

AGRICULTURE.

TAKEN as a whole, Australasia may be said to be just emerging from the first phase of agricultural settlement; indeed, several states have not yet wholly passed 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 average production from agriculture in each state for the last five years is shown below. While the returns in 1902 from several of the states were lower than usual, owing to adverse seasons, New Zealand had a remarkably favourable year, the wheat harvest in that colony being nearly 7,500,000 bushels as compared with 4,100,000 bushels in New South Wales and Victoria combined. In 1900, however, these two states produced 34,000,000 bushels as compared with 6,500,000 bushels in New Zealand, while present conditions are so favourable that in all probability the combined yield of the two states will amount to 54,000,000 bushels.

State.	Average value of Crops for last five years.	Average Value of Produce per acre for last five years.	Proportion of Total Value.
	£	£ s. d.	per cent.
New South Wales	5,563,000	2 7 11	19·30
Victoria	7,216,000	2 5 11	25·03
Queensland	1,876,000	4 13 9	6·51
South Australia	3,287,000	1 9 1	11·40
Western Australia	759,000	3 15 6	2·63
Tasmania	1,506,000	6 7 1	5·23
Commonwealth	20,207,000	2 7 3	70·10
New Zealand	8,619,000	5 1 8	29·90
Australasia	28,826,000	2 16 3	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 of the Commonwealth, a fact which is due to the proportionately large area under sugar-cane 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 Commonwealth group, the produce of that province having a value slightly 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 wheat, potatoes, and from gardens and orchards. New Zealand also produces over one-fourth of the total, and New South Wales over one-sixth. The average value of the principal crops, and the percentage of each to the total production for the quinquennial period, 1899 to 1903, are given in the following statement:—

Name of Crop.	Value.	Proportion to Total.
	£	per cent.
Wheat	6,619,000	23·0
Maize	1,371,000	4·8
Barley	428,000	1·5
Oats	2,700,000	9·4
Hay	6,522,000	22·6
Grass seed	260,000	0·9
Potatoes	2,104,000	7·3
Grapes	915,000	3·2
Hops	56,000	0·2
Tobacco	14,000	0·0
Sugar-cane	636,000	2·2
Orchards and Gardens	2,247,000	7·8
Green forage	1,051,000	3·6
Other crops (other grain, root, &c.)...	3,903,000	13·5
Total	28,826,000	100·0

The principal crop is wheat, which returned 23 per cent. of the total value, hay coming next with 22·6 per cent. “Other” crops returned the large sum of £3,903,000—13·5 per cent.—to which, New Zealand alone contributed £3,020,000, 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 last five years is represented by the following figures. It will be seen that New Zealand shows the highest value, followed in order by South Australia, Tasmania, Victoria, Western Australia, 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	1	7
Victoria.....	6	0	7
Queensland	3	15	9
South Australia	9	1	11
Western Australia	4	1	8
Tasmania	8	14	1
Commonwealth	5	7	1
New Zealand	11	3	0
Australasia	6	6	9

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 given above, it will be seen that while the total production of Australasia now averages nearly £9,000,000 more than in 1881, the average value per head has declined over 12 per cent., and that, as compared with 1891, the value per head shows an increase of 12s. 3d. 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 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; while towards the close of 1902, when the effects of the adverse season were acutely felt, prices rose to double those of the previous year.

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	Australasia (average for years 1897-1902)	29	6·5
Denmark	19	8·6			

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 1871, will serve to illustrate the progress which agriculture has made. In this table, and in the others which follow, the years 1871, 1881, 1891, and 1902 embrace the period from the 1st April in each of those years to the 31st March in the following year :—

State.	1871.	1881.	1891.	1901.	1902.
	acres.	acres.	acres.	acres.	acres.
New South Wales.....	390,099	578,243	846,383	2,276,628	2,245,839
Victoria	851,354	1,435,446	2,116,654	2,965,681	3,246,568
Queensland	59,969	117,664	242,629	483,460	275,383
South Australia.....	837,730	2,156,407	1,927,689	2,236,552	2,224,593
Western Australia	51,724	53,353	64,209	216,824	228,118
Tasmania	155,046	148,494	168,121	232,550	246,923
Commonwealth.....	2,345,922	4,489,607	5,365,685	8,411,695	8,467,424
New Zealand	337,282	1,070,906	1,424,777	1,545,683	1,603,602
Australasia.....	2,683,204	5,560,513	6,790,462	9,957,378	10,071,026

In addition to the 1,603,602 acres under crop in New Zealand as shown above, there were in 1902, 69,342 acres of grass land cut for hay, and 61,444 acres of clover and grass were cultivated for seed. If these areas be taken into consideration, the total acreage in cultivation in New Zealand will be 1,734,388. In 1861, the cultivated area in Australasia was 1,337,548 acres, so that the extent of land under crop is now over seven times as large as it was in that year. If, however, the land artificially grassed be included, the total will come to 23,289,517 acres, or nearly eighteen times the area in cultivation in 1861. A comparison of the acreage under crop on the basis of population, 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.	1902.
	acres.	acres.	acres.	acres.	acres.	acres.
New South Wales	0·7	0·8	0·8	0·7	1·7	1·6
Victoria	0·8	1·1	1·7	1·8	2·6	2·7
Queensland	0·1	0·5	0·5	0·6	1·0	0·5
South Australia	3·2	4·5	7·5	5·9	6·2	6·1
Western Australia	1·6	2·0	1·8	1·2	1·2	1·6
Tasmania	1·8	1·5	1·2	1·1	1·3	1·4
Commonwealth.....	1·1	1·4	2·0	1·6	2·2	2·2
New Zealand.....	0·7	1·3	2·1	2·2	2·1	2·0
Australasia	1·1	1·4	2·0	1·7	2·2	2·2

For the whole of Australasia the decennial 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 period intervening 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, however, together with the satisfactory advance in the price of wheat during the three years 1896-98, enabled the industry to show a substantial rate of progress during the ten years prior to 1902, when, although the area under crop was greater than in the previous year, the return was small.

In the following table will be found the proportion of land under crop to the total area of each state, and the same with regard to Australasia as a whole. In instituting comparisons between the several states, however, it must be borne in mind that circumstances other than the mere area in cultivation require to be taken into consideration. It would not be fair, for instance, to compare Tasmania, which has 6·57 persons per square mile, with Western Australia, which has only 0·19 inhabitant to the square mile. The table has a value chiefly because it shows how each province has progressed in cultivation of the soil during the periods quoted :—

State.	1861.	1871.	1881.	1891.	1901.	1902.
	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
New South Wales	0·15	0·20	0·29	0·44	1·44	1·13
Victoria	0·73	1·51	2·55	3·76	5·27	5·77
Queensland	0·001	0·01	0·03	0·06	0·11	0·06
South Australia	0·07	0·15	0·37	0·33	0·39	0·38
Western Australia	0·006	0·008	0·009	0·01	0·03	0·04
Tasmania	0·97	0·92	0·88	0·99	1·39	1·47
Commonwealth	0·07	0·12	0·24	0·28	0·44	0·45
New Zealand	0·10	0·50	1·60	2·13	2·40	2·40
Australasia	0·07	0·14	0·28	0·34	0·51	0·51

The subjoined table shows the proportion of cultivated area devoted to the principal crops in each province, during the year 1902. It will be seen that wheat forms the greatest percentage of the total tillage in Australasia as a whole, and in New South Wales, Victoria, South Australia, and Western Australia. Maize and sugar-cane are the principal crops in Queensland, and oats in New Zealand. In Tasmania only 16·6 per cent. of the land cultivated was under wheat, the area cut for hay forming 26·7 per cent. of the total acreage. "Other crops"

also show a considerable increase in the Queensland returns—the figures being 26·6 as against 15·3 in the previous year. The advance is chiefly due to the extensive planting of quick-growing green crops in favoured places for stock-feed during the dry season.

