

1901.  
QUEENSLAND.

ANNUAL REPORT OF THE SECRETARY FOR AGRICULTURE  
FOR THE YEAR 1900-1901.

Presented to both Houses of Parliament by Command.

TO HIS EXCELLENCY THE RIGHT HONOURABLE SIR SAMUEL WALKER GRIFFITH, P.C., G.C.M.G., K.C.,  
LIEUTENANT-GOVERNOR OF THE STATE OF QUEENSLAND AND ITS DEPENDENCIES, IN THE  
COMMONWEALTH OF AUSTRALIA.

Brisbane, 30th September, 1901.

SIR,—I have the honour to place before your Excellency the report of this Department for the twelve months ending with the 30th day of June, 1901.

Towards the close of that period the State and the Department suffered an irreparable loss by the death of my predecessor. Both as a representative of the people and as a Minister of the Crown Mr. Chataway had earned for himself honourable distinction, as was evidenced by the respectful and affectionate references to him in Parliament during the current session, and the unanimous and enthusiastic appreciation of his services to agriculture expressed at the recent conference of farmers at Bundaberg. It must be mournfully confessed that, like others of our public men of late, he shortened a life invaluable to the State by devoting himself too assiduously, in defiance of medical advice, to public affairs.

The first item in the following table shows the cost of administering this Department during the year under review, with like information concerning the preceding year. A comparison of the amounts expended during the two years on the more important institutions connected with the Department is added thereto:—

		1899-1900.	1900-1901.
		£ s. d.	£ s. d.
<b>DEPARTMENT OF AGRICULTURE.</b>			
Gross Expenditure	...	62,666 17 4	48,812 9 4
Revenue	...	5,540 0 2	6,829 16 7
Net cost	...	£57,126 17 2	£41,982 12 9
<b>AGRICULTURAL COLLEGE.</b>			
Gross Expenditure	...	8,062 8 1	6,731 8 8
Revenue	...	1,823 3 0	2,940 12 7
Net cost	...	£6,239 5 1	£3,790 16 1
<b>WESTBROOK.</b>			
Gross Expenditure	...	974 12 5	1,051 5 0
Revenue	...	87 16 8	121 15 8
Net cost	...	£886 15 9	£929 9 4
<b>HERMITAGE.</b>			
Gross Expenditure	...	*1,981 18 1	880 5 6
Revenue	...	106 4 11	165 0 7
Net cost	...	£1,875 13 2	£715 4 11
<b>BIGGENDEN.</b>			
Gross Expenditure	...	668 8 6	400 3 10
Revenue	...	43 15 11	6 14 6
Net cost	...	£624 12 7	£393 9 4
<b>GINDIE.</b>			
Gross Expenditure	...	2,322 7 1	1,101 0 6
Revenue	...	247 12 3	94 3 6
Net cost	...	£2,074 14 10	£1,006 17 0
<b>KAMERUNGA.</b>			
Gross Expenditure	...	700 4 7	743 3 4
Revenue	...	Nil.	9 19 6
Net cost	...	£700 4 7	£733 3 10
<b>BOTANIC GARDENS AND GOVERNMENT DOMAIN.</b>			
Gross Expenditure	...	2,682 2 0	2,498 2 7
Revenue	...	72 7 6	72 12 6
Net cost	...	£2,609 14 6	£2,425 10 1

\* Including £760 paid for land.

These figures being taken as a basis, it will be seen that our gross expenditure last year on Agriculture amounted to about the one-hundredth part of the whole public revenue, and to about 1s. 11d. for every inhabitant. As it may be of interest to know how this compares with public expenditure for a like purpose in other countries where the State pays some attention to agriculture, the information is given in the following table:—

COMPARATIVE STATEMENT showing TOTAL EXPENDITURE ON AGRICULTURE, EXPENDITURE ON AGRICULTURE per INHABITANT, and percentage of REVENUE expended on AGRICULTURE in the undermentioned Countries.

Country.	Gross Annual Expenditure on Agriculture.	Amount Annually Expended on Agriculture per Inhabitant.	Percentage of Annual Revenue Expended on Agriculture.
	£	Pence.	Per Cent.
United Kingdom ... ..	86,000	0½	0·07
Denmark ... ..	190,000	18	4·75
France ... ..	1,800,000	11	1·3
Hungary ... ..	2,000,000	26	4·54
Austria ... ..	1,800,000	17	2·6
Belgium ... ..	450,000	16	2·37
Prussia ... ..	1,200,000	8	1
Italy ... ..	120,000	4	0·8
Sweden ... ..	260,000	11	3·25
Switzerland ... ..	113,000	9	2·75
Argentina ... ..	130,000	6	1
Queensland ... ..	49,000	23	1·12
New South Wales ... ..	98,716	17½	1·01
Victoria ... ..	55,072	11¼	0·74
South Australia ... ..	7,739	4¾	0·28
West Australia ... ..	6,205	8¾	0·22
Tasmania ... ..	2,386	3¼	0·25
New Zealand ... ..	74,581	24	1·31

It will be observed that Queensland stands about midway on the list if only the proportion of revenue expended on agriculture is regarded, but takes a much higher place if the amount so expended is considered only in relation to her population. In the latter respect she is surpassed by only two countries—New Zealand and Hungary, and inquiry proves that much of the expenditure charged in those countries to agriculture is treated otherwise in this State. In New Zealand the Estimates of the Department of Agriculture include appropriations for the inspection of dairies, the collection of agricultural statistics, and the destruction of rabbits. In Hungary a very considerable portion of the agricultural vote is applied to the purchase of large estates with the view of dividing them into small holdings for the peasantry of the more congested districts. It ought to be pointed out that in no instance do these calculations embrace loans advanced or guaranteed by the State for agricultural purposes. The omission of the United States from the list may excite some surprise. It should be explained that for it the necessary statistics for 1900 are not available. In 1896, however, the amount of public expenditure on agriculture was £2,200,000, or 8d. per head of population.

In the numerous books and pamphlets on agriculture generally that have appeared during the last few years the dominant note is one of admiration for the progress of the industry in continental Europe. That progress, apparently, is taking place in countries differing widely from each other in area, soil, climate, race, government. Yet differ as these countries may in those respects, it is agreed that all of them have adopted substantially the same measures to advance agricultural interests, and that to those measures this progress should be mainly attributed.

A brief consideration of these measures cannot fail to be of interest to us, who inhabit a country which is not inferior in agricultural resources to the most favoured portions of Europe, and which will yield easily and abundantly every useful plant of Britain and of Ceylon, and of every land between them. It might be well, too, to inquire to what extent and with what results these measures have been adopted in Queensland.

The two causes assigned for the satisfactory condition of agriculture in the more progressive States of Europe are the extent to which co-operation and combination prevail among the farmers, and the extent to which the principles of scientific tillage are diffused among them.

With reference to the former cause it seems safe to assert that in most of these countries there is hardly a farmer who is not a member of a district agricultural club. The district clubs are organised into provincial associations, which in their turn are federated into grand national unions. These societies, or other societies arising out of them, generally initiate or encourage co-operative undertakings for the production of agricultural manufactures, for the purchase and sale of agricultural requirements and produce, for the establishment of agricultural banks, for mutual insurance against loss of crops by storms and of stock by disease. As a rule, these co-operative societies do not owe their origin to State action; but, where necessary, the State has incorporated them by statute, or has appointed an organiser to assist in establishing them.

Queensland, too, has many agricultural societies, which, however, differ in their aims and methods from those that have just been described. In two or three districts, indeed, some attempt has been made to bring a few of the neighbouring societies into union; but in the main the operations of each

society are confined to its own locality, and there seems to be no machinery by which it may be brought to combine readily for any purpose with any kindred society. In fact, vicinity is as likely to produce discord as to produce unity; for there have been instances of two societies only a few miles apart being at open war. No central body, empowered to speak on behalf of all or even a majority of the societies, has yet been called into existence. It has to be added that beyond holding shows and bestowing prizes for exhibits not exclusively agricultural, these societies have done little or nothing to reproduce here, in any fulness, the continental model.

Perhaps in no field of action do the continental societies exercise such a potent influence as in the legislative sphere. A tendency to centralisation is undoubtedly a marked feature of some continental governments, but that feature has little chance to assert itself very prominently where agricultural interests are concerned. Speaking generally, none of these governments ventures on legislation affecting such interests without ascertaining the views of the farmers regarding that legislation. Usually those views are obtained through consultative councils composed mainly of representatives of the agricultural societies. To those societies, moreover, is in many cases entrusted much of the administrative work of the Department of Agriculture. In Denmark, indeed, the principle of devolution is carried so far that the Danish Minister of Agriculture appears to have no duty beyond taking care that no farm product of an inferior quality is exported. There can be no difficulty in understanding why continental tariffs in general favour, in intention at least, the farmer, when it is remembered how mighty is the pressure he can bring to bear on the ruling agency. "It is worth noting," says a recent writer, "that foreign States refrain from burdening their agriculturists with taxes for revenue. They make the foreign importer contribute to their revenue, and by so doing at once relieve their people from taxation and protect their industrial enterprises." This result may be held to indicate ignorance of the true principles of political economy; but it at least shows the power of perfect and far-reaching organisation on the part of the farmers.\*

In Queensland, on the other hand, it is well nigh impossible to learn quickly and decisively the opinions of the farmers on a matter peculiarly concerning them. There being no central organisation to speak on their behalf, the only way the Department has of ascertaining those opinions is by addressing all the societies individually; and even then it is not easy to know how far any society really voices the sentiments of the district it is supposed to represent. Assuming, however, that all these societies really possess the necessary delegated authority, the effects of a departmental appeal to them for advice are by no means encouraging. Last year, for example, the late Minister wished to know the opinions of the farmers generally as to the administration of one of the most important statutes committed to him. The question was put to 126 societies. Of these 126 societies only 48 sent replies, and these replies were so vague or conflicting that the matter has remained to this moment unsettled. It is true that once in every year the Department has an opportunity of learning the views of the farming community on some of the more pressing agricultural problems. Once in every year, at the invitation of the Department, is held a conference of representatives of most of the agricultural societies of the State, at which conference papers are read and discussed, and views expressed which are not without effect on subsequent administration. One lesson taught by all these conferences is that extensive as Queensland is, and occupying as she does an area as large as that of all the European States together in which agriculture has attained a very high degree of development, her farmers, however widely separated they may be physically, have common aims, common interests, and common difficulties. The latest of these conferences was held at Bundaberg, and was beyond all doubt the most interesting and instructive of the series. It was also the most valuable of them; for among the resolutions it adopted was one appointing a committee to frame a constitution for a Queensland chamber of agriculture. The committee has completed its work; and probably, before this report can be tabled, the chamber will have commenced its labours. Those labours, however, will not be conspicuously successful unless the new institution is enthusiastically supported by the agricultural societies. It might be advisable, therefore, to appoint some competent person to report on the condition of those societies, and on the causes which have hindered their developing to the same extent as kindred associations elsewhere. At least one such person is known to the Department; and his services might be obtained for the purpose without cost to the State, as a very small fraction of the amount paid in subsidies to these societies would cover the whole expense of the inquiry.

While, hitherto, our farmers have not shown in an eminent degree that genius for combination with its resulting co-operation and the individual self-effacement involved, so characteristic of the continental races, Queensland, in the direction of industrial education, has recognised the value of continental ideals, and has made determined efforts to attain them. Not that her achievements in this respect can compare with, say, the elaborate agricultural education system of France, where agricultural training "begins in the rural primary schools with the simplest facts of agriculture, extends through every phase of practice and theory in special schools, and culminates in a National Institute, where the highest forms of agricultural instruction are given by a staff of the first men of science of France." But thanks to the strong hands and true which founded it, we have an Agricultural College which would take a high place even in France, and has no superior among the kindred institutions of Australasia. The good work it is doing, both as a seminary for our youths and as a model farm for their elders, meets with general recognition. Not the least pleasing fact about it is the circumstance that most of its "old boys" betake themselves for a livelihood to agriculture, and that some of them are occupying positions of trust and responsibility connected therewith. It should be added that the institution is highly popular, and that room cannot be found for all who desire admission.

\* The latest triumph of the Agrarians is the new German tariff. See the *Times* of 30th July, 1901.



The maize-grower had quite as favourable a year as the wheat-grower experienced. The area cultivated increased from 110,489 acres in 1899 to 127,974 acres in 1900; the quantity yielded from 1,965,598 bushels to 2,456,647 bushels; the average yield per acre from 17.79 bushels to 19.2 bushels; the money value of the crop from £343,979 to £429,913. As in the case of wheat, the local supply of maize did not equal the demand, and 247,449 bushels, valued at £42,388, had to be imported. The largest yield of maize per acre was at Cairns, where it exceeded 40 bushels. The district in which the largest area was under maize was Warwick, where it amounted to 10,146 acres; Toowoomba coming second with 9,512 acres.

STATEMENT showing the ACREAGE of the UNDERMENTIONED CROPS during the YEARS 1899 and 1900.

Crops.	ACREAGE.	
	1899.	1900.
	Acres.	Acres.
Sugar-cane ... ..	110,657	108,535
Wheat, Grain ... ..	52,527	79,304
Maize " ... ..	110,489	127,974
Barley—		
Malting, Grain ... ..	6,011	6,302
Other " ... ..	1,463	1,231
Oats " ... ..	714	385
Rice " ... ..	319	271
Tobacco ... ..	745	665
All Other Crops ... ..	137,821	132,730
	420,746	457,397

The following table shows the number of acres under crops at the State Farms in 1899-1900 and in 1900-1901:—

Farms.	ACREAGE UNDER CROP.	
	1899-1900.	1900-1901.
	Acres.	Acres.
Westbrook ... ..	150	150
Hermitage ... ..	109	158
Biggenden ... ..	22	15
Gindie ... ..	134	156

Thanks to the efforts of the departmental experts, fruit-growing is being established on a more satisfactory basis; superior and more suitable varieties are being cultivated; insect and fungus pests are being encountered with the most effective remedies. In grapes the production increased from 3,230,627 lb. in 1899 to 3,634,949 lb. in 1900; the area under bananas increased from 5,802 acres to 6,215 acres; under oranges, from 2,324 acres to 2,882 acres; under mangoes, from 245 acres to 411 acres; under strawberries, from 87 acres to 121 acres; under apples, from 132 acres to 238 acres. The export trade increased from £93,187 to £104,385. The Department has spared no effort to keep the local orchards free from pests, and to exclude all infected fruit and plants coming from abroad. The officers whose business it is to perform this invidious work have done their duty fearlessly and well, and with very little friction, considering the extreme methods they have sometimes to adopt. The diseases noticed upon the fruit imported have been principally codlin moth, fruitfly, red scale, mussel scale, black brand, black spot, and San José scale. The codlin moth has been found in all consignments of apples from America and New South Wales, but in not one consignment of apples from Tasmania. This seems to indicate that in Tasmania a stricter watch is kept on fruit exports than in either America or New South Wales. It is gratifying to know that, owing to the stringent precautions taken with respect to imported grape-cuttings, Queensland has escaped so far a visitation from phylloxera. It is to be regretted, on the other hand, that no effective scheme for the extermination of another fruit-grower's enemy—the flying-fox—has yet been devised. The trade by Wallangarra during the apple season required the services of an inspector in addition to the staff usually stationed there. The Northern export trade, which consists principally of bananas, has received considerable attention. The fruit exported has been of a better quality, but unless improved storage is given by the shipping companies the decline in the trade will soon commence. Many persons formerly engaged in banana-growing are now cultivating maize and other crops of general farming, the change being directly traceable to the loss on shipments. The Department interested itself with some beneficial results, but there is much room for improvement before the facilities are equal to those of the steamers in the Fiji trade.

None of our agricultural pursuits seems to have made more rapid or enduring progress than the dairying industry. The very last of them to establish a footing, it is already one of the most important of them. In 1900 there were at work 53 butter and cheese factories, and 146 creameries, employing 595 persons. The output that year was 3,875 tons of butter and 886 tons of cheese, valued altogether at £658,177. Of that quantity of butter 620 tons were exported, as against 517 tons for the preceding

year. A similar healthy condition of things is evinced in the allied industry of ham and bacon curing, of which the exports were valued at £31,067 in 1899 and £45,831 in 1900. Experts on the matter agree that everything which conduces to successful and profitable dairy-farming exists in Queensland, excepting proximity to the great markets for dairy produce, and that even this disadvantage would have no appreciable effects if Queensland had the shipping facilities enjoyed by the other States of the Australian Commonwealth. Determined efforts should therefore be made to have Brisbane included among the ports visited by the European mail steamers, which now make Sydney their destination.

The following table gives the estimated value of all the agricultural productions in 1899 and in 1900:—

	1899.			1900.		
	£	s.	d.	£	s.	d.
Crops ... ..	1,436,832	10	3½	1,501,622	0	0
Dairy produce ... ..	686,972	15	8	658,177	1	4
Farm stock... ..	3,534,350	0	0	4,024,050	0	0
	£5,658,155	5	11½	£6,183,849	2	1

STATEMENT SHOWING the VALUE of the Undermentioned AGRICULTURAL EXPORTS during the Years 1899 and 1900.

Exports.	VALUE.	
	1899.	1900.
	£	£
Butter and cheese ... ..	49,646	52,252
Fruit ... ..	93,397	104,747
Grain—Wheat ... ..	106	74
"    Maize ... ..	22	363
"    Oats ... ..	91	...
"    Rice ... ..	8	...
Hay and chaff ... ..	1,256	1,500
Honey and beeswax ... ..	1,646	1,738
Meat (pigs and poultry only) ... ..	31,431	47,102
Sugar ... ..	1,163,010	669,389
Vegetables (fresh) ... ..	3,131	4,005
"    (preserved) ... ..	...	8
All other kinds of agricultural produce ... ..	23,758	22,993
	£1,367,502	£904,171

Some reference ought to be made to the efforts of the Department during the year to find a cheap and effective means of eradicating the prickly pear. Bunker's Hill, a portion of the State Farm at Westbrook, was the field of experiment, and the result was that the desired remedy was discovered, though it is not yet possible to state exactly what would be the cost of clearing ordinarily infested land by means of it. The land treated presented extraordinary difficulties, and was operated upon simply because it was a nursery of pear that was a constant menace to the Farm. Probably the cost of freeing infested land generally from the pest will be from £1 to £2 an acre.

Appended are the reports of the following officers of the Department:—

The Principal, Queensland Agricultural College.	Inspector, S.W. Guarantee Act.
The Agricultural Chemist.	The Director of the Botanic Gardens.
The Colonial Botanist.	The Manager, State Nursery, Kamerunga.
The Entomologist.	The Manager, State Farm, Westbrook.
The Instructor in Fruit Culture.	The Manager, State Farm, Hermitage.
The Assistant in Fruit Culture.	The Manager, State Farm, Biggenden.
The Viticulturist.	The Manager, State Farm, Gindie.
The Tobacco Expert.	The Chief Inspector of Stock.
Instructor in Coffee Culture.	

I have, &c.,

D. H. DALRYMPLE,  
Secretary for Agriculture.

## REPORT OF THE PRINCIPAL OF THE QUEENSLAND AGRICULTURAL COLLEGE.

SIR,—I have the honour to submit the following Report on the work done at the College during the year that ended on the 30th June last.

The changes that have taken place on the teaching staff were:—(1) Mr. P. Sutherland, Science Master, severed his connection with the Institution, and has been succeeded by Mr. E. W. Gurney, lately Chief Assistant to the Agricultural Chemist of the Department of Agriculture, New South Wales Government; (2) the appointment of Assistant Chemist was vacated by Mr. L. Van Nott, and has not since been filled; (3) Mr. R. N. T. Quinn, Mechanical Master, accepted a position in the Works Department, and has been succeeded by Mr. W. Doughty.

In addition to the regular staff valuable lectures have been given by Dr. McDonald on "First aid"; Mr. Quinnell, M.R.C.V.S., weekly lectures and demonstrations in Veterinary Science; Mr. Tryon on Entomology, and by Mr. John Bailey on Botany. A great deal of interest is taken in these lectures by the students. The lectures are of such an educational character that a boy with less than ordinary intelligence must profit very considerably.

The class work has suffered somewhat during the time under review, because of the number of holidays that were granted, the principal of which were two Lockyer shows, two Brisbane Exhibitions, arrival of British troops, and the Royal visit.

Taking the practical and scientific work together, good progress has been made all round. It is pleasing to be able to write that those associated with me join in reporting favourably of the progress made, and the general conduct of the students.

It may not be out of place for me to state here that some who are admitted as students are so poorly educated as to render it difficult to obtain high results in class work. The class work, however, was better maintained than during previous years. This has been brought about to a great extent by the masters backing up their lectures by practical teaching. This method (especially with the class of students that graduate at agricultural colleges), is to my mind the only means whereby satisfactory results may be expected.

*Mensuration and Surveying* are taught by Mr. Pitt, who reports that great interest has been taken and good progress made in each subject. Three terms are given, too, for this work. During the first, areas of land, regular and irregular, are computed by means of measuring tape only; in the second by measurement and angles, the latter obtained without the use of instruments; and during the third the course of instruction is given in the use of the theodolite and level.

*Book-keeping*: Mr. Pitt reports good progress in this subject.

*Chemistry*: Mr. Gurney commenced duty at the beginning of last term, and reports that since he has taken charge of the laboratory the orderly and attentive behaviour of the students during class hours and the interest taken in the scientific side of their work is very gratifying.

Mr. Gurney impressed upon his classes the necessity of acquiring a knowledge of the mechanical and chemical analysis of soil, the plant food requirements of the different crops, the composition and use of artificial manures. Stress was laid upon the scientific principles taught in the laboratory that were in actual adoption upon the College farm.

The outdoor teachers, including Messrs. Watt, the farm foreman; Mr. McGrath, superintendent of the dairy; Mr. W. Doughty, the mechanical superintendent, all report good progress in their respective departments.

I wish to again draw attention to the great mistake made by some parents who send their sons here and withdraw them after a period of from six to twelve months, or just at a time when they have gone through the rudimentary work and are likely to make rapid progress. Action of this kind is not likely to raise the standard of this institution to a very high degree, because it is thought by some that the fact of a boy spending but a short period at an Agricultural College qualifies him to hold first rank as an agriculturist.

The first term of the year under review was commenced with 47 students, 16 of whom did not return for the second term. Fourteen new students were, however, enrolled, making a total of 38 for the year, including 4 bursars. Twenty-two students actually graduated through the College during the year ending the 30th June. Of this number 7 went through the full course of three years, 5 two years, and 11 one year.

The 7 students who went through a three years' course are now actually engaged in work, which enables them to put the knowledge acquired here into practice. Three of them are managing farms, 1 is upon his own farm, 2 are managing dairy factories, 1 is in charge of the electric lighting plant here.

Five who went through a two years' course are occupied as follows:—One in engineering, 1 grazing pursuits, 3 in mixed farming.

Of 10 one-year students 4 are farming, 3 in pastoral pursuits in Western Australia, 1 in chemistry, 1 at a grammar school. Of 1 there is no record.

From the above facts it may be gathered that a very large number of those who pass through this College actually settle on the land or a calling which has some connection with it.

It is suggested that no student (unless for a special course) be admitted for a shorter period than two years. By the adoption of this or some similar method, we would be in a position to turn out a class of young men that would do us credit.

The conduct of the students generally has been really good, and the rules and regulations have been strictly obeyed.

The health of the students has been excellent, and there were no accidents or sickness of any importance.

The following is a list of the students who obtained diplomas and marks allotted the various subjects:—

Name of Student.	Subjects.	Marks— Per cent.	Name of Student.	Subjects.	Marks— Per cent.
C. Barth	Farming	81	Frank Hendy Palmer	Agriculture	79
	Chemistry	82		Dairying	82
	Carpentering	90		Carpentering	80
	Dairying	68		English	74
	Veterinary Science	65		Bacon Curing	95
	Gardening	85		Arithmetic	80
	Botany	77		Breeding, Feeding Live Stock	84
	Breeding, Feeding Live Stock	63		Gardening	76
	Conduct	100		Conduct	100
	Henry Cottrell Webb	Agriculture		75	Andrew John Conachan
Chemistry		78	Dairying	74	
Veterinary Science		62	Mechanics	86	
Dairying		82	Bacon Curing	85	
Botany		70	Gardening	80	
Gardening		90	Breeding, Feeding Live Stock	78	
Breeding Live Stock		76	Conduct	98	
Bacon Curing		93	Dairying	90	
Conduct		94	(Special Dairy Student) Book-keeping	95	
			Conduct	100	

Name of Student.	Subjects.	Marks— Per cent.	Name of Student.	Subjects.	Marks— Per cent.	
Albert Edward Anderson...	Agriculture ...	83	W. A. McIlwraith ...	Agriculture ...	84	
	Dairying ..	77		Chemistry ...	69	
	Mechanics ...	87		Blacksmithing ...	70	
	Chemistry ...	92		Dairying ...	87	
	Veterinary Science	91		Carpentering ...	75	
	Botany ...	90		Conduct ...	90	
	Bacon Curing ...	86		Frank Lloyd Jones ...	Agriculture ...	95
	Gardening ...	90			Dairying ...	89
	Arithmetic ...	69			Mechanics ...	70
	English ...	85			Bacon Curing ...	87
	Book-keeping ...	60			English ...	81
	Breeding, Feeding Live Stock ...	77			Arithmetic ...	78
	Conduct ...	100			Surveying ...	77
	Thomas Francis Bowler ...	Dairying ...			94	Gardening ...
Bacon Curing ...		63	Breeding, Feeding Live Stock ...		92	
Agriculture ...		79	Conduct ...		95	
Breeding, Feeding Live Stock ...		95	Angus McKinnon ...		Dairying ...	92
Conduct ...	88	Farming (practical only) ...			90	
Percy Mollineau Bayley ...	Dairying ...	93			Mechanics ...	73
	Chemistry (three terms) ...	87			Bacon Curing ...	92
	Mechanics ...	85		Gardening ...	81	
	English ...	92		Breeding, Feeding Live Stock ...	89	
	Arithmetic ...	100		Conduct ...	100	
	Conduct ...	100				

Apart from the actual teaching at the College a great deal of information has been furnished to people from all parts of the State, and to farmers and others who visit the institution for the purpose of acquiring knowledge.

