Commonwealth	47,346	59,822	201,604	568,779	755,256	1,014,536
New Zealand	98,029	118,484	199,508	5,869,247	7,357,229	11,620,178
Australasia ...	145,375	178,306	401,112	6,438,026	8,112,485	12,634,714

In Victoria, Tasmania, and New Zealand various areas of sown grasses are cut for seed, chiefly rye grass and cocksfoot, the total quantity of grass seed produced in 1901 being 6,514 tons, valued at £215,000. The production in Victoria was 537 tons; in Tasmania, 800 tons; and in New Zealand, 5,177 tons. The acreage on which this grass seed was produced is included in the total given above for sown grasses, and amounted to 1,877 acres in Victoria, 8,043 acres in Tasmania, and 44,120 acres in New Zealand.

THE VINE.

The history of the vine in Australia dates from the year 1828, when cuttings from the celebrated vineyards of France, Spain, and the Rhine Valley were planted in the Hunter River District of New South Wales, forming the nursery for the principal vineyards of that State. Years afterwards the vine was planted in the Murray River District and other parts of New South Wales, and was afterwards introduced into Victoria and South Australia, and is now cultivated in all the

provinces of the Australian continent. In South Australia a large number of Germans are employed in the industry of wine-making.

The climate and soil of Australia are peculiarly adapted to the successful cultivation of the vine, and with an increasing local demand, and the opening up of a market in England, where Australian wines have obtained due appreciation, the future expansion of wine-growing appears fairly assured. The depreciation which some of the foreign wines have suffered, both in quantity and quality, owing to the devastation of the vineyards by phylloxera, is an additional reason why the vine-growers of this continent should look forward to largely-increased operations for their industry.

The progress of vine cultivation since the year 1861 is illustrated by the table subjoined. The areas given include the vines producing table-fruit, as well as those cultivated for wine-making, also the young vines not yet in bearing :—

State.	1861.	1871.	1881.	1891.	1901.
	acres.	acres.	acres.	acres.	acres.
New South Wales	1,130	4,152	4,027	8,281	8,606
Victoria	1,464	5,523	4,923	24,483	28,592
Queensland	40	568	1,212	1,988	1,990
South Australia.....	3,918	5,455	4,202	12,314	20,860
Western Australia	457	692	527	1,004	3,724
Australia	7,009	16,390	14,891	48,070	63,772

At present the area devoted to vines is much larger in Victoria and South Australia than in the other States ; in the former State 4,109 and in the latter 8,546 acres have been added to the vineyard area since 1891. This is not great progress compared with Algeria, for example, which has already 375,136 acres under vines, although systematic planting dates only from 1849 ; nevertheless it is a hopeful sign in Australia, where patient waiting for the harvest to be gathered years hence is not a characteristic of the agriculturist. The progress of New South Wales has been very slight, the area under vines in 1901 being only 325 acres more than in 1891. The introduction of phylloxera into the county of Cumberland has greatly retarded this industry as most of the table grapes are grown there, and until some efficient means of easily guarding against the disease have been found but little progress can be expected in this State. Vine-growing has never been carried on to any extent in Tasmania or New Zealand, although there are numerous places in the latter colony suited for growing vines for the manufacture of both wine and raisins. The area under vines in New Zealand in 1901 was returned at 543 acres.

The following tables show the progress made in wine-growing during the last forty-one years :—

State.	1861.	1871.	1881.	1891.	1901.
	gallons.	gallons.	gallons.	gallons.	gallons.
New South Wales.....	85,328	413,321	513,688	913,107	868,479
Victoria	47,568	713,589	539,191	1,554,130	1,981,475
Queensland.....	.....	.....	72,121	168,526	148,835
South Australia.....	312,021	852,315	313,060	861,835	2,077,923
Western Australia .....	.....	.....	99,600	166,664	119,500
Australia	444,917	1,979,225	1,537,660	3,604,262	5,196,212

The production of table-grapes during the same period is shown below :—

State.	1861.	1871.	1881.	1891.	1901.
	tons.	tons.	tons.	tons.	tons.
New South Wales.....	224	508	1,103	3,694	3,475
Victoria	849	1,545	740	2,791	5,110
Queensland.....	.....	.....	255	1,169	1,814
South Australia.....	1,161	1,692	1,498	4,590	12,608
Western Australia .....	.....	.....	.....	.....	400
Australia.....	2,234	3,745	3,596	12,244	23,407

Among other produce of the vineyards may be mentioned 9,351 gallons of brandy in New South Wales, while Victoria and South Australia produced respectively 30,078 cwt. and 10,753 cwt. of raisins and currants. Victoria produces much more brandy than any of the other States, but it is not wholly made from grapes and the figures cannot be ascertained.

It is impossible to tabulate the average wine-yield of all the States, as in many instances the acreage under cultivation for wine-making purposes cannot be separated from young unproductive vineyards or areas cultivated for table varieties of the grape only. Making due allowance for this fact, it would appear that the average production for the season 1901-1902, which was a very unfavourable one, was about 177 gallons in New South Wales, 88 gallons in Queensland, 72 gallons in Western Australia, and 77 gallons in Victoria. Taking an average year, the production for Australia may be set down at 190 gallons.

Compared with the wine production of other countries, that of Australia is certainly trifling. In 1898, the latest year for which information is available, the world's production was estimated at 2,716,000,000 gallons, to which Australia only contributed 4,000,000 gallons; while in 1901 the production of Australia was returned at 5,000,000 gallons.

The following table illustrates the progress made in the export of Australian wine to countries outside of Australasia since 1881. It will be noticed that in 1901, the trade with foreign countries had grown to seventeen times the value in 1881, while the number of gallons exported had also increased very largely. The 1901 figures are, exclusive of Queensland, 39 gallons, valued at £19; and Western Australia, 173 gallons, valued at £116:—

State.	1881.		1891.		1901.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	gallons.	£	gallons.	£	gallons.	£
New South Wales..	13,271	3,520	12,368	2,904	8,242	1,923
Victoria	5,588	2,341	142,294	26,152	340,353	43,327
South Australia	1,751	580	227,681	39,054	485,671	67,136
Australia ...	20,610	6,441	382,343	68,110	834,266	112,386

Including the inter-state as well as the foreign trade, the exports of each State during the same years are shown below. The figures for 1901 are exclusive of Queensland, 39 gallons, valued at £19; Western Australia, 185 gallons, valued at £122; and Tasmania, 24 gallons, valued at £27.