Crop.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Commonwealth.	New Zealand.	Australasia.
	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
Wheat	57·0	61·4	0·7	73·5	40·3	16·6	60·9	12·1	53·1
Maize	9·0	0·3	32·6	....	0·1	....	3·6	0·8	3·1
Barley	0·2	1·2	0·2	1·0	1·7	3·4	0·9	1·7	1·0
Oats	1·9	13·4	0·0	2·3	4·5	22·3	7·0	30·2	10·7
Potatoes	0·9	1·5	1·0	0·3	0·9	14·0	1·4	2·0	1·5
Hay	21·9	17·9	7·3	14·6	45·8	26·7	18·8	4·3	16·5
Vines	0·4	0·9	0·6	1·0	1·5	....	0·7	....	0·6
Sugar-cane ..	0·9	....	31·0	....	....	....	1·2	....	1·1
Other crops..	7·8	3·4	26·6	2·3	5·2	17·0	5·5	48·9	12·4
Total	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0

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 14·1 per cent. of the whole in 1902, as compared with 8·6 per cent. in 1861:—

Product.	1861.	1871.	1881.	1891.	1901.	1902.
	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
Wheat	53·6	51·4	60·7	55·0	52·7	53·1
Oats	10·6	13·5	7·9	8·4	8·7	10·7
Maize	4·6	5·3	3·0	4·3	3·3	3·1
Barley	2·2	2·3	1·9	1·4	1·0	1·0
Potatoes	4·2	3·0	1·8	2·0	1·4	1·5
Hay	16·2	11·9	15·1	16·0	17·6	16·5
Vines	0·5	0·7	0·3	0·7	0·6	0·6
Sugar-cane ..	....	0·5	0·7	1·1	1·3	1·1
Other crops	8·1	11·4	8·6	11·1	13·4	12·4
Total	100·0	100·0	100·0	100·0	100·0	100·0

WHEAT.

With the exception of Queensland and Western Australia, all the states during 1901 produced 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 1902-3, although a larger area was sown than at any previous period, the long continued dry weather caused a decline in production, the returns for Victoria and New South Wales averaging only 1·3 and 1·2 bushels per acre respectively. Taking Australasia as a whole, there was a net export of breadstuffs, during 1902, equivalent to 11,678,845 bushels of grain, valued at £2,628,000.

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

State.	1861.	1871.	1881.	1891.	1901.	1902.
	acres.	acres.	acres.	acres.	acres.	acres.
New South Wales	123,468	154,030	221,888	356,666	1,392,070	1,279,760
Victoria	196,922	334,609	926,729	1,332,683	1,754,417	1,994,271
Queensland	392	3,024	10,958	19,306	87,232	1,850
South Australia ...	310,636	692,508	1,768,781	1,552,423	1,743,452	1,746,842
Western Australia	13,584	25,697	21,951	26,866	93,707	92,065
Tasmania	58,923	63,332	51,757	47,584	44,084	40,898
Commonwealth	703,825	1,273,200	3,002,064	3,335,528	5,114,962	5,155,716
New Zealand	29,531	108,720	365,715	402,273	163,462	194,355
Australasia ...	733,356	1,381,920	3,367,779	3,737,801	5,278,424	5,350,071

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 1902 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. In these two states there were decreases in acreage, although the falling-off was partly due to the unfavourable seasons. In Australasia, as a whole, the increase in area since 1881 amounts to 1,982,292 acres—but while New South Wales shows an extension of cultivation during the period amounting to 1,057,872 acres, and Victoria an increase of 1,067,542 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 at intervals since 1871 was as follows :—

State.	1871.	1881.	1891.	1901.	1902.
	bushels.	bushels.	bushels.	bushels.	bushels.
New South Wales	2,229,642	3,405,966	3,963,668	14,808,705	1,585,097
Victoria	4,500,795	8,714,377	13,629,370	12,127,382	2,569,364
Queensland	36,288	39,612	392,309	1,692,222	6,165
South Australia	3,967,079	8,087,032	6,436,488	8,012,762	6,354,912
Western Australia	345,368	153,657	288,810	933,101	970,571
Tasmania	847,962	977,365	930,841	963,662	876,971
Commonwealth.....	11,927,134	21,378,009	25,641,486	38,537,834	12,363,080
New Zealand.....	2,448,203	8,297,890	10,257,738	4,046,589	7,457,915
Australasia	14,375,337	29,675,899	35,899,224	42,584,423	19,820,995

The adverse weather conditions 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, while in 1902 the expected crop fell off by at least forty million bushels. In New Zealand the harvest was an exceptionally good one, the yield being at the rate of over 38 bushels per acre, an increase of nearly 14 bushels on the average of the previous year.

The greatest increase in production between 1881 and 1901 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 during the period, 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	29·4	38·0	28·5
Queensland	0·1	1·1	3·9
South Australia	27·2	17·9	18·3
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

From a preceding table it will, however, be seen that in 1902 New Zealand produced nearly 40 per cent. of the total wheat crop in Australasia, and New Zealand and South Australia together, about 70 per cent.

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 last year forming less than 0·7 per cent. of the world's wheat crop. According to the estimate published by Beerbohm, the world's production of wheat in 1902 was 375,000,000 quarters, of which Australasia produced only 2,500,000 quarters. The figures for each country are appended:—

Country.	In Quarters of 480 lb.	Country.	In Quarters of 480 lb.
Europe—	000's omitted.	Africa—	000's omitted.
Russia	61,000	Algeria	3,500
France	42,000	Egypt	1,500
Hungary	22,800	Tunis.....	1,000
Germany.....	17,900	Cape Colony.....	500
Italy	16,000	Total	6,500
Spain	13,500		
United Kingdom	7,250	America—	
Austria	6,200	United States	85,000
Roumania	9,900	Argentine Republic..	13,500
Bulgaria	5,000	Canada	12,000
Turkey	5,000	Mexico	1,550
Belgium	1,750	Chili	1,500
Servia	1,500	Uruguay	1,000
Portugal	750	Total	114,550
Sweden and Norway..	500		
Holland	750	Australasia—	2,500
Switzerland	500		
Denmark.....	400	Grand Total.....	375,000
Greece.....	750		
Total	213,450		
Asia—			
India	28,000		
Asia Minor.....	5,000		
Syria	2,500		
Persia	2,500		
Total	38,000		

The yield of wheat per acre during the season 1902-3 ranged from 1·2 bushels in New South Wales to 38 bushels in New Zealand, and, with

the exception of New Zealand, Tasmania, and Western Australia, was far below the average for the last ten years. The average yields per acre for each state for 1902 and during the ten years 1893-1902 are shown below :—

State.	Average Yield per acre.	
	1902.	1893-1902.
	bushels.	bushels.
New South Wales	1·20	8·8
Victoria	1·29	6·7
Queensland	3·28	15·9
South Australia	3·64	4·6
Western Australia	10·54	10·5
Tasmania	21·44	19·7
Commonwealth	2·40	6·7
New Zealand	38·37	27·2
Australasia	3·70	7·7

A yield of 7·7 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 last ten years :—

Country.	Average Yield per acre.	Country.	Average Yield per acre.
	bushels.		bushels.
United Kingdom	32·9	India	10·5
Germany	25·6	Russia	7·6
France	18·5	Argentine Republic	11·3
Hungary	15·5	Canada (Ontario and Manitoba)	18·2
United States	13·3		

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, and better cultivation and the use of artificial fertilizers are becoming more general.

The average value of the wheat crop for the last five years 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.....	£1,664,000	£1 3 11
Victoria	1,920,000	0 19 0
Queensland	137,000	2 11 3
South Australia	1,352,000	0 15 0
Western Australia	191,000	2 5 6
Tasmania	202,000	3 10 6
Commonwealth	£5,466,000	£1 0 3
New Zealand.....	1,153,000	4 13 6
Australasia.....	£6,619,000	£1 3 5

The very high value returned in New Zealand is due to the heavy yield of grain, the area under cultivation being comparatively 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 portions of the years.

A detailed table of the value of the yield per acre during each of the last thirteen 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, also for the very low values shown in 1902–3 for Victoria and New South Wales :—

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
1903	1·2	1·3	3·6	0 7 11	0 7 10	1 1 7
*1904	19·2	12·6	7·6	.....	.....	.....

* Estimated.