One thousand five hundred and thirty-four letters were written during the year, an increase of 334 over that of the previous year. The majority of these were written in reply to inquiries made by persons desirous of acquiring information on agricultural dairying, &c., &c.

Two thousand four hundred and eighty-four persons visited the College, which number does not include the district people who come here on usual visiting days: the second and last Wednesday in each month. At least 95 per cent. of those who visit the College do so for the purpose of obtaining information regarding the work carried out in connection with the various departments.

Seeds and plants have also been distributed to people situated in different parts of the State.

Fifteen young pure-bred bulls have been disposed of at a price within the reach of the smallest dairyman. Some of these animals have since been awarded prizes at the leading shows. One hundred and seventy-seven pure-bred pigs were sold, the breeds being Berkshires, Tamworths, large, middle, and small Yorkshires.

The season on the whole was not a favourable one for the growth of crops. The earlier part of the season looked promising, but dry weather set in during the latter end of September and continued all through October and well into the month of November. The crops suffered so severely from this dry weather that the early crops resulted in almost failure.

The following rainfall for the season was as follows:—

	Inches.		Inches.		Inches.		Inches.
July ...	2.73	October ...	nil	January ...	6.27 (storm)	April ...	3.86
August ...	1.33	November ...	4.12	February ...	1.54	May ...	1.55
September ...	2.81	December ...	0.47	March ...	6.73	June ...	2.94
Total, 34.45 inches.							

There having been two exhibitions held in Brisbane during the year a good deal of time was devoted to preparing exhibits, and making the necessary arrangements.

#### FARM.

A great deal of important work was carried out in this Department. Manurial experiments and experiments with various quantities of seeds per acre planted at various depths, particulars of which have appeared at different times in the *Queensland Agricultural Journal*, with the results obtained therefrom.

The following are the correct returns from the crops harvested:—

**MALTING BARLEY.**—34 acres 36 perches produced 882 bushels, or an average of 26 bushels per acre.

**WHEAT.**—31 acres 19 perches.—Two acres were allowed to ripen and threshed; result, 72 bushels (36 bushels per acre). The remaining 29 acres were cut for hay for an average of 3 tons 5 cwt. per acre. Two and a-quarter acres of Allora spring wheat were cut for hay, yielding 5 tons per acre—a splendid return. This crop was planted on the 27th April last, under the following conditions:—

Plot 1.—Seed pickled with bluestone; quantity, 20 lb. per acre; depth of planting, 2 inches; area, 1 acre.

Plot 2.—Treated with bluestone; area,  $1\frac{1}{4}$  acres; seed 30lb. per acre; depth of planting, 1 inch.

Regarding the quality and quantity of the above plots, there was no noticeable difference.

Plot 3.—Belatourka wheat; area, 1 acre; 25 lb. seed; planted  $1\frac{1}{2}$  inches deep; manures used, 3 cwt. superphosphate and 1 cwt. kainit, mixed.

Plot 4.—No manure; 1 acre; 25 lb. seed; depth of planting,  $1\frac{1}{2}$  inches.

Plot 5.—1 acre; 35 lb. seed; depth of planting,  $1\frac{1}{2}$  inches; no manure.

Plot 6.—1 acre; 35 lb. seed; planted  $1\frac{1}{2}$  inches deep; pickled with lime.

Plot 7.— $5\frac{3}{4}$  acres; 25 lb. seed per acre; planted 2 inches deep; pickled with bluestone; no manure.

Plot 8.—1 acre; no manure; unpickled; depth of planting,  $1\frac{1}{2}$  inches.

Plot 5 produced the best results, the straw being clean and free from flag, and not of such a rank nature as that in most of the other plots; length of straw, 6 feet 10 inches.

Plot 7 showed a good sample of hay, and no doubt, had it been allowed to stand for grain, the results would have surpassed those from all other plots. There is no doubt that the best results are being obtained from thin seeding, particulars of which will be given in next month's report. No comment can be offered on deep or shallow planting. The length of straw in all the above plots varied from 6 feet 8 inches to 7 feet 2 inches. The crop was a most extraordinary one, yielding  $6\frac{1}{2}$  tons of excellent hay to the acre.

The 2 acres of wheat saved for grain was sown with Belatourka.



**PANICUM**, 19 acres 1 rood 10 perches. Owing to the dry weather a great deal of the seed failed to germinate, so that an accurate yield per acre cannot be given; a portion of the crop was eaten off by stock.

**CAPE BARLEY**.—Eleven acres three roods twenty-two perches yielded 51 tons of green fodder, which was fed milch cows. The crop is the best winter fodder we can grow.

**POTATOES** planted early in August returned a fair crop of seed only; the crop planted later was not worth harvesting. This failure was brought about by dry weather. Twenty-five acres, harvested in September and October, yielded 52 tons 7 cwt.—43 tons 11 cwt. of which were sold in Brisbane, realising as high as £5 per ton. This yield may be considered very good considering the dry season. One hundred and eight varieties were grown in small areas, particulars of which appeared in the *Agricultural Journal*.

**MAIZE**.—Twenty-seven acres were harvested. The early crop was almost a total failure, but the late crop returned about 22 bushels to the acre.

**PUMPKINS**.—Six acres; yield, 100 tons 14 cwt.; all fed to pigs.

**FIELD PEA**.—This crop did very poorly; was cut and fed to pigs.

**COW PEA**.—Four acres; this crop was partially destroyed by rain while being harvested.

**RYE**.—Five acres gave a return of 16 tons grain and straw.

**OATS**.—Fourteen acres 1 rood 2 perches returned 41 tons of first-class hay. Two acres of Algerian oats were threshed for 45 bushels of grain.

**AMBER CANE AND SORGHUM**.—Six acres produced 12 tons 4 cwt. per acre, which was put through the ensilage cutter and converted into silage, with a mixture of maize.

**ROOT CROPS**.—Making allowance for dry weather, I consider all root crops returned high yields.

Two acres of Swede turnips gave 27 tons 6 cwt.

One acre mangolds yielded 15 tons 10 cwt.

Sugar Beet, 7 tons per acre.

Twenty-one tons ten hundredweight of white Belgian carrots were removed from a plot of  $1\frac{1}{4}$  acres. A number of rows in this were treated with different manures, but the yield from these (with the exception of that where farmyard manure was used) was no greater than that from the unmanured rows. The manures used were as follows:—First row, one load stable manure; second row, wood ashes. Artificial manures consisted of—superphosphate, 400 lb.; kainit, common salt, each 66 lb. per acre. For the purpose of comparison, a number of rows were left unmanured. The fact that no greater yield was obtained from the manured rows may be attributed to the richness of the soil on which the crop was produced and the dryness of the season. The carrots were put through a pumpkin slicer, and fed to working horses, causing them to put on condition very rapidly.

Onions, half-an-acre yielded 30 cwt.

Chicory did remarkably well.

Cabbages, half-an-acre grown on the farm did well, but owing to there being no market the lot were fed to pigs.

Vetches did very poorly and were not worth harvesting.

**BUCKWHEAT** appears to be well adapted for our soils.

**FLAX**.—This crop made good growth during the favourable weather, but when the dry time set in its growth was checked, and gave but a fair return.

**STUD WHEATS**.—The different varieties numbered from 1 to 196, as shown upon pages 5 and 6 of my report for the year ending the 30th June, 1900, were again planted. Of these the following were harvested:—

D 3. Farrar's New Strain	E Farrar's New Strain	H 2 Farrar's New Strain
383. Comeback	G " "	A A A " "
T. Farrar's New Strain	H " "	J J " "
B. 3 " "	DDD " "	X X " "
J 1 " "	FFF " "	T1 " "
85 B Y 86 A 1 Old Strain	B B A " "	R " "
S 1 Farrar's New Strain	G 2 " "	F 2 " "
86 Y. Farrar's Old Strain	E 1 " "	V V " "
F F Farrar's New Strain	M M " "	Q 2 " "
B 2 A " "	J 2 " "	II " "
E 1 " "	G 1 " "	B 4 " "
Misingen	N " "	N 1 " "
Egyptian	Q " "	E 2 " "
Pharos	F E " "	U " "
Egyptian A 1	G A " "	Indian F
Egyptian A 2	C " "	Mica
Pugh's R R	B " "	Ibex D Farrar's Old Strain
A 1 Farrar's New Strain	J " "	85 A B " "
E E " "	D " "	Allora Spring

The remainder of the wheats, owing to the pinched nature of the grain, were not harvested.

I have found here, as is the case in all other districts, that the condition of the weather and the changeable season has a marked effect on the growth and yield of the different wheats; a class of wheat that may do well this season may be an utter failure next season. The hard flint wheats do best, and are not susceptible to rust as is softer kinds.

**INDIAN MILLETTES** (39 varieties) were harvested—

Gangad	Fulgar	Gudghi
Nirmali	Sadhi	Gidgar
Saragad	Dakshinu	Utawali
Akawa	Kar Jola	Sholapuri
Nealo	Yellaspun	Farfaria
Kati	Mungari	Cottur Jowar
Amber Jowar	White Wain	Dhawala
Potasi	Kondal	Kempu
Rati	Javari Jola	Wain Perio
Deshi Perio	Jowla	Nilwa (Khandest)
Imphi	Bile Jowar	Kala Bondi
Mogar Wain	Perio	Khondi
Nilwa (Poona)	Neoria	Chapti

Seed was saved from 15 of the best varieties for the purpose of planting next season. Some of these millets grew to the height of 14 feet 6 inches.

**LUCERNE**—The area has been increased from 35 to 76 acres. This crop (with the exception of that planted in the early history of the College) is doing remarkably well, the average return for the season being 5 tons to the acre. The larger proportion of the crop was chaffed up with wheaten and oaten hay and fed to horses.

**GRASSES AND CLOVERS**.—All grasses and clovers planted last year, with the exception of *Paspalum dilatatum*, were ploughed out. The latter grass is doing well and is much admired by all who have seen it growing. It adapts itself to all sorts of conditions and soil, and withstands dry weather very well. Roots and seeds have been distributed in all parts of the State, and I am unable to supply the demand. Owing to the grass being newly planted, and the dry season, I was not justified in testing its feeding values by grazing it down with sheep. I intend, however, to do so this year.

An analysis of the grass was made by the Agricultural Chemist, but, owing to the advanced state of the grass at the time when the sample was taken, the actual constituents could not be arrived at.

The following is a list giving particulars of standing crops on the 30th June, 1901, and crops removed during the year under review :—

PARTICULARS AS TO LAND UNDER CROP AND CROPS REMOVED DURING YEAR 1900-1901.			
Under crop June 30th, 1900			
	a.	r.	p.
Crops removed during present year—	241	3	10
Malting barley	34	0	36
Wheat	31	0	19
Panicum	19	1	10
Cape barley	11	3	22
Potatoes	35	2	39
Maize, with pumpkins	6	0	26
Pumpkins	6	0	9
Artificial grasses (ploughed out)	7	0	34
Field peas	7	3	13
Cow pea	4	0	8
Rye	8	0	38
Oats	16	1	12
Maize	10	3	21
Amber cane and sorghum	6	0	33
Mangolds	1	0	9
Carrots	1	1	22
Clovers	2	1	14
Kafir corn	2	0	0
Sugar beet	1	1	16
Onions	1	0	38
Millet	22	0	18
Swede turnips	2	0	25
Vetches	0	3	20
Buckwheat	0	0	38
Flax	0	1	0
Chicory	0	0	38
Cabbages	0	2	6
Stud wheats	0	1	0
Tobacco	0	0	28
Prairie Grass (ploughed out)	0	2	1
Total area crops removed	221	3	33
Standing Crops, June 30th, 1901—			
Paspalum	8	3	17
Beans (experimental)	0	0	30
Sorghums	11	0	35
Potatoes	11	0	25
Potatoes (experimental)	0	0	10
Sundry root crops (experimental)	0	0	10
Lucerne	76	0	24
Maize	7	3	29
Maize and pumpkins	31	3	4
Swede turnips	2	0	3
Carrots	1	2	10
Barley	30	0	23
Oats	6	1	8
Wheat	32	2	11
Millet	1	1	30
Mangolds	0	1	4
Amber cane	1	0	34
Orchard	5	1	21
Vines	2	2	17
Vegetables	2	0	0
Total area under crop, June 30, 1901	232	3	25

Thirty-eight horses were kept at work all the year round. They consume 11½ tons of chaff per month, besides a large quantity of grain, all of which is produced on the farm.

It cannot be expected that students, especially new beginners, can do a good day's work with a team, and therefore the full value of the food consumed is not obtained, all of which adds to the expense of running the farm.

The farm foreman speaks well of the progress and conduct of the students.

**HORSES**.—The imported draught stallion Black Watch has improved very much. A limited number of mares besides our own were served last season, and with one exception all proved to be in foal.

Two very handsome draught mares were imported from Victoria, and are working well.

**SHEEP**.—Two hundred merino ewes are kept for crossing with the Romney Marsh and Shropshire breeds. The lambs from the above crosses, particularly the Shropshire, are strong and healthy. I cannot, however, give reliable information as to which breed is the most profitable until I am in a position to have them pastured on measured areas of grasses.

I find these sheep invaluable for eating down weeds amongst the maize crops and on fallow lands.

**APIARY**.—This may be considered a new branch of education. Thirteen hives of bees have been procured, and instruction is at present given in the method of treatment of bees and preparation of honey for market.

**POULTRY**.—This branch of education is only in its infancy. A number of valuable fowls of the best breeds have been imported. During the next year it is intended to add this branch of farming to the educational part of the College.

DESCRIPTION OF STOCK AT COLLEGE.

<b>HORSES.</b>		<i>Ayrshires.</i>
17 draught mares.		2 stud bulls.
12 do. geldings.		6 yearlings.
1 do. do. (unbroken)		32 females.
1 do. stallion.		
7 light harness horses.		<i>South Coast.</i>
2 mares.		5 females.
1 two year old filly.		
<b>DAIRY CATTLE.</b>		<i>Shorthorns.</i>
1 Guernsey bull.		1 stud bull.
1 do. heifer.		8 yearlings.
1 do. calf.		18 females.
<i>Holsteins.</i>		<i>Mixed Cattle.</i>
1 bull.		19 males.
1 do. yearling.		93 females.
3 females.		
<i>Jerseys.</i>		<b>SHEEP.</b>
2 stud bulls.		190 ewes.
4 yearlings.		70 lambs.
22 females.		<b>BEEES.</b>
		13 hives.

The following are returns of milk and butter yields from 49 cows from the College Herd, for one milking period:—

Name of Cow.	Breed.	Yield.	Commer- cial Butter.	Date of Calving.	Date Dried off.	Remarks.
		Lbs.	Lbs.			
Linnet ...	Ayrshire	7282	256.38	10 June, 1900	20 April, 1901	
Laverock ...	"	7143	289.56	7 Dec., 1899	27 Oct., 1900	
Blink ...	"	6178	261.62	21 Mar., 1900	26 Nov. "	
Annie Laurie	"	6049	250.84	30 May "	27 Jan., 1901	
Lena ...	"	6349	261.88	30 July "	20 May "	
Leesome ...	"	5515	225.52	12 Oct. "	4 June "	
Ream Routhie	"	4348	181.27	19 Sept. "	15 May "	
Rosebud ...	"	4283	175.80	13 April "	17 Jan. "	
Stumpy ...	Jersey	6539	325.48	1 July "	18 May "	
Opale ...	"	4422	233.9	16 Dec., 1899	14 Sept., 1900	
Jersey Belle	"	5547	316.73	21 May, 1900	18 May, 1901	
Evileen ...	"	5307	279.8	13 Aug. "	11 June "	
Connie ...	"	2889	151.88	29 Sept. "	30 May "	
Ivy ...	"	3124	155.36	2 Oct. "	4 June "	With first calf
Beatrice ...	"	3032	151.45	19 Oct. "	30 June "	With first calf
Spec ...	"	3719	181.96	26 Aug. "	30 May "	With first calf
Dairymaid ..	Holstein	7308	261.92	15 Mar. "	30 Dec., 1900	
Damsel ...	"	5175	187.90	5 Dec., 1899	26 Oct. "	With first calf
Painter ...	Shorthorn	5240	218.96	4 Sept., 1900	30 April, 1901	With first calf
Brush ...	"	4969	211.81	12 Sept., 1899	14 May, 1900	With first calf
Kit ...	"	5345	219.8	16 Dec., 1900	30 July, 1901	With first calf
Alice ...	"	6494	276.26	13 Nov., 1899	16 Oct., 1900	
Frizzy ...	"	4514	188.57	27 Sept., 1900	11 June, 1901	
Violet ...	"	4353	184.08	1 Oct. "	25 May "	
Florrie ...	"	5142	203.14	15 Sept. "	23 June "	
Blossom ...	"	4423	181.17	14 Sept. "	20 May "	
Empress ...	"	5217	219.01	23 Aug. "	16 May "	
Gladdy ...	"	5652	232.68	2 May "	20 Feb. "	
May ...	"	4697	195.85	20 May "	20 Feb. "	
Stranger ...	Grade Shorthorn	5805	246.48	15 Aug. "	11 June "	
Whiteflank...	"	7486	310.92	4 June, 1899	20 April, 1900	
Redmond ...	"	5055	205.92	6 Oct., 1900	30 May, 1901	
Rosella ...	"	5629	226.98	9 Oct., 1899	11 June, 1900	
Duchess ...	"	4788	202.34	27 Oct. "	23 June "	
Trial ...	"	6019	256.18	26 Oct. "	20 Aug. "	
Peggie ...	"	4420	191.72	14 July "	1 June "	
Podge ...	"	4327	173.78	1 Nov. "	23 June "	
Rusty ...	"	5765	242.9	17 Jan., 1900	26 Oct. "	
Sally ...	"	6144	239.02	23 Sept., 1899	18 Aug. "	
Laurel ...	"	5884	242.33	4 Oct., 1900	21 June, 1901	
Restless ...	"	5662	218.84	4 Oct. "	23 June "	
Hilda ...	Shorthorn	4807	198.23	25 Mar. "	20 Dec., 1900	
Nestor ...	"	6042	252.06	21 April "	23 April, 1901	
Broad ...	Devon	3598	167.56	5 Oct., 1899	10 May, 1900	
Rosie ...	"	3336	144.11	11 Oct., 1900	14 April, 1901	
Youghy ...	South Coast	4693	173.34	1 Sept., 1899	20 April, 1900	
Scarlet ...	"	4233	178.00	13 Oct. "	14 April "	
Effie ...	Jersey	4781	242.77	16 Dec. "	30 Sept. "	
Playful ...	Grade Jersey	3173	150.08	6 Aug., 1900	8 Mar., 1901	

From the above returns it may be observed that the Ayrshires take first place as milk and butter yielders. The milking period could be extended by keeping the bull from the cows for a longer time after calving.

No special methods of feeding were adopted to bring about these returns.

Grade shorthorn denotes a cross with the Ayrshire bull and the ordinary bred shorthorn cow.

THE DAIRY.—The work in this Department has been well maintained throughout the year.

There are more applicants for a special course in this branch of education than it is deemed advisable to admit. A keen interest has always been taken in the dairywork, and several who graduated at the College this year are now holding responsible positions in factories. Two are managing cheese and butter factories, and two are engaged in butter-making in factories.

The services of students have been allowed to agricultural societies for milk-testing in connection with prizes awarded for the best milch cows at the annual shows.

The most modern methods in the manufacture of butter and cheese, and also in milk-testing, are adopted in our dairy.

Experiments were made regarding the use of preservatives in butter, with the result that the keeping quality was in no way improved.

Weekly lectures were given by Mr. McGrath and myself on the manufacture of dairy produce, milking, testing, and the breeding and feeding of cattle.

A quantity of potted cheese was manufactured, the quality of which is considered excellent. The demand has been far greater than the output.

The College trophy of dairy produce at the show of the National Agricultural and Industrial Association this year included Cheddar cheese, potted cheese, condensed milk, concentrated milk, pasteurised milk, tinned butter, bacon, hams, and lard.

A consignment of loaf cheese, potted cheese, and bacon and hams was, by an order from H.R.H. the Duke of York, placed on board the H.M.S. "Ophir" for the use of the Royal visitors, and was so highly thought of that the order was repeated from New Zealand, and a supply of bacon and cheese was despatched to Adelaide to be placed on board the H.M.S. "Ophir" there.

The machinery and dairy plant worked well.

The quantity of milk treated during the year in the dairy was 22,528 gallons. Of this quantity 8,039 gallons was converted into cheese for a yield of 8,418 lb. of cheese, and 14,489 gallons was converted into butter for a yield of 5,747½ lb. of butter.

The quantities treated monthly were as follow:—

1900.	Gallons.	Lb. Cheese.	Gallons.	Lb. Butter.
1—31 July ...	445	451	1,206	452
1—31 August ...	246	258	1,160	444
1—30 September ...	555	557	1,056	364½
1—31 October ...	788	797	1,313	499
1—30 November ...	832	854	957	378
1—31 December ...	697	721	1,063	420



**HORTICULTURAL DEPARTMENT.**—In the orchard all trees (with the exception of the orange) have made good progress. The orange-trees appear to do very poorly, and have made but little growth during the last two years. The peaches, apricots, and figs have all made rapid growth and yielded a good crop of fruit.

The orchard at the creek has been increased in area, and a new orchard of  $2\frac{1}{2}$  acres planted near the buildings. The following fruit trees were procured from Victoria:—Apples, 54 varieties; figs, 7 varieties (including the true Smyrna, White Genoa, White Marseilles, and Pallani); quinces, 6 varieties; pears, 22 varieties; plums, 24 varieties of the leading European sorts; almonds, 4 varieties; cherries, 18 varieties; walnuts, 2 varieties; Spanish chestnuts; apricots, 10 varieties; peaches, 14 varieties; raspberries, 100 assorted, including many of the leading American kinds; American brambles, 5 varieties; currants, 12 varieties; gooseberries, 24 varieties. In addition to the above, 500 stocks, including 5 varieties, have been obtained for the purpose of training students in the propagation of fruit trees, budding, and grafting.

Notwithstanding the dry weather, many of the abovenamed trees are doing well.

The vines near the Principal's house and the one at the creek are thriving, particularly the latter, from which we obtained an excellent return of grapes.

An avenue of camphor laurel-trees was planted along the road to the stables and from the stables to the dairy.

**THE VEGETABLE GARDEN.**—Owing to unfavourable circumstances, this garden did not give results equal to those of past years; however, sufficient vegetables were produced to supply the College demand.

**MECHANICAL DEPARTMENT.**—A great deal of work has been carried out in the department. Apart from the usual work of horseshoeing, repairing implements, &c., the erection of a new poultry yard was begun, and good progress made; there is, however, a great deal more work to be done before completion.

An elaborate hay press was made to enable us to press bales of various sizes.

The fence round the Principal's house has been completed, painted, &c. The work of repairing damage done by storm was carried out with the assistance of the students.

Students take part and are taught how to make gates, shoe horses, repair implements, and the general repairs of the place in connection with blacksmithing and carpentering. The fact of having thirty-five horses regularly at work necessitates our keeping a smith regularly at work.

The electric light has been installed in all the buildings, and is giving complete satisfaction.

The telephone has also been laid from my office to the dairy and stables, thereby saving a considerable amount of running from place to place.

During the summer vacation I visited the southern colonies for the purpose of purchasing live stock for the College. I journeyed as far as Adelaide, and while there had every facility for acquiring information afforded me by the Minister for Education, from whose office the Agricultural Department is controlled. I visited the Roseworthy Agricultural College, where I received a hearty welcome from the principal, Professor Lowrie, who spared no pains in making me fully acquainted with the working of this institution. The principal crops grown are wheat, grapes, and fruits. Roots and vegetable crops are out of the question. Dairying is not included in the College work, there being only a few cows kept to supply the students with milk. A few very nice pigs (Essex) are kept to consume the waste products from the farm. I purchased six shorthorn heifers in the Ballarat district from the well-known herd of Mr. R. Liggett, and an Ayrshire bull from the noted breeder, Mr. J. Burnip. I also procured Berkshire pigs from Messrs. Madden, of Geelong, and Bell, of Yarra Glen; one Tamworth from Mr. Chirnside, of Werribee Park; one Yorkshire and two Berkshires from Mr. Betts, of Gladsville, of New South Wales. On my return to this latter colony, I visited the Wagga Experiment Farm, and was shown over the place by the manager, Mr. McKeown. The principal work carried out on this farm is wheat-growing and the raising of grapes and fruit. I also visited the Kiama district, where I inspected many of the best dairy herds. It may be truthfully said that our live stock and methods of working at the Agricultural College will compare favourably with any similar institution that I have had the privilege of inspecting.