State.	1881.		1891.		1901.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	gallons.	£	gallons.	£	gallons.	£
New South Wales..	22,377	7,233	54,143	11,644	39,651	12,256
Victoria	12,544	5,388	160,982	32,516	364,413	50,950
South Australia.....	54,001	12,637	285,107	58,282	593,357	91,548
Australia ...	88,922	25,258	500,232	102,442	997,421	154,754

The total value of the grape crop and the average return per acre in the Australian States, for the year 1901, will be found below :—

State.	Total value of crop.	Average value per acre—	
		Of Total Area under Vines.	Of Productive Vines.
	£	£ s. d.	£ s. d.
New South Wales	136,500	15 17 3	17 9 4
Victoria	461,800	15 16 0	18 0 0
Queensland	39,800	14 13 6	17 5 4
South Australia	337,700	16 17 9	18 11 4
Western Australia.....	55,900	15 0 0	.....
Commonwealth	1,031,700	16 3 4	18 3 7
New Zealand	8,100	15 0 0	.....
Australasia	1,039,800	16 3 4	18 3 7

The Government of Victoria made provision for assisting the wine industry in that State by establishing wineries. Under safeguarding regulations it undertook to advance up to £3,000 to each company on its formation, and a sum of £8,600 was advanced to companies at Rutherglen, Stawell, Mooropna, and Yarrawonga.

SUGAR-CANE.

The growth of the cane and the manufacture of sugar are important industries in Queensland and New South Wales; but whilst in the former State the industry if not increasing is maintaining its position, in the latter the area under crop has declined by nearly one-third since 1896. The area under cane in each State in the various years shown was as follows :—

Year.	Queensland.	New South Wales.
	acres.	acres.
1864	94	22
1871	9,581	4,394
1881	28,026	12,167
1891	50,948	22,262
1896	83,093	32,927
1901	112,031	20,809

The conditions of cultivation in the two States are not precisely the same. In New South Wales, taking one year with another the area under cane is usually twice as great as the area from which cane is cut, but in Queensland the productive area is very much larger. This will be seen from the following statement :—

Year ended 31st March.	Total Area.		Area from which Cane was cut.		Yield of Cane per acre.	
	Queensland.	New South Wales.	Queensland.	New South Wales.	Queensland.	New South Wales.
	acres.	acres.	acres.	acres.	tons.	tons.
1898	98,641	25,865	65,432	12,936	13·4	20·8
1899	111,012	24,759	82,391	14,578	18·7	19·8
1900	110,657	22,517	79,435	9,435	14·8	18·1
1901	108,535	22,114	72,651	10,472	11·7	19·0
1902	112,031	20,809	78,160	8,790	15·1	21·4

For the five years the average for Queensland was 14·7 tons per acre, as against 19·8 tons in New South Wales. This does not by any means prove the superiority of the land in New South Wales for cane-growing, for if the whole area under cane be taken into account very different results are arrived at. The following figures cover five years :—

Yield of cane from total area under crop—

Queensland	10·3 tons per acre.
New South Wales	9·6 „ „

In New South Wales cane is cut every second year, but in the Northern State a crop is obtained from the greater part of the cane area yearly, and this is the explanation of the difference in the yields and the large area in New South Wales apparently unproductive.

The quantity of sugar obtained from the cane-fields has varied during the last ten years between 77,752 and 192,844 tons per annum, the average being 118,518 tons, of which 94,497 tons were produced by Queensland, and 24,021 tons by New South Wales. The yield of sugar per ton of cane varies, of course, with the density of the juice. In an ordinary season it may be set down at 9·75 per cent.

The greater part of the field-work on the plantations in Queensland is performed by coloured labour, chiefly South Sea Islanders. In New South Wales the work was formerly done entirely by white labour, but latterly there has been a considerable proportion of coloured persons, chiefly Hindoos, employed on the cane-fields. In Queensland during last season the number of coloured labourers was about 8,850, and as the area cut was 78,160 acres, the employment of coloured labour was in the proportion of one man to every 8·8 acres. In New South Wales the coloured labourers numbered about 1,010, and the area cut being 8,790

acres, the proportion was one man to every 8·7 acres. From this statement it would appear that there is little difference between the States in regard to the employment of coloured labour compared with the area cropped. There is, however, a further difference between the States. In Queensland the law restricts the employment of Kanakas to the field work of a cane plantation; in New South Wales no similar restriction exists, and coloured labour is employed in several occupations reserved for white labour in Queensland. This, of course, refers to the conditions obtaining anterior to recent federal legislation.

The cost of growing cane may be set down at from 2s. 11d. to 3s. 5d. per ton of cane, according as black or white labour is employed, the lower figures representing the cost of black labour.

In New South Wales the cost of harvesting the cane is somewhat as follows, the average being for areas on which white labour is employed:—

	s.	d.
Cutting	3	3
Carting to riverside	1	0
Transfer to Mills	0	9
Sundry Expenses	0	3
	<hr/>	
	5	3
Average price paid for standing cane	11	3
	<hr/>	
Total, per ton	16	6

In Queensland the plantations are more favourably situated in regard to the mills, and the cost delivered to the mill is about 12s. 2d. per ton. This represents 4s. 4d. per ton of cane, and at the rate of 9 tons of cane per ton of sugar the comparison is 39s. per ton in favour of Queensland. From Dr. Maxwell's report to the Federal Premier it would appear that the wages of coloured labourers working in the fields, after making all necessary allowances, is 2s. 4½d. per day.

In 1901 the Federal Parliament passed an Act which greatly affects the sugar industry, especially in Queensland. Under the provisions of this measure, which is entitled the Pacific Island Labourers Bill, a limited number of Pacific Islanders are allowed to enter Australia up to the 31st day of March, 1904, but on and after that date their immigration is prohibited. All agreements for their employment terminate on the 31st December, 1906, and after that date any Pacific Islander found in Australia will be deported.

The duty on imported cane sugar is £6 per ton, while the excise duty on locally-grown sugar is £1 per ton on sugar produced by white labour, and £3 per ton on sugar in the manufacture of which black labour has been employed. The employment of white against black labour is thus protected to the extent of £2 per ton of sugar, or equal to about 4s. 5d. per ton of cane.