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 1902, 1 ton of flour being taken as equal to 50 bushels of grain. The exporting states were New South Wales, Victoria, and South Australia. Between 1896 and 1902, 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. In the early part of 1902, heavy exports were also made, but towards the close of the year, when the harvest prospects were discouraging, shipments ceased and extensive imports were arranged for. The year, nevertheless, showed an excess of exports amounting to 2,774,782 bushels. During the last few years Tasmania as a rule produced enough wheat for home consumption, and in 1901 had a small surplus available for export :—

State.	Net Imports. Bushels.	Net Exports. Bushels.
New South Wales .....	.....	2,774,782
Victoria .....	.....	5,233,255
Queensland	1,957,187	.....
South Australia .....	.....	6,541,495
Western Australia	804,348	.....
Tasmania	51,732	.....
	<hr/>	<hr/>
Commonwealth .....	.....	11,736,265
New Zealand	57,420	.....
	<hr/>	<hr/>
Australasia .....	.....	11,678,845

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	1893	32,759,693	8,829,941
1883	21,492,505	4,742,290	1894	36,929,947	11,916,782
1884	35,714,456	17,130,843	1895	30,855,812	6,774,377
1885	30,559,060	11,583,644	1896	19,557,726	(—) 4,347,168
1886	20,165,988	(—) 603,532	1897	20,880,479	(—) 3,641,306
1887	28,899,220	4,265,924	1898	28,241,409	1,341,596
1888	35,930,697	10,643,673	1899	41,417,853	11,581,198
1889	19,757,509	(—) 2,107,136	1900	48,353,402	13,965,610
1890	34,039,289	8,836,170	1901	38,537,834	24,770,592
1891	27,118,259	10,646,298	1902	12,363,080	11,736,265
1892	25,675,265	4,126,538			

(—) 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.
1893	26 4	1898	34 0
1894	22 10	1899	25 8
1895	23 1	1900	26 11
1896	26 2	1901	26 8
1897	30 2	1902	28 1

During 1902, Great Britain imported 5,396,000 tons of wheat and flour, the countries of origin being as follows :—

	tons.	per cent.
United States	3,248,000	60·19
Argentine Republic.....	227,000	4·21
Russia and Austria	379,000	7·03
Other Foreign Countries	270,000	5·00
Total from Foreign Countries ...	4,124,000	76·43
India	442,000	8·19
Canada	611,000	11·32
Australasia	219,000	4·06
Total from British Possessions ...	1,272,000	23·57
Total	5,396,000	100·00

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.	1871.	1881.	1891.	1901.	1902.
	acres.	acres.	acres.	acres.	acres.
New South Wales.....	13,795	16,348	12,958	32,245	42,992
Victoria	175,944	146,995	190,157	329,150	433,489
Queensland	131	88	715	1,535	78
South Australia	3,586	3,023	12,637	34,660	50,296
Western Australia	1,474	827	1,301	9,641	10,180
Tasmania	29,631	27,535	28,360	54,089	55,058
Commonwealth.....	224,561	194,816	246,128	461,320	592,093
New Zealand.....	139,185	243,387	323,508	405,924	483,659
Australasia.....	363,746	438,203	569,636	867,244	1,075,752

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 two-thirds 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 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. In 1902 the yield of oats in all the Commonwealth states was small. The output of New Zealand, however, increased by over 6,700,000 bushels, the increase being nearly equal to the whole yield of the Commonwealth.

The total yield in each state for the period covered by the preceding table was as follows :—

State.	1871.	1881.	1891.	1901	1902.
	bushels.	bushels.	bushels.	bushels.	bushels.
New South Wales ...	280,887	356,566	276,259	687,179	351,758
Victoria	3,299,889	3,612,111	4,412,730	6,724,900	4,402,982
Queensland .....	.....	1,121	16,669	42,208	520
South Australia	38,894	32,219	80,876	469,254	620,823
Western Australia...	28,330	8,270	18,539	158,638	161,714
Tasmania	593,477	783,129	873,173	1,702,659	1,752,745
Commonwealth ...	4,241,477	4,793,416	5,678,246	9,784,838	7,290,542
New Zealand	3,726,810	6,924,848	11,009,020	15,045,233	21,766,708
Australasia	7,968,287	11,718,264	16,687,266	24,830,071	29,057,250

The average yields per acre in each state in 1902, and during the ten years 1893–1902 are shown below :—

State.	Average yield per acre.	
	1902.	1893–1902.
	bushels.	bushels.
New South Wales	8·2	17·9
Victoria	10·2	18·4
Queensland	6·7	18·8
South Australia	12·3	10·4
Western Australia	15·9	16·3
Tasmania	31·8	29·4
Commonwealth	12·2	18·8
New Zealand	45·0	36·6
Australasia	27·0	27·4

In all the provinces which grow oats to any extent, with the exception of New Zealand, Tasmania, and South Australia, the yield last year was considerably below the decennial average. New Zealand had the very high average of 45 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 average value of the oats crop and the return per acre, in each of the Commonwealth states and New Zealand, for the last five seasons, will be found below :—

State.	Value.	Value per acre.
New South Wales	£63,000	£2 0 8
Victoria	690,000	2 1 5
Queensland	2,000	3 6 11
South Australia	46,000	1 8 9
Western Australia	16,000	2 13 4
Tasmania	180,000	3 9 3
<hr/>		
Commonwealth.	£997,000	£2 3 11
New Zealand.....	1,703,000	3 19 0
<hr/>		
Australasia.....	£2,700,000	£3 1 1

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 1902 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 1902, although Tasmania and Victoria also exported fairly large quantities. Owing to the late war in South Africa, a large demand for oats as horse-feed was created, and for the year ended 31st March, 1903, no less than 3,988,000 bushels of oats, valued at £511,558, were exported to that country by New Zealand alone. The total export of oats from New Zealand amounted to £666,644, of which a quantity valued at over £60,000 was sent to New South Wales. Tasmania also took advantage of the shortage on the mainland, and exported oats to the value of £139,265, of which an amount of £109,695 was consigned to New South Wales.

State.	Net Imports.	Net Exports.
New South Wales.....	1,577,236 bushels.	..... bushels.
Victoria .....	..... "	1,643,130 "
Queensland.....	301,747 " "
South Australia.....	..... "	134,277 "
Western Australia	638,912 " "
Tasmania..... "	972,839 "
<hr/>		
Commonwealth "	232,351 "
New Zealand..... "	5,182,240 "
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Australasia..... "	5,414,591 "

According to a carefully-compiled estimate of the average production in the principal countries growing oats throughout the world, issued by the Board of Agriculture of the United Kingdom, the yield of this grain in 1902 was as follows :—

	Quarters.
Europe	250,953,112
North America	109,000,449
Africa	514,125
Australasia.....	3,632,156
Total	364,099,842

To this may probably be added 5,250,000 quarters raised in Asia and South America, making the total output about 370,000,000 quarters.

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.	1871.	1881.	1891.	1901.	1902.
	acres.	acres.	acres.	acres.	acres.
New South Wales	119,956	117,478	174,577	167,733	202,437
Victoria	1,709	1,783	8,230	10,020	10,906
Queensland	20,329	46,480	101,598	116,983	89,923
Other States.....	113	36	23	530	186
Commonwealth	142,107	165,777	284,428	295,266	303,452
New Zealand .....	.....	3,177	5,447	12,503	12,038
Australasia ...	142,107	168,954	289,875	307,769	315,490

The production in the same years was as follows :—

State.	1871.	1881.	1891.	1901.	1902.
	bushels.	bushels.	bushels.	bushels.	bushels.
New South Wales	4,015,973	4,330,956	5,721,706	3,844,993	3,049,269
Victoria	30,833	81,007	461,447	615,472	750,524
Queensland	508,000	1,313,655	3,077,915	2,569,118	1,033,329
Other States	2,000	648	483	5,611	2,498
Commonwealth	4,556,806	5,726,266	9,261,551	7,035,194	4,835,620
New Zealand .....	.....	127,257	238,746	571,834	607,609
Australasia ...	4,556,806	5,853,523	9,500,297	7,607,028	5,443,229

It will be seen from the tables given above that although there has been an increase in acreage amounting to over 25,000 acres since

1891, the production declined by about 1,894,000 bushels in 1901, and by about 4,000,000 bushels in 1902, the falling off being accounted for by the unfavourable seasons.

The following table shows the average yield of each state and of Australasia for 1902, and for the ten years ended 1902 :—

State.	Average yield per acre.	
	1902.	1893-1902.
	bushels.	bushels.
New South Wales	15·1	27·6
Victoria	68·8	55·4
Queensland	11·5	21·5
Western Australia	13·4	16·6
Commonwealth	15·9	26·3
New Zealand	50·4	42·1
Australasia	17·2	26·9

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 period, has never had more than 250 acres under this crop—the average yield for ten years being less than 17 bushels per acre under cultivation, producing 12,498 bushels.

The average value of the crop for the last five seasons, and the average return per acre, will be found below :—

State.	Average value of crop. £	Average value per acre. £ s. d.
New South Wales	838,000	4 5 1
Victoria	101,000	9 16 1
Queensland	340,000	3 1 10
Other States	400	3 14 9
Commonwealth	1,279,400	4 0 8
New Zealand	90,000	5 19 11
Australasia	1,369,400	4 2 5

The net import or export of maize by each state during 1902 was as follows :—

State.	Net Imports. bushels.	Net Exports. bushels.
New South Wales	1,218,668	.....
Victoria .....	.....	445,293
Queensland	1,100,955	.....
South Australia	3,878	.....
Western Australia.....	6,034	.....
Commonwealth	1,884,242	.....
New Zealand .....	.....	225,829
Australasia	1,658,413	.....