In conclusion, I am pleased to be in a position to say that the work and teaching at the College during the year under review have been a marked success. The behaviour of the students was all that could be desired. Some boys lack the ability to become brilliant, but after a reasonable time here they will, I feel sure, become useful and successful agriculturists. I find that, in many cases, the boys who are too devoted to book knowledge do not show high results in practical knowledge. However, taking everything into consideration, there are no grounds for complaint while we continue to follow the lines upon which we are now working. As stated in the earlier part of this report, experiment work did not receive the attention that I should have liked. In the first place, the season was unfavourable, and, secondly, there was the considerable amount of work entailed in keeping the area under cultivation in good condition. A very important matter in connection with the College lands, and one which is worthy of early attention, is the necessity for drainage and irrigation. The greater part of our agricultural land is low, holding the water for a considerable period, thereby preventing us from carrying on cultivation at certain seasons of the year, and detracting considerably from the production of crops. In the matter of irrigation, an outlay of about £200 would increase our yield of lucerne, apart from other crops, by over 2 tons per acre. This means a total increase of over 175 tons for the year. Apart from the financial gain to the College, its educational value alone would justify the work being carried out. By the addition of extra labour the area under cultivation could be increased considerably, which would be a means of largely adding to the present returns from both dairy farm and piggery. The pressure of important work prevented my delivering lectures equal in number to last year.

The social life at the College is not neglected. There are now two tennis, two cricket, and two football clubs, and a quarterly social arranged by students, who invite their friends. A strong committee in connection with the above matters exists; and this, together with monitors—two for each dormitory—rendered me valuable assistance.

JOHN MAHON, Principal.

#### REPORT OF THE AGRICULTURAL CHEMIST.

SIR,—I have the honour to submit to you herewith my fourth annual report.

Nearly the whole of my time was devoted to analytical work, of which the following was carried out during the year:—

12 Soils, complete analyses	requiring 450 determinations
5 Waters, complete analyses	do. 75 do.
3 Clay, mangrove mud, &c.	do. 35 do.
2 Tobaccos, complete analyses	do. 52 do.
4 Grasses, complete analyses	do. 66 do.
8 Ashes from tobacco, grasses, &c.	do. 115 do.
11 Manures, complete analyses	do. 95 do.
8 Tanning barks	do. 56 do.
4 Tanning liquors, &c.	do. 20 do.
6 Shell sands	do. 12 do.
2 Potassium cyanide	do. 4 do.

Total ... 65 Analyses requiring 980 determinations.

Besides the work enumerated above, a large amount of both analytical and experimental work was carried out in connection with preparation of spraying solutions for prickly pear extermination, analysis of apparently diseased prickly pears, preparation of inks for branding of meat, &c.

A rather interesting series of analyses were carried out on behalf of the tobacco expert, Mr. R. S. Nevill, with a view of comparing our own tobacco soil from the Texas district with some of the well-known American tobacco soils from different parts of Kentucky. These soils were not only analysed according to the usual method of agricultural analysis, but also absolute analyses were made, and again different methods of elutriation were tried. The results showed that our own tobacco soil resembles the American soils in a most remarkable manner, both in regard to chemical and physical properties.

So far very little has been done in our State with regard to the analysing of our native grass crops, and other plants used as fodder for stock. I made a start, if only in a very modest way, by getting samples of some of our common pasture, and one of its principal varieties of grass, also of common couch grass, to compare them with a good crop of the well-known *Paspalum dilatatum*. The results of the analysis are rather interesting, and will be published shortly in the *Agricultural Journal*. Much more work of this class should be carried out at our agricultural laboratory; all the most important varieties of grasses should be dealt with in similar manner, not only comparing varieties, but also pasture of various districts, and grown under varying conditions.

Another very important field of investigation was opened out by the testing of various commercial samples of wattle tanning barks, submitted by one of our most enterprising tanners, to compare them with the bark of a native tree, received from Cairns. Mr. F. M. Bailey, our venerable Government botanist, has interested himself in this matter, and on his instigation samples of barks of various trees are being collected in different parts of the State, to be submitted later on to analysis.

It is greatly to be pitied that the scope of our analytical work is not considerably extended, in various directions, for the benefit not only of agriculture pure and simple, but of all the important industries intimately connected with agriculture and the product of our land. Already in my last yearly report, and in other correspondence during the year, I have drawn your attention to the necessity of increasing your laboratory staff, in order to deal with a larger amount of analytical work. Even now, with the limited space at our disposal, we have room and appliances for at least three qualified analysts to work side by side, and as soon as the contemplated laboratory in Brisbane near your headquarters is finished, we would have room for more if necessary. So far any reference to analytical work, which appears so frequently in various articles of our *Agricultural Journal*, is always taken either from American or Continental sources, which, if applied to our local conditions and backed up by our own analyses, might have to be very considerably modified.

At the last Agricultural Conference, just recently held at Bundaberg, and at which I had the pleasure to be present, the important question of testing our wheats with regard to milling qualities was again brought forward. This work alone would be of great value to our wheatgrowers, and would occupy pretty well the whole time of an assistant if a small experimental milling plant, for which the money has already been voted once, would be purchased.

In order to induce some of our farmers to make manuring experiments on a small scale on their own farms I wrote a short article, "What kind of manure should I use?" in the October number of our *Agricultural Journal* (Vol. VII., pages 310 to 315). Not sufficient stress can be laid on the fact that manuring of our land is absolutely necessary if the fertility and yield should be kept up. With a very few simple experiments carried out on a small area, each farmer can easily find out what manures his land, under his peculiar local conditions, may require. To encourage these classes of experiments Messrs. Webster and Co. have offered to supply a few farmers with small amounts of manures, necessary to carry out such experiments, free of cost, under the condition that such experiments are made conscientiously, and under my direction and supervision.

Our State possesses, so far, no Act regulating the sale and quality of manures or fertilisers. As it is of the greatest importance that a farmer should know exactly the quality of a manure he buys, the sale of manures by guaranteed analysis, as it is already done by the larger firms, should be encouraged. I beg to recommend that a farmer, when buying a larger quantity of manure of, say, one ton or more, should be able to get an analysis made free of cost, at our departmental laboratory, by applying to the Department of Agriculture, stating at the same time when, where, what quantity, and under what guarantee, the manure was purchased, and following strictly the instructions laid down, for the taking and collecting of samples for analysis, in the "Public Announcements," made at the end of the *Agricultural Journal* (page v. to vii.). The usual charge for the analysis, however, should be made as hitherto, if a sample is sent in by a manufacturer or vendor of manures.

On our Government experiment farms, nothing has been done so far with regard to properly conducted manuring experiments. I am pleased to say that, in company of the Agricultural Adviser, Mr. P. McLean, I paid a visit to the Westbrook and the Hermitage State Farms early in May, and that we drew up, with the help of their managers, series of manuring experiments, to be carried out this season. At the Hermitage farm a large block of suitable land will be devoted to manuring experiments with wheat, and, in order to minimise expenditure in connection with cultivating, sowing, and harvesting of the crop, the experiments are made on rather a large scale on half-acre blocks. At the Westbrook farm, experiments will be made, both with oats and barley, on quarter-acre blocks, and again parallel series of rotation of crops, on a block of land set aside for this purpose, are contemplated. I have no doubt that similar experiments will be made on our other farms as soon as the seasons permit, but I must point out that it is absolutely necessary that such experiments be continued on all our farms for some years, as, unfortunately, the results of one year, due to outside influences, are often not always deciding. It is not only necessary that such experiments are carried out, and their results closely studied, with a view to obtain a maximum yield at a practical minimum of cost, without impoverishing the soil, but the most important point must not be overlooked, that a large amount of extra analytical work has to be made in connection with the experiments, in order to get at the cause of certain results, and to find the actual value of the resulting crop as a food for man or beast. For this purpose not only the soils of the experimental blocks, but the manures applied have to be analysed: also complete analyses of the products, including their ashes, have to be made.

I think I made my case clear and convincing, that in order to carry out the work outlined, for the purpose of advancing agriculture, and to benefit thus the whole State, it is absolutely necessary to increase the laboratory staff, instead of letting me plod along single-handed, leaving our laboratory empty and appliances idle.

J. C. BRÜNNICH, F.C.S.

#### REPORT OF THE COLONIAL BOTANIST.

SIR,—I have the honour to submit the following brief summary report of the past year's work in connection with the office of Colonial Botanist.

I am pleased to be able to state that the desire for botanical information increases year by year, so that the work of the office is expanding. Also, from my long experience and practical knowledge of Australian horticulture, I am constantly being consulted on such matters by persons who contemplate the cultivation of various plants for special commercial products.

A number of objects have been added to the Museum during the year, but the want of cases has prevented the exhibition of many more which I should like to be shown.

The practical advantage of a Museum of Economic Botany cannot be overrated. It is one large book of object lessons; useful to persons in almost every walk of life; and I am glad to say that the practical men do make use of this portion of my work to a considerable extent; but there should be no standing still. The objects should be increased in numbers and variety; the woods indigenous to the State should not stop at the 600 at

present on view, but the whole 1,000 kinds should be represented. I do not consider that Queensland possesses any one kind of wood in sufficient quantity—easy of access—to make it a payable export when very large quantities are required; but among the smaller kinds, as well as some few of the trees of larger growth, are woods of unexceptional beauty, which, if known in the European market, would command a high price. In the event, however, of merchants or others shipping any of our woods to Europe or elsewhere, they must bear in mind that it is an absolute necessity for the systematic name to accompany the local or vernacular name, the neglect of which often causes confusion and loss.

The next in importance among our indigenous plants are probably the grasses. These are numerous in species, and for the most part rich in nutritive qualities. The most valuable feature, however, which they possess is certainly the wonderful tenacity of life which enables them to lie dormant during the long periods of drought to which the inland portions of Queensland are subject, and burst into a magic-like growth with the first fall of rain. No other grasses in the world possess this, at least in so high a degree. Thus it is not surprising that applications are constantly being received for seeds of these grasses from persons both within and beyond the colony. My correspondents are often good enough to send me, now and again, small packets of seed, but I would ask that I be allowed to expend a small sum from time to time, when it may come to my knowledge that at a certain place a particular kind is obtainable. If such were allowed, I might offer to pay for the time of a man or boy in gathering the seed. I might mention that seeds of these kinds are not kept in stock by the seedsmen, and are not at all times available in their native habitats, so much depending on the rain.

The poisonous plants sent in for identification during the year have been the same as of former years. With these, as usual, were a number of quite harmless plants which were supposed to have occasioned losses in stock. With noxious weeds, however, two have to be added to the list—viz., the Common Burdock (*Arctium Lappa*) and the Slender Thistle (*Carduus pycnocephalus*). The first-mentioned, if allowed to spread, will probably become particularly troublesome to the sheep-farmer. Another weed which has made its first appearance in the vicinity of Brisbane during the year will, should it obtain a footing on the Darling Downs farms, prove a troublesome pest. The plant referred to is known in Europe as the Climbing Buckwheat (*Polygonum convolvulus*).

No special bulletins have been prepared at my office during the year, but when possible the new Queensland species and such that have become naturalised have been worked into the new "Queensland Flora" now in course of publication, or their descriptions given in the pages of the *Queensland Agricultural Journal*. In this latter publication I have also described and figured a few interesting plants belonging to New Guinea, the specimens of which were collected by His Excellency the Lieutenant-Governor (Mr. G. R. Le Hunte) and others in that colony. The printing of the "Queensland Flora" has been steadily gone on with, the fifth part being now in the printer's hands. I am proud to be able to state that all who are competent to give an opinion upon the subject speak of it in the highest terms. With regard to the aboriginal names and the uses to which the natives put the plants, I have been more fortunate than I at first anticipated. This is principally due to the great help I have received from Dr. W. E. Roth, the Northern Protector of Aborigines, who for some time has been sending me packets of specimens of plants used for various purposes by the natives. In the death of the late Minister (Hon. J. V. Chataway) I have lost one who was in sympathy with this work. Indeed, he urged me to commence it long before he became Minister of the Department. I hope before writing another annual report that the sixth and last part of this Flora will be in the hands of the public. Before beginning this work I carefully examined the principal published "Floras," and have comprised in the Queensland one every feature that I considered would be advantageous to those who would use the work. Thus I may, without exaggeration, say that it aims at being the most complete work published on the subject of any single State or country belonging to the British Crown. In the sixth part I intend to give an addendum containing descriptions of those plants which may have been omitted or discovered in the State during the time the work was in progress, and also matters not previously available.

At the request of the late Minister, my assistant took the Botany classes at the Agricultural College in February last, and has since carried on the work, the time occupied being one day in each week.

The only special collecting trip that has been undertaken during the year is the one to the islands of the Gulf of Carpentaria, my assistant having been allowed to accompany Dr. Roth on his present visit to those parts, and from whence I expect him to return this month.

These islands have scarcely been visited by any botanist since the celebrated Dr. Robert Brown, who was there with Captain Flinders in 1802. Thus, the chance of a botanist again visiting the locality was most opportune.

I have kept the expenditure for the library within the limit allowed, and by carefully selecting only those works most necessary I am gradually forming a most useful library for a working botanist.

I take this opportunity of thanking my numerous correspondents for the many specimens they have forwarded to me during the past year, a number of which have reached me in good condition and furnished me with the means of exchange with other botanical departments, which, from being without a collector, I could not otherwise have carried out.

F. MANSON BAILEY, Colonial Botanist.

#### REPORT OF THE ENTOMOLOGIST.

SIR,—I have the honour to submit the following report relating to the work of this office during the year ending 30th June, 1901.

##### VISITORS.

As in the past, there has been the usual daily attendance of visitors, to whom has been afforded information with reference to the several inquiries preferred. The latter have related to such subjects as the nature and mode of treatment of plant ailments; insect depredators—their habits, and the methods for effecting their destruction; and the names and systematic relations not only of these, but of animals generally associated with them in the same order—*Insecta*.

##### CORRESPONDENCE AND REPORTS.

In addition to the questions relating to Plant Pathology and Agronomic Entomology that have been dealt with on the occasion of the above personal interviews, the following topics—amongst others—have formed subjects of written communication and report involving in many cases considerable original investigation:—

##### I.—ECONOMIC ENTOMOLOGY.

APPLE.—Codling Moth (*Carpocapsa pomonella*), Toowoomba, Stanthorpe, New South Wales, &c.; Fruit Miner (*Cacæcia sp.*), Toowoomba; Greedy Scale Insect (*Aspidiotus camelliae*, Sign), New South Wales; Pernicious Scale Insect (*Aspidiotus perniciosus*), Brisbane, Stanthorpe, Toowoomba, &c.; Quince Scale Insect (*Aspidiotus cydonia*, Comst.), Brisbane and Tasmania.

PEACH AND APRICOT.—Fruit Fly Maggot (*Tephritis Tryoni*), several districts; Pernicious Scale Insect (*Aspidiotus perniciosus*), Toowoomba, Jimboomba; Plant Bug (*Dindymus sp.*), Allora; Swarming Fly Bug (*Nysius vinitor*), Stanthorpe, Roma, and other localities.

PLUMS.—Pernicious Scale Insect (*Aspidiotus perniciosus*), Stanthorpe and Warwick; Fruit Miner (*Cacæcia sp.*), Toowoomba.

PEAR.—Pernicious Scale Insect (*Aspidiotus perniciosus*), Toowoomba; Fruit Miner (*Conogethes punctiferalis*, Gn.), Brisbane; Fruit Fly Maggot (*Tephritis Tryoni*), Brisbane.

CHERRIES.—Pernicious Scale Insect (*Aspidiotus perniciosus*), New South Wales.

CITRACEOUS FRUIT.—Tree Bug (*Oncoscelis sulciventris*), Fassifern; Wood Borers (*Uracanthus cryptophagus*), Wallon and Blackall Ranges; Wood Borer, secondary (*Curculionidæ*), near Brisbane; Flower Beetle (*Glyciphana brunneipes*), Bundaberg; Fruit Fly (*Tephritis Tryoni*), Brisbane; Spotted Fruit Fly (*Trypeta psidii*), Nerang; Fruit Miner (*Conogethes punctiferalis*), Brisbane; Fruit-piercing Moths (*Ophiderinæ*), Bowen, &c.; Red Scale Insect (*Aspidiotus aurantii*); White Scale Insect (*Chionaspis citri*); Glover's Mussel Scale Insect (*Mytilaspis Gloveri*), Brisbane, Blackall Ranges, and other localities; Fulvous Mussel Scale Insect (*Mytilaspis fulva*), Brisbane, and in process of import; Lemon Circular Scale Insect (*Aspidiotus limonii*), on imported fruit; Quince Scale Insect (*Aspidiotus cydoniæ*), on imported fruit; Soft Scale Insect (*Lecanium hesperidum*), Charters Towers and Childers; Expanded Soft Scale Insect (*Lecanium expansum*), Maryborough; Scale Insects, Charleville; Cottony Cushion Scale Insect (*Icerya Purchasi*), Enoggera; Pink Wax Scale (*Ceroplastes rubra*), Woombye; Leaf-Cutting Ants (*Campanotus sp.*), Runcorn.

MANGO.—Fruit Fly Maggot (*Tephritis Tryoni*), Rockhampton; Saltatory Beetle (?), injurious (*Scirtes sp.*), Mackay; Seed Weevil (*Cryptorhynchus mangiferae*), Brisbane.

CUSTARD APPLE.—Long Soft Scale (*Lecanium longulum*), Brisbane.

LOQUAT.—Blossom-destroying Beetle (*Diphucephala sp.*), North Coast Railway Line.

GUAVA.—Quince Scale (*Aspidiotus cydoniæ*), Burrum.

MULBERRY.—Red Scale Insect (*Aspidiotus coccineus*), and Lecanium Scale (*Lecanium nigrum*), Bundaberg.

GRAPE VINE.—Bronzy Eumolpid bud-eating Beetle, Beenleigh; Mealy Bug (*Dactylopius sp.*), Mackay; Anthribid beetle (*Aræocerus fasciculatus*) (?) injurious, Gladstone; Red Scale Insect (*Aspidiotus aurantii*), Bundaberg.

FRUIT TREES (generally).—Termites or "White Ants," Charleville.

COFFEE.—Bark-gnawing insect, Lower Russel River; Birds' Dropping Scale Insect (*Pulvinaria psidii*), Woombye; Lecanium Scale Insect (*Lecanium hesperidum*), Woombye; Grasshoppers (*Acrididæ*), Cairns district; Nest-building Ant (*Ecophylla smaragdina*), Cairns district.

BANANA.—Aphis, Brisbane; Fruit Fly (*Tephritis Tryoni*), Cairns.

PINEAPPLE.—Pineapple Mealy Bug (*Dactylopius bromeliæ*), Mossman River district.

POTATO.—Cut-worm (*Agrotis suffusa*), Brisbane; Lady-bird (*Epilachna 28-punctata*), Childers; Tuber-gnawing beetle (*Isodon puncticollis*, Macl.), Toowong; Tuber-gnawing insect, Kyoomba; Tuber Miner (*Lita solanella*), Brisbane.

SWEET POTATO.—Weevil Borer (*Cylas formicarius*), Beenleigh, Cairns, Rockhampton, &c.

BEAN.—Pod-stinger (*Riptortus annulipes*), Brisbane; Stem Maggot (*Agromyza phaseæi*, Coq.), Brisbane and Cairns.

CABBAGE.—Diamond Moth Caterpillar (*Plutella cruciferarum*), Bundaberg, Charters Towers, Gladstone, Gympie; Stem Borer (*Hellata undalis*), Darling Downs; Cabbage Aphis, Brisbane.

CARROT.—Leaf-eating Caterpillar (*Plusia secundaria*), Moreton Bay.

MANGOLD.—Leaf-eating Beetle, Morayfield.

TOMATO.—Fruit Fly Maggot (*Tephritis Tryoni*), Brisbane; Rot-producing Maggot (*Helomyza sp.*), Brisbane.

TOBACCO.—Stem and Leaf Miner (*Lita solanella*), Texas.

SUGAR-CANE.—"Wire-worm," Mackay; Berg's Meal-wing Fly (*Aleurodes Bergi*), Mackay; Set-eating Beetle (*Pentodon australis*), Proserpine; Termites, Lower Burdekin; Leaf-Hopper (*Delphax sp.*), Lower Burdekin; Grubs (*Larvæ of scarabæidæ*), Isis district.

WHEAT.—Stem injury, apparently caused by some haustellate insect, Roma district; Subterranean caterpillar (Fam. *Ecophoridae*), Warwick.

LUCERNE.—Some parasite that renders it unfit for cattle to eat, Grantham.

PASTURAGE.—A caterpillar plague, Kensington Downs; Visitation of Grasshoppers (*Pachytylus australis* Br.), Darling Downs.

ORNAMENTAL PLANTS.—Scale insects (*Parlatoria sp.*, *Aspidiotus*) (?) *spinosus*, Comstock, and *Asp. trilobiformis* Gn., var), on Camellias from Japan; Scale Insects (*Ceroplastes cerifera* and *Lecanium oleæ*), on Azaleas from Japan; Root-gnawing Mole-cricket (*Gryllotalpa sp.*), Lecanium Scale Insects (*L. longulum*, *L. filicum*, and *L. sp.*), Mealy Bug (*Dactylopius sp.*) White Scale Insect (*Diaspis rosæ*), Cottony Cushion Scale Insects (*Icerya Purchasi*), and Leaf Hopper (*Phoromnina marg nella*), on Rose, Charters Towers; Bag Scale Insect (*Eriococcus coriaceus*), Brisbane, on Eucalypts; Trunk-boring Grub (*Endoxyla Boisduvali*), Brisbane, on Desert Gum—Lerp Insects (*Psyllidæ*), Western Queensland; on White Cedar ( ), White Diaspid Scale Insect (*Chionaspis sp.*), Charters Towers; on Melaleuca—Bag Scale Insect (*Eriococcus leptospermi*), Bowen.\*

## II.—VEGETABLE PATHOLOGY.

Many specimens of cultivated plants being victimised by parasitic vegetable-life, or manifesting general constitutional derangement, have, as in past years, been submitted as matters for investigation and report. Amongst these may be mentioned:—

APPLE.—Eye Scab, associated with presence of *Sporodesmium vrebriforme* and a special mite, New South Wales.

PEAR.—Black Spot, caused by *Fusicladium pyrinum*, Toowoomba.

APRICOT.—Freckle of Fruit, Toowoomba.

ORANGES AND LEMONS.—Fumagine of Orange, caused by *Capnodium citricolum*, St. George; Bark Encrustation, caused by *Corticium*, Blackall Ranges; Etiolation of Plant, Coomera; Lemon Scab, associated with the presence of *Phyllosticta scabiosa*, Tambourine.

PASSION VINE.—Leaf Disease, caused by *Helmiathosporium sp.*, Zillemere; General Plant Disease, Zillemere.

BANANA.—Internal Rotting of Fruit, caused by root-affection, Cairns; Black Spot Disease, caused by *Glaosporium fructigenum*, Cairns; Rust of Fruit, caused by *Thysanopterous* insect, Cairns.

\*NOTE.—Scale insects occurring upon native plants are often sent, that the suggestion that they may be identical with those members of this class that are injurious to fruit trees may be considered. This remark applies to some of the preceding, and to others unspecified.



VINE.—Root Disease, caused by *Heterodera radicola*, St. Helena; Fruit Rot, attended by presence of *Aureobasidium*, Darling Downs; Brown Leaf-discolouration, Darling Downs; Black Spot of Leaf and Fruit, caused by *Glæosporium ampelophagum*, Brisbane and Darling Downs.

COFFEE.—Dying of Primaries, Cairns; Epiphytal lichen (*Strigula sp.*), Lower Russell; Constitutional Disease, Daintree River.

TOMATO.—Root Disease, caused by *Heterodera radicola*, Wellington Point; Leaf Disease, caused by *Septoria lycopersici*, Wellington Point and Walloon; Fruit Rot, caused by various fungi, &c., Wellington Point and Brisbane.

POTATO.—Bacterial Disease, Beenleigh; Potato Scab, Brisbane and Toowoomba.

TURNIP.—Leaf and Fruit Disease, caused by *Cystopus candidus*, Brisbane.

CUCURBITACEOUS PLANTS.—Leaf Mildew of Rock Melons and Vegetable Marrows, caused by *Erysiphe cichoracearum*, Brisbane and Nundah.

SUGAR-CANE.—Red Rot, Proserpine.

WHEAT.—Barrenness and low temperature, Warwick; stem shrinkage, discolouration, Roma district.

ORNAMENTAL PLANTS.—Dahlia Root Galls, caused by *Tylenchus*, Italy; Carnation—Leaf Disease, caused by *Uromyces caryophyllum*, Roma.

MISCELLANEOUS.—Reports relating to the utilisation of Locust Fungus for the destruction of (1) Grasshoppers and (2) Cane Grubs (*Scarabæidæ*) have also been prepared.