The following table shows the apparent consumption of sugar in each State during 1901. Queensland was the only province which was able to meet its own requirements, and spare a quantity of sugar for export.

The net export from that State amounted to 70,598 tons, valued at £788,600 almost the whole of which was consigned to the other Commonwealth States.

State.	Locally Produced.	Net Import.	Total Locally Produced or Imported.
	tons.	tons.	tons.
New South Wales	19,569	41,101	60,670
Victoria .....	.....	59,608	59,608
Queensland	120,858	*70,598	50,260
South Australia .....	.....	20,725	20,725
Western Australia .....	.....	9,087	9,087
Tasmania .....	.....	8,536	8,536
Commonwealth	140,427	68,459	208,886
New Zealand .....	.....	44,560	44,560
Australasia	140,427	113,019	253,446

* Net Export.

The quantity shown above does not necessarily represent the consumption of sugar during the year, as the surplus available from previous years and the amount carried over at the end of the year have to be considered. Taking the last ten years' average of 103·5 lb. per head the annual consumption of the Commonwealth would appear to be 174,800 tons, which is 34,086 less than shown in the table.

The country of origin of 98,448 tons of the sugar which were imported into Australia from abroad during 1901 can be ascertained, and was as shown below. The unspecified balance consisted partly of small quantities imported from other countries, but mostly of re-exports, the original port of shipment of which could not be traced from one State to another. The quantity shown as imported from Europe was probably beet sugar :—

Country of Origin.	Quantity Imported.
	tons.
Mauritius	8,453
Fiji	694
Java	72,643
Hongkong	1,791
Europe	4,876
Egypt	3,936
Peru	6,055
Unknown	18,322
Total	116,770

The re-export of foreign and Queensland sugar from Australia amounts to 48,311 tons.

The total value of the sugar crop and the average return per acre, in the sugar-growing States of Australia, will be found below for the year 1901 :—

State.	Value of Cane grown.	Average Value per Acre.
	£	£ s. d.
New South Wales	83,400	4 0 2
Queensland	501,600	4 9 6

SUGAR-BEET.

The question of cultivating beet-root for the production of sugar has attracted attention in these States, principally in Victoria, where experiments were made in this direction over thirty years ago. The results obtained were not considered satisfactory enough to induce growers to cultivate this particular crop, and it was not until the year 1896 that a systematic attempt was made to establish the industry.

On the 6th March, 1896, the Victorian Parliament passed an Act empowering the Government to assist in the establishment of the sugar-beet industry by granting loans to duly registered public companies which might be formed for the purpose of erecting mills and equipping them with the necessary machinery and plant for the extraction of sugar from the roots. The company applying for aid must satisfy the Treasurer of the State of certain conditions, and if he were satisfied that these conditions were likely to be fulfilled, and that the company had a paid-up capital of not less than £20,000, he was authorised to advance to the company a sum not exceeding twice the amount raised by its shareholders.

As a result of these concessions a company was formed in Victoria, This company erected a factory at Maffra, at a total cost of £17,200, and the first campaign ended in June, 1898. The cultivation was further persevered with until May, 1900, when the factory was closed down. The failure of the industry was ascribed to various causes, the principal one being that the supply of beet was not sufficient, since 9,000 tons was the greatest quantity treated in a campaign by the factory, which was capable of treating 40,000 tons. Want of expert knowledge by the farmers in growing beet-root was another cause of failure ; the first crop only produced 9 tons to the acre, and the others were even worse. Dry seasons were also blamed, so that, on the whole, the cultivation of beet in Victoria was not a success. The percentage of sugar produced during the three seasons was as follows :—

1897-98.....	14·0 per cent.
1898-99.....	11·8 „
1899-1900.....	14·6 „

while the sugar produced had a standard of purity of 80 per cent., 76 per cent., and 85 per cent. respectively.

The Government expenditure on plant and machinery at Maffra amounted to £60,000, and altogether upwards of £100,000 of public money has been laid out in connection with the venture. Although the industry so far has been a failure, the Minister of Agriculture in Victoria has determined to make another effort to resuscitate it on a sounder basis.

In New South Wales, although, as already stated, portions of the soil, particularly in the New England district, have been demonstrated to be admirably adapted to the cultivation of beet of excellent saccharine properties, no systematic effort has yet been made towards the establishment of the sugar-beet industry on a commercial basis.

TOBACCO.

The cultivation of the tobacco-plant has received attention in the three eastern states. The following table shows the area and production of tobacco at various periods :—

Year.	New South Wales.		Victoria.		Queensland.		Australia.	
	Area.	Production.	Area.	Production.	Area.	Production.	Area.	Production.
1861	acres.	cwt.	acres.	cwt.	acres.	cwt.	acres.	cwt.
1861	224	2,647	220	2,552.	..	..	444	5,190
1871	507	4,475	299	2,307	44	.....	910	6,782
1881	1,025	18,311	1,461	12,876	68	521	3,154	31,708
1888	4,833	55,478	1,685	13,355	123	1,418	6,641	70,251
1891	880	9,314	545	2,579	790	7,704	2,221	19,597
1892	848	8,344	477	658	318	3,808	1,643	12,810
1893	854	10,358	1,057	8,952	475	4,577	2,386	24,887
1894	710	8,132	1,412	7,155	915	9,571	3,043	24,858
1895	1,231	10,548	2,029	15,223.	1,061	7,511	4,321	33,282
1896	2,744	27,468	1,264	7,890	994	8,029	5,002	43,987
1897	2,181	19,718	522	3,419	755	5,703	3,458	28,840
1898	1,405	12,706	78	190	617	3,276	2,100	16,172
1899	546	6,641	155	1,365	745	6,551	1,446	14,557
1900	199	1,905	109	311	665	4,032	973	6,248
1901	182	1,971	103	345	768	5,848	1,053	8,164