Of the maize imported by New South Wales and Queensland, over 1,500,000 bushels, valued at £246,000, was shipped by the Argentine Republic.

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, this grain 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. The following statement shows the world's production of maize during the past two years :—

	1901. Quarters, 000's omitted.	1902. Quarters, 000's omitted.
North America	160,000	310,000
South East Europe	40,000	24,000
Argentine	9,500	10,000
Australasia	950	700
Africa and elsewhere.....	50,550	47,300
Total.....	261,000	392,000

In 1901, owing to the low yields in the United States, the world's production of maize was the smallest in recent records. This shortage was responsible for a marked decrease during 1902 in the American exports of bacon and hams, the exports to Great Britain alone showing a decline of 150,000,000 lb. on the figures of the previous year.

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.	1871.	1881.	1891.	1901.	1902.
	acres.	acres.	acres.	acres.	acres.
New South Wales.....	3,461	6,427	4,459	6,023	4,557
Victoria	16,772	48,652	45,021	32,423	37,716
Queensland.....	971	256	739	11,775	430
South Australia.....	17,225	11,953	11,461	15,517	21,493
Western Australia	5,083	3,679	3,738	2,719	3,874
Tasmania	4,275	4,597	2,650	6,104	8,281
Commonwealth	47,787	75,564	68,068	74,561	76,351
New Zealand	13,305	29,808	24,268	26,514	27,921
Australasia.....	61,092	105,372	92,336	101,075	104,272

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

State.	1871.	1881.	1891.	1901.	1902.
	bushels.	bushels.	bushels.	bushels.	bushels.
New South Wales.....	55,284	135,218	93,446	106,361	18,233
Victoria	335,506	927,566	830,741	693,851	581,144
Queensland.....	11,836	3,207	21,302	277,037	3,595
South Australia.....	164,161	137,165	107,183	243,362	317,155
Western Australia	5,083	36,790	48,594	35,841	45,778
Tasmania	76,812	102,475	71,686	167,485	201,133
Commonwealth.....	648,682	1,342,421	1,172,952	1,523,937	1,147,038
New Zealand	287,646	664,093	688,683	855,993	1,136,232
Australasia.....	936,328	2,006,514	1,861,635	2,379,930	2,283,270

The average yield of barley per acre in each state for 1902, and for the ten years ended 1902, is given in the following table :—

State.	Average Yield per Acre.	
	1902.	1893-1902.
	bushels.	bushels.
New South Wales	4·0	15·3
Victoria	15·0	17·2
Queensland	8·4	19·0
South Australia	14·8	13·3
Western Australia	11·8	11·9
Tasmania	24·3	23·7
Commonwealth	15·0	16·7
New Zealand	40·7	30·2
Australasia	21·9	20·4

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 world's production of 1,050,100,000 bushels in 1902 Australasia contributed only a little over 2,000,000 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 Tasmania and New Zealand, were dependent in 1902 upon external sources. The trade in barley and malt for the Commonwealth and New Zealand in 1902 was as follows:—

State.	Barley.		Malt.	
	Net Imports.	Net Exports.	Net Imports.	Net Exports.
	bushels.	bushels.	bushels.	bushels.
New South Wales	214,141	.....	356,639	.....
Victoria	661,122	.....	.....	305,390
Queensland .....	.....	82,184	111,277	.....
South Australia .....	.....	8,240	.....	10,097
Western Australia	61,780	.....	149,665	.....
Tasmania .....	.....	25,375	.....	4,457
Commonwealth	821,244	.....	297,637	.....
New Zealand .....	.....	151,314	828	.....
Australasia	669,930	.....	298,465	.....

The average value of the barley crop and the return of this cereal per acre during the past five seasons will be found below:—

State.	Average value of	Average value
	barley crop.	per acre.
	£	£ s. d.
New South Wales	11,000	1 14 9
Victoria	161,000	3 2 9
Queensland	20,000	3 6 9
South Australia	38,000	2 4 8
Western Australia	7,000	2 6 9
Tasmania	24,000	3 15 0
Commonwealth	261,000	2 18 0
New Zealand	167,000	4 7 11
Australasia	428,000	3 6 10

Owing to the rapid progress of the brewing industry in Australia, increased attention is now being given to the cultivation of barley for malting purposes. Several of the larger malting companies are offering special inducements to farmers to cultivate the crop, and it is expected that the area devoted to it will show a considerable increase in the near future.

POTATOES.

The cultivation of the potato is not confined to any particular state. Victoria, New Zealand, and Tasmania have the largest areas under this crop, but New Zealand shows the greatest production. The largest area under potatoes was recorded 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.	1871.	1881.	1891.	1901.	1902.
	acres.	acres.	acres.	acres.	acres.
New South Wales	14,770	15,943	22,560	26,158	19,444
Victoria	39,064	39,129	57,334	40,058	49,706
Queensland	3,121	5,086	9,173	13,338	2,899
South Australia	3,156	6,136	6,892	6,248	7,763
Western Australia	494	278	532	1,829	2,069
Tasmania	8,154	9,670	16,393	25,444	34,625
Commonwealth...	68,759	76,242	112,884	113,075	116,506
New Zealand.....	11,933	22,540	27,266	31,259	31,408
Australasia	80,692	98,782	140,150	144,334	147,914

As in the case of the area the production was highest in 1899, when it amounted to 629,275 tons. Of this New South Wales, Victoria, and New Zealand contributed 476,842 tons, as against 392,758 tons in 1902. The production for each state was as follows:—

State.	1871.	1881.	1891.	1901.	1902.
	tons.	tons.	tons.	tons.	tons.
New South Wales	44,758	44,323	62,233	39,146	30,732
Victoria	125,841	134,290	109,786	125,474	168,759
Queensland	6,585	11,984	25,018	39,530	3,257
South Australia	10,989	18,154	27,824	15,059	28,312
Western Australia	1,457	556	1,596	5,665	6,200
Tasmania	22,608	33,565	63,100	114,704	163,518
Commonwealth...	212,238	242,872	289,607	339,578	400,778
New Zealand.....	42,130	121,890	162,046	206,815	193,267
Australasia	254,368	364,762	451,653	546,393	594,045

The average production of potatoes per acre is next given, for 1902, and for the ten years ended 1902. New Zealand, it will be seen, shows a considerably larger return than any of the other provinces :—

State.	Average Yield per Acre.	
	1902.	1893-1902.
	tons.	tons.
New South Wales	1·6	2·3
Victoria	3·4	3·1
Queensland	1·1	2·1
South Australia	3·6	2·6
Western Australia	3·0	3·1
Tasmania	4·7	3·9
Commonwealth	3·4	3·0
New Zealand	6·1	5·9
Australasia	4·0	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 1902 :—

State.	Net Imports.	Net Exports.
	tons.	tons.
New South Wales	50,284	.....
Victoria .....	.....	22,053
Queensland	27,759	.....
South Australia	1,974	.....
Western Australia	12,116	.....
Tasmania .....	.....	67,944
Commonwealth	2,136	.....
New Zealand.....	.....	17,679
Australasia .....	.....	15,543

The average value of the potato crop and the return per acre for the past five years will be found below :—

State.	Value of crop.	Average value per acre.
	£	£ s. d.
New South Wales	230,000	8 6 4
Victoria	606,000	13 4 10
Queensland	82,000	9 12 11
South Australia	76,000	10 12 11
Western Australia	34,000	16 13 2
Tasmania	440,000	16 17 2
Commonwealth.....	1,468,000	12 12 4
New Zealand.....	636,000	19 0 10
Australasia.....	2,104,000	14 0 6

These values are remarkably high, but the ruling prices in 1901 and 1902 were far in excess of those realised for some considerable time.

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.	1871.	1881.	1891.	1901.	1902.
	acres.	acres.	acres.	acres.	acres.
New South Wales	51,805	146,610	163,863	442,163	491,918
Victoria	103,206	212,150	369,498	659,239	580,884
Queensland	3,828	16,926	30,655	63,055	20,068
South Australia.....	97,812	333,467	304,171	369,796	325,789
Western Australia.....	*14,342	24,445	28,534	92,964	104,505
Tasmania	31,578	34,790	45,445	61,495	66,038
Commonwealth...	302,571	768,388	942,166	1,688,712	1,589,202
New Zealand	30,717	68,423	46,652	236,465	258,479
Australasia.....	333,288	836,811	988,818	1,925,177	1,847,681

* In 1869.