#### “THE DISEASES IN PLANTS ACT OF 1896.”

The Entomologist is now relieved of the performance of the duties of Inspector under “*The Diseases in Plants Act of 1896*,” except under special circumstances. Plants, &c. that have been imported from beyond the limits of the Commonwealth, and to the inspection of which, therefore, special importance attached, have in most cases been examined and disinfected by him, or immediately under his supervision. Grape vines and grape-vine cuttings have, however, been excepted from this special oversight. He has also overlooked the work of the Inspector attending the arrival of packages of plants at the Parcels Branch of the Post Office. Several questions that have arisen in the administration of the measure, involving technical considerations, have further been remitted to him. Moreover, as a member he has attended the meetings of the Board of Advice constituted under it, and has taken part in the deliberations and discussions that have arisen on these occasions. In addition, those inspectors employed exclusively in carrying out the provisions of the Diseases in Plants Act have from time to time made frequent demands on his office for precise information to guide them in the discharge of their important undertaking. In connection with this special province of work some sixty special reports have been furnished, and to the majority of them both importance and responsibility has necessarily attached. This is exclusive of much oral counsel that has also been tendered.

#### PLANT DISINFECTION, Etc.

Much attention has been bestowed upon one of the principal methods of disinfecting fruit and fruit trees, —viz., that consisting in the employment of hydrocyanic acid gas. Experiments have been conducted for the purpose of estimating the effect, if any, due to the excessive use of sulphuric acid in generating the gas; the changes undergone by fruit of different qualities and exhibiting different physical conditions when subjected to the process; also, with a view to ascertain the practicability of reducing the amount of potassium cyanide employed in the process without impairing its efficacy.

As the outcome of these investigations, the following important conclusions have been arrived at:—(1) That an excessive use of sulphuric acid—though uncalled for—is not attended with any injury to the fruit or other material subject to the disinfecting process. (2) That a prejudicial effect may be occasioned in case of citraceous fruit of a particular class, or that manifest injury or special physical conditions that are within the means of the grower or his agent to largely control. (3) That the minimum effective dose for the destruction of scale insects upon the fruit is much below that prescribed in the Regulations under “*The Diseases in Plants Act of 1896*,” as well as in those connected with the vegetation diseases Acts of the different States of the Commonwealth of Australia, and that much of the injury complained of as being exhibited by fruit that has been subjected to the hydrocyanic acid gas method of disinfection might be obviated by a modification of the procedure in the direction suggested by this discovery, and there are grounds for concluding that in the near future these findings will find expression in the issue of amended regulations having reference to the fumigation of fruit for export.

Experiments have been also conducted for the purpose of ascertaining the availability, the limits to employment, and the safeguards to be recognised, with respect to the use of hydrocyanic acid gas in the destruction of household insect pests, including both those directly and those indirectly injurious to ourselves.

#### INSECTIVOROUS BIRDS.

Much attention has been given to the subject of insectivorous birds. Although, as is well-known, Queensland is especially well provided with different kinds of these; still, it is a matter of frequent comment that the number in which each occurs is becoming continuously reduced, notwithstanding the existence of legislation enacted with a view to securing an opposite result. As a preliminary step, therefore, to urging the claims of our feathered friends upon the consideration of the agricultural and horticultural public, it has been deemed expedient to make known to them and others those of our birds that are really insectivorous. Accordingly, the formation of a collection has been commenced of stuffed examples of these; each species being represented by individuals, displaying as far as possible general habit and sexual distinctions. This collection—when further augmented—will be available for public reference and information, and, supplemented by a brief account of the birds that comprise it, should subserve a most useful purpose.

#### SYSTEMATIC ENTOMOLOGY, Etc.

Much time has been devoted to the determination of the systematic relations and names of insects of different orders. This work has embraced both harmful and useful species, and the important class of Scale Insects (*Coccidæ*) has been made a special object of study. It has been extended to objects occurring even beyond the confines of the State, and that have been referred to the Entomologist by kindred establishments and his professional confrères elsewhere resident.

#### AGRICULTURAL CONFERENCE.

In the capacity of a delegate from the Department of Agriculture the Entomologist attended the Agricultural Conference held at Bundaberg on the 11th to 14th June, 1901, and whilst there read a paper entitled “Some Obstacles to Successful Sugar-cane Cultivation,” and, took part in deliberations and discussions relating to Fruit-trees and their Destroyers.

## AGRICULTURAL COLLEGE LECTURES.

For a considerable period of the year the Entomologist has been charged with the conduct of a series of combined lectures and demonstrations—two per week—at the Agricultural College, on matters relating to “Systematic Entomology and Plant Pathology.” Although evidence is forthcoming that these have been appreciated, and, moreover, have served a useful purpose in adding to the completeness of tuition bestowed at the institution named, still the fact must be recognised that they involve considerable expenditure of time and labour, and serve to disturb the continuity of whatever special research may be contemporaneously occupying the officer’s attention. On the other hand, investigations in the field, when protracted, as is sometimes unavoidable, serve to interrupt the regularity of their succession.

To repeat what has already been stated in a previous report—the delivery of single lectures on “Economic Entomology and Plant Pathology” to the members of horticultural and agricultural societies—is, however, a matter that can be more readily entered upon, and it is therefore to be regretted that these organisations do not more frequently avail themselves of the opportunity for securing the means, that is afforded by the delivery of such lectures, for being instructed in subjects having so important a bearing upon their calling, seeing that this office is always willing—in this and in other respects—to meet their requirements.

## FIELD WORK.

The field work that has been called for has fallen short of that engaged in during previous years. In the spring of 1890 the injurious “grubs” affecting sugar-cane in the Isis district formed a subject of special investigation, the plan of work followed being identical with that pursued in conducting a cognate inquiry in the Mackay district some years since. Owing, however, to circumstances that it was impracticable to control, this line of research, that gave promise of most useful results, had to be suspended, to be resumed with the advent of the forthcoming summer.

## PUBLICATIONS.

The following publications have issued from this branch of the Department, viz.:—

- (1.) “Harvesting Ants,” *Queensland Agricultural Journal*, Vol. VII., pp. 71-79.
- (2.) “The Sweet Potatoe Weevil” (*Cylas turcipennis*, Bohn.; *C. formicarius* auct. nec. Fabr. *Op. cit.*, pp. 176-189.
- (3.) “Carpenter Bees,” *Op. cit.*, pp. 553-554.
- (4.) “Disease in Tomatoes,” *Queensland Agricultural Journal*, Vol. VIII., pp. 136-137.
- (5.) “Pineapple Mealy Bug” (*Dactylopius Cromeliae*, Bouché), *Op. cit.*, pp. 297-298.
- (6.) “Some Obstacles to Successful Sugar-cane Cultivation,” *Queensland Agricultural Journal*, Vol. IX., pp. 85-90.

## LIBRARY.

The accessions to the library by purchase have, as during the preceding year, almost entirely been confined to current numbers of six periodicals devoted to the subjects of plant disease and systematic entomology. It has however, in addition, received many valuable donations from correspondents resident in different parts of the world. These contributions, that are gratefully acknowledged, conduce very materially to its usefulness.

## COLLECTIONS.

The collections during the year have received but slight accessions only; the money available for the purchase of insect specimens being but a small amount, and the time at the disposal of the Entomologist for obtaining such in the field very limited. The office has, however, benefited in this direction by the liberality of private donors. Amongst these may be specially mentioned Dr. A. J. Turner, Messrs. R. Illidge, F. P. Dodd, and Messrs. Newport and Henderson. For the purposes of study and investigation, demonstration in connection with special teaching, and constant reference generally, greater facilities for augmenting the collections of useful and injurious insects should be forthcoming than are now enjoyed. Without this, the services of the Entomologist cannot be availed of to such an extent as would otherwise be the case.

The above remarks apply, with some modification only, to the collecting of illustrations of Vegetable Pathology.

HENRY TRYON, Entomologist.

## REPORT OF THE INSTRUCTOR IN FRUIT CULTURE.

SIR,—I have the honour herewith to submit to you my report for the year ended 30th June, 1901, and in doing so I am glad to be able to say that, despite the fact that the coastal parts of Queensland experienced an unprecedented dry spell during the spring of 1900 and the early summer of 1901, the fruit industry of this State has continued to make steady progress, and the area of land planted with fruit trees, both evergreen and deciduous, shows an increase on that of any other year since my arrival in this colony in November, 1896. I am also glad to be able to say that a considerable portion of the newly planted area is set out with fruit trees of such varieties that have been proved of the highest commercial value in the particular district in which they are planted. This has been strongly urged by me ever since I came to Australia, and I am glad to see that my teachings have been taken to heart and acted upon, as the growing of the right kinds of fruit in the right places is essential to profitable fruit culture.

The necessity for keeping fruit and fruit trees free from disease is being more generally recognised, but there is still considerable room for improvement in this branch of his business by the average fruitgrower.

The systematic treatment of fruit pests has now become essential to the successful culture of all kinds of fruit in all parts of the State—in fact, it may be said to be the most important part of the grower’s work, as no matter how well the land is cultivated or manured, and no matter how well the trees are pruned, if diseases are not kept in check, the health and vigour of the trees will deteriorate and the produce will be more or less unmarketable.

The importance of this subject has been fully recognised by me, and I have continued to devote considerable attention to it, both by means of articles in the *Agricultural Journal*, by lectures to fruitgrowers, and by practical demonstrations and instructions in the orchard in many parts of the State. As stated in previous reports, I am still of opinion that the practical demonstrations in the orchards are the best means of teaching growers how to keep fruit pests in check; and it is my intention to continue this work in all the fruit-growing districts that I visit, as once the fruitgrowers know how to fight the pests attacking their fruit and fruit trees I find that as a rule they begin to take greater care of their orchards and do their best to keep all pests in check. In addition to giving practical demonstrations with known remedies a considerable number of experiments have been carried out with various spray mixtures, and sundry other methods of fighting pests have been tested. The departmental cyaniding plant has been kept busily employed during the greater part of the year, and there are applications for its use now in hand that will take several months’ work to put through. This method of destroying scale insects on evergreen fruit trees is spreading in favour; several private outfits are at work in different parts of the State, and many growers are experimenting with one or two tents before deciding definitely whether they will go in for a complete outfit.

Experiments have been conducted in several parts of the State as well as at the orchards attached to the State farms to determine the practicability and cost of protecting fruit from the attack of the fruit fly by covering the trees with a strong but cheap netting, the mesh of which is small enough to prevent the passage of the fly. This method had been tested in Cape Colony, and proved efficacious there, so that it was deemed desirable to conduct experiments here; for which purpose a quantity of netting, costing the Department about 1d. per square yard landed, was obtained from the United States of America. The netting was 72 inches wide, and was in rolls of 40 yards in length, each roll thus containing 80 square yards, worth 6s. 8d. This quantity was found sufficient to cover two trees from 8 to 9 feet high, and the same in diameter, or 3s. 4d. for a tree of this size. When carefully handled the netting has been used for two succeeding crops of fruit (guavas), and is still in sufficiently good order to be used twice more during the coming season, thus reducing the cost to 10d. per tree of the size stated per treatment. These experiments have proved highly successful where the trees were sheltered from heavy winds, but where heavy winds were prevalent, as in the State orchards on the Darling Downs, the netting was more or less torn and injured. In all cases, however, the trees protected ripened their fruit without injury when similar fruit on adjacent unprotected trees was more or less badly infested with the larvæ of the fly—in some instances being quite worthless in consequence. This method of protecting the fruit against the fly will, in my opinion, pay in the cases of bushy growing fruits, such as the purple guava and first-class peaches, nectarines, persimmons, and Japanese plums, which will realise sufficiently high prices to pay for the extra expense; especially if such trees are so pruned both root and top as to keep them dwarfed, and to have the greatest amount of bearing wood in the smallest space. It will also prove a great boon to the non-professional fruitgrower who is anxious to grow a limited quantity of fruit for home consumption, and to whom the growing of perfectly sound fruit is of more consideration than the actual cost of production. In all cases the netting was placed over the trees before the fly had attacked them—viz., in stone fruit shortly after the stones had formed and before the flesh had commenced to show the slightest sign of ripening, and in guavas and other fruit whilst still green, as the fly rarely lays its eggs in the fruit till it is sufficiently matured to support the young larvæ when they hatch out.

The importance of gathering and destroying all fly-infested fruit is constantly being pointed out; but considerable apathy is still shown by both professional and private growers in this matter, and the fly is consequently allowed to multiply, and does multiply rapidly when the weather conditions are favourable to its development.

The dryness of the past spring and early summer was unfavourable to the breeding of the fruit fly, consequently the loss caused by it was, on the whole, less than usual; but this partial immunity is no guarantee that the fly is decreasing, as given a good moist spring and summer we will have the fly again in full strength unless growers realise the importance of destroying all infested fruit, especially early in the season.

Owing to the large plantings of recent years, and to the increased attention that is now being devoted to keeping fruit pests in check, there is every probability of our fruit production increasing to such an extent that new markets must be found for our produce. This is especially the case with oranges, mandarins, pineapples, and mangoes, and to a smaller extent with bananas, strawberries, custard apples, &c. This surplus fruit will either have to be exported in the green state or must be utilised by canning or otherwise preserving. As to exporting, the market in the southern States is capable of considerable extension, provided that our fruit was better handled and that we had a better system of distribution.

As to the markets outside of Australasia, I have no doubt whatever that profitable ones can be established both for our fresh fruit, such as oranges, mandarins, and pineapples; and for preserved fruits, such as canned pineapples, mango in the form of chutney, orange marmalade, and jams made from our typical fruits, such as Cape gooseberry, rosella, &c.

All preserves, of whatever kind, will, however, require to be of extra quality, and put up in the best and most attractive form possible, as we must remember that we will have to compete in open markets against the best that the world produces.

In order to establish a successful export trade, and to utilise our fruits to the best advantage, the old method of the grower marketing his produce will have to be done away with. The work of the grower in future will be to grow the fruit—viz., to work the land, prune the trees, manure them, and keep them free from pests; and the central packing house, either with or without a complete canning plant, run on up-to-date business lines, will do the distribution. Thus fruit suitable for local requirements will be devoted to this purpose; that required by the southern States will be sent south, and that adapted for export beyond the Commonwealth will be sent to such markets as may be decided upon, and packed in the manner required by such markets.

This is the method adopted by all the large fruit-producing countries, and is essential to the establishment and maintenance of a profitable export trade.

During the year a small trial shipment of 105 cases of oranges was made to Vancouver. The oranges were obtained from the Buderim Mountain and Woombye district, and were either packed by myself or under my personal supervision. They carried to Vancouver all right, our advices stating that they reached their destination in equally good condition to the average shipments of Californian fruit, which had only come a comparatively short distance. The fruit realised an average of about 10s. per case, but the expenses were so heavy that the net returns to the growers were only about 4s. per case, or 1s. 6d. per case more than the value of the fruit in the local market at time of shipment. The importance of this trial shipment is due to the fact that it proved conclusively that our oranges are good keepers, as they were shipped as ordinary cargo, and not in cold storage.

During the year I have visited a large number of fruit districts in many parts of the colony, and have acted as a judge at many shows. I have written a series of articles on "Citrus Culture" in the *Agricultural Journal*, have delivered a number of lectures, and, as stated in the earlier part of this report, have devoted a considerable amount of time to giving practical demonstrations in the orchards which, I am certain, are appreciated by the growers, and which result in permanent good to the district in which they are given.

ALBERT H. BENSON.

#### REPORT OF THE ASSISTANT INSTRUCTOR IN FRUIT CULTURE.

SIR,—I have the honour to present my report of the year's work in connection with the State Farm orchards.

##### WESTBROOK.

In this orchard very satisfactory work has been accomplished in spite of one or two considerable drawbacks. The broken and mild weather which prevailed during a great part of last winter caused a number of the trees to shoot and blossom earlier than was desirable, and this growth was rudely checked later on by very late and severe frosts.

So late did these frosts occur that nearly all varieties suffered more or less, and the setting of the fruit was seriously interfered with.

As a result, we only got a partial crop; however, with the advent of warmer weather, the trees made splendid growth, and the fruit reached a high standard, both as regards size and general quality, and realised good prices when put on the market.

In peaches, apricots, plums, apples, quinces, and figs, we had very satisfactory results. During the fruit season useful experiments were carried out as follows:—

1st.—Experiments in grading, wrapping and packing the fruit as an illustration of what could be done by growers generally in the way of putting their fruit before the public in a better form than is generally done, and, as a result, getting a better price for it.

Detailed reports of this work have long since been sent in and published in the *Journal*, and also in the public Press, so I need not say more than this—that our experiments proved the value of a little trouble and care, as some of the prices reached just about double what was obtained under common methods of marketing.

I am glad to say that our fruit was most highly appreciated by those who got it.

2nd.—Experiments for preventing the attack of fruit fly, by means of light nets put over the trees: I am very pleased to say that these experiments were successful, and that we gathered and marketed perfectly sound fruit from trees so treated, while the fruit on neighbouring trees was attacked. This means a great deal to our growers, and I would earnestly commend to their careful perusal and consideration the reports of these experiments as published.

Spraying has been rigorously followed up in this orchard as far as was necessary, and I can with satisfaction report the place almost entirely free from anything in the way of scale pests.

Thorough cultivation has been kept up, with the result that, although a serious dry spell occurred in the spring and early summer, the orchard held its own and showed little sign of suffering in this respect.

The general growth and progress made by this orchard is gratifying in the extreme, and, with its extensive list of varieties, all being carefully watched, and records kept, should prove a very useful object lesson to people in the district who want to know what is possible in the way of fruitgrowing.

I must acknowledge the courteous assistance I have received from the late manager, Mr. H. C. Quodling, in all my work, and a special word of praise is also due to Mr. R. Soutter, who has carried out much of the general work in the orchard. He has been a valuable help to me.

#### THE HERMITAGE.

This orchard is, as you know, almost identical with that at Westbrook, but the conditions surrounding it are in some ways different; so that, while much that has been reported of Westbrook will also apply to it, there are some points which come out differently. For instance, I regret that I can report no fruit at the Hermitage, as, owing to a more exposed situation, the whole crop was ruined by the severe late frosts which occurred in the spring.

This was a very keen disappointment to me, and also to Mr. Ross, who was then manager of the place. The promise was for a good crop, and things looked well, only we knew they were a bit early, and the cold was a bit late, and the frost came with a vengeance and settled the whole thing.

With the exception of a very few later fruits, the whole crop was spoilt and the year lost. All I need say is that the usual work of summer pruning and cultivation was carefully followed up, insect and scale pests were carefully dealt with by means of spraying until midsummer, by which time the trees had made great growth, and the orchard was a picture.

Then, as though the elements were not at all satisfied with the damage done by the frost, a great storm came, with wind, rain, and hail all beating with terrific force upon everything that stood in their way, and the beautiful orchard was torn and scarred and battered most unmercifully.

Some trees were torn out by the roots, others snapped off, others again blown over. This winter replants will be required in many places, to make up for this storm.

Still the orchard looks well, and is in very good order, and I sincerely hope that next season we may have a fair chance of showing that it can also give a good account of itself.

My thanks are due to Mr. Ross for the valuable assistance he rendered me in my work.

#### BIGGENDEN.

A small orchard was planted on this farm by me last winter, the varieties being those most likely to suit the locality and prove of commercial value. Shortly after planting severe dry weather came on and continued for some months, with the result that the growth was not as good as could be wished. A few trees succumbed to the drought, and these will be replanted this winter.

Another year or two must elapse before much can be said about this orchard.

On my last visit the cultivation was in excellent order, and the manager was doing his best to make the young trees a success.

#### GINDIE.

A limited number of trees selected for test in this district were planted by me last winter, but I regret to say that the terrible drought which has prevailed in the district killed a number of the trees, and has kept the others almost at a standstill.

Efforts were made by the manager, Mr. Jarrott, to pull the trees through by watering, and I am sure his work in this direction was the means of saving those that have survived.

Replanting the gaps will be carried out this winter, and I believe that once the season turns, and a good rainfall is experienced, the trees will do well, as the land is wonderfully good in quality, and is kept in a fine state of cultivation. As in the case of Biggenden, a year or two must pass before any extensive report can be made on this place.

S. C. VOLLER.

#### REPORT OF THE VITICULTURIST.

SIR,—I have the honour to report upon my work for the year ending 30th June, 1901, as follows:—

The season in all viticultural districts was characterised by extreme dryness, which had the effect of diminishing the volume of the grape crop, and in some places caused production of stunted wood. It is to be feared that where the latter was the case there will also be a shortage in next season's crop. The effects of the drought was felt by all the vineyards at the State farms, causing a certain amount of wilting of the fruit and some loss of freshly-planted vines. Generally speaking, it may be calculated that the past grape crop was from one-half to two-thirds of an average crop, the lesser obtaining in those districts furthest away from the coast. The quality of wine grapes was, generally speaking, excellent, and the wine made this season should be very good. As much as 28 per cent. of sugar was registered in Roma musts, and 26.5 per cent. on the Eastern Downs, the grapes in both cases being black Hermitage with fine colour and body.

The work effected for the past year at the experimental farms is as follows:—

HERMITAGE.—This vineyard is most unfortunate, inasmuch as every season since the vines were planted the crop has been destroyed by meteorological disasters. In 1899 and 1900 the vegetation and crop were destroyed by late spring frosts, and this season all the grapes were utterly destroyed by hail shortly before ripening; consequently I have been unable to make any observations upon the adaptability of the varieties planted at the Hermitage for cultivation on the Eastern Downs. The area of this vineyard is 1 acre, and has neither been increased or diminished during the year. The cost of cultivation has not been recorded.

**WESTBROOK.**—The lower half of this vineyard was again touched by frost towards the end of September, which caused a certain amount of damage to the young shoots and lightened the crop at that end. The vines were also considerably knocked about by incessant winds through the spring and early summer, causing extra expense for tying up, &c. At flowering time a few days of hot winds caused much "coulure" or non-setting in the Muscat of Alexandria vines. The long continued dry weather also assisted to lighten the crop, as the berries remained small; this, with the effects of the frost and "coulure," reduced the crop to about 70 cwt. from  $3\frac{1}{2}$  acres of bearing vines.

Since writing my last report the European vines, then in quarantine at St. Helena, have been planted out at this farm after a careful examination for disease and precautionary disinfection. Taking into consideration the dryness of the past season, the majority have made excellent growth; the Portuguese varieties in particular show uncommon vigour, and promise to be a successful importation. Some of the weaker varieties were, however, killed by the drought. Steps are being taken to trellis this part of the vineyard. I hope to plant out, shortly, some of the vines imported last year from Europe, and now in quarantine at Dunwich; they will be carefully examined for any signs of disease and disinfected before doing so.

The ground is now being prepared for the reception of these and other varieties of wine and table grapes.

The total cost of cultivating the 7 acres of vineyard for the past year has been £16 16s., or £2 8s. per acre as follows:—2 ploughings, £2 18s. 9d.; 3 scuffings, £2 12s. 6d.; pruning, £2 (only 4 acres pruned); 30 days work at 5s., painting, tying up, chipping, &c., £7 10s.; acid, sulphur, &c., 5s.

Experiments have been made on topping, grafting, girdling, &c., the results of which have been or will be published in the *Agricultural Journal*.

**GATTON COLLEGE.**—The vines planted the winter before last made splendid growth this spring, and this vineyard promises to be one of the finest in the State. No time should be lost in trellising these vines, otherwise the splendid growth they will make this season will be broken down with the wind. No returns as to the cost of cultivation are to hand. Experiments as to the efficacy of various treatments against fungus disease were made on the vines near the creek in the spring, the results of which were published in the *Agricultural Journal* for November, 1900.

**BIGGENDEN.**—Nearly an acre of ground was planted last August with American and European varieties of wine and table grapes, but the drought had a disastrous effect on the young plants, and only about half of them survived, these will be replaced this season. Altogether, there will be 28 varieties of wine and table grapes, new to the district, grown in this vineyard. Steps are being taken to trellis the vines this winter, and the "record" box plan of illustrating various systems of pruning as at the Westbrook Farm will be initiated. The total cost of cultivation has been £3 14s. for  $1\frac{1}{2}$  acres, or £2 10s. per acre as follows:—2 ploughings, 17s. 6d.; 4 scuffings, £1 7s. 6d.; tying up, weeding, acid, &c., 19s.; pruning, 10s.

**GINDIE.**—This vineyard was planted last August with Almeria, Zante, and a few table varieties; but from the day the cuttings were put in months elapsed before any rain fell, with the result that the few cuttings that did strike subsequently perished for want of moisture. This is a serious loss of time in an interesting experiment which I greatly deplore. The ground will be replanted this season with, it is to be hoped, more successful results.

**GENERAL OBSERVATIONS.**—Improvement is taking place in the quality of the wines made, and there is an increasing demand for the cuttings of the finer varieties of wine grapes which I have constantly advocated; with outside competition, and a better class of grape to work upon, a further improvement in the quality of our wines is to be looked for, if care and judgment is shown in their preparation. One of the difficulties vignerons in this State have to deal with in winemaking is the abnormal amount of albuminous, peptic, and gummy matters to be found in Queensland musts, the presence of which in wine causes it to be prone to bacterial assaults. In the preparation of red wine the vating or fermentation in contact with the husks has the effect of removing much of this albuminoid matter, and, given a fair acidity and astringency, the wine is not difficult to keep sound. But for white wines it is another matter, the new wine has such a superabundance of albuminous substances that most of it, at one period or another, suffers from the action of disease germs with resultant deterioration and unsound constitution. The quality of this class of wine would be greatly improved, and its keeping powers enhanced if the musts were first sterilised with appropriate apparatus and then infected with cultivated yeasts. The choice of variety of cultivated yeasts would open up a wide field for experimental work. The same danger presents itself in the case of natural sweet wines, as the undecomposed sugar affords a fertile soil for the propagation of disease germs, and in consequence vignerons allow their wines to ferment dry and add cane-sugar when it is required sweet, a procedure which will never produce as fruity and fragrant a wine as one naturally sweet. (Enotherming or pasteurising would overcome much of this trouble.