Owing to over-production and the want of a foreign market, the area devoted to tobacco-culture greatly declined from 1888 to 1892, after which it showed signs of development until 1896, but since then consistently declined until 1901, when the acreage showed a slight increase over that of the previous season. The Australasian tobacco-leaf has not yet been prepared in such a way as to find acceptance abroad, and until such is accomplished it will be useless to expect the cultivation of the plant to become a settled industry. The soil and climate of Australia appear to be suitable for the growth of the plant, but sufficient care and skill have not been expended upon the preparation of the leaf. The quantity of 70,251 cwt. of leaf produced in 1888 was so greatly in excess of local requirements that very low prices only could be obtained, and a large

portion of the crop was left upon the growers' hands. The result was that many farmers abandoned the cultivation of tobacco, so that the area under this crop during 1889 was only 3,239 acres in New South Wales, and 955 acres in Victoria, producing respectively 27,724 cwt. and 4,123 cwt. of leaf—less than half the crop of the previous year. In 1891 the area showed a further decline in the case of New South Wales and Victoria. In the mother State this decline continued until 1894; but in Victoria and Queensland the smallest area devoted to the crop was during the season 1892. The year 1895 saw a great increase in the cultivation of tobacco in all three States, and in New South Wales in 1896 there was again a large extension of the area under the plant, although in Victoria and Queensland the advance made in 1895 was not maintained. Since that year the area under cultivation and the production have both steadily declined in each State until, in 1900, the total production was only 6,248 cwt., the lowest since 1861. The production in 1901 was very small, being only about 8,000 cwt. In 1898 the crop in Victoria was almost a complete failure.

The average production per acre of tobacco in 1901, and during the ten years ended 1901, were as shown below:—

State.	Average Production per Acre.	
	1901.	1892-1901.
	cwt.	cwt.
New South Wales	10·8	9·9
Victoria	3·3	6·2
Queensland	7·6	8·1
Australasia	7·7	8·4

The Agricultural Department of Queensland is endeavouring to assist the tobacco-growers by the importation of American seed of first quality, suited to the Queensland climate, and, following the example set by Victoria and New South Wales, the services of an American expert have been secured. New Zealand, also, has commenced the cultivation of tobacco, but so far it is only in the nature of an experiment; and a small area has been planted in the Northern Territory of South Australia. In 1897 the Victorian Government decided to grant a bonus of 3d. per lb. on all tobacco-leaf of approved quality grown in the State, and cured and shipped under the supervision of the tobacco expert. The bonus was only payable to the actual grower of the leaf, and 3 tons were assigned as the maximum quantity for which payment was to be made to any one grower or association. In Western Australia preparations are being made for cultivating tobacco on a large scale, and a company has been formed which proposes to acquire suitable land for raising the crop. Samples of the product grown in the State

have been submitted to experts and pronounced equal to the finest Havana, and a large firm in England has undertaken to purchase any quantity of similar leaf at from 1s. 9d. to 3s. per lb.

The following table shows the imports of tobacco, cigars, and cigarettes for home consumption during 1901; but the amounts for this year are above the normal consumption owing to excessive imports in anticipation of the Federal Tariff.

State.	Quantity. lb.
New South Wales	4,403,930
Victoria	3,668,700
Queensland	933,500
South Australia	793,315
Western Australia	872,000
Tasmania	379,930
<hr/>	
Commonwealth	11,051,375
New Zealand	1,972,300
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Australasia	13,023,675

The proportion of waste in the manufacture of tobacco is about one-third, so that the quantity of leaf represented above may be set down as 19,535,500 lb. Applying the decennial average of 8·4 cwt. per acre, it would appear that the produce of 20,764 acres is required annually to supply the demand for tobacco in Australasia. The total value of the tobacco crop for 1901 in Australia was only £10,300, returning an average value of £9 15s. 7d. per acre.

GARDENS AND ORCHARDS.

The cultivation of fruit in Australasia does not attract anything like the attention it deserves, although the soil and climate of large areas in all the provinces are well adapted to fruit-growing. Still, some progress has been made, especially in recent years. In 1901 the proportion of the total cultivation allotted to fruit was 2·1 per cent., and in 1891 2·1 per cent., while in 1881 the proportion was 1·5 per cent. The area per 1,000 persons, in 1901, was 44·6 acres; in 1891, 36 acres; and in 1881, 29·4 acres. Grapes, oranges, apples, pears, and peaches are the principal fruits grown; but with an unlimited area suitable for fruit-cultivation, and with climatic conditions so varied, ranging from comparative cold in New Zealand and on the high lands of New South Wales and Victoria to tropical heat in Queensland, a large variety of fruits could be cultivated. The industry, however, languishes partly on

account of the lack of skill and care on the part of the grower ; good fruits commanding high prices, while those placed within the reach of the multitude are generally of lower quality ; and partly owing to the lack of means of rapid transit to market at reasonable rates. The inferior quality of much of the fruit produced was due to the ravages of fruit pests. The pests were almost wholly imported from Europe and America on fruit and cuttings, and as the orchards of Australia were threatened, and the fruit industry likely to be seriously interfered with, Acts have been passed in all the states prohibiting the importation of diseased fruit. The result of this legislation has been wholly beneficial, and if supplemented by legislation aimed at eradicating diseases existing in the orchards themselves, the future of the fruit industry would be assured. The area under orchards and gardens in 1881, 1891, and 1901 was as follows :—

State.	1881.		1891.		1901.	
	Acres.	Percentage to total area under Crops.	Acres.	Percentage to total area under Crops.	Acres.	Percentage to total area under Crops.
New South Wales	24,565	4·3	40,116	4·7	55,941	2·4
Victoria	20,630	1·4	37,435	1·8	58,807	2·0
Queensland	3,262	2·8	9,758	4·0	14,771	3·0
South Australia	9,864	0·4	14,422	0·7	25,320	1·1
Western Australia .. . . .	.....	...	.....	...	6,177	2·8
Tasmania	6,717	4·5	10,696	6·4	13,231	5·7
Commonwealth.....	65,038	1·5	112,427	2·1	174,247	2·1
New Zealand	16,360	1·5	29,235	2·0	30,191	1·9
Australasia	81,393	1·5	141,662	2·1	204,438	2·1

With the extension of artificial irrigation and the increased facilities for export afforded by the adoption of cool chambers for the preservation of fruit during long voyages, the orchardists of Australasia are now enabled to compete with foreign States in the fruit supply for the English market, which averages about £8,000,000 in value annually. The Tasmanian fruit trade with England has passed the experimental stage, and every season large steamers visit Hobart to receive fruit for the home market.