In New Zealand, for all the years prior to 1901, 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 only includes the quantity of grass cut :—

State.	1871.	1881.	1891.	1901.	1902.
	tons.	tons.	tons.	tons.	tons.
New South Wales.....	77,460	198,532	209,417	472,621	243,379
Victoria	144,637	238,793	505,246	884,369	601,272
Queensland	6,278	19,640	58,842	122,039	23,181
South Australia.....	98,266	240,827	193,317	346,467	308,825
Western Australia	14,288	24,445	28,534	91,517	91,593
Tasmania	30,891	44,957	66,996	109,383	89,210
Commonwealth...	371,820	767,194	1,062,352	2,026,396	1,357,460
New Zealand.....	35,674	89,081	67,361	94,476	104,016
Australasia.....	407,494	856,275	1,129,713	2,120,872	1,461,476

The average yield of hay per acre will be found in the next table, the periods covered being the year 1902 and the ten years which closed with 1902 :—

State.	Average yield per acre.	
	1902.	1893-1902.
	tons.	tons.
New South Wales	0·5	0·9
Victoria	1·0	1·2
Queensland	1·1	1·9
South Australia	0·9	0·8
Western Australia	0·9	0·9
Tasmania	1·4	1·4
Commonwealth	0·8	1·0
New Zealand	1·5	1·8
Australasia	0·9	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 1902 was as follows:—

State.	Net Imports. tons.	Net Exports. tons.
New South Wales	293,810	.....
Victoria .....	.....	264,221
Queensland	48,870	.....
South Australia .....	.....	98,279
Western Australia	932	.....
Tasmania .....	.....	30,626
Commonwealth .....	.....	49,514
New Zealand .....	.....	1,636
Australasia .....	.....	51,150

The value of the return from hay in 1902-3 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	1,303,000	2 12 10
Victoria	3,070,000	5 5 8
Queensland	125,000	6 4 0
South Australia	1,535,000	4 14 2
Western Australia	554,000	5 5 6
Tasmania	451,000	6 16 4
Commonwealth	7,038,000	4 8 7
New Zealand	1,195,000	4 12 5
Australasia ..	8,233,000	4 9 1

The above averages, with the exception of New South Wales, 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. In 1902 Victoria and South Australia found profitable markets in New South Wales and Queensland for their hay and chaff. It will be seen that the net imports into New South Wales were 293,810 tons, and into Queensland 48,870 tons. Of the New South Wales supplies 160,000 tons, or more than one-half, came from Victoria, while nearly 90,000 tons came from South Australia. With the improved conditions now prevailing, New South Wales should be in a position to supply her own requirements, and the other states will, therefore, have to secure a market elsewhere for the disposal of their surplus products.

GREEN FORAGE AND SOWN GRASSES.

The cultivation of maize, sorghum, barley, oats, and other cereals or green food in addition to lucerne and grass is confined chiefly to the districts where dairy farming is carried on. The following table shows the area under such green food in 1891, 1901, and 1902, 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.		
	1891.	1901.	1902.	1891.	1901.	1902.
	acres.	acres.	acres.	acres.	acres.	acres.
New South Wales..	32,138	110,215	109,146	333,238	467,339	477,629
Victoria	9,202	32,795	30,720	174,982	162,954	565,635
Queensland	10,727	39,793	51,279	20,921	34,679	24,286
South Australia ...	6,416	13,695	14,937	17,519	23,510	23,636
Western Australia	238	1,024	1,000	.....	11,132	*12,000
Tasmania	1,101	4,082	3,355	208,596	314,422	319,090
Commonwealth	59,822	201,604	210,437	755,256	1,014,536	1,422,276
New Zealand	118,484	199,508	205,357	7,357,229	11,620,178	11,808,215
Australasia ...	178,306	401,112	415,794	8,112,485	12,634,714	13,230,491

* Estimated.

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 1902 being 8,778 tons, valued at £202,964. The production in Victoria was 141 tons ; in Tasmania, 536 tons ; and in New Zealand, 8,101 tons. The acreage on which this grass seed was produced is included in the total given above for sown grasses, and amounted to 1,568 acres in Victoria, 3,879 acres in Tasmania and 55,765 acres in New Zealand. The prosperity of New Zealand is largely due to its rich meadow lands, which have been created by human industry and were not the free gift of nature. Last year nearly 12,000,000 acres were under artificial grasses in the colony, or about ten times the area devoted to the crop in the Commonwealth. The productiveness of these pastures is very great.

In the Victorian returns "sown grasses" show an increase of over 400,000 acres on the figures of the previous year. This is accounted for by the fact that the total includes for the first time bush land on cultivated holdings on which imported grass, clover, &c., has spread without cultivation, also burnt off scrub land on which grass has been sown without ploughing.

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 fact that the vineyards in these States have suffered comparatively little from the ravages of phylloxera, which have had such a disastrous effect on immense areas of the European vineyards, is an additional reason why the vine-growers of Australia 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.	1871.	1881.	1891.	1901.	1902.
	acres.	acres.	acres.	acres.	acres.
New South Wales	4,152	4,027	8,281	8,606	8,790
Victoria	5,523	4,923	24,483	28,592	28,374
Queensland	568	1,212	1,988	1,990	1,559
South Australia.....	5,455	4,202	12,314	20,860	21,692
Western Australia	692	527	1,004	3,724	3,425
Australia	16,390	14,891	48,070	63,772	63,840
New Zealand.....	.....	.....	.....	543	705
Australasia.....	.....	.....	.....	64,315	64,545

At present the area devoted to vines is much larger in Victoria and South Australia than in the other states; in the former state 3,891 and in the latter 9,378 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, or the Argentine with 112,467 acres; 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 1902 being only 509 acres more than in 1891. The introduction of phylloxera into the county of Cumberland somewhat retarded this industry as most of the table grapes are grown there, but recently the Government has propagated a large number of phylloxera-resistant stocks, which are being disposed of to vigneronns at cost price, and better progress may be expected in the near future. 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, and in 1902 at 705 acres.

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

State.	1871.	1881.	1891.	1901.	1902.
	gallons.	gallons.	gallons.	gallons.	gallons.
New South Wales.....	413,321	513,688	913,107	868,479	806,140
Victoria	713,589	539,191	1,554,130	1,981,475	1,547,188
Queensland.....	.....	72,121	168,526	148,835	100,852
South Australia.....	852,315	313,060	861,835	2,077,923	2,145,525
Western Australia .....	.....	99,600	166,664	119,500	185,735
Australia	1,979,225	1,537,660	3,604,262	5,196,212	4,785,440

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

State.	1871.	1881.	1891.	1901.	1902.
	tons.	tons.	tons.	tons.	tons.
New South Wales.....	508	1,103	3,694	3,475	3,561
Victoria	1,545	740	2,791	5,110	4,327
Queensland.....	.....	255	1,169	1,814	400
South Australia.....	1,692	1,498	4,590	12,608	11,797
Western Australia .....	.....	.....	.....	400	°400
Australia... ..	3,745	3,596	12,244	23,407	20,485

* Estimated.

Among other produce of the vineyards may be mentioned 6,800 gallons of brandy in New South Wales, while Victoria and South

Australia produced respectively 39,256 cwt. and 16,448 cwt. of raisins and currants, the latter being an advance of nearly 6,000 cwt. on the output of the previous year. 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

In 1902 the export of Australian wine to countries outside of Australasia had increased to 1,011,487 gallons, valued at £122,362.

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

In 1902 the inter-state and foreign exports had increased to 1,338,419 gallons, valued at £205,655.

The total value of the grape crop and the average return per acre in the Australian states, for the year 1902, 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	102,278	11 12 8	13 4 3
Victoria	320,376	11 5 10	12 11 0
Queensland	18,618	11 18 10	14 6 0
South Australia	260,846	12 0 6	14 1 8
Western Australia.....	41,593	11 15 9	14 12 6
Commonwealth	743,711	11 15 8	13 5 11
New Zealand	8,570	12 3 1	.....
Australasia	752,281	11 12 7	13 5 11

The average value per acre of productive vines cannot be shown for New Zealand, as the area is not distinguished.

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, Mooroopna, and Yarrowonga.

The removal of the border duties has had a remarkably invigorating effect upon the South Australian inter-state wine trade. During the five years which preceded federation, South Australian inter-state exports averaged only 48,000 gallons; while last year the total reached 160,000 gallons. The progress of the trade with New South Wales is especially noticeable, the increase during the period mentioned being over 61,000 gallons. Victorian growers have also taken advantage of the removal of the border duties, and during the last three years the inter-state

trade has increased from 5,000 to 55,000 gallons. Vignerons in the county of Cumberland in New South Wales, who depend upon table grapes for their chief returns, have suffered severely in recent years owing to New Zealand closing her markets to their grapes, through fear of introducing phylloxera, and the loss of this market has probably depreciated the value of table grapes in Cumberland and Camden at least 30 per cent.