The present system of packing grapes for market calls for improvement, and I hope this season that an opportunity will be allowed me of introducing into Queensland the American system of grape baskets of various sizes and dimensions, all characterised by lightness and cheapness, with minimum of handling of the fruit which goes so far to take away its attractive appearance. Pending, however, the general recognition of the superiority of the American system I would recommend growers to make use of granulated cork dust as a packing material, especially in the case of grapes which have to travel long distances. Its great elasticity prevents grapes from bruising in transit, and the fruit is easily and quickly freed from the packing material when removed from the cases. Granulated cork is, however, practically unknown to our men, or is not used on account of its supposed expense. This, however, is not considerable; it can be bought in Melbourne for 22s. 6d. per cwt., and the approximate cost of packing a case of 25 lb. weight of grapes would be 6d., or about  $\frac{1}{4}$ d. per lb. It cannot be doubted that the extra 6d. would be realised on the selling price of the grapes. Seeing the large consumption of cork for bottling purposes in this State, and the possibilities of large requirement of granulated cork in the future, it is a pity that more systematic efforts have not been made to acclimatise the cork-tree in Queensland. Like many other plants, it was at one time tested under improper conditions of soil and climate, and failure was the result, so the fiat went forth that the cork-tree will not grow in this State. Possibly, but give it a fair trial, as it is well worth establishing if it can be done. The most suitable climatic conditions for it would be found in the neighbourhood of Stanthorpe on well-drained granitic detritus. The trees, if grown successfully, might not produce the best cork, but there are so many uses for inferior qualities that any trouble and expense taken to establish this valuable tree would be amply repaid.

It is to be regretted that no steps have yet been taken to establish in this State an experimental vineyard and cellar, a thing that Queensland vignerons have agitated for for some years. There can be no doubt that such an establishment would be of material benefit to present and future winemakers. In the majority of cases, when I am requested to assist or instruct in winemaking, I am confronted with insufficient, defective, and infected plant, without means of sterilising it, or reducing the temperature of fermenting must, and also with a variety of grapes ill-adapted for making the wine required. This state of affairs is eminently unsatisfactory for demonstrating the theory and practice of rational winemaking. Moreover, if the wine turns out well the vigneron takes all the credit of it, whereas, if it turns out badly the blame is put on my shoulders. In a properly equipped cellar only can wine be relied upon to turn out sound and in the best possible condition, and until Queensland vignerons are able to visit such a cellar, note the essentials in wine-making plant, and see the same in working order, poor, badly prepared, and unsound wines will continue to be produced in considerable quantity. Apart from its value as an object lesson in wine preparation, it would assist in showing to what standard of quality Queensland wines could attain, and what class of wine would be best for the vignerons to aim for in the various districts; the common idea that every known variety of wine can be produced out of a 5-acre vineyard being to the last degree absurd.

Further, by inaugurating a system of experiments with different types of grapes in various blends for producing each class of wine, by experimenting with cultured yeasts in sterilised musts, fermenting at different temperatures, for longer or shorter periods, &c., &c., valuable information would be afforded to the private vigneron unable to make such experiments for himself, and reliable data would be supplied him for producing the best type of a given class of wine.

In the United States it has long been recognised that State assistance of this description is necessary to enable winemakers to produce and maintain the best possible types of wine, and in several places in California there are stations for experimenting in the way I have described. Should an experiment vineyard and cellar be established in Queensland it ought to pay for itself after the third or fourth year.

If winemaking is to advance in this State, such an establishment will be as necessary as was the first properly equipped dairy for instruction in cheese and butter making.

During the past year analysis of a large number of wines procured from retail wine shops and cellars has revealed that a considerable amount of fictitious "wine" is being sold to the public, the so-called "wine" being practically fermented cane-sugar and water, dyed and scented. In the interests of the general public, and those vignerons who prepare and sell the pure juice of the grape, it is quite time that an Act similar to the Victorian Wine Adulteration Act, be passed by the Queensland Legislature.

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E. H. RAINFORD.

#### REPORT OF THE TOBACCO EXPERT.

SIR,—I have the honour to submit my report for the year ending 30th June, 1901:—

It having been determined to establish the Experimental Tobacco Farm at Texas, work was begun in July 1900, but owing to the dry weather it was late before the ground could be put into proper condition for the crop; we were able, however, to get it prepared in time to finish planting the crop of  $9\frac{1}{2}$  acres by 22nd November, and now have on hand about  $5\frac{1}{2}$  tons of well-cured desirable tobacco.

Of this about 1 ton is of a new variety to Queensland, known as "Burley," and the result is most satisfactory, as I feel sure it will supply a demand for medium light-coloured tobaccos, which has been either absent or very scarce heretofore in the tobacco of the State. We have found that the use of cheese cloth on the plant beds has proved most satisfactory, as plants were abundant on the farm, while those in the surrounding district were badly damaged by insects, and in many instances destroyed altogether. These coverings have not, however, proved effective, as I had hoped, against blue mould, as this disease appeared in our beds on 12th October. We were able to check its ravages by giving the beds plenty of sunlight, covering with the cloth at night, and ceasing to water the plants. No serious damage was done. The experimental farm will show a credit over the working expenses.

The condition of the tobacco industry within the colony at this time is most satisfactory. The consumption of the locally-grown product has kept pace with the increased demand, and prices paid have been remunerative to the grower. Forty-five per cent. of all the tobacco consumed in the colony is of the home-grown, and, with one exception, this has been maintained for several years past, showing clearly it is not losing favour, and if the new federal tariff is friendly to the local industry, I look for a largely increased demand. The amount of Queensland tobacco consumed in the calendar year of 1900 reached 615,407  $\frac{1}{2}$  lb. The consumption of home-grown tobacco in the past year has increased 338 per cent., or 56 per cent. yearly average. The reputation of our tobacco is growing and extending to the States of the Commonwealth, and we have inquiries concerning the crop from them, and some has been sold for delivery as soon as interstate freetrade is established.

#### CIGAR TOBACCO.

So far only a very small amount of cigar tobacco has been grown for want of a local market. In the southern States there is a considerable demand for it, and a good deal of leaf is imported. This demand could and should be supplied by Queensland. I have been able to obtain reports on samples of Queensland-grown cigar leaf, and they were most satisfactory on some of the samples shown.

R. S. NEVILL.

#### REPORT OF THE INSTRUCTOR IN COFFEE CULTURE.

SIR,—I have the honour to submit my report:—

The past year has, on the whole, been a fairly good one for coffee. The dry weather in the early part of the season, though in some few instances lasting long enough for the coffee to droop, on the whole was more of an advantage to the coffee than drawback. The coffee-tree will not, as a rule, suffer to any extent in a drought that will parch most other economic staples; moreover, at the right time of year—that is, during the blossoming season—dry weather encourages the formation of the spike, and the naturally retentive nature of the soils in this country ensures the retention of sufficient moisture to set this blossom. During the latter part of the year rain has been regular throughout the coffee districts, but floods on the one hand and frost on the other have this past year been conspicuous by their absence.

The crops throughout the colony have been fairly good, in several localities averaging well over 10 cwt. to the acre. A somewhat curious though not very serious effect of the long dry season was noticed this year in the parchment skin, or putamen, being thinner than is usual. This reduced the percentage of loss by weight on hulling, but, by admitting moisture in the process of curing, in several instances caused an adhesion of the silver skin to the bean, which extra polishing was required to remove. In one or two samples the adhesion was so complete that the silver skin was only separated in the process of roasting, and was fanned off before the beans were ground.

The crops in this past season have, in direct consequence of pruning and cultivation, ripened up much more uniformly. The dragging on of the crop-picking season for half the year or more is becoming a matter of the past, the result being, as was anticipated, considerable reduction in the cost of picking.

Labour for picking has been, on the larger estates, somewhat of a difficulty, except to a few exceptionally situated ones. In the North, where aboriginal labour was available, use was made of it, but picking by contract by white men, women, and children, has been much more general. Rates for picking have varied from 2 to 3 lb. of cherry, 1d.; and wages of 30s. and over per week with rations have been made.

This more regular ripening of the crop has not only demonstrated very vividly that the cost of picking and curing is thereby reduced but that the pickers themselves have been able to gather more than hitherto during the same working hours. It is to be anticipated therefore, as previously stated, that before long not only will there be gangs of coffee-pickers ready to undertake the work as the season comes on, but that a good wage will be made, at least during the greater part of the season, at even more favourable rates for the grower.

New machinery, both for drying and pulping, has been erected and put in use this year for the first time by a number of growers in all districts; others have replaced, by good machines, their rough-and-ready or home-made apparatus. Stores and drying sheds have also been built, and more use made generally of time and labour-saving

appliances. The building of a very fine mill, replete with modern machinery, by Messrs. De Molyns and Butter, of the Lower Russell, being a noticeable instance.

Pulpers and other machinery necessary in the culture of coffee, which have had hitherto to be imported, can now be obtained in the country. Messrs. Law, Smith, and Co., of the Phoenix Engine Works, Cairns, are manufacturing very good pulping machines of a capacity quite sufficient for any estate up to 10 or 15 acres, at a price well within the reach of small growers. Several of these pulpers, tested and approved, are in use.

Crops have in most instances been locally bought up this year, and a few growers, not having pulping machines of their own, disposed of their crop to their neighbours, who have generally purchased it outright at rates varying from 1d. to 1½d. per lb. in the cherry. A little of last season's crop was held over by the growers, and in one or two cases some little difficulty was experienced in disposing of the inferior grades.

The necessity of care in cultivation, picking, and curing, especially in curing, cannot be too strongly emphasised. The necessity for the production of only high-grade coffees has already been pointed out, and, as the time approaches when consignments will be sent to markets outside Queensland, the inferior grades may not only not sell readily, but possibly prove derogatory to the sale of the better qualities.

The quality of samples generally through the State have, it is gratifying to notice, very materially improved during the past year; and the badly cured, small, discoloured bean, is almost unknown. The samples on exhibition at the various shows throughout the Northern districts exhibit this in a marked degree, of which the comparison of old and recent samples provide interesting evidence.

In this respect the acknowledgment of merit evidenced by the award to Queensland coffee, from Mount Buderim, of a gold medal by the Earl's Court Exhibition, may be mentioned.

No coffee this year has been sent to the London market, due mainly to the fact that fairly good prices have been obtained in Queensland for the higher grades, and of the medium qualities there has not been sufficient to ship a consignment large enough to make its export to so distant a market worth while.

Not much advantage is gained by sending small consignments to the larger markets, especially when it is desired to make a name and draw the attention of dealers and brokers to the new brands. It is generally considered that consignments of less than 5 tons do not receive as much consideration at the hands of buyers as those of this amount or over. In this respect co-operation by growers, by means of associations, would greatly facilitate the export of coffee in bulk, and tend largely to promote not only the value of coffee sold locally, but the welfare of the industry by the prompt disposal of all raw coffees produced.

That the sample, as now produced, would meet with more consideration than the trial consignment sent home some three years ago, I am confident. While the sending of small consignments of a few cwt. each from individual growers would be troublesome and unsatisfactory, the bulking of the crop of a district would be quite feasible, and this matter is one worthy of the attention of growers as a whole, for, as the output exceeds the local demand and consumption, the open markets, either of the Federated Commonwealth, the home country, or the continent, will have to be approached.

The Cairns District Coffee-growers' Association early in the year obtained the sanction of the Department to apply, whenever desired, for certificates stating that coffees for export bearing such were up to a given standard, with the object of discouraging the export of inferior grades. This measure was a move in the right direction, and it is to be regretted that scarcely any opportunity occurred whereby it could have been carried into effect. No such certificates were applied for or granted.

The demand for manufactured coffee has increased, and the sale in every district of the locally manufactured article is noticeably on the increase. Attention has been given to roasting and grinding, with marked improvement. The manufactured coffee now put on the market is not only a creditable article, but in nearly every case is tastefully and well put up. Pure coffees are becoming more and more popular, but small mixtures of chicory are in all cases also put up by the manufacturers for such of the public as require it.

The systematic visiting of growers has been carried out during the past year as far as was practicable with the other duties in hand. Fourteen separate tours have been undertaken, aggregating some 141 days. The following places were visited:—Port Douglas, Kuranda, Myola, Mantaka, Oaklands, Hambledon, Lower Russell, Geraldton, Alligator Point, Townsville, Mackay, Mount Jukes, Hampden, Rockhampton, Yeppoon, Byfield, Percy Island, Maryborough, Pinalba, Mount Buderim, Mount Coolum, and the Maroochy River district. Of the places not visited last year, Geraldton, the Johnstone River, and Percy Island have been toured to, but it was not found possible to visit the Bloomfield.

The estates were found to be in very much better order, generally, than on former visits, much more interest being taken by the growers in the cultivation of, and attention to, the trees in the field, which is encouraged by the very obvious improvement in quantity and quality of the sample already obtained, directly due to such field work as clean weeding, cultivation of the soil, topping and pruning carried out last year.

A number of applications for information, *re* opening up under coffee, have been received from various districts, as well as for seed. Only in a few instances has seed been supplied from the Kamerunga State Nursery, for not only is the supply there limited, but the industry is quite sufficiently advanced and spread over the colony for intending growers to obtain seed from existing plantations.

Applicants have therefore, in most cases, been given the addresses of reliable growers who can prepare seed, and been referred to them.

The incoming correspondence has amounted to 180 letters; the outgoing to 220. Applications for visits, 18; applications for instruction and advice, *re* coffee culture, by letter, 52. Reports on various matters, 17. Articles published in the Departmental *Journal*:—

1.	Article No. 4, "Pulping and Curing,"	<i>Queensland Agricultural Journal</i> , Vol. VII., Part 1, p. 45
2.	" 5, "Disbudding" ... ..	" " VIII., " 2, p. 112
3.	" 6, "Picking" ... ..	" " " " 3, p. 217
4.	" 7, "Clearing, Stumping, and Lining"	" " " " 4, p. 277
5.	" 8, "Pitting and Planting"	" " " " 5, p. 371
6.	" 9, "Young Plants" ... ..	" " " " 6, p. 437
7.	" "Irregular, "Foxiness in Coffee"	" " " " 4, p. 295

It is proposed, should time allow, to continue this series of articles until the principal works relating to coffee culture have been dealt with in regular order month by month, and to subsequently group the whole in handy form for the use of growers.

Subsequently it is suggested, in writing, from time to time, on such irregular subjects as may be necessary, to publish regular field and store notes for coffee-growers each month in the *Journal*.

With regard to touring work, it may be of interest to growers to anticipate roughly the times of intended visits, though it is, of course, impossible to give definite dates.

In August it is proposed to tour in the Daintree district, and also to Atherton and Martintown; in September, to Geraldton, Clump Point, and the Lower Russell; in October, to Mackay, Mount Jukes, Hampden, &c., and also to Rockhampton, Yeppoon, and Byfield—should time permit, possibly also to Percy Island; in November and December, to Maryborough, Pinalba, Mount Buderim, Mount Coolum, and the Maroochy district; in January, to Kuranda and the Cairns district, and, if possible, to Cooktown and the Bloomfield.

The printed note and record books supplied during the year for coffee cultural work have been very useful, and the saddle-horse indispensable in local touring.

HOWARD NEWPORT, Instructor in Coffee Culture.

## REPORT OF THE INSPECTOR UNDER THE SUGAR WORKS GUARANTEE ACT.

SIR,—I have the honour to submit my Annual Report on the operations of the Central Mills under "The Sugar Works Guarantee Acts, 1893 to 1895," for the past season.

The operations under "The Sugar Works Guarantee Acts, 1893 to 1895," during the year under review have been restricted, so far as advances to companies are concerned, owing to Royal Assent having been withheld to the Amendment Bill of 1900, in which provision was made whereby an additional £150,000 was made available for the following purposes, viz. :—

- (a) For the erection of two new mills in the Johnstone River and Russell River Districts, respectively, estimated to cost in the aggregate £110,000 (£45,000 for the Johnstone River Mill and £65,000 for the Russell River Mill);
- (b) The necessary additions to existing mills, principally for tramway extensions, and the perfection of the milling plant in such of the mills where it had been found that the plant was unevenly balanced and consequently unable to cope successfully and rapidly with the cane delivered for crushing.

The advances actually made under the Acts during the year in all amount to the sum of £1,927 15s. 3d only, divided in the following manner :—

	£	s.	d.
Plane Creek Central Mill ... ..	164	4	10
Mount Bauple Central Mill ... ..	1,200	0	0
Marian ... ..	543	2	11
Johnstone River Central Mill ... ..	20	7	6
	£1,927	15	3

The total sum advanced under the Acts to the 30th June, 1901, amounting to £498,800 8s. 10d.

With the exception of those mills situated in the extreme north, the season was not by any means a good one, chiefly owing to the abnormally dry weather.

The southern district, in addition to the drought, experienced severe frosts, thus accounting for the short crops and poor returns.

In comparing the results of the individual mills, it will be seen, on reference to the table given below, that the Mulgrave and Mossman Mills had a splendid season, and that both the Proserpine and the Mackay Mills did well under the circumstances, a result largely due to the fact that the management generally has given greater attention to good mill work and economy, showing in this direction much improvement over previous years, and that, as the cane supply to the mills increases, yet better results may be confidently expected.

In comparing results of mill work considerable difficulty is experienced, as with the exception of four of our Central mills, no reliable chemical data is available. The actual number of tons of cane taken to make a ton of sugar is no criterion of good work, as were chemical data of the sucrose content available, it would probably be found that the mill showing a greater number of tons of cane per ton of sugar had done equally as good work as the other with a lesser.

Want of chemical control is one of the greatest drawbacks to more successful mill work at our Central mills.

Turning to the financial aspect of the Central Mills. On the passing of the Amendment Bill last year the matter of the payments thereunder, the first of which became due on 31st December last, was brought before the notice of the Honourable the Treasurer, who, acting upon the advice of the Minister, agreed to permit the interest outstanding on the 30th June, 1900, to remain a standing debt, not bearing interest, reducible only after the current redemption payments under the conditions as set forth in the new Bill had been met.

The companies fully realising the value of this concession have made payments during the year in reduction of their debt, with interest, amounting to £24,118 12s. 1d., divided as follows :—Interest, £17,873 7s.; redemption, £6,245 5s. 1d. The payments made prior to the 30th June, 1900, since the inception of the Act in 1893, amounted to £40,293 17s. 1d., so that last year's payments represent nearly 40 per cent. of the total repayments made since the Act came into force, a fact which fully justifies the concession made.

During the year it was found necessary to increase the temporary advances made to the Proserpine Mill under Government control to £8,500, and it is confidently expected, from the results obtained thus far this season, that this amount will be largely reduced, if not altogether repaid, out of this year's profits.

The special temporary advances made to the two mills under direct Government control at present stand at £13,800 (£5,300, Moreton Mill, and £8,500, Proserpine Mill).

As the Double Peak Central Sugar Company does not come under the head of the return above given, it being a tramway company in connection with the North Eton Mill, I beg to draw attention to the fact that last season's operations resulted in a loss, including depreciation, of £1,794 17s. 4d.

The amount advanced to this company to the 30th June last is £18,200, and the overdue interest and redemption amounted to £3,307 9s. 5d. This is a very unsatisfactory position, and some strong effort on the part of the North Eton Company, who have guaranteed the advance, should be taken to improve this company's position with the Treasury.

The Racecourse and North Eton Mills, to which advances have been made from Consolidated Revenue, had fairly good seasons, and should do much better this year. The Racecourse Mill has paid its indebtedness to the Treasury to the 31st December last, the amount owing as on 30th June last standing at £7,306 12s. 3d.

The North Eton Company has paid interest to 31st December last, leaving the debt to the Treasury on 30th June last at £14,258 8s.

R. W. M. McCULLOCH,  
Government Inspector and Valuator.



"THE SUGAR WORKS GUARANTEE ACT OF 1893."

PARTICULARS OF MILL WORK OF CENTRAL MILLS, AND COMPARISON BETWEEN NORTHERN AND SOUTHERN MILLS.

Particulars.	NORTHERN MILLS.					SOUTHERN MILLS.					Totals and Averages.	Grand Total and Averages for Both.		
	Marian.	Pleystowe.	Plane Creek.	Proserpine.	Mulgrave.	Mosman.	Totals and Averages.	Gin Gin.	Isis.	Mount Bauple.			Moreton.	Nerang.
	13 Aug., 1900 20 Dec., 1900 21,377 2,533 per cent. 8.4 1.5	1 Aug., 1900 27 Nov., 1900 18,192 1,962 per cent. 9.2 0.7	25 July, 1900 6 Nov., 1900 21,617 2,537 per cent. 8.7 0.7	13 July, 1900 30 Nov., 1900 16,614 1,845 per cent. 9.01 1.4	10 July, 1900 21 Dec., 1900 46,064 5,243 per cent. 8.7 1.2	9 July, 1900 10 Jan., 1901 59,507 6,033 per cent. 8.1 .8	...	27 July, 1900 20 Oct., 1900 13,906 1,337 per cent. 10.4 .8	11 Aug., 1900 2 Dec., 1900 10,949 1,060 per cent. 10.2 1.4	22 July, 1900 17 Oct., 1900 7,835 801½ per cent. 9.7 2.2			25 July, 1900 29 Oct., 1900 9,501 918 per cent. 10.3 1.6	...
Commenced crushing	...	...	...	...	...	...	...	...	...	...	...	...	...	
Ceased crushing	...	...	...	...	...	...	...	...	...	...	...	...	...	
Tons cane crushed	...	...	...	...	...	...	...	...	...	...	...	...	...	
Tons of sugar made 88 n.t.	...	...	...	...	...	...	...	...	...	...	...	...	...	
Tons cane per ton sugar 88 n.t.	...	...	...	...	...	...	...	...	...	...	...	...	...	
Tons wood per ton sugar 88 n.t.	...	...	...	...	...	...	...	...	...	...	...	...	...	
Cost of manufacture	...	...	...	...	...	...	...	...	...	...	...	...	...	
Cost of manufacture per ton sugar 88 n.t.	...	...	...	...	...	...	...	...	...	...	...	...	...	
Cost of cane	...	...	...	...	...	...	...	...	...	...	...	...	...	
Cost of cane per ton sugar 88 n.t.	...	...	...	...	...	...	...	...	...	...	...	...	...	
All other charges	...	...	...	...	...	...	...	...	...	...	...	...	...	
All other charges per ton sugar 88 n.t.	...	...	...	...	...	...	...	...	...	...	...	...	...	
Total expenditure	...	...	...	...	...	...	...	...	...	...	...	...	...	
Total expenditure per ton sugar 88 n.t.	...	...	...	...	...	...	...	...	...	...	...	...	...	
Average price realised per ton sugar	...	...	...	...	...	...	...	...	...	...	...	...	...	
Net profit on season's operations	...	...	...	...	...	...	...	...	...	...	...	...	...	
Net loss on season's operations	...	...	...	...	...	...	...	...	...	...	...	...	...	
Per cent. of profit on capital	...	...	...	...	...	...	...	...	...	...	...	...	...	
Average price paid cane-grower	...	...	...	...	...	...	...	...	...	...	...	...	...	
Average cost of cane at weighbridge	...	...	...	...	...	...	...	...	...	...	...	...	...	
Interest and redemption paid from inception	...	...	...	...	...	...	...	...	...	...	...	...	...	
Interest and redemption in arrears as on 30th June, 1901	...	...	...	...	...	...	...	...	...	...	...	...	...	
Net titre of sugars made, No. 1	...	...	...	...	...	...	...	...	...	...	...	...	...	
Ditto ditto No. 2	...	...	...	...	...	...	...	...	...	...	...	...	...	
Ditto ditto No. X	...	...	...	...	...	...	...	...	...	...	...	...	...	
Average for all sugars	...	...	...	...	...	...	...	...	...	...	...	...	...	

\* £11,459 10s. 9d. of this amount is redemption money, and the balance (£52,797 18s. 8d.) interest.

† £49,461 12s. 7d. is interest due, and £8,603 16s. 11d. redemption money.

R. W. McCULLOCH,  
Government Inspector and Valuator.

## REPORT OF THE DIRECTOR, BOTANIC GARDENS.

SIR,—I have the honour to present my Annual Report for the financial year just closed, and propose to make it (as becomes a business document) as brief as possible. This is the seventy-third annual report emanating from this institution, and the thirteenth from myself.

Before I took charge in 1889, this institution was managed by a board of seven trustees, a head gardener, and an overseer. I am now performing the duties then discharged by these nine officials, besides other advisory duties, and in addition have the control of the Government Domain.

The expenditure during the year under review was £120 less than in the year preceding my arrival, £140 less than the preceding year, and £183 less than the average for the past twenty-one years.