The following table shows the import and export trade of each State in green fruit and pulp for 1901, from which it will be seen that Tasmania is, as yet, the only State whose export largely exceeds its

import, although in both Queensland and South Australia the exports of domestic produce are now well above the imports :—

State.	Imports.	Exports of Domestic Produce.
	£	£
New South Wales	303,956	79,965
Victoria	88,633	71,283
Queensland	94,181	101,975
South Australia	21,712	62,692
Western Australia	25,315	682
Tasmania	23,006	228,468
Commonwealth	556,803	545,065
New Zealand	135,353	262
Australasia	692,156	545,327

The total value of the produce of gardens and orchards and the average return per acre in 1901 were as given below :—

State.	Total Value of Crop.	Average Value per Acre.
	£	£ s. d.
New South Wales	474,500	8 9 8
Victoria	1,470,200	25 0 0
Queensland	215,300	14 11 6
South Australia ..	443,100	17 10 0
Western Australia	108,100	17 10 0
Tasmania	330,800	15 0 0
Commonwealth	3,042,000	17 9 2
New Zealand	557,600	18 9 5
Australasia	3,599,600	17 12 2

The average returns per acre have but little value for purposes of comparison, as much depends on the proportion of the areas under certain kinds of fruit and under vegetable gardens, which tends to increase or decrease, as the case may be, the general average of a State. It will be seen that Victoria shows the largest return from this class of cultivation, the total value of the produce being £1,470,000, equal to an average of £25 an acre. In this State there are great facilities for disposing of the crop, while the bonuses offered by the Government have caused increased attention to be devoted to the fruit industry. Under the planting bonus of £3 an acre offered for trees planted after the 8th May, 1890, over 8,000 acres have been cropped during the period of eleven years

up till 1901. A sum of £25,00 was set apart for payment of these allowances, and of this about £21,000 have been expended. The export trade has also greatly benefited by a system of bonuses. Prior to 1896 the amount was 2s. per case, but since that date, up to 1901, it was at the rate of 1s. per case. Last season over 12,000 cwt. of apples and pears were exported, several of the shipments realising very high prices in the English market. In New South Wales the smallness of the average is explained by the fact that in a great number of instances, owing to a lack of facilities for disposing of the fruit crops, the produce of the orchards did not reach the markets, and in some cases was not even gathered. In Tasmania stone fruits are principally grown, and the gross returns from these are much smaller than the returns obtained from the cultivation of sub-tropical fruits such as the orange and citron, which tend to increase the average returns in some of the other provinces. In South Australia the large area cultivated as market gardens, which return a greater value per acre than orchards, accounts for the high value of production shown.

MINOR CROPS.

Besides the crops already specifically noticed, there are small areas on which are grown a variety of products, chiefly rye, bere, onions, beans, peas, turnips, rape, mangold wurzel, and hops; but they are not sufficiently important to warrant special mention, except turnips and rape in New Zealand, where no less an area than 422,359 acres was planted with these crops. The area under minor crops in each province in 1901 was as follows:—

State.	Acres.
New South Wales	13,780
Victoria	20,077
Queensland	20,189
South Australia	2,066
Western Australia	5,533
Tasmania	41,334
Commonwealth	102,979
New Zealand	568,675
Australasia	671,654

In 1901 there were 547 acres under coffee in Queensland, which produced on an average 238 lb. per acre. There were also 399 acres under arrowroot, with an average production of 10·2 tons per acre, and 205 acres under rice, which returned a yield of 5,222 bushels, or an average of 25·5 bushels to the acre. Small quantities of cotton, also, are grown in Queensland; and it has been found that heavy crops of cotton can be raised at the Pera Artesian Settlement in New South Wales. In 1897 the South Australian Government granted a lease of Bathurst Island, comprising an area of 500,000 acres, to a syndicate, which proposes to plant india-rubber trees on a large scale.

DISSEMINATION OF AGRICULTURAL KNOWLEDGE.

Although considerable progress has of late years been made in some directions, yet it must be admitted generally that agriculture in Australasia has only now passed the tentative stage. The typical Australian agriculturist, relying largely on a bountiful Nature, does not exercise upon his crops anything approaching the same patience, care, and labour that are bestowed by the European cultivator, nor as a rule does he avail himself of the benefits of scientific farming and improved implements to the extent that prevails in America and Europe. It may be expected that improvements will take place in this respect, and that the efforts made by the Governments of the various States for the promotion of scientific farming will bear good fruit. In most of the provinces, agricultural colleges and model farms have been established, and travelling lecturers are sent to agricultural centres. At present New South Wales possesses the Hawkesbury Agricultural College and experimental farm, and the experimental farms at Wagga, Wollongbar, Bathurst, Coolabah, the Pera Bore, and Moree. Victoria has the two agricultural colleges of Dookie and Longerenong, with experimental farms attached to them, and another farm at Framlingham, together with a viticultural college at Rutherglen. South Australia has an agricultural college and experimental farm at Roseworthy. The Queensland Government established an agricultural college and farm at Gatton in 1896. By a change in the distribution of the money voted for State scholarships, four bursaries have been allotted, entitling the holders to free board and instruction for a period of three years as resident students of the college. State farms have also been established at Westbrook, Hermitage, Biggenden, and Gindie. New Zealand possesses an agricultural college and an experimental farm at Lincoln, in Canterbury.

In New South Wales experimental cultivation by means of irrigation with artesian and catchment water has been successfully conducted at some of the tanks and bores owned by the State, notably at the Pera Bore. The total expenditure by the Government on artesian boring up to the 31st December, 1901, was £263,829. In South Australia a central agricultural bureau in Adelaide, with about one hundred branch bureaus in the country, assists the farmers by disseminating valuable information, publishing papers, introducing new economic plants, and improving the breed of dairy cattle. A State school has been established in Adelaide for the purpose of affording instruction to "secondary agricultural pupils." The fees paid by the scholars, who must be over 15 years of age and have passed the compulsory examination, are at the same rate as those paid in the ordinary State schools. In Tasmania, the Council of Agriculture gives valuable advice to farmers concerning improved methods of agriculture, extermination of insect pests, etc.; while Western Australia possesses seventeen agricultural halls subsidised by the Government, where the latest literature of interest to farmers may be examined, and where lectures are delivered on agricultural subjects.