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 has so far maintained 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. acres.	New South Wales. acres.
1865.....	94	22
1872.....	9,581	4,394
1882.....	28,026	12,167
1892.....	50,948	22,262
1897.....	83,093	32,027
1902.....	112,031	20,809
1903.....	85,338	20,301

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 proportion of 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.
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
1903	85,338	20,301	59,102	8,899	10·8	20·9

For the five years the average for Queensland was 14·5 tons per acre, as against 19·7 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	10·2 tons per acre.
New South Wales	9·3 " " "

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. Hitherto little attention has been given in Queensland to the question of irrigating sugar-cane plantations, but last year 7,500 acres were irrigated, being an increase of 3,000 acres on the figures for the previous year.

The greater part of the field-work on the plantations in Queensland has hitherto been 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 1901 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.

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 coming 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. On the 1st December, 1903, there were 8,454 islanders in Queensland; 874 were returned to their homes in 1901, 1,775 in 1902; and 932 during the first eleven months of 1903.

The duty on imported cane sugar is £6 per ton, while the excise duty is fixed at £3 per ton, but a bounty of 4s. per ton of cane (equal to £2 per ton of sugar) is allowed on Australian sugar grown by white labour, the bounty being paid to the grower. 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.

In New South Wales last year 85 per cent. of the sugar was white grown and 15 per cent. black, while in Queensland the figures were reversed, 86 per cent. being black and 14 per cent. white grown. Of the total production, 98,170 tons, Queensland raised 76,626 as against 21,544 in New South Wales.

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, may be set down at 2s. 4½d. per day.

The following table shows the quantities of sugar locally produced together with the net import or export during 1902. 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 71,173 tons, valued at £932,610 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.....	21,544	50,746	72,290
Victoria .....	.....	58,227	58,227
Queensland.....	76,626	*71,173	5,453
South Australia.....	.....	19,260	19,260
Western Australia.....	.....	9,123	9,123
Tasmania.....	.....	7,270	7,270
Commonwealth	<hr/>	<hr/>	<hr/>
	98,170	73,453	171,623
New Zealand .....	.....	34,886	34,886
Australasia	<hr/>	<hr/>	<hr/>
	98,170	108,339	206,509

* Net Export.

The quantity shown above does not 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. The trade returns present certain anomalies in the light of the information given in the succeeding table, and the figures are therefore advanced only for what they are worth.

A fairly correct estimate of the consumption of sugar in the states of the Commonwealth may be gathered from the statement below, which shows the quantities on which import duty and excise were paid after allowing for inter-state adjustments :—

State.	Quantity of sugar on which import duty was paid.	Quantity on which excise was paid.	Apparent consumption.	Consumption per head of population.
	tons.	tons.	tons.	lb.
New South Wales.....	11,662	55,911	67,573	107·5
Victoria	47,851	3,722	51,573	95·8
Queensland.....	1,077	20,561	21,638	94·1
South Australia.....	16,014	446	16,460	100·8
Western Australia	7,389	2,431	9,820	102·2
Tasmania	4,346	4,622	8,968	113·4
Commonwealth	88,339	87,693	176,032	101·5

In New Zealand the net import of sugar in 1902 was 34,886 tons, or 96·7 lb. per head of population.

In the chapter on "Food Supply" the average consumption of sugar in the Commonwealth is given at 105·7 lb. per head for the last ten years, and on this basis the annual consumption would appear to be 183,400 tons, which is slightly more than shown in the table.

In 1898, Queensland produced 163,734 tons of sugar, which is the highest output recorded for that state; 1,542,090 tons of cane were crushed, yielding sugar at the rate of 1·99 tons per acre. In 1902, owing to the dry season, only 641,927 tons were crushed, but the juice attained a high degree of density, and 76,626 tons of sugar were produced, only 8·38 tons of cane being required to make a ton of sugar. It is estimated that the decrease of 538,000 tons of cane on the return of the previous year represented a loss of £486,500, of which the growers' share, with cane at 10s. per ton, would be £269,000. Of the 641,126 tons of cane produced in Queensland in 1902, 10·9 per cent. was produced in the Southern or Bundaberg District, 33·5 per cent. in the Central or Mackay, and 55·6 per cent. in the Northern or Cairns District.

It may be estimated that the Commonwealth consumes annually about 179,000 tons of sugar. In average years the production is about 142,400 tons, leaving to be imported or for further production 36,600 tons. The year 1902 was, therefore, below the required average to the extent of about 81,000 tons.

The country of origin of 93,302 tons of the sugar which were imported into Australia from abroad during 1902 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.
Mauritius	20,924 tons
Fiji	25 „
Java	61,738 „
Hongkong	7,923 „
Europe	500 „
China.....	2,163 „
United States	16 „
India.....	13 „
Total	<u>93,302 „</u>

The re-export of foreign sugar from Australia amounted to 3,086 tons, while 296 tons of Australian sugar were exported outside the Commonwealth.

With the abolition of inter-state duties and the imposition of a uniform federal tariff, Queensland and New South Wales have been placed in a better position as regards competition with the foreign-grown imported article. Consideration will have to be given to the question of establishing an export trade, as in a good season these states can produce sugar more than sufficient for the needs of the Commonwealth.

Prior to last year, the area of cane cut as food for stock had no bearing on the question of sugar production, but in 1902 the adverse season caused such a demand for fodder that over 15,000 acres were cut for this purpose.

The total value of the cane crop in the sugar-growing states of Australia for the year 1902 was :—

State.	Value of Cane grown.
New South Wales	£135,421
Queensland	320,963
Total	<u>£456,384</u>

These amounts are, however, exclusive of rebate on white-grown sugar amounting to £36,731 in the case of New South Wales, and £24,536 in the case of Queensland. The value of the sugar manufactured during the year was about £1,000,000 sterling. In 1902, however, the returns were considerably below the average for the last five years, when the cane crop was equal to £636,000 and the sugar manufactured £1,510,000 per annum.

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 had to satisfy the Treasurer of the state of certain conditions, and if he were of opinion that these conditions were likely to be fulfilled, and it was shown that the company had a paid-up capital of not less than £20,000, he was authorised to advance a sum not exceeding twice the amount raised by the shareholders.

As a result of these concessions a company was formed in Victoria, and erected a factory at Maffra, with a capacity of 420 tons per day. The first campaign in 1898 created disappointment, though the factory had at its disposal 9,109 tons of roots, grown on 1,287 acres. In the second year, the supply of beets had fallen to 6,271 tons from over 1,500 acres under crop. The industry had the misfortune to start with two very bad seasons, the average yield of beet being only 7·08 and 4·15 tons per acre. The low yield in these years was, however, due not only to unfavourable seasons but to want of experience on the part of the growers. The cultivation was further persevered with until May, 1900, when the factory was closed down. 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, these figures comparing favourably with the United States yields, which vary from 12·9 in the case of the Oxnard Company, Grand Island, Nebraska, to 15 per cent. at the works of the Western Company, Watsonville, California, where over 30,000,000 lb. of sugar are produced annually.

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, it is well known that there are large areas of Victorian soil suitable for the cultivation of beet,

but before the factory can be re-started vigorous efforts will have to be put forward in the direction of securing a good and plentiful crop each year.

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.

It must not, however, be forgotten that the abolition of the border duties and the stoppage of any system of state bounties in aid of such an enterprise will compel the beet sugar to compete on level terms with the cane-grown sugars of Queensland and New South Wales, the supply of which already, in favourable years, more than meets local demands.

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.
	acres.	cwt.	acres.	cwt.	acres.	cwt.	acres.	cwt.
1861	224	2,647	220	2,552	..	..	444	5,199
1871	567	4,475	299	2,307	44	.....	910	6,782
1881	1,625	13,311	1,461	12,876	68	521	3,154	31,708
1888	4,833	55,478	1,685	13,365	123	1,418	6,641	70,251
1891	886	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	10,858	1,057	8,952	475	4,577	2,368	24,387
1894	716	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	8,629	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
1902	317	2,604	171	781	722	1,818	1,210	5,203

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 1902, and during the ten years ended 1901, were as shown below:—

State.	Average Production per Acre.	
	1902.	1892-1901.
	cwt.	cwt.
New South Wales	8·2	9·9
Victoria	4·6	6·6
Queensland	2·5	7·5
Australia	4·3	8·2

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. At Texas, Queensland, leaf of fine quality has been raised, which realises a high price in the Sydney markets. In 1902, however, owing to the dry weather, only 70 tons were produced as against 275 in ordinary seasons. The price obtained for the leaf ranges from 6d. to 9d. per lb. 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. The bonuses have now lapsed, but during 1902 samples of tobacco were exported to England from Victoria, and the price obtained—5½d. per lb., was fair, considering that leaf, from new sources, is treated with caution by buyers, who hesitate to alter the flavour of their well known brands by using an unknown product. The flavour of the leaf was reported to be good, but the packing was inferior. This will, however, doubtless be remedied by experience.