It will be seen from this that a decreasing revenue has had to be struggled against, and glancing at the estimates of expenditure in the other States, and comparing the several gardens, it becomes a source of wonder that so much has been accomplished here.

The Gardens have been maintained during the year in the highest state of efficiency possible. No form of report which I could present would be so useful or demonstrative as a walk through them. Considerably more than one-fourth of the population of Queensland reside within easy reach of the Gardens, and avail themselves of their advantages in constantly increasing numbers. The measures which I have so persistently urged and undertaken for making them popular and instructive to the people at large are being fully appreciated. During the year a Saturday afternoon instrumental promenade concert has been commenced, the band being provided by the Municipal Council. The average attendance up to the present has been over 3,000, with an increasing tendency.

As regards the plant collections, these have been increased by every possible means. Permanent labels of an imperishable character have been placed to several hundreds of the larger plants, and this work is proceeding. Every demand for trees for public schools, street planting, &c., has been met, and a large number of useful plants distributed. The correspondence of my office has largely increased.

I have laid before the Minister, from time to time, schemes for increasing the usefulness and attractiveness of the Gardens, and their value to the whole State, and these will doubtless have sympathetic consideration in due course.

The high praise bestowed on the Gardens during the past year by the many distinguished visitors to the metropolis must have been as satisfactory to the Minister as it has been gratifying to me.

During the year a new bandstand and a new aviary have been erected by the Works Department in consultation with myself. These structures are great improvements, from all points of view, on any previous work of the sort done here, and fully answer the purposes for which they were designed.

The necessity for economy in printing makes me omit tables and other matter which might be used to elaborate this brief statement, but I would ask that the attached list of plants available for exchange be printed as an Appendix, as it will be very useful to many into whose hands the Report of the Department will come

PHILIP MAC MAHON, Director.

## APPENDIX.

## LIST OF PLANTS FOR EXCHANGE.

It is hoped that the following list of plants will prove useful to persons wishing to send us native plants in exchange for some of those included below. It would also prove useful to schoolmasters desirous of forming school gardens to illustrate the different orders of plants. For this purpose the order of every genus is given as well as an abbreviation of the name of the author who first used the name of the genus or species. A very brief descriptive note is added where this appears helpful. As to the letters which follow each name "P" means that plants are available, "S" means that seeds are available, "SS" means that seeds are usually available at the proper season, "C" means that cuttings can be had at the proper season, "B" means that bulbs may be procured in season. This list does not, of course, represent by any means all the plants available, the stock being varied and constantly changing. It is simply given as a guide to persons uncertain what to ask for.

- Aberia*, *Hoch.*; *Bixineæ*—  
*A. caffra*, *Hook.* S. Africa. Kai apple. Ev. sh., 8 ft. Hedge plant, drought-resisting. P.
- Abroma*, *Jacq.*; *Sterculiaceæ*—  
*A. augusta*. E. Indies. Ev. sh., 10 ft. Free-flowering. P.
- Abutilon*, *Gærtn.*; *Malvaceæ*—  
*A. longiuspi.* Shrub. P.  
*A. Thompsonii*, var. *variegata*, *Hort.* Loose-growing ev. sh., 10 ft. P.
- Acacia*, *Willd.*; *Leguminosæ*—  
*A. Baileyana* Queensland. Ev. tr., 15 ft. Has a most beautiful flower. P.  
*A. Farnesiana*, *Willd.* Queensland. Ev. sh., 15 ft. Flowers used for perfumery. P.  
*A. horrida*, *Willd.* Africa. "Doornboom" Ev. sh., 12 ft. Produces a good gum. P.  
*A. linifolia*, *Willd.* Queensland. Ev. sh., 12 ft. Wood soft and elastic. "Salee." P.  
*A. longifolia*, *Willd.* Australia. Ev. tr., 30 ft. Useful for binding coast lands (Maiden). Wood hard and tough. P.  
*A. melanoxylon*, *R. Br.* Australia. Blackwood. Ev. tr., 30 ft. Valuable timber. Hard, close-grained; slow growing. SS.  
*A. podalyriæfolia*, *A. Cunn.* Queensland. Silver wattle. Ev. sh., 15 ft. Beautiful flowers; very ornamental. P.  
*A. pycnantha*, *Benth.* Victoria and S. Australia. Golden wattle. Ev. tr., 40 ft. Valuable tan bark. P.
- Acalypha*, *Linn.*; *Euphorbiaceæ*—  
*A. Keffordi.* S. S. Islands. Ev. sh., 5 ft. Ornamental foliage. P.  
*A. marginata*, *Spreng.* E. Indies, Ev. sh., 6 ft. Beautifully coloured foliage. P.  
*A. reticulata.* Ev. sh., 8 ft. Beautifully coloured foliage. P.  
*A. Wilkesiana*, *F. v. M.* S. S. Islands. Ev. sh., 8 ft. Coloured foliage. P.
- Acanthophaenix*, *Linn.*; *Palmæ*—  
*A. rubra*, *W. et D.* Mauritius. Ev. tr., 30 ft. Red Cabbage Palm. P.
- Achillea*, *Linn.*; *Compositæ*—  
*A. millefolium*, *Linn.* Europe. "Milfoil" or "Yarrow" Medicinal herb. 1 ft. P.
- Acokanthera*, *Don.*; *Apocynaceæ*—  
*A. spectabilis*, *Benth.* S. Africa. Ev. sh.; 5 ft. Poisonous. P.
- Acrocarpus*; *Leguminosæ*—  
*A. fraxinifolia.* P.
- Adelia*; *Euphorbiaceæ*—  
*A. pubescens.* Jamaica. Ev. sh. P.
- Ægle*, *Corr.*; *Rutaceæ*—  
*A. marmelos*, *Corr.* India. "Bael Tree." Ev. tr., 40 ft. Timber and fruit useful. P.
- Agapanthus*, *L'Her.*; *Liliaceæ*—  
*A. umbellatus*, *L'Her.* S. Africa. African Star Lily, 3 ft. Bright blue showy flower. B.  
var. *albiflorus*, *L'Her.* S. Africa. Bulbous plant, 3 ft. Beautiful white flower. B.
- Agathis*, *Salisb.*; *Coniferæ*—  
*A. robusta*, *C. Moore.* Queensland. Dundathu Pine, or Queensland Kauri, 60 ft., Timber useful. SS, P.
- Agave*, *Linn.*; *Amaryllideæ*—  
*A. americana*, *Linn.* Trop. America. American Aloe. Hardy perennial. Fibre plant, 5 ft. P.  
var. *variegata.* P.  
*A. rigida*, *Mill.* var. *sisilana*, *Engelm.* Sisal Hemp Plant, 5 ft. P.
- Ailanthus*, *Desf.*; *Simarubæ*—  
*A. glandulosa*, *Desf.* China. Tree of Heaven. 40 ft. Valuable for reclaiming coast sands. P.
- Albizzia*, *Duraz.*; *Leguminosæ*—  
*A. amara.* Tree. P.  
*A. fastigiata*, *E. Mey.* Trop. Africa. Tree. P.  
*A. hypoleuca.* Tree. P.  
*A. Lebbek*, *Benth.* E. Indies. "Siris Acacia." Fine shade tree, 60 ft. Leaves used in India as fodder for cattle. P, SS.  
*A. odoratissima*, *Benth.* Trop. Asia. Ev. tr. Fine shade; beautiful fragrant flowers. S.  
*A. procera*, *Benth.* E. Indies. Fast growing; useful timber tree; gives a large quantity of gum. P.
- Aleurites*, *Forst.*; *Euphorbiaceæ*—  
*A. cordata*, *Muell. Arg.* China. Chinese Varnish-tree. P.  
*A. moluccana*, *Willd.* S. S. Islands and Australia. Candle-nut tree. Nuts edible and oil producing. P.

- Allamanda, *Linn.*; Apocynaceae—  
*A. Hendersonii*, *Hort.* Ev. creeper. Yellow flower; very showy. P.  
*A. nerifolia*, *Hook.* S. America. Ev. sh. Yellow flower. P.
- Alocasia, *Schott*; Aroidae—  
*A. violacea*. Aroid. 5 ft. P.
- Alpinia, *Linn.*; Scitamineae—  
*A. nutans*, *Rosc.* E. Indies. Indian Shell flower. P.
- Alstonia, *R. Br.*; Apocynaceae—  
*A. venenata*. Ev. tr. White flower. P.
- Amaryllis, *Linn.*; Amaryllidaceae—  
*A. hybrida*. Bulbous perennial. B.
- Amoora, *Roxb.*; Meliaceae—  
*A. Rohituka*. E. Indies. P.
- Andira; Leguminosae—  
*A. inermis*. Jamaica. Cabbage-tree. 30 ft. Purple flower. P.
- Andropogon, *Linn.*; Gramineae—  
*A. erianthoides*. P.  
*A. sericeus*, *R. Br.* Australia. Blue grass. One of the most valuable of the native grasses. P.
- Angelonia, *Humb. et Bonpl.*; Scrophulariaceae—  
*A. floribunda*, *Kunze.* Brazil. Pretty bedding plant; blue flower, 1 ft. P.  
 var. *alba*. White flower, 1 ft. P.
- Anomatheca, *Ker.*; Iridaceae—  
*A. cruenta*, *Lindl.* S. Africa. Bulbous perennial, 1 ft. Crimson flower. B.
- Anona, *Linn.*; Anonaceae—  
*A. cherimolia*, *Willd.* S. America. "Cherimoyer." Ev. tr., 20 ft. Fruit edible. P.  
*A. muricata*, *Linn.* W. Indies. "Sour Sop." Ev. tr., 15 ft. Fruit edible. P.  
*A. reticulata*, *Linn.* Brazil. "Custard Apple." Ev. tr., 25 ft. Fruit edible. Medicinal. P.
- Anthistiria, *Linn.*; Gramineae—  
*A. avenacea*. Perennial Grass. P.
- Antidesma, *Linn.*; Euphorbiaceae—  
*A. Dallachyanum*, *Baill.* Queensland. Herbert River Cherry-tree, 20 ft. Fruit edible. SS.
- Antigonon, *Endl.*; Polygonaceae—  
*A. leptopus*, *Hook.* S. America. Climber. Very handsome rosy-pink flowers. P, S, SS.
- Apodytes, *E. M.*; Oleaceae—  
*A. dimidiata*. P.
- Aralia, *Linn.*; Araliaceae—  
*A. Guilfoylei*, *F. v. M.* S.S. Islands. Ev. tr., 6 ft. P.  
*A. papyrifera*, *Dcne.* China and Japan. Rice paper. Ev. sh., 6 ft. P, SS.  
*A. Veitchii*. New Caledonia. Ev. sh. Ornamental. P.
- Araucaria, *Juss.*; Coniferae—  
*A. Bidwillii*, *Hook.* Queensland. Bunya-bunya Pine. Ev. tr., 150 ft. Timber useful. P, SS.  
*A. Cookii*, *R. Br.* New Caledonia. Capt. Cook's Pine. Ev. tr., 150 ft. Timber useful. P.  
*A. Cunninghamii*, *Ait.* E. Australia. Hoop or Moreton Bay Pine. Ev. tr., 150 ft. Timber useful. P, SS.  
*A. Cunninghamii*, var. *glauca*, *Antoine.* E. Australia. Ev. tr., 60 ft. Timber useful. P.  
*A. excelsa*, *R. Br.* Norfolk Island. Ev. tr., 80 ft. Norfolk Island Pine. Timber useful. P.
- Archontophoenix, *Wendl. et Drude*; Palmæ—  
*A. Alexandræ*, *Wendl. et Drude.* Rockingham Bay. P.
- Ardisia, *Swartz*; Myrsinaceae—  
*A. crenulata*, *Vent.* W. Indies. Ev. sh., 6 ft. Pretty red berries. P.
- Arenga, *Labill.*; Palmæ—  
*A. saccharifera*, *Labill.* Moluccas. "Gomuti" or Sugar Palm. Useful for sugar and fibre. P, SS.
- Argyrea, *Lour.* Convolvulaceae—  
*A. speciosa*, *Sweet.* E. Indies. Ev. cr.. Elephant creeper. Medicinal. P.
- Aristolochia, *Tournef.*; Aristolochiaceae—  
*A. elegans*. Ev. cr. Singularly shaped flowers. P.  
*A. indica*, *Linn.* E. Indies. Ev. cl. Purple flower. P.  
*A. ornithocephala*, *Hook.* Brazil. Ev. cl. Purple flower. SS, P.
- Artemisia, *Linn.*; Compositae—  
*A. absinthium*, *Linn.* Europe. Wormwood. Ev. herb. Medicinal plant. P.
- Arundo, *Linn.*; Gramineae—  
*A. arinaria*, *Grass.* P.  
*A. donax*, *Linn.* S. Europe. Spanish reed, 12 ft. Very ornamental, and useful for decorative purposes. P.
- Asparagus, *Linn.*; Liliaceae—  
*A. æthiopicus*. S. Africa. Ev. sh., 30 ft. P.  
*A. falcatus*. India. Ev. perennial, 3 ft. P.  
*A. plumosus*. S. Africa. Ev. cl. Handsome foliage. P.  
*A. racemosus*, *Willd.* Queensland. Ev. cl. P.  
*A. Sprengeri*. Ev. cl. Very showy. P.  
*A. virgatus*. S. Africa. P.
- Astrebla, *F. v. M.*; Gramineae—  
*A. pectinata*. P.
- Asystasia, *Blume*; Acanthaceae—  
*A. Mackaya*, *Harv.* S. Africa. Ev. sh., 3 ft. P.
- Atalantia, *Corr.*—Rutaceae.  
*A. buxifolia*, *Oliv.* Hongkong. Ev. sh., 8 ft. P.
- Atriplex, *Linn.*; Chenopodiaceae—  
*A. nummularia*, *Lindl.* Europe and Australia. Salt Bush. Ev. sh., 5 ft. Fodder plant. S.
- Baccharis, *Linn.*; Compositae—  
*B. halimifolia*, *Linn.* N. America. Groundsel Tree. Ev. sh., 8 ft. P.
- Bambusa, *Schreb.*; Gramineae—  
*B. arundinacea*, *Willd.* E. Indies. Common Bamboo. P, C.  
*B. Fortunei*, *Van Houtte.* Japan. Variegated Bamboo. Dwarf species. 20 ft. P.  
*B. nigra*, *Munro.* E. Indies. Black Bamboo. Whangee Cane. Useful for pipe stems, &c. P.  
*B. siamensis*. P.  
*B. vulgaris*, *Wendl.* E. Indies. Yellow and green striped Bamboo. Very ornamental. P.
- Baphia, *Afzel.*; Leguminosae—  
*Bracemosa*, *Hochst.* Trop. Africa. Ev. sh. P.
- Barklya, *F. v. M.*; Leguminosae—  
*B. syringifolia*, *F. v. M.* Queensland. Ev. tr., 40 ft. Pretty yellow flowers. P, S, SS.
- Barleria, *Linn.*; Acanthaceae—  
*B. cristata*, *Willd.* E. Indies. Ev. sh., 4 ft. P.  
 var. *alba*. Ev. sh., 4 ft. P.  
*B. obtusa*, *Nees.* Ev. sh. 2 ft. C.
- Bauhinia, *Linn.*; Leguminosae—  
*B. acida*. P.  
*B. acuminata*, *Linn.* E. Indies. Ev. sh., 6 ft. P.  
*B. alba*. Ev. tr., 20 ft. White flowers. S, SS, P.  
*B. Galpinii*. Ev. sh., 5 ft., Red flowers. P.  
*B. Hookeri*, *F. v. M.* Queensland. Queensland Ebony. Ev. tr., 40 ft. Timber used for cabinet and other kinds of work. P, SS.  
*B. purpurea*, *Linn.* E. Indies. Ev. tr., 15 ft. Pretty purple flowers. Useful for tanning, fodder, and pickling purposes. P, S, SS.  
*B. tomentosa*, *Linn.* Ceylon, Malabar, &c. Oxhoof, or "Unha de Boy" of Brazil. Ev. sh., 12 ft. P.  
*B. variegata*. Malabar Islands. Ev. tr., 20 ft. P.
- Beaumontia, *Wall.*; Apocynaceae—  
*B. grandiflora*, *Wall.* E. Indies. Ev. cl. Handsome white flowers. P.
- Begonia (various species and varieties). P.
- Bignonia, *Linn.*; Bignoniaceae—  
*B. jasminoides*. P.  
*B. picta*, *Lindl.* Buenos Ayres. Ev. cl. Purple flower. P.  
*B. Tweediana*, *Lindl.* S. America. Ev. cl. Yellow trumpet flower. P, SS.  
*B. venusta*, *Ker.* Brazil. Ev. cl. Pretty orange-yellow flowers. P.
- Bixa, *Linn.*; Bixineae—  
*B. orellana*, *Linn.* S. America. Ev. tr., 20 ft. Arnotto or Arnatto. Dye purposes. P, S, SS.
- Bœhmeria, *Jacq.*; Urticaceae—  
*B. nivea*, *Hook et Arn.* China. Chinese grass plant "Ramee." Fibre plant. P.
- Bombax, *Linn.*; Malvaceae—  
*B. malabaricum*, *D.C.* E. Indies and Queensland. Cotton-tree. Timber and gum also obtained from this tree. P.
- Borago, *Linn.*; Boraginaceae—  
*B. officinalis*, *Linn.* Europe. Useful herb. P.
- Bougainvillea, *Comm.*; Nyctaginæ—  
*B. glabra*, *Linn.* S. America. Ev. cl. Pale purple flower. P.  
*B. spectabilis*, *Juss.*, var. *magnifica*. S. America. Ev. cl. Dark purple flower. Very showy. P.
- Bowenia, *Hook.*; Cycadaceae—  
*B. spectabilis*, var. *serrata*, *Hook.* Queensland. P.
- Brahea, *Mart.* Palmæ. *B. glauca*, *Hort.* See *Erythea armata*. P.
- Brassaia, *Endl.*; Araliaceae—  
*B. actinophylla*, *Endl.* Queensland. Umbrella-tree. Ev. tr., 20 ft. P.
- Buckinghamia, *F. v. M.*; Proteaceae—  
*B. celsissima*, *F. v. M.* Queensland. Ev. tr., 60 ft. Very showy white flowers. SS, P.
- Buddleia, *Linn.*; Loganiaceae—  
*B. madagascariensis*, *Vahl.* Madagascar. Ev. sh., 10 ft.
- Butea, *Roxb.*; Leguminosae—  
*B. frondosa*, *Roxb.* E. Indies. Deciduous tree, 40 ft. Timber useful; also fibre, gum, and dye produced from this tree. P, SS.
- Buxus, *Linn.*; Euphorbiaceae—  
*B. sempervirens*, *Linn.* Europe and Western Asia. Box-tree. Ev. tr., 30 ft. Timber heavy and slow growing, but still useful for many purposes. P.
- Cæsalpinia, *Linn.*; Leguminosae—  
*C. coriaria*, *Willd.* C. America. "Divi-divi." Ev. tr., 30 ft. Produces a powerful tanning material. P, SS.  
*C. pulcherrima*, *Sw.* W. Indies. Barbadoes flower-juice. Sh., 8 feet. Showy flower. P.  
*C. nuga*. P.  
*C. vernalis*. P.
- Calamus, *Linn.*; Palmæ—  
*C. australis*, *Martius.* Queensland. Australian Lawyer or Rattan Palm. Ev. palm. Used chiefly for basketwork, &c. P.

- Calodendron, *Thunb.*; Rutaceæ—  
*C. capense, Thunb.* S. Africa. Cape Chestnut. Ev. tr., 40 ft. Very pretty when in flower. P.
- Calotropis, *R. Br.*; Asclepiadææ—  
*C. gigantea, R. Br.* E. Indies. Ev. sh., 15 ft. Fibre plant. P.
- Calpurnia, *Meyer.*; Leguminosæ—  
*C. lasogynia, Meyer.* Abyssinia. Ev. tr., 20 ft. P.
- Calycanthus, *Lindl.*; Calycanthaceæ—  
*C. præcox, Lindl.* Japan. Japanese Allspice. P.
- Calla, *Kunth.*; Aroideæ—  
*C. æthiopica, Kunth.* S. Africa. Lily of the Nile. White flowers, useful for decorative work. P.
- Calliandra, *Benth.*; Leguminosæ—  
*C. portoricensis, Benth.* S. America. Ev. sh., 10 ft. P.  
*C. pulcherrima, Paxt.* Mexico. Ev. sh., 10 ft. Showy scarlet flowers. P.
- Callitris, *Vent.*; Coniferæ—  
*C. arborea.* P.  
*C. australis.* S.  
*C. Parlartorii.* P.  
*C. robusta, R. Br.* Australia. Cypress Pine. 50 ft. Valuable timber. P. SS.
- Camellia, *Linn.*; Ternstroemiaceæ—  
*C. japonica.* P.
- Canna (various varieties). P.
- Capsicum (various varieties). P.
- Carica, *Linn.*; Passifloreæ—  
*C. papaya, Linn.* S. America. Tree, 10 ft. Papaw-tree. Fruit edible. P.
- Carnation. *Dianthus caryophyllus* (various varieties). C.
- Caryota, *Linn.*; Palmæ—  
*C. Rumphiana, Mart.* Queensland. P.  
*C. urens, Linn.* E. Indies. Wine Palm. 50 ft. P.
- Casimiroa, *Llav. et Lex.*; Rutaceæ—  
*C. edulis.* Mexico. Fruit edible. P.
- Cassia, *Linn.*; Leguminosæ—  
*C. fistula, Linn.* E. Indies. Pudding Pipe-tree, 20 ft. Bark used for tanning and dyeing. P, S, SS.  
*C. grandis.* P.  
*C. pistaciæfolia, H. B. et K.* S. America. Ev. tr., 50 ft. S, SS.  
*C. tomentosa, Linn.* S. America. Ev. tr., 7 ft. P.  
*C. tora.* Tropics. Annual. P.
- Castanospermum, *A. Cunn.*; Leguminosæ—  
*C. australis, A. Cunn.* Queensland. Moreton Bay Chestnut. Ev. tr., 60 ft. Useful timber. P, S, SS.
- Casuarina *Forst.*; Casuarinææ—  
*C. glauca, Sieb.* Australia. Ev. tr. 80 ft. She-oak. P.  
*C. quadrivalvis, Ait.* Australia. Ev. tr., 20 ft. P.
- Ceratonia, *Linn.*; Leguminosæ—  
*C. siliqua, Linn.* Levant. St. John's Bread, or Locust-tree. Ev. tr., 50 ft. Pods edible. P.
- Cedrela, *Linn.*; Meliaceæ—  
*Toona, Roxb.* E. Indies and Australia. Red Cedar, or Toon tree. Valuable timber. P, S, S.
- Celtis, *Linn.*; Urticaceæ—  
*C. Kraussiana.* P.  
*C. sinensis.* China. Chinese Nettle-tree. P.  
*C. Tournefortia, Lam.* Levant. P.
- Cercis, *Linn.*; Leguminosæ—  
*C. sinensis.* P.
- Cestrum, *Linn.*; Solanaceæ—  
*C. aurantiacum, L'Her.* Guatemala. Ev. sh., 12 ft. P.  
*C. elegans, Scheidw.* Mexico. Ev. sh., 10 ft. Showy flowers. P.  
*C. nocturnum, L'Her.* Jamaica. Ev. sh., 12 ft. P.
- Chamærops, *Linn.*; Palmæ—  
*C. arborescens.* P.  
*C. elegans, Hort.* Europe. 20 ft. P.  
 var. *argentea.* P.  
*C. gracilis.* P.  
*C. humilis, Linn.* Southern Europe and Northern Africa, Dwarf European Hemp, or Fan Palm. 12 ft. P.
- Chrysanthemum (various varieties). P.
- Cinnamomum, *Blume*; Laurinææ—  
*C. camphora, Nees,* Japan and China. Ev. tr., 40 ft. Camphor of commerce. P, S, SS.
- Clematis, *Linn.*; Ranunculaceæ—  
*C. Gouriana.* P.  
*C. ligustrifolia.* P.
- Clerodendron, *Linn.*; Verbenaceæ—  
*C. fallax, Lindl.* Java. Ev. sh., 8 ft. Scarlet flower. P.  
*C. fragrans, Hook.* Japan. Ev. sh., 6 ft. White scented flower. P.  
*C. glabrum.* P.  
*C. grandiflora.* P.  
*C. nutans, Wall.* E. Indies. Ev. sh., 6 ft. P.  
*C. Thomsonæ, Balf.* Africa. Ev. climber. Bright crimson flowers. P.
- Clivia, *Lindl.*; Amaryllidææ—  
*C. miniata, Hook.* S. Africa. Bulb. Deep-orange flowers. B.  
*C. nobilis, Lindl.* S. Africa. Noble Caffre Lily. B.
- Cocos, *Linn.*; Palmæ—  
*C. coronata, Mart.* Brazil. P.  
*C. odorata, (St. Catherine).* P.  
*C. plumosa, Lodd.* Brazil. Feather Palm, 50 ft. P, S, SS.
- Cocos, *Linn.*; Palmæ—continued—  
*C. romanzoffiana, Cham.* Brazil. P.  
*C. Weddelliana, Wendl.* Brazil. Showy species. P.
- Codium, *Rumph.*; Euphorbiaceæ (various varieties). P, C.
- Coffea, *Linn.*; Rubiaceæ—  
*C. arabica, Linn.* Trop. Africa. Ev. sh., 10 ft. Coffee of commerce. P, S, SS.
- Coleus (various varieties). C.
- Colocasia, *Schott.*; Aroideæ—  
*C. macrorrhiza, Schott.* Queensland. P.
- Combretum, *Linn.*; Combretaceæ—  
*C. purpureum, Vahl.* S. America. Ev. climber. Showy flower. S.
- Cordia, *Linn.*; Boraginææ—  
*C. Myxa, Linn.* Tropics. Sebestan fruit. Fruit edible; also rope made from this plant. P.
- Cotoneaster, *Medik.*; Rosaceæ—  
*C. microphylla, Wall.* E. Indies. Deciduous shrub, 4 ft. P.
- Crætagus, *Linn.*; Rosaceæ—  
*C. crus-galli, Linn.* N. America. Deciduous tree, 20 ft. P.
- Crinum, *Linn.*; Amaryllidææ—  
*C. amabilis; var. rosea.* Bright-red flowering bulb. B.
- Crotalaria, *Linn.*; Leguminosæ—  
*C. capensis.* S. Africa. Ev. sh., 10 ft. Yellow flower. S, P.
- Cryptocarya, *R. Br.*; Laurinææ—  
*C. australis, Benth.* Australia. Ev. sh. P.
- Cryptostegia, *R. Br.*; Asclepiadææ—  
*C. grandiflora, R. Br.* Madagascar. India-rubber vine. Evergreen climber. P.
- Cupania, *Linn.*; Sapindaceæ—  
*C. pseudorhus, A. Rich.* E. Australia. Ev. tr., 20 ft. P.
- Cuphea, *P. Br.*; Lythrarinææ—  
*C. jorullensis, H. et B.* Mexico. Ev. sh., 3 ft. P.
- Cupressus, *Linn.*; Coniferæ—  
*C. Africana, Endl.* S. Africa. South African Cypress. 20 ft. Timber useful. P.  
*C. Benthamiana, Endl.* Mexico. Bentham's Cypress. 100 ft. P.  
*C. horizontalis, Linn.* S. Europe and Asia. Common Cypress. 60 ft. P.  
*C. macrocarpa, Hartw.* California. Monterey, or Citron Cypress. 150 ft. P.  
*C. sinensis, Lamarch.* E. Indies. Cedar of Goa, or Grey Cypress. 100 ft. P.  
*C. torulosa, Don.* E. Indies. Himalayan Cypress. 70 ft. P.
- Cyperus, *Linn.*; Cyperaceæ—  
*C. alternifolius, Linn.* Madagascar, semi-aquatic. Ornamental foliage. P.  
*C. papyrus, Linn.* Egypt. Egyptian paper reed, or rush. P.
- Cyphomandra betacea. Toma'o tree. Fruit edible. Sh., 12 ft. P.
- Daphne, *Linn.*; Thymelacææ—  
*D. oleoides.* South-East Europe. Olive-like Daphne. P.
- Dasylyrion, *Zucc.*; Liliaceæ—  
*D. longifolium.* Mexico. P.
- Datura, *Linn.*; Solanaceæ—  
*D. cornigera, Hook.* Organ Mountains. Trumpet flower. Poisonous. Ev. sh., 15 ft. P.
- Deeringia, *R. Br.*; Amarantaceæ—  
*D. celosioides, R. Br.* Australia and E. Indies. Cockscomb. Deeringia. Ev. climber. P.
- Dendrocalamus, *Nees.*; Graminææ—  
*D. strictus, Roxb.* E. Indies. Bamboo. 25 ft. Fodder, building, and many other uses. P.
- Derris, *Lour.*; Leguminosæ—  
*D. scandens, Benth.* E. Australia. Climber. P.
- Desmodium; Leguminosæ—  
*D. tiliaefolium.* P.
- Deutzia, *Thunb.*; Saxifrageæ—  
*D. scabra, Thunb.* Japan. Deciduous sh., 6 ft. P.
- Dictyospermum, *Wendl et Drude*; Palmæ—  
*D. album, Wendl.* Mauritius. P.
- Dianthera; Acanthaceæ—  
*D. secunda.* W. Indies. Ev. sh., 8 ft. Red flower. P.
- Dillenia, *Linn.*; Dilleniaceæ—  
*D. indica, Linn.*; E. Indies. Chalta. Ev. tr., 20 ft. Timber useful. P.
- Diploglottis, *Hook.*; Sapindaceæ—  
*D. Cunninghamii, E.* Australia. Queensland Tamarind-tree. Ev., 50 ft. Fruit edible. S.
- Diplothemium, *Mart.*; Palmæ—  
*D. maritimum, Mart.* Brazil. Brazilian Wine Palm, 20 ft. P, S, SS.
- Dodonæa, *Linn.*; Sapindaceæ—  
*D. viscosa, Linn.* Australia, New Zealand, &c. Jamaica Switch Sorrel. Ev. sh., 20 ft. P.
- Dombeya, *Cav.*; St. reuliaceæ—  
*D. mollis, Hook.* Madagascar. Ev. sh., 10 ft. SS.  
*D. natalensis, Sond.* Natal. Cape Wedding Flower. Ev. sh., 10 ft. P.
- Doryanthes, *Corr.*; Amaryllidææ—  
*D. Palmerii, Queensland.* Queensland Spear Lily. Bulb, 8 ft. B.
- Dracæna, *Linn.*; Liliaceæ—  
*D. Draco, Linn.* Canary Islands. Dragon-tree. Ev., 20 ft. P, S.  
*D. Hookeriana.*