STATE ADVANCES TO FARMERS.

The oldest system by which advances of money are made to farmers is probably that which was established, as early as 1770, by the German "Landschaften Bank"; and the principle, assuming different forms according to the circumstances of the countries into which it was introduced, was gradually extended to the other great countries of Europe, with the exception of the United Kingdom, where an unwieldy system of land transfer, and the growing accumulation of large estates, form obstacles in the way of its successful application. Since 1849, mainly by the efforts of Raiffeisen, the German Land Credit Banks have taken the form of purely co-operative institutions, and in this respect they have been followed by Sweden, the Baltic provinces of Russia, and Poland, as well as, to some extent, by Austria-Hungary; but in most of the European countries the institutions may be classed as partly State and partly co-operative. In France alone is the system exclusively administered by the State; and it is the French *Credit Foncier* which has been adopted in Australasia wherever the idea of rendering financial aid to agriculturists has been carried into effect, namely, in the States of New South Wales, Victoria, South Australia, Western Australia, Queensland, and New Zealand; while in Tasmania the system has received consideration.

It was not till very recently that New South Wales adopted the principle of advances to settlers. Act No. 1, of 1899, was passed to assist settlers who were in necessitous circumstances, or who were financially embarrassed owing to the droughts. Under this Act a Board was appointed to consider applications for relief, and determine whether such relief should be granted. No advance to any settler was to exceed £200, to be repaid in ten years at 4 per cent. per annum. An Amending Act (No. 1 of 1902) was passed, giving to the Board power to advance up to £500, and providing that the advances with interest thereon should be repaid within thirty-one years. Up to 3rd October, 1900, 4,393 applications had been received for advances, the amount applied for being £377,000. Of these applications, 4,251 have been dealt with by the Board, and 1,564 have been refused. The number of applications approved is 2,687, representing advances to the amount of £193,037. Repayments of principal amount to £9,773, in addition to which £2,948 has been received in interest. The Government has in contemplation the introduction of a scheme somewhat on the lines followed in Victoria, in which the system will be carried on in connection with the Savings Bank.

In Victoria, a section of the Savings Banks Act of 1890 empowered the Commissioners to entertain applications for loans, and to lend sums of money on security by way of mortgage of any lands and hereditaments held in fee-simple free of all prior charges, quit-rents excepted, at such rate of interest as might, from time to time, be fixed by them. The conditions were not very liberal, but they endured for a number of

years. Five per cent. was the rate of interest charged, and 2 per cent. was payable annually in redemption of the principal. Opportunity was taken in the Act for the amalgamation of the Savings Banks, assented to on the 24th December, 1896, to definitely grant advances to farmers under the land-credit system. Under the new Act the Commissioners of Savings Banks are empowered to assist farmers, graziers, market-gardeners, or persons employed in agricultural, horticultural, viticultural, or pastoral pursuits, by making advances, either by instalments or otherwise, upon the security of any agricultural, horticultural, viticultural, or pastoral land held by them, either in fee simple, or under a lease from the Crown in which the rent reserved is taken in part payment of the purchase money of the land demised by such lease. The Commissioners have the option of making such advances either in cash or in mortgage bonds; and it is provided that all advances, together with interest at the rate of $4\frac{1}{2}$ per cent. per annum, are to be repaid in sixty-three half-yearly instalments, or such smaller number as may be agreed upon by the Commissioners and the borrower. From the commencement of the Act to the 30th June, 1901, advances to the amount of £1,163,105 had been made. The total number of loans in existence on that date was £2,323, representing the sum of £1,022,836, averaging £440 each. The actual advances made during the financial year 1900-01 amounted to £189,670, of which £172,016 was advanced to pay liabilities, £3,533 to pay Crown rents, and £14,121 to improve resources of land, and to carry on. To enable them to make the necessary advances the Commissioners had sold Treasury bonds and debentures to the nominal value of £1,183,600, of which £155,050 have been redeemed, leaving a balance of £1,028,550.

In Queensland the Agricultural Bank Act, assented to on the 31st December, 1901, empowered the Government to establish a bank for the purpose of promoting the occupation, cultivation, and improvement of the agricultural lands of the State. The amount to be raised must not exceed £250,000, and may be advanced to farmers and settlers in sums not greater than £800. Applications for advances not exceeding £200 are to be given priority over those of a greater amount, and no advance must exceed 13s. in the £ of the fair estimated value of the improvements to be made. Interest at the rate of 5 per cent. per annum is to be paid on advances for a period of five years, and thereafter the advances must be repaid within twenty years by half-yearly instalments of £4 0s. 3d. for every £100 advanced.

The South Australian Parliament, on the 20th December of that year, passed the State Advance Act of 1895, providing for the establishment of a State Bank for the purpose of making advances to farmers and producers, to local authorities, and in aid of industries, on proper security, consisting either of lands held in fee-simple or under Crown lease; the funds for this purpose to be raised by the issue of mortgage bonds guaranteed by the State. The rate of interest was to be a matter

of arrangement between the bank and the borrower, the maximum being 5 per cent. per annum. To the 31st March, 1901, the South Australian State Bank, thus established, had advanced £620,705, and received repayments to the amount of £113,296. On that date there were arrears of interest to the amount of £339 outstanding; and £6,057 interest had accrued and become due on the 1st April. In order to enable these advances to be made, mortgage bonds had been sold to the amount of £618,900, of which £114,700 had been repurchased, leaving the amount current at £504,200. The advances made during the financial year 1900-01 amounted to £90,824.