The following table shows the imports of tobacco, cigars, and cigarettes for home consumption during 1902; the amounts for this year however are below the normal consumption owing to the excessive imports during 1901 in anticipation of the Federal Tariff.

State	Quantity. lb.
New South Wales	2,134,450
Victoria	1,644,590
Queensland	727,820
South Australia	494,076
Western Australia	975,005
Tasmania	240,917
Commonwealth	6,216,858
New Zealand	1,971,120
Australasia	8,187,978

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 12,282,000 lb. Applying the decennial average of 8·2 cwt. per acre, it would appear that the produce of 13,370 acres is required annually to supply the demand for tobacco in Australasia. The total value of the tobacco crop for 1902 in Australia was only £14,000, returning an average value of £11 11s. 5d. per acre. In the United States, last year, 1,030,734 acres were under tobacco, producing 821,823,963 lb., valued at £11,927,000, or £11 11s. 3d. 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 1902 the proportion of the total cultivation allotted to fruit was 2·0 per cent., while in 1881 the proportion was 1·5 per cent. The area per 1,000 persons, in 1902, was 43·8 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.

Fruit-drying is a growing industry, and promises before long to attain considerable dimensions. At Mildura, on the left bank of the Murray, in Victoria, between 9,000 and 10,000 acres are under intense culture, the crops raised including currants, sultanas, peaches, and citrus fruits. The rainfall is only about 9 inches per annum, but a plentiful supply of water is obtained by pumping from the Murray, and the channels command an irrigable area of about 35,000 acres. Last year the returns from the sale of fruits amounted to about £110,000.

At Renmark, in South Australia, somewhat similar work is being carried on. Some 3,000 acres are under irrigation, and maintain a population of nearly 1,000 persons. The value of the fruits and olive oil sold last year amounted to over £30,000. As an evidence of the value of irrigation, it may be noted that an adjoining station, with much land as productive as that at Renmark, consisting of 250,000 acres, only carried 5,000 sheep last year.

The area under orchards and gardens in 1881, 1891, and 1902 was as follows:—

State.	1881.		1891.		1902.	
	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	55,847	2·5
Victoria	20,630	1·4	37,435	1·8	58,415	1·8
Queensland	3,262	2·8	9,758	4·0	13,023	4·6
South Australia	9,864	0·4	14,422	0·7	26,865	1·2
Western Australia .....	.....	.....	.....	.....	6,765	3·0
Tasmania	6,717	4·5	10,696	6·4	14,568	5·6
Commonwealth.....	65,038	1·5	112,427	2·1	175,483	2·1
New Zealand	16,360	1·5	29,235	2·0	30,056	1·9
Australasia	81,395	1·5	141,662	2·1	205,539	2·0

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 £11,000,000 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. During the year 1902, Tasmania exported £163,000 worth of apples to Great Britain; but, as that country imports annually some £2,000,000 worth of such fruit, there is ample scope for increasing the exports from Australia.

The following table shows the import and export trade of each state in green fruit and pulp for 1902, 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	335,321	97,475
Victoria	81,932	81,348
Queensland	78,655	120,252
South Australia	29,066	37,315
Western Australia	31,106	20
Tasmania	25,544	300,899
Commonwealth.....	581,624	637,309
New Zealand	88,728	3,107
Australasia	670,352	640,416

The average value of the produce of gardens and orchards, and the average return per acre, during the past five years were as given below :—

State.	Average Value	Average Value
	of Crop. £	per Acre. £ s. d.
New South Wales	457,000	10 3 0
Victoria	696,000	12 4 2
Queensland	179,000	13 3 3
South Australia ..	358,000	14 10 0
Western Australia	81,000	12 10 0
Tasmania	177,000	13 12 3
Commonwealth	1,948,000	12 19 0
New Zealand	299,000	11 1 6
Australasia	2,247,000	12 1 1

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 £696,000, equal to an average of £12 4s. 2d. an acre. In this state there are great facilities for disposing of the crop, while the bonuses offered by the Government 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 were cropped during the period of eleven years up till 1901. A sum of £25,000 was set apart for payment of these allowances, but the amount has now been expended and the payment of further bonuses is dependent upon the will of the Federal Parliament. The export trade also greatly benefited by the system of bonuses. Prior to 1896 the amount was 2s. per case, but since that date, up to 1901, when the bonuses ceased, 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 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, English fruits, such as apples and pears, are principally grown, and the gross returns from these are smaller than the returns obtained from the cultivation of sub-tropical fruits such as the orange and lemon, 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, while in Queensland over 6,000 acres are under bananas and pineapples, from which excellent returns are received.

MINOR CROPS.

Besides the crops already specifically noticed, there are small areas on which are grown a variety of products, chiefly rye, 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 523,000 acres was planted with these crops. The area under minor crops in each province in 1902 was as follows :—

State.	Acres.
New South Wales	13,148
Victoria	22,087
Queensland	18,414
South Australia	8,916
Western Australia	5,049
Tasmania	24,200
Commonwealth	91,814
New Zealand	618,103
Australasia	709,917

In 1902 there were 396 acres under coffee in Queensland, of which 314 acres were in bearing, which produced on an average 360 lb. per acre. There were also 296 acres under arrowroot, with an average production of 5.9 tons per acre, and 38 acres under rice, which returned a yield of 1,093 bushels, or an average of 29 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 in many parts of 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 proposed to plant india-rubber trees on a large scale.

In British New Guinea, coffee-planting has been initiated with good prospects of success, and on one of the estates some 20,000 plants are already in full bearing.

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. Improvements are, however, already noticeable in this respect, and the efforts made by the Governments of the various States for the promotion of scientific farming are beginning to 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, Grafton, Bathurst, Coolabah, Cowra, Glen Innes, 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 and Moree

Bores. 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 13 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.

In Victoria, South Australia, and New Zealand, the Governments have established export depôts, where consignments of meat, butter, and other produce are inspected by Government experts, and graded and branded according to their quality. By this means little but produce of prime quality is exported, and the Colonies are gaining a high name in Great Britain for the excellence of the goods despatched.

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 31st December, 1902, 7,632 applications had been received for advances, the amount applied for being £994,276. Of these applications, 7,363 have been dealt with by the Board, and 2,929 have been refused. The number of applications approved is 4,434, representing advances to the amount of £371,127. Repayments of principal amount to £61,344, in addition to which £15,457 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, 1902, advances to the amount of £1,364,510 had been made. The total number of loans in existence on that date was 2,625, representing the sum of £1,145,961, averaging £437 each. The actual advances made during the financial year 1901-2 amounted to £201,405, of which £179,992 was advanced to pay liabilities, £6,148 to pay Crown rents, and £15,265 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 £1,383,600, of which £184,750 have been redeemed, leaving a balance of £1,198,850.

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. During the year 267 applications were received for advances, amounting in the aggregate to £38,050, of which 188 were approved for £23,486. Eleven applicants declined the partial advances offered, leaving 177 actually made, amounting to £22,613. Interest in arrear, on which a penalty has been incurred, amounted to £52. The average of advances approved was £127 15s. 1d. It has been pointed out by the authorities charged with the administration of the act that it would be desirable to extend the scope of the measure in the direction of allowing advances for such purposes as purchasing seed wheat, dairy stock, etc.

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, 1903, the South Australian State Bank, thus established, had advanced £794,008, and received repayments to the amount of £232,262. On that date there were arrears of interest to the amount of £1,734 outstanding. In order to enable these advances to be made, mortgage bonds had been sold to the amount of £773,740, of which £230,740 had been repurchased, leaving the amount current at £543,000. The advances made during the last financial year amounted to £81,281.

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 was to 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. A further Amending Act, passed in 1902, empowers the manager to advance up to two-thirds the value of improved agricultural, and one-half the value of improved horticultural, properties, the maximum grant to any one person being raised to £1,000. At least one-third of any sum borrowed under this Act must be expended in further improvements; the balance may be applied to the liquidation of liabilities, or to the purchase of stock, plant, or other farm requisites. Where portion of an advance is made to pay off liabilities, the repayment of so much of the advance begins after the expiration of one year from the date of the advance. The capital allotted to the bank is £300,000, and to the 30th June, 1903, loans to the value of £201,200 had been approved; while repayments to the value of £13,630 had been made. During the financial year 1902-3, loans were advanced to 335 applicants, the total granted being £44,975. The transactions of the bank for the same period resulted in a net profit of £617.