- Duranta*, *Linn.*; *Verbenaceae*—  
*D. Plumieri*, *Linn.* S. America. Sky Flower. Ev. sh., 15 ft.  
 Hedge plant. P, S, SS.  
 var. *Ellisii*, *Jacq.* P.  
 var. *variegata*. P.
- Elionurus* *Humb. et Bonpl.*; *Gramineae*—  
*E. citrus*, *Munro*. Queensland. Citron-scented grass. P.
- Episcia*, *Mart.*; *Gesneraceae*—  
*E. fulgida*, *Lindl.* New Granada. Ornamental leaved greenhouse plant. P.  
*E. chontalensis*, *Seem.* Mexico. Handsome little plant for pot work. P.
- Eragrostis*, *Beauv.*; *Gramineae*—  
*E. Brownii*, *Nees*. Australia and India. Lovegrass. P.
- Rythæa*, *S. Watts*; *Palmæ*—  
*E. armata*, *S. Watts*. California. P.  
*E. edulis*, *S. Watts*. California. P.
- Erythrina*, *Linn.*; *Leguminosæ*—  
*E. acanthocarpus*. P.  
*E. americana*. SS.  
*E. caffra*, *Thunb.* Cape of Good Hope. Caffre Coral-tree. Ev. sh., 10 ft. P.  
*E. crista-galli*, *Linn.* Brazil. Sh., 8 ft. P.  
*E. indica*, *Lam.* E. Indies and Australia. Coral-tree. 30 ft. P, S.  
*E. insignis*. P.  
*E. speciosa*, *Ait.* S. America. Coral Bean-tree. 30 ft. P.  
*E. vespertilio*, *Benth.* Queensland. Australian Cork-tree. P.
- Erythroxylon*, *Linn.*; *Lineæ*—  
*E. coca*, *Lam.* Andes and Peru. Ev. sh., 6 ft. Medicinal plant. SS.
- Eucalyptus*, *L'Her.*; *Myrtaceæ*—  
*E. calophylla*, *R. Br.* W. Australia. Red Gum of Port Gregory. Ev. tr., 60 ft. P, S.  
*E. gomphocephala*. PS.  
*E. marginata*, *Sm.* W. Australia. Jarrah, or Mahogany Gum-tree. 50 ft. S.  
*E. microcarys*. P, S.  
*E. paniculata*, *Sm.* Australia. She-ironbark. 40 ft. P.  
*E. pillularis*, *Sm.* Australia. Great Blackbutt. 300 ft. P, S.  
*E. plendioniana*. P.  
*E. rostrata*, *Schl.* Australia. Red Gum of Victoria. 120 ft. P, S.  
*E. salubris*. S.
- Eugenia*, *Lindl.*; *Myrtaceæ*—  
*E. Jambos*, *Linn.* E. Indies. Rose Apple. Ev. tr., 20 ft. Fruit edible. S.  
*E. myrtifolia*, *Sims.* E. Australia. Scrub Cherry. Ev. tr., 12 ft. P.  
*E. uniflora*, *Linn.* Brazil. Brazilian Cherry. Ev. sh., 8 ft. Fruit edible. P, SS.
- Eulalia*; *Gramineæ*—  
*E. japonica*, var. *zebrina*. Japan. Ornamental Grass. 3 ft. P.
- Euonymus*, *Linn.*; *Celastrineæ*—  
*E. japonica*, var. *variegata*, *Thunb.* Japan. Ev. sh., 6 ft. White flower. P.
- Eupatorium*, *Linn.*; *Compositæ*—  
*E. ageratoides*, *Linn. fil.* N. America. Herbaceous perennial. P.
- Euphorbia*, *Linn.*; *Euphorbiaceæ*—  
*E. pulcherrima*, *Willd.* Mexico. Poinsettia or Flor de Pasqua. Ev. sh., 2 ft. Bright-scarlet leaves. Very handsome. C.
- Eustrephus*, *R. Br.*; *Liliaceæ*—  
*E. latifolius*, var. *angustifolia*, *R. Br.* Queensland. Ev. twiner. P.
- Excæcaria*, *Linn.*; *Euphorbiaceæ*—  
*E. reticulata*. P.  
*E. sebifera*, *Muell. Arg.* China and Japan. Chinese Tallow-tree. Tallow, dye, and oil obtained from this tree. SS.
- Ficus*, *Linn.*; *Urticaceæ*—  
*F. Benjamina*, *Linn.* E. Indies. Weeping Fig. 60 ft. P, SS.  
*F. Cunninghamii*. P, SS.  
*F. carica*, *Linn.* Southern Europe. Common Fig.  
 var. *Black Ischia*, Brown Provence, Castle Kennedy, Green Ischia, San Pedro, Smyrna Drying. Tropa, Turkey, White Adriatic, White Provence. P.  
*F. bengalensis* *Linn.* E. Indies. Banyan Fig. Fibre, medicinal. P.  
*F. capri*. C.  
*F. elastica*, *Bl.* E. Indies. India-rubber-tree. 30 ft. P.  
*F. glomerata*, *Roxb.* E. Indies and Queensland. Cluster Fig. Fruit. P.  
*F. hispida*, *Linn.* N. Australia and Queensland. Opposite-leaved Fig. Ev. tr. P.  
*F. macrophylla*, *Desf.* Queensland. Moreton Bay Fig-tree. Timber useful. S, SS, P.  
*F. nitida*, *Thunb.* Queensland. Ev. tr., 30 ft. Good shade tree. P.  
*F. religiosa*, *Linn.* E. Indies and Java. Ev. tr., 30 ft. Sacred or Peepul Fig. Timber useful. P.
- Flemingia*, *Roxb.*; *Leguminosæ*—  
*F. strobilifera*, *R. Br.* E. Indies. Ev. sh. P.
- Flueggea*, *Willd.*; *Euphorbiaceæ*—  
*F. leucopyrus*. P.
- Fœniculum*, *Adans.*; *Umbellifereæ*—  
*F. officinale*, *Allioni*. Europe and Asia. Common Fennel. Useful herb. P.
- Fraxinus*, *Linn.*; *Oleaceæ*—  
*F. xanthoxyloides*. P.
- Fuchsia* (various varieties). P.
- Furcraea*, *Vent.*; *Amaryllidæ*—  
*F. elegans*. Mexico. Succulent, 6 ft. P.  
*F. gigantea*, *Vent.* S. America. Succulent. Hemp plant, 5 ft. SS, P.  
*F. longæva*. Mexico. P.
- Garcinia*, *Linn.*; *Guttiferæ*—  
*G. Livingstonii*, *And.* Trop. Africa. Dr. Livingston's Mangosteen. Fruit edible. P.  
*G. xanthochynus*. P.
- Gardenia*, *Linn.*; *Rubiaceæ*—  
*G. florida*, *Linn.* China and Japan. Ev. sh., 6 ft. P.  
*G. Thunbergia*, *Linn. f.* S. Africa. Ev. sh., 5 ft. P.
- Geitonoplesium*, *A. Cunn.*; *Liliaceæ*—  
*G. cymosum*, *A. Cunn.* Queensland. Ev. twiner. P.
- Gleditschia*, *Linn.*; *Leguminosæ*—  
*G. triacanthos*, *Linn.* N. America. Honey Locust-tree. 50 ft. S, P, SS.
- Gouania*, *Jacq.*; *Rhamnæ*—  
*G. Domingensis*. Jamaica. Chaw-stick of Jamaica. P.
- Grevillea*, *R. Br.*; *Proteaceæ*—  
*G. robusta*, *A. Cunn.* E. Australia. Silky Oak, timber useful. Ev. tr.; 100 ft. P, S, SS.
- Guaiacum*, *Linn.*; *Zygophylleæ*—  
*G. officinalis*, *Linn.*; Jamaica. Common Lignum vitæ. Ev. tr., 40 ft. Timber useful. P.
- Gynerium*, *H. et B.*; *Gramineæ*—  
*G. argenteum*, *Nees*. S. America. Pampas grass, white flower. P.  
 var. *rosea*. Pink Pampas grass. P.
- Hæmatoxylon*, *Linn.*; *Leguminosæ*—  
*H. campeachianum*, *Linn.* C. America. Logwood. Ev. tr., 40 ft. Dye and medicinal. P, SS.
- Hakea*, *Schrad.*; *Proteaceæ*—  
*H. gibbosa*, *Cavanilles*. N. S. Wales. Ev. sh., 20 ft. P.
- Hamelia*, *Jacq.*; *Rubiaceæ*—  
*H. patens*, *Jacq.* S. America. Ev. sh., 8 ft. P.
- Hardenbergia*, *Benth.*; *Leguminosæ*—  
*H. monophylla*, *Benth.* Australia. Sarsaparilla. S.
- Harpullia*, *Roxb.*; *Sapindaceæ*—  
*H. pendula*, *Planch.* E. Australia, Moreton Bay Tulip wood. Ev. tr., 50 ft. P, SS.
- Hedera*, *Linn.*; *Araliaceæ*—  
*H. Helix*, *Linn.*, var. *amurensis*. Ivy. P.
- Hedyscepe*, *Wendl et Drude*; *Palmæ*—  
*H. canterburyana*, *W. et D.* Lord Howe's Island. P.
- Heeria*, *Schlech.*; *Melastomaceæ*—  
*H. rosea*, *Schlech.* Mexico. Handsome flowering sh., 6 ft. P.
- Heliotropium*, *Linn.*; *Boraginæ*—  
*H. peruvianum*, *Linn.* Peru. Heliotrope. P.
- Heritiera*, *Ait.*; *Sterculiaceæ*—  
*H. macrophylla*, *Wall.* Burmah. Looking-glass tree. Ev., 20 ft. P.
- Hibiscus*, *Linn.*; *Malvaceæ*—  
*H. molle*. P.  
*H. rosa-sinensis*, *Linn.* China. Ev. sh., 10 ft. P.  
 var. *alba-flore plena*. P.  
*H. tiliaceus*, *Linn.* Queensland coast. Ev. tr., 20 ft. P, S, SS.
- Higginsia*, *Sw.*; *Rubiaceæ*—  
*H. mexicana*. Mexico. Ornamental sh., 6 ft. P.
- Hiptage*, *Gærtner*; *Malpighiaceæ*—  
*H. madablota*, *Gærtner*. E. Indies. Ev. cl., 10 ft. Medicinal. P.
- Holmskioldia*, *Retz*; *Verbenaceæ*—  
*H. sanguinea*, *Retz.* E. Indies. Ev. sh., 8 ft. P.
- Hovenia*, *Thunb.*; *Rhamnæ*—  
*H. dulcis*, *Thunb.* Japan and China. Japanese Raisin-tree, 8 ft. P.
- Howea*, *Beccari*; *Palmæ*—  
*H. belmoreana*, *Becc.* Lord Howe's Island. Curly Palm. 30 ft. P.  
*H. Forsteriana*, *Becc.* Lord Howe's Island. Flat or Thatch leaf Palm. 30 ft. P.
- Hoya*, *R. Br.*; *Asclepiadæ*—  
*H. viridiflora*. P.
- Hydriastele*, *Wendl. et Drude*; *Palmæ*—  
*H. Douglasiana*. P.
- Hymenæa*, *Linn.*; *Leguminosæ*—  
*H. courbaril*, *Linn.* W. Indies and Trop. America. West Indian Locust-tree, 60 ft. Resin and timber obtained from this tree. P.
- Hymenosporum*, *F. v. M.*; *Pittosporæ*—  
*H. flavum*, *F. v. M.* Queensland and N. S. Wales. Ev. tr., 25 ft. P.
- Hypericum*, *Linn.*; *Hypericineæ*—  
*H. hircinum*. Mediterranean Regions. Ev. sh., 4 ft. P.
- Ilex*, *Linn.*; *Piceinæ*—  
*I. Paraguayensis*, *St. Hil.* Paraguay. Paraguay Tea plant or "Mate." Ev. sh., 12 ft. SS.

- Iresine*, *Linn.*; *Amarantaceae*. P.  
*Jacaranda*, *Juss.*; *Bignoniaceae*—  
*J. mimosifolia*, *Don.* Brazil. Deciduous tree, 50 ft. P, SS.  
*Jasminum*, *Linn.*; *Oleaceae*—  
*J. grandiflorum*, *Linn.* E. Indies. Ev. cl. White flower. P.  
*J. pubescens*, *Willd.* India and China. Ev. sh. P.  
*J. simplicifolia*, *Forst.* Queensland. Ev. cl. White flower. P.  
*Jatropha*, *Linn.*; *Euphorbiaceae*—  
*J. multifida*, *Linn.* S. America. French Physic Nut. Ev. tr., 6 ft. SS.  
*Juniperus*, *Linn.*; *Coniferae*—  
*J. procera*, *Hoch.* Abyssinia. Ev. tr. P.  
*Justicia*, *Linn.*; *Acanthaceae*—  
*J. lanceolata*. P.  
*J. procumbens*, *Linn.* E. Indies and Australia. P.  
*Kentia*, *Blume*—*K. monostachya*, *F. v. M.* E. Australia. Whipstick or Walking-stick Palm. P.  
*Kibara*, *Endl.*; *Monimiaceae*—  
*K. macrophylla*, *Benth.* Queensland. Ev. tr., 60 ft. P.  
*Kigelia*, *D.C.*; *Bignoniaceae*—  
*K. pinnata*, *D.C.* Nubia, Abyssinia, &c. Sacred Tree in Nubia. 50 ft. Medicinal. P.  
*Kraussia*, *Horn.*; *Rubiaceae*; *K. floribunda*. P.  
*Laburnum*, *Griseb.*; *Leguminosae*—  
*L. vulgare*, *Griseb.* Europe. 20 ft. Yellow flower. P.  
*Lafœnsia*, *Vandelli*; *Lythrarieae*—  
*L. puniceifolia*, *D.C.* St. Martha. Ev. tr., 30 ft. White flower. SS.  
*Lagerstrœmia*, *Linn.*; *Lythrarieae*—  
*L. indica*, *Linn.* E. Indies. Ev. sh., 50 ft. Pink flowers. P, SS.  
var. *Matthewsii*. P.  
var. *purpurea*. P.  
*Lagunaria*, *G. Don*; *Malvaceae*—  
*L. Patersonii*, *Don.* Queensland. Ev. tr., 50 ft. Norfolk Island Cowitch-tree. SS.  
*Lasiandra*, *Don*; *Melastomaceae*—  
*L. Fontainesii*, *D.C.* Rio Janeiro. Ev. sh., 6 ft. Purple flower. P.  
*Latania*, *Comm.*; *Palmæ*—  
*L. Loddigessii*, *Mart.* Mauritius. P.  
*Lavendula*, *Linn.*; *Labiatae*—  
*L. vera*, *D.C.* Europe. Common Lavender. Herb. P.  
*Leea*, *Linn.*; *Ampelideae*—  
*L. sambucina*, *Willd.* Asia and Queensland. Ev. sh. P.  
*Leptochloa*, *Beauv.*; *Gramineae*—  
*L. chinensis*, *Nees.* Tropics and Sub-tropics. P.  
*Leptospermum*, *Forst.*; *Myrtaceae*—  
*L. laevigatum*, *F. Muell.* Australia. Coast Tea-tree. P.  
*Libonia*, *C. Koch*; *Acanthaceae*—  
*L. Penrhosiensis*. Brazil. Rich crimson flower. P.  
*Ligustrum*, *Linn.*; *Oleaceae*—  
*L. Iboti*. Japan. Ev. sh. White flower. P.  
*L. japonicum*, *Thunb.* Japan. Japanese Privet. Ev. sh., 8 ft. White flower. P.  
*L. javanicum*. P.  
*L. nilgiriense*. P.  
*L. vulgare*, *Linn.* Europe. English Privet. Ev. sh., 10 ft. Hedge plant. P.  
*Lippia*, *Linn.*; *Verbenaceae*—  
*L. citriodora*, *Kunth.* Peru. Lemon-scented Verbena. Deciduous sh., 3 ft. P.  
*Livistona*, *R. Br.*; *Palmæ*—  
*L. australis*, *Mart.* E. Australia. Cabbage Palm. 80 ft. S, P, SS.  
*L. chinensis*, *Mart.* China. Handsom Palm. 50 ft. P.  
*L. olivæformis*, *Mart.* Java. Olive-shape-fruited Fan Palm. P.  
*L. rotundifolia*, *Mart.* Malay Islands.  
*Lonicera*, *Linn.*; *Caprifoliaceae*—  
*L. caprifolium*, *Linn.* Europe. Woodbine. P.  
*L. rosea*. P.  
*Lycium*, *Linn.*; *Solonaceae*—  
*L. horridum*, *Willd.* S. Africa. Caffre Box-thorn. Ev. sh. P.  
*Macadamia*, *F. v. M.*; *Proteaceae*—  
*M. ternifolia*, *F. v. M.* Queensland and N. S. Wales. Queensland Nut. Ev. tr., 40 ft. P, S, SS.  
*Macrozamia*, *Miq.*; *Cycadaceae*—  
*M. Paulo-Gulielmi*. S. Queensland. P.  
*M. spiralis*, *Miq.* S. Queensland. P.  
*Magnolia*, *Linn.*; *Magnoliaceae*—  
*M. fuscata*, *Andr.* China. Chinese Tulip-tree. Ev. sh., 6 ft. P.  
*Malvaviscus*, *Dill.*; *Malvaceae*—  
*M. arboreus*, *Cass.* W. Indies. Ev. sh., 12 ft. P.  
*Mandevilla*, *Lindl.*; *Apocynaceae*—  
*M. suaveolens*, *Lindl.* Buenos Ayres. Chili Jasmine. Ev. climber. White flower. P.  
*Manettia*, *Mutis*; *Rubiaceae*—  
*M. bicolor*. Organ Mountains. Ev. climber. Pretty scarlet and orange-yellow flower. P.  
*Mangifera*, *Linn.*; *Mango* (various varieties). P.  
*Manihot*, *Adans*; *Euphorbiaceae*—  
*M. Api*, *Linn.* Trop. S. America. Sweet Cassava, or Tapioca plant. Ev. sh., 8 ft. P.  
*M. utilisissima*, *Pohl.* S. America. Bitter Cassava, or Tapioca plant; 3 ft. P.  
*Marantas* (various varieties). P.  
*Medinilla*, *Gaudich.*; *Melastomaceae*—  
*M. speciosa*, *Blume.* Java. Ev. sh., 5 ft. P.  
*Melaleuca*, *Linn.*; *Myrtaceae*—  
*M. leucadendron*. Cajuput-tree. 20 ft. S, P.  
*Melia*, *Linn.*; *Meliaceae*—  
*M. Azedarach*, *Linn.* E. Indies. Common Bead-tree, or White Cedar. Deciduous. 50 ft. Oil and timber obtained from this tree. P.  
*M. sempervirens*. Jamaica; Ev. tr. 25 ft. P.  
*Melissa*, *Linn.*; *Labiatae*—  
*M. officinalis*, *Linn.* S. Europe. Palm. Useful herb; also good bee plant. P.  
*Melochia*, *Bytterniaceae*; *M. hyranivata*. P.  
*Mentha*, *Linn.*; *Labiatae*.  
*M. piperita*, *Linn.* Europe. Peppermint. Medicinal plant. P.  
*M. rotundifolia*, var. *variegata*, Europe. Variegated Mint. P.  
*Montbretia*. *Iridæe* Bulb. B.  
*Moræa*, *Linn.*; *Iridæe*—  
*M. bicolor*, *Sweet.* S. Africa. Bulb. Yellow and brown flower. B.  
*M. irioides*, Bulb. White and yellow flower. B.  
*Morus*, *Linn.*; *Urticaceae*—  
*M. nigra*, *Linn.* Persia. Common Black Mulberry. P.  
*Murraya*, *Linn.*; *Rutaceae*—  
*M. exotica*, *Linn.* E. Indies. Ev. sh., 15 ft. Timber useful for wood-carving. P, SS.  
*Myrica*; *Myrtaceae*—  
*M. vagi*. P.  
*Myrospermum*, *Jacq.*; *Leguminosae*—  
*M. Pereira*, *Klotz.* C. America. Balsam of Peru Tree. Medicinal. Deciduous. 30 ft. P.  
*Narcissus* (various varieties). B.  
*Nauclea*, *Linn.*; *Rubiaceae*—  
*N. Cadamba*. P.  
*Nelumbium*, *Juss.*; *Nymphaeaceae*—  
*N. speciosum*, var. *alba*. Aquatic. White Water-lily. P.  
*Nephelium*, *Linn.*; *Sapindaceae*—  
*N. Litchi*, *Camb.* China. Ev. tr., 20 ft. Fruit edible. P.  
*Nerium*, *Linn.*; *Apocynaceae*—  
*N. Oleander*, *Linn.* E. Indies. Ev. sh., 15 ft. P.  
*Nicotiana Solanaceae*—Large leaf tobacco. S.  
*Nymphaea*, *Linn.*; *Nymphaeaceae*—  
*N. alba*, *Linn.* Europe. White Water-lily. Aquatic. P.  
*N. gigantea*, *Hook.* Queensland. Large Blue Water-lily. P.  
*N. lutea*. P.  
*Ocimum*, *Linn.*; *Labiatae*—  
*O. Basilicum*. India, Ceylon, and Java. Common or Sweet Basil. Herb. P.  
*Oenothera*, *Linn.*; *Onagrarieae*—  
*O. Lamarckiana*, *Ker.* S. Africa. Lamarck's Evening Primrose. P.  
*Olea*, *Linn.*; *Oleaceae*—  
*O. cuspidata*. P.  
*O. europæa*, *Linn.* S. Europe and Levant. Common cultivated Olive. 30 ft. Fruit, bark, and oil obtained from this tree. P.  
*O. paniculata*, *R. Br.* Queensland. Queensland Olive. Ev. tr., 30 ft. P.  
*Oncoba*, *Forsk.*; *Bixineae*—  
*O. Kraussiana*, *Planch.* S. Africa. Ev. sh. P.  
*Oreodoxa*, *Willd.*; *Palmæ*—  
*O. oleracea*, *Mart.* W. Indies. Cabbage Palm, 100 ft. P.  
*O. regia*, *Kunth.* W. Indies. Royal Palm, 60 ft. P.  
*Origanum*, *Linn.*; *Labiatae*—  
*O. marjoranum*, *Linn.* Europe. Common Marjoram. Herb. P.  
*Oxyanthus D. C.*; *Rubiaceae*—  
*O. natalensis*, *Soud.* Natal. Ev. sh., 5 ft. P.  
*Pandanus*, *Linn.*; *Pandaneae*—  
*P. morticola*. P.  
*P. pedunculatus*, *R. Br.* Queensland. Native Screw-pine. P.  
*P. Veitchii*, *Hort.* S. S. Islands. Ev. sh. Veitch's Screw-pine. P.  
*Panicum*, *Linn.*; *Gramineae*—  
*P. muticum*. P.  
*P. teneriffæ*, *R. Br.* S. Africa. Red Natal-grass. Fodder. SS.  
*Parkia*; *Leguminosae*—  
*P. biglandulosa*. Malay Peninsula. P.  
*Paspalum*, *Linn.*; *Gramineae*—  
*P. dilatatum*, *Poir.* Trop. S. America. Spreading Paspalum Grass. P.  
*P. Galmaræ*. P.  
*Passiflora*, *Linn.*; *Passifloreae*—  
*P. edulis*, *Sims* America. Passion-fruit. Ev. cl. P.  
*P. incarnata*. Southern U.S. of America. P.  
*Peddiæ africana*. P.  
*Pelargoniums* (various varieties). C.  
*Pentas*, *Benth.*; *Rubiaceae*—  
*P. carnea*, *Benth.*; Africa. Ev. sh., 2 ft. P.  
*Persea*, *Gærtn.*; *Laurineae*—  
*P. carolinensis*. P.  
*Ptræa*, *Linn.*; *Verbenaceae*—  
*P. volubilis*, *Linn.* S. America. Ev. cl. Handsome purple flower. P.