In Western Australia the Agricultural Bank Act of 1894 authorised the establishment of a bank for the purpose of assisting persons in the occupation, cultivation, and improvement of agricultural lands. Under the provisions of the Act the manager of the bank is empowered to make advances to farmers and other cultivators of the soil on the security of their holdings in fee-simple, or under special occupation lease, or under conditional purchase from the Crown, or under the Homestead Farms Act of 1893. The advances are granted either for the purpose of making improvements on unimproved holdings, or of making additional improvements on holdings already improved, and, under the original Act, could not exceed in amount one-half of the fair estimated value of the improvements proposed to be made. The maximum rate of interest chargeable was fixed at 6 per cent. per annum payable half-yearly, and it was provided that the largest sum to be advanced to any one person shall be £400. Repayment is made in half-yearly instalments of one-fiftieth of the principal sum, to commence on the 1st January or the 1st July next following the expiration of five years from the date of the advance, until the whole amount is repaid with interest. Arrangements can, however, be made for the repayment of advances at shorter intervals, and in larger instalments. For the purposes of the Act, improvements were defined as clearing, cultivating, and ringbarking; but by an Amending Act passed in 1896 the term was extended so as to include fencing, drainage works, wells of fresh water, reservoirs, buildings, or any other works enhancing the value of the holding. The same Act raised the largest sum which can be advanced to £800, reduced the maximum rate of interest to 5 per cent., made provision for the acceptance of pastoral leases as security, and allowed advances to be made up to three-fourths of the estimated value of the proposed improvements. The capital allotted to the Agricultural Bank is £200,000; and to the 31st December, 1901, loans to the amount of £145,650 from 1,458 applicants had been approved. During the financial year 1899-1900, advances to the amount of £15,330 were approved.

In New Zealand the Government Advances to Settlers Act of 1894 provided for the establishment of an Advances to Settlers Office, empowered to lend money on first mortgages of land occupied for farming, dairying, or market-gardening purposes, urban and suburban

lands used for residential or manufacturing purposes being expressly excluded from the scope of the Act. At that time one class of loans only was contemplated, viz., loans on mortgage security, which were repayable by seventy-three half-yearly instalments, subject, however, to redemption at any time; but by an Amending Act passed in 1896 authority was given for the granting of fixed loans for any term not exceeding ten years. These loans can only be granted on freehold lands, and are repayable without sinking fund at the end of the period for which they are made. The amount advanced on fixed loan is not to exceed one-half the estimated value of the security; while under the instalment system the Board of Control has power to grant loans up to 60 per cent. of the realisable value of freehold securities, and up to 50 per cent. of the lessee's interest in leasehold securities. In both cases interest is fixed at the rate of 5 per cent. per annum, and the amount advanced cannot be less than £25 nor more than £3,000—the maximum under the 1894 Act having been £2,500. Instalment loans are repayable in 36½ years, in half-yearly payments, at the rate of 5 per cent. for interest and 1 per cent. in redemption of the principal sum. The first meeting of the General Board for the purpose of considering applications for loans was held on 23rd February, 1895; and up to 31st March, 1902, the Board had authorised 11,312 advances, amounting to £3,736,620. The total amount applied for in the 11,312 applications granted in full, or in part, was £4,253,000. 1,450 applicants declined the partial grants offered to them, amounting to £662,935; so that the net advances authorised at 31st March, 1902, numbered 9,862, and amounted to £3,073,685. The security for the advances authorised was valued at £6,737,611. The number of applications received up to 31st March, 1902, was 14,746, and the amount applied for, £5,204,300.

WATER CONSERVATION.

The necessity of providing water for stock in the dry portions of the interior of the Australian continent induced the Governments of the States to devote certain funds to the purpose of sinking for water, and bringing to the surface such supplies as might be obtained from the underground sources which geologists stated to exist in the tertiary drifts and the cretaceous beds which extend under an immense portion of the area of Central Australia, from the western districts of New South Wales to a yet unknown limit into Western Australia.

In New South Wales the question of the existence of underground water had long been a subject of earnest discussion, but doubts were set at rest in 1879 by the discovery on the Kallara Run, at a depth of 140 feet, of an artesian supply of water, which, when tapped, rose 26 feet above the surface. The Government then undertook the work of searching for water, and since the year 1884 the sinking of artesian

wells has proceeded in a scientific and systematic manner, under the direction of specially-trained officers. Private enterprise, which had shown the way, has also followed up its first successes.

Up to 1901 the Government of New South Wales had undertaken the sinking of 103 wells; of these, 88 have been completed, and 15 are in progress. Of the completed wells, 58 are flowing, 19 are sub-artesian, yielding pumping supplies, and 11 have been failures; these wells represent 143,391 feet of boring, while with the uncompleted wells the total depth bored has been 170,507 feet. From the completed wells about 33,000,000 gallons of water flow every day to the surface. The deepest bore completed is that at the Dolgelly, on the road from Moree to Boggabilla, where boring has been carried to a depth of 4,086 feet; this well yields a supply of approximately 745,200 gallons per diem. The largest flow obtained in the State is from the Kenmare Bore, on the road from Bourke to Hungerford; the depth of this well is 1,539 feet, and the estimated flow about 2,050,000 gallons per diem. Another important bore is that at Pera, 8 miles from Bourke, on the Wanaaring road, where at a depth of 1,154 feet a flow of 350,000 gallons per diem is obtained. At this bore the most extensive system of irrigation by artesian water as yet undertaken in the State is being carried out. An area of 57 acres has been set apart for experimental cultivation by the Government, and certain fruits and other products indigenous to the temperate and torrid zones are being grown with success. Equally good results have been obtained at Native Dog, Barrington, Enngonia, and Belalie bores, on the road from Bourke to Barrington. Lucerne, maize, wheat, tobacco, millet, planter's friend, sugar-cane, date palms, pineapples, bananas, and many other fruits and vegetables of tropical and sub-tropical character have been found to thrive there exceedingly well.

On the road from Wanaaring to Milparinka, once a waterless track, successful boring operations have been carried on. Seven bores have been completed. Four of these give a pumping supply, and three are flowing, yielding an aggregate supply of 3,150,000 gallons daily. Boring operations have been extended farther to the north-west, and two bores have been sunk at Paldrumata and Oarnoo, on the Tibooburra to Yalpunga road. These two bores are sub-artesian, and yield pumping supplies at depths of 780 and 1,357 feet respectively. Another bore is in progress at Warri Warri. A remarkable flow has also been obtained at the Moree bore, amounting to 1,108,000 gallons daily. This bore has been carried to a depth of 2,792 feet, through formations of the same age as the Ipswich coal measures (*Trias Jura*), thus demonstrating the fact that water can be obtained in other than the lower cretaceous formation. An experimental farm has been established at this site, where sub-tropical fruits and plants are grown.