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 are chiefly 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, 1903, the Board had authorised 12,922 advances, amounting to £4,316,940. The total amount applied for in the 12,922 applications granted in full, or in part, was £4,903,515. 1,629 applicants declined the partial grants offered to them, amounting to £735,280; so that the net advances authorised at 31st March, 1903, numbered 11,293, and amounted to £3,581,660. The security for the advances authorised was valued at £7,849,728. The number of applications received up to 31st March, 1903, was 16,643, and the amount applied for, £5,927,495.

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 1902 the Government of New South Wales had undertaken the sinking of 110 wells; of these, 103 have been completed, and 7 are in progress. Of the total number of wells, 74 are flowing, 23 are sub-artesian,

yielding pumping supplies, and 13 have been failures; these wells represent 149,858 feet of boring, while with the uncompleted wells the total depth bored has been 191,677 feet. From the completed wells about 60,000,000 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 Oreel No. 2 Bore, in the Narrabri district; the depth of this well is 3,116 feet, and the estimated flow about 3,500,000 gallons per diem. The bore at Walgett, with a depth of 2,036 feet, has a daily flow of some 3,000,000 gallons. 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, Barringun, Enngonia, and Belalie bores, on the road from Bourke to Barringun. 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 80 and 1,357 feet respectively. 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, 166 private bores have been undertaken in New South Wales, of which 16 were failures, 2 were abandoned, and 4 are 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 Goondablue with 3,000,000 gallons per day. From the private wells approximately 82,000,000 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 117,000,000 gallons, and that, in addition, large supplies can be pumped from sub-artesian wells. The average depth of the 103 wells completed by the Government is 1,454 feet 1 inch, with a range from 165 to 4,086 feet, while the temperature of the water varies from 80 to 139 degrees Fah. The total cost of the wells (including actual boring, casing, carriage, and incidental expenses) was £288,234, or an average of £2,620 6s. 2d. per bore, or £1 18s. 6d. per foot.

In Queensland up to the 30th June, 1903, there were 960 completed bores, of which 70 were Government, 32 Local Government, and 858 private bores.

Of the Government bores, 25 were artesian, 18 sub-artesian, and 27 were abandoned as failures. The daily flow of water from the successful bores amounted to 10,827,300 gallons. The Local Government bores included 11 artesian and 19 sub-artesian, while 2 were abandoned. From the successful bores a daily flow of 6,346,300 gallons is obtained. Of the private bores, 540 were artesian, 174 were sub-artesian, and 135 were failures or uncertain. It is estimated that the daily flow of water from private bores amounts to no less than 368,331,200 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 30th June, 1903, amounted to £368,629 on water conservation, of which £124,039 was expended 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 Longlands bore, which yields 6,000,000 gallons daily; Corio-Cunnamulla East, 4,500,000; Burrumbilla and Gooia, 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, 1903, was 1,171,461 feet, the average depth per bore being 1,220 feet. At Helidon water of so low a temperature as 60 degrees Fah. was flowing; while at Elderslie No. 2 the water had a temperature of 202 degrees. Large areas are served by the water from the bores for irrigation purposes; in 1902 there were 14,344 acres under irrigation as compared with 6,526 acres in 1901. 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 1902 the Water Conservation Department of South Australia had completed 104 bores, of which, however, only fifty-six 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. The south-western portion of the great artesian basin lies under the north-east corner of South Australia proper, and a portion of it is under the south-eastern corner of the Northern Territory. This portion of the basin covers an area of 120,000 square miles, and towards its southern and western fringe occur the well-known mound springs, naturally indicating the existence of artesian water. Of the Government borings in this basin, there are seven flowing artesian wells under 1,000 feet in depth, seven from 1,000 to 3,000 feet, one between 3,000 and 4,000 feet, and three from 4,000 to 5,000 feet. It will therefore be seen that the South Australian Government has had considerable difficulties to overcome in prosecuting the work of opening up these sources of national wealth. The sea basin, which at one time existed within what is now South Australia, was of great depth, and many of the bores pierced through a thickness of strata varying from three-quarters of a mile to nearly a mile before striking the artesian water. The daily flow from the bores ranges from 100,000 to 1,500,000 gallons. The quality of the water varies considerably. Most of the bores furnish excellent drinking water, but towards the fringe of the basin, where there is little or no circulation, the supply is too salt for domestic use, and is only fit for cattle. The average increase in the temperature of the water has been found to be 1 degree Fah. to every 27 feet in depth. From certain of the deep borings, the water flows over the surface at a temperature of about 200 degrees Fah. Some very successful bores have also been put down on pastoral holdings. In some other parts of South Australia there are comparatively small local artesian basins from which good supplies have been obtained. Four successful bores have been put down in these districts by the Government, and the artesian areas have also been tapped by private persons. The depth of the private bores, however, is seldom over 200 feet. In parts of the state, where flowing supplies are not obtainable, the Government has for many years carried on boring operations, and in a fair number of cases sub-artesian water has been struck.

The results from Government bores up to 31st December, 1902, are as follows:—

Flowing artesian wells	22
Spb-artesian wells of good water	34
Salt, or otherwise unsuccessful bores	48
Total	104

In addition to these, four deep borings are in progress. The total expenditure by the Government on boring has been £233,186, of which £20,595 was expended during the year 1902.

The Government of Western Australia, following the example set by those of the eastern states has sunk 25 bores in various parts of the state, and 14 bores have been sunk by private owners. Of the Government bores, 19 have been successful, and yield a daily supply of 7,131,500 gallons, and 6 were failures. All the private bores yield supplies of water with the exception of two—the daily flow being 2,414,000 gallons. The deepest flowing bore is at Carnarvon, and reached a depth of 3,011 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, 1902, the Government had expended £40,835 on artesian boring, while £9,819 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 30th June, 1903, 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, including Government expenditure on Melbourne Water Supply, was £8,684,922.

EMPLOYMENT IN AGRICULTURAL PURSUITS.

The following table shows the number of persons engaged in agricultural pursuits in Australasia during the years 1891 and 1901. The figures relate to the direct producers who were employed on holdings at the end of March in each year, and are exclusive of persons engaged in the manufacture of raw materials, as well as of casual hands who may have been employed at other periods of the year than that stated.

State.	1891.			1901.		
	Males.	Females.	Total.	Males.	Females.	Total.
New South Wales	67,576	7,022	74,598	75,884	1,735	77,619
Victoria	79,090	6,028	85,118	78,539	17,381	95,920
Queensland	33,891	6,089	39,980	38,260	2,081	40,341
South Australia	27,961	886	28,847	33,039	1,147	34,186
Western Australia	4,378	164	4,542	8,322	285	8,607
Tasmania	14,584	1,447	16,031	17,348	2,074	19,422
Commonwealth	227,480	21,636	249,116	251,392	24,703	276,095
New Zealand	56,671	2,387	59,058	65,723	2,089	67,812
Australasia	284,151	24,023	308,174	317,115	26,792	343,907

A classification of the returns for 1901 according as the persons employed in agricultural pursuits were engaged therein as proprietors and managers, relatives assisting, or servants, is given below for all the states except Queensland, where the information has not been published.

State.	Proprietors and Managers.			Relatives assisting.			Servants.		
	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.
New South Wales..	32,466	1,607	34,073	10,271	111	10,382	33,147	17	33,164
Victoria	33,333	3,031	36,411	17,009	13,025	31,234	27,547	725	28,272
South Australia....	13,796	691	14,487	4,108	240	4,348	15,135	216	15,351
Western Australia	3,747	131	3,878	1,426	139	1,565	3,149	15	3,164
Tasmania	7,028	371	7,399	3,373	1,205	4,578	6,947	498	7,445
New Zealand	29,340	1,091	30,431	12,301	841	13,142	24,082	157	24,239

With regard to Victoria it appears that females engaged in domestic duties, who also gave some assistance in farming, were classified as relatives assisting in agricultural pursuits, whereas, in other states, these were included in the category of dependents performing domestic duties.

In proportion to population the persons engaged in agricultural pursuits numbered 8·9 per cent. in 1891, compared with 7·6 in 1901. The decrease in the latter year is accounted for partly by the rapid extension of the dairying industry which has absorbed many of those formerly engaged in agriculture, and partly by the increased cultivation of wheat, which does not require such a large proportion of labour as other miscellaneous crops.