Much has been done in the way of artesian boring by private enterprise. As far as can be ascertained, 128 private bores have been undertaken in New South Wales, of which 16 were failures, 2 were abandoned, and 1 is in progress. Amongst the most important are two wells on

Lissington Holding, one with a flow of 4,000,000 gallons and the other with 3,000,000 gallons per day ; one at Cuttabulla (Lila Springs), with a daily flow of 4,000,000 gallons ; one at Toulby with 3,500,000 gallons per day ; and one at Goondabluie with 3,000,000 gallons per day. From the private wells approximately 45,000,000 gallons are discharged daily.

A better idea of the value of artesian wells to the community will be obtained when it is known that the aggregate daily flow of underground water in New South Wales is now approximately 78,000,000 gallons, and that, in addition, large supplies can be pumped from sub-artesian wells. The average depth of the 88 wells completed by the Government is 1,628 feet 4 inches, with a range from 165 to 4,086 feet, while the temperature of the water varies from 80 to 139 degrees Fahrenheit. The total cost of the wells (including actual boring, casing, carriage, and incidental expenses) was £252,759, or an average of £2,872 5s. 3d. per bore, or £1 15s. 3d. per foot.

In Queensland up to the 31st December, 1901, there were 907 completed bores, of which 65 were Government, 30 Local Government, and 812 private bores.

Of the Government bores, 24 were artesian, 14 sub-artesian, and 27 were abandoned as failures. The daily flow of water from the successful bores amounted to 10,365,600 gallons. The Local Government bores included 10 artesian and 18 sub-artesian, while 2 were abandoned. From the successful bores a daily flow of 6,007,100 gallons is obtained. Of the private bores, 499 were artesian, 174 were sub-artesian, and 107 were failures. It is estimated that the daily flow of water from private bores amounts to no less than 344,701,800 gallons. The large proportion of abandoned Government bores is due to the fact that many of them were sunk for experimental purposes in order to ascertain the prospects of obtaining artesian water. Others were put down by the old methods of boring, by which depths over 1,000 feet could not be penetrated in the swelling clays of Queensland. The total expenditure by the Government up to the 31st December, 1901, amounted to £345,943 on water conservation, and £138,060 on artesian bores. The deepest Government bore is at Winton, and reaches 4,010 feet, while the most copious supply, namely, 3,000,000 gallons per day, is obtained at the Charleville bore. The deepest private bore, and also the deepest bore in the State, is the Whitewood on the Bimerah run, and reaches 5,045 feet. The largest supplies are obtained from the Coongoola bore, which yields 6,000,000 gallons daily ; Cunnamulla East, 4,500,000 ; Burrumbilla and Cunnamulla West, 4,000,000 ; Boatman, 3,500,000 ; and Savannah Downs yielding 3,400,000 gallons daily. The total depth bored in search of artesian water up to 30th June, 1901, was 1,066,605 feet, the average depth per bore being 1,176 feet. At Helidon water of so low a temperature as 60 degrees Fahrenheit was flowing ; while at Dagworth, the water had a temperature of 196 degrees. Large areas are served by the water from the bores for irrigation purposes, the total at the end of 1901, according

to the returns received being 6,526 acres, of which 4,490 acres were principally under sugar-cane; and in addition several stations, which made no returns, also used the water for purposes of irrigation. Some of the bore waters contain soda in various forms, and these it is impossible to use, except for a limited period, and in small quantities.

At the end of 1897, the latest date for which any information is available, the Water Conservation Department of South Australia had completed eighty-seven bores, of which, however, only thirty-three were successful. These are spread over widely-distant parts of the territory, successful bores existing at Nullarbor Plains, on the boundary of Western Australia; at Oodnadatta, the present terminus of the Northern Railway system; and at Tintinara, in the south-eastern extremity of the State. The bore at Tintinara has proved that the marine tertiary area is water-bearing. For purposes of water conservation, the State may be divided into four large areas, namely, the West Coast division, where 12 bores were attempted and 3 were successful; the Far North and North-west division, where 13 out of 32 bores were successful; the Central division, where 15 out of 39 bores were a success; and the South-east division, where 2 out of 4 bores were successful. Of the bores on the west coast, Robert's Well No. 1, on Nullarbor Plains, reaches a depth of 777 feet, and gives a daily supply of 68,000 gallons; the total supply from the three flowing wells being 133,000 gallons. Much greater depths have been reached in the far north; a well at Kopperamanna being the deepest in the State, viz., 3,000 feet. This well gives a daily supply of 800,000 gallons. A well at Strangways, and another at Coward, give daily supplies of 1,200,000 gallons each—the maximum obtained in South Australia. The flowing bores in this division gave a daily yield of 3,928,200 gallons. The wells in the central area are much less important, the largest supply, viz., 108,000 gallons daily, being obtained from one in the vicinity of Gawler. The deepest well in this division is situated at Percyton, and reaches 930 feet. The total daily supply in the central area amounts to 354,400 gallons. The two successful wells in the south-east have a daily outflow of 134,000 gallons. The total daily supply for the whole State reaches, therefore, 4,449,600 gallons. According to a report by the engineer-in-chief, it would appear that the South Australian Government had expended £19,202 on machinery and £148,689 in boring operations, or a total of £167,891, at the end of the year 1897.

The Government of Western Australia, following the example set by those of the eastern States has sunk 22 bores in various parts of the State, and 10 bores have been sunk by private owners. Of the Government bores, 12 have been successful, and yield a daily supply of 5,129,504 gallons, 9 were failures, and 1 is in progress. All the private bores yield supplies of water with the exception of one which is in progress—the daily flow being 1,543,000 gallons. The deepest bore is at South Perth, and reached a depth of 1,860 feet; while the largest supply is obtained from the municipal bore at Guildford, and amounts

to 1,120,000 gallons daily. Up to the 31st December, 1901, the Government had expended £39,283 on artesian boring, while £8,500 had been spent by private owners.

In Victoria the attempts to obtain water by means of artesian boring have not been successful. Up to the 31st December, 1901, 46 bores had been sunk, 16 of which were driven to bed rock, but none yielded artesian supplies. The expenditure on these bores amounted to £68,864, and the cost of water conservation, excluding Government expenditure on Melbourne Water Supply, was £8,570,603.

It is unfortunate that later information than that quoted in regard to South Australia cannot be given; but there seems to be a singular apathy on the part of the Departments concerned in all the States in publishing reports on this most important service. The statistics are presented for South Australia for the date referred to, although a large amount of work has been carried out during the last year or two in the direction of boring for artesian water.