- Philadelphus, *Linn.*; Saxifragaceæ—  
*P. inodorus*, *Linn.* N. America. Ev. sh., 5 ft. White flower. P.
- Philodendron, P.
- Phillyrea, *Linn.*; Oleaceæ—  
*P. angustifolia*, *Linn.* Southern Europe. Ev. sh., 8 ft. P.
- Phoenix, *Linn.*; Palmæ—  
*P. acaulis*, *Roxb.* E. Indies. Stemless Date Palm. 12 ft. SP.  
*P. canariensis*, P.  
*P. dactylifera*, *Linn.* Africa. Common Date Palm. 100 ft. P.  
*P. paradenia*, P.  
*P. rupicola*, *T. Anders.* Himalayas. P, S.  
*P. spinosa*, P.  
 Sp. from Zanzibar. P.
- Photinia, *Linn.*; Rosaceæ—  
*P. japonica*, *Lindl.* Japan and China. Loquat, Japan Quince, or Medlar. P.  
*P. serrulata*, *Lindl.* China. Chinese Hawthorn. Ev. sh. 20 ft. P.
- Phyllanthus, *Linn.*; Euphorbiaceæ—  
*P. polygonoides*, P.  
*P. reticulatus*, P.
- Physianthus; *Mart.*; Aslepiadeæ.
- Phytolacca, *Linn.*; Phytolaccaceæ—  
*P. dioica*, *Linn.* S. America. Bella-Sombra or Great Ink-berry Tree. Fast-growing. 30 ft. P, S.
- Pilea; Urticaceæ—  
*P. muscosa*, Artillery or Pistol Plant. P.
- Pinus, *Linn.*; Coniferæ—  
*P. longifolia*, *Roxb.* India. Long-leaved or Chir Pine. P.  
*P. ponderosa*, *Doug.* America. Pitch Pine. Timber useful. P.
- Piper, *Linn.*; Piperaceæ—  
*P. nigrum*, *Linn.* E. Indies. Black Pepper of commerce. P.
- Pithecolobium, *Mart.*; Leguminosæ—  
*P. pruinatum*, *Benth.* Pittosporæ. E. Australia. Curl Brush Leaf. P.
- Pittosporum, *Banks*—  
*P. letrospermun.* P.  
*P. undulatum*, *Vent.* Australia. Victorian Laurel. Ev. sh. 6 ft. SS.  
*P. viridiflorum*, Cape of Good Hope. P.
- Platanus, *Linn.*; Platanaceæ—  
*P. orientalis*, *Linn.* S. Europe. Plane-tree. Deciduous. 60 ft. Timber useful. P, S.
- Plectronia, *Linn.*; Rubiaceæ—  
*P. spinosa*, P.
- Pleroma, *Don.*; Melastomaceæ—  
*P. heteromalla*, *Don.* Brazil. Ev. sh., 6 ft. P.
- Plumbago, *Linn.*; Plumbagineæ—  
*P. capensis*, *Thunb.* Cape of Good Hope. Cape Leadwort. Ev. sh., 10 ft. P.
- Plumeria, *Linn.*; Apocynaceæ—  
*P. acuminata*, *Ait.* E. Indies. Franchipanier or Pagoda-tree. 20 ft. P.
- Podocarpus, *L'Her.*; Coniferæ—  
*P. elata*, *R. Br.* E. Australia. White or She Pine. Ev. tr., 120 ft. Timber useful. P, S, SS.
- Poinciana, *Linn.*; Leguminosæ—  
*P. regia*, *Boj.* Madagascar. Royal Peacock Flower. Ev. tr., 50 ft. Handsome flowers. P, S, SS.
- Pollinia, *Trin.*; Gramineæ—  
*P. fulva*, *Benth.* Australia. Sugar-grass. P.
- Pongamia, *Vent.*; Leguminosæ—  
*P. glabra*, *Vent.* E. Indies. Poonga Oil-plant. 10 ft. Medicinal. P.
- Populus, *Linn.*; Salicinæ—  
*P. dilatata*, *Linn.* Italy. Upright or Lombardy Poplar. Deciduous tree. 150 ft. Timber of great value. P.
- Pothos, *Linn.*; Aroidæ—  
*P. aurea*, Solomon Islands. Ev. cl. Suitable for bush-house. P.
- Fritchardia, *Seem et Wendl.*; Palmæ—  
*P. Gaudichaudii*, Sandwich Islands. P.  
*P. Thurstonii*, P.
- Pseudarthria Leguminosæ—*P. Hookeri*, P.
- Psidium, *Linn.*; Myrtaceæ—  
*P. Cattleianum*, *Sabine.* Brazil. Purple Guava, Ev. tr., 20 ft. P. SS.
- Ptychosperma, *Labill.*; Palmæ—  
*P. elegans*, *Blume.* Lord Howe's Island. Bangalow Palm. P.
- Punica, *Linn.*; Lythraceæ—  
*P. granatum*, *Linn.* E. Indies. Common Pomegranate. Deciduous shrub, 30 ft. P.
- Putranjiva, *Roxburghii* Euphorbiaceæ. P.
- Quercus, *Linn.*; Cupulifereæ—  
*Q. agrifolia*, *Née.* N. W. America. Ev. tr., 20 ft. P.  
*Q. Douglasii*, P.  
*Q. glauca*, *Thunb.* Japan. Sea-green Japan Oak. 30 ft. P.  
*Q. lusitanica*, *Willd.* South Europe and North Africa. Portugal Oak. Ev. tr., 40 ft. P.  
*Q. pedunculata*, *Willd.* Europe. British Oak, 100 ft. Valuable timber. P, SS.  
*Q. suber*, *Linn.* S. Europe and N. Africa. Cork Oak. Ev. tr., 40 ft. Cork of commerce. P.  
*Q. Valonia*, P.
- Quisqualis, *Linn.*; Combretaceæ—  
*Q. indica*, *Roxb.* E. Indies. Rangoon Creeper. Ev. cl. P, SS.
- Randia, *Linn.*; Rubiaceæ—  
*R. dumetorum*, *Wallich.* E. Indies. Ev. sh., 5 ft. White flower. P.  
*R. Fitzalani*, *F. v. M.* Queensland. Ev. tr., 12 ft. White flower. P.
- Ravenala, *Adans.*; Scitamineæ—  
*R. madagascariensis*, *Sonner.* Madagascar. Travellers' Tree. Ev. sh., 20 ft. SS.
- Rhaphiolepis, *Lindl.*; Rosaceæ—  
*R. indica*, *Lindl.* China. Indian Hawthorn. Ev. sh., 10 ft. S, P.  
*R. ovata*, *Lindl.* China. Ovate-leaved Indian Hawthorn. Ev. sh., 6 ft. SS, P.
- Rhapis, *Linn.*; Palmæ—  
*R. flabelliformis*, *Ait.* China and Japan. Ground Rattan-cane. 5 ft. P.
- Rhœo, *Hance*; Commelynaceæ—  
*R. discolor*, *Hance.* C. America. P.
- Rhopalostylis, *Wendl et Drude*; Palmæ—  
*R. sapida*, *W. et D.* New Zealand. N. Z. Cabbage Palm. 30 ft. P.
- Rhus, *Linn.*; Anacardiaceæ—  
*R. punjabensis*, P.  
*R. succedanea*, *Linn.* Japan and China. Red Lac or Japanese Wax-tree. Ev. sh. 15 feet. P.
- Ricinus, *Linn.*; Euphorbiaceæ—  
*R. communis*, *Linn.* Arabia and N. Africa. Castor-oil plant. Ev. tr. 20 ft. S.
- Rivina, *Linn.*; Phytolaccaceæ—  
*R. humilis*, Carribbee Islands. Ev. sh., 2 ft. P.
- Romneya; Papaveraceæ—  
*R. Coulteri*, California. P.
- Rosa, *Linn.*; Rosaceæ—  
*R. moschata*, *Miller.* Barbary. Musk Rose. P.
- Roses (various varieties). P, C.
- Rosmarinus, *Linn.*; Labiatae—  
*R. officinalis*, *Linn.* Asia Minor. Rosemary. Ev. sh., 4 ft. Medicinal. P.
- Rubus, *Linn.*; Rosaceæ—  
*R. elipticus*, P.
- Rumex, *Linn.*; Polygonaceæ—  
*R. hymenoccephala*, P.
- Russelia, *Jacq.*; Scrophularinæ—  
*R. juncea*, *Zucc.* Mexico. Ev. sh., 6 ft. P.
- Ruta, *Linn.*; Rutaceæ—  
*R. gravecolens*, *Linn.* S. Europe. Common Rue. Herb., 3 ft. Medicinal. P.
- Sabal, *Adans.*; Palmæ—  
*S. acaulis*, P.  
*S. Adansonii*, *Guers.* Florida. Stemless Fan Palm. P.  
*S. Blackburniana*, *Glazeb.* Tropics. 25 ft. P, SS.  
*S. mauritiiformis*, *Griseb. et Wendl.* Trinidad. Savannah Palm. P, S.  
*S. minor*, P.  
*S. Palmetto*, *Lodd.* Georgia. Cabbage Palmetto Palm. 40 ft. SS.  
*S. princeps*, P.  
*S. sp.* Trinidad. P.  
*S. umbraculifera*, *Griseb.* Jamaica. Tallipot Palm. P.
- Saccharum, *Linn.*; Gramineæ—  
*S. officinarum*, *Linn.* India, China, and New Caledonia. Varieties of sugar-cane as under: Bais rouge, Bamboo rouge, Borneo, Galogo C, Iscambine rouge, Louzier royee, Otamite, Port Mackay, Settlers, Tamarin. P.
- Salix, *Linn.*; Salicinæ—  
*S. caprea*, *Linn.* Britain. Common Sallow. Goat Willow. Deciduous tree; 30 ft. P.  
*S. phylicifolia*, *Linn.* Britain. Tea-leaved Willow. 10 ft. P.  
*S. Russelliana*, *Smith.* England. Deciduous tree 40 ft. P.
- Salvia, *Linn.*; Labiateæ—  
*S. coccinea*, *Benth.* S. America. Herbaceous perennial, 4 ft. P.  
*S. officinalis*, *Linn.* S. Europe. Common Sage. Herb. P.
- Sambucus, *Linn.*; Caprifoliaceæ—  
*S. variegata*.
- Sanchezia, *Ruiz et Pav*; Acanthaceæ—  
*S. nobilis*, Ecuador. Ev. sh. 6 ft. P.
- Sansevieria, *Thunb.*—  
*S. cylindrica*, *Bojer.* Trop. Africa. Fibre plant. P.  
*S. guineensis*, *Willd.* Trop. Africa. African Bowstring Hemp. P.  
*S. zeylanica*, *Willd.* Tropics. Fibre plant. P.
- Saraca, *Linn.*; Leguminosæ—  
*S. papaya*, P.
- Schinus, *Linn.*; Anacardiaceæ—  
*S. molle*, *Linn.* Mexico and Peru. Peruvian Pepper. Ev. tr., 15 ft. Medicinal. P, S.
- Schotia, *Jacq.*; Leguminosæ—  
*S. brachypetala*, P.  
*S. Patifolia*, *Jacq.* S. Africa. Elephant Hedge Bean. Ev. tr., 20 ft. P, S, SS.

- Senecio, *Linn.*; Compositæ—  
*S. Kleinia*, *Linn.* S. Africa. P.  
*Sida*, *Linn.*; Malvaceæ—  
*S. corylifolia*. P.
- Smilax, *Linn.*; Liliaceæ—  
*S. Kraussiana*. P.
- Sophora, *Linn.*; Leguminosæ—  
*S. violacea*. P.
- Spathodea, *Beauv.*; Bignoniaceæ—  
*S. campanulata*, *Beauv.* W. Africa. Tulip-tree. 50 feet.  
 Handsome flower. P.
- Spiræa, *Linn.*; Rosaceæ—  
*S. bella*, *Linn.* Nepaul. Sh., 3 ft. Red flower. P.  
*S. callosa*, *Thunb.* China. Deciduous sh., 2 ft. White  
 flower. P.
- Spondias, *Linn.*; Anacardiaceæ—  
*S. pleiogyna*, *F. v. M.* Queensland. Bur lekin Plum. Ev. tr., 30  
 ft. Fruit edible. P, S, SS.
- Sporobolus, *R. Br.*; Gramineæ—  
*S. indicus*, *R. Br.* Tropics and sub-tropics. Rats'-tail  
 grass. P.  
*S. indicus*, var. *elongatus*. *R. Br.* Australia. P.
- Stachys, *Linn.*; Labiatae—  
*S. lanata*, *Jacq.* Siberia. P.
- Stachytarpheta *Vahl.*; Verbenaceæ—  
*S. mutabilis*, *Vahl.* S. America. Ev. sh., 3 ft. Crimson  
 flower. P.
- Stenocarpus, *R. Br.*; Proteaceæ—  
*S. salignus*, *R. Br.* Australia. Willow-leaved Stenocarpus or  
 Beefwood-tree, 50 ft. P, S, SS.  
*S. sinuatus*, *Endl.* Australia. Queensland Tulip-tree or Fire-  
 tree. Deciduous. 60 ft. Handsome scarlet flower.  
 P, S, SS.
- Sterculia, *Linn.*; Sterculiaceæ—  
*S. acerifolia*, *A. Cunn.* N. S. Wales and Queensland. Flame-  
 tree or Lace Bark of N. S. Wales. P, SS.  
*S. diversifolia*, *G. Don.* Australia. Victorian Bottle-tree.  
 Currijong. Timber useful. P.
- Stigmaphyllon, *A. Juss.*; Malpighiaceæ—  
*S. jatrophaefolium*, *Juss.* Brazil. Ev. climber. Yellow flower. P.
- Strelitzia, *Banks.*; Scitamineæ—  
*S. angustifolia*, *Dry.* S. Africa. Narrow-leaved Birds-tongue  
 flower. SS.  
*S. augusta*, *Thunb.* S. Africa. Birds-tongue flower. P, S.
- Strobilanthes, *Blume.*; Acanthaceæ—  
*S. Dyeriana*. P.
- Strychnos, *Linn.*; Loganiaceæ—  
*S. Nux-vomica*, *Linn.* E. Indies. Nux-vomica-tree. Medicinal.  
 SS.
- Syncarpia, *Ten.*; Myrtaceæ—  
*S. laurifolia*, *Ten.* E. Australia. N. S. Wales Turpentine-tree.  
 Ev., 60 ft. S.
- Tabernæmontana, *Linn.*; Apocynaceæ—  
*T. coronaria*, *Willd.* E. Indies. Adam's Apple. Ev. sh., 6 ft.  
 White flower. P.  
*T. orientalis*, *R. Br.* Queensland. Queensland Cow-tree. P.
- Tamarindus, *Linn.*; Leguminosæ—  
*T. indica*, *Linn.* E. Indies. Tamarind-tree. Ev., 60 ft. Fruit  
 and timber useful. P.
- Tamarix, *Linn.*; Tamariscineæ—  
*T. gallica*, *Linn.* Europe. Tamarisk or Flowering Cypress.  
 10 ft. P.
- Tanacetum, *Linn.*; Compositæ—  
*T. vulgare*, *Linn.* Europe. Tansy. Herb. P.
- Taxodium, *L. C. Rich.*; Coniferæ—  
*T. distichum*, *Rich.* N. America. Virginian Swamp or Bald  
 Cypress. Deciduous-tree, 120 ft. P, S.
- Tecoma, *Juss.*; Bignoniaceæ—  
*T. capensis*, *R. Br.* S. Africa. West Indian Cape Honeysuckle  
 or Fire Flower. Ev. cl. P.  
*T. stans*, *Juss.* S. America. Shrubby Trumpet Flower. Ev. sh.,  
 12 ft. Yellow flower. P, SS.
- Tephrosia, *Pers.*; Leguminosæ—  
*T. Kraussiana*. P.
- Terminalia, *Linn.*; Combretaceæ—  
*T. arjuna*, *Beddome.* E. Indies. Arjun-tree of Bengal. Ev.,  
 80 ft. Timber and gum. P, S.  
*T. belerica*, *Roxb.* E. Indies. Belleric Myrobalan-tree. Ev.  
 Timber, Fruit, Dye, and Tan plant. P.
- Theobroma, *Linn.*; Sterculiaceæ—  
*T. cacao*, *Linn.* S. America. Cocoa and chocolate of commerce. P.
- Thevetia, *Linn.*; Apocynaceæ—  
*T. nerifolia*, *Juss.* E. Indies. Exile Oil Plant. Ev. sh.,  
 12 ft. Oil obtained from seeds. P.
- Thrinax, *Linn. f.*; Palmæ—  
*T. argentea*, *Lodd.* W. Indies. Silver-thatch Palm. 15 ft.;  
 used for making hats, baskets, &c. P.
- Thuja, *Linn.*; Coniferæ—  
*T. orientalis*, var. *aurea*, *Hort.* China. Dwarf Golden Arbor-  
 vitæ. Ev. sh., 5 ft. P.  
*T. pendula*, *Lamb.* China and Japan. Weeping Arbor-vitæ.  
 Ev. tr., 20 ft. P, S, SS.
- Thunbergia, *Linn. f.*; Acanthaceæ—  
*T. erecta*, *Benth et Hook.* W. Africa. Ev. sh., 4 ft. P.  
*T. grandiflora*, *Roxb.* China and India. Great-flowered Thun-  
 bergia. Ev. cl. Blue flower. P.  
*T. laurifolia*, *Linn. f.* India, &c. Laurel-leaved Thunbergia.  
 Ev. cl. P.
- Thymus, *Linn.*; Labiatae—  
*T. vulgaris*, *Linn.* Southern Europe. Common Thyme. Herb.  
 P.
- Toddalia, *Rutaceæ*—  
*T. lanceolata*. Tropics. P.
- Trachelospermum, *Lemaire*; Apocynaceæ—  
*T. jasminoides*, var. *variegata*, *Lemaire.* Ev. cl. P.
- Triplaris, *Linn.*; Polygonaceæ—  
*T. Lindeni*. P.
- Trachycarpus, *Wendl.*; Palmæ—  
*T. excelsus*, *Wehd.* Japan. P.
- Tripsacum, *Linn.*; Gramineæ—  
*T. dactyloides*. P.
- Triraphis; Gramineæ—  
*T. mollis*. P.
- Tristania, *R. Br.*; Myrtaceæ—  
*T. conferta*, *R. Br.* E. Australia. Brisbane box-tree. Ev.,  
 50 ft. Timber useful. P, S.  
*T. laurina*, *R. Br.* E. Australia. Laurel-leaved Tristania.  
 Ev. sh. P.
- Tropæolum, *Linn.*; Geraniaceæ—  
*T. pentaphyllum*, *Lamarck.* Monte Video. Five-fingered  
 Indian cress. Climber. P.
- Turraea, *Linn.*; Meliaceæ—  
*T. hete ophylla*. Upper Guinea. P.
- Uniola, *Linn.*; Gramineæ—  
*U. latifolia*, *Michaux.* N. America. Broad-leaved seaside  
 oat. P.
- Uraria, *Desvaux*; Leguminosæ—  
*U. crinita*, *Desv.* India. P.
- Uvaria; Anonaceæ—  
*U. caffra*. P.
- Vangueria, *Juss.*; Rubiaceæ—  
*V. edulis*, *Vahl.* Trop. Africa. Fruit edible. P.  
*V. lasiantha*. P.
- Veronica, *Linn.*; Scrophularineæ—  
*V. saxatilis*. Britain. Rock speedwell. Blue flower. P.
- Viburnum, *Linn.*; Caprifoliaceæ—  
*V. Tinus*, *Linn.* S. Europe. Laurestinus. Ev. sh., 6 ft. P.
- Vitex, *Linn.*; Verbenaceæ—  
*V. trifolia*, *Linn.* E. Indies and Australia. Filfil-burree or  
 Wild Pepper of India. Ev. sh., 10 ft. P.
- Vitis, *Linn.*; Ampelideæ—  
*V. persica*. P.  
*V. semi-glabra*. P.  
*V. serianæfolia*. P.
- Vriesia, *Glaziovii*—  
 Washingtonia, *Wendl.*; Palmæ.  
*W. filifera*, *Wendl.* California. 40 ft. P.  
*W. robusta*, *Wendl.* California. 7 ft. P.  
*W. Sonoræ*, *Wendl.* P.
- Wellingtonia, *Lindl.*; Coniferæ—  
*W. gigantea*, *Lindl.* California. Mammoth-tree. 300 ft. P.
- Willemetia, *Neck*; Rhamneæ—  
*W. capensis*. S. Africa. Ev. sh., 10 ft. Hedge plant. P, S, SS.
- Wistaria, *Nutt.*; Leguminosæ—  
*W. sinensis*, *D.C.* China. Chinese Kidney-bean. Deciduous;  
 climber. Handsome lavender-coloured flower. P.
- Yucca, *Linn.*; Liliaceæ—  
*Y. aloifolia*, var. *variegata*. Mexico. Variegated Dagger-leaf.  
 12 ft. P.  
*Y. Whipplei*. California. P.
- Zephyranthes, *Herb.*; Amaryllidæ—  
*Z. candida*, *Herb.* Buenos Ayres. Zephyr Lily. White.  
 Bulb. B.
- Zingiber, *Adans.*; Scitamineæ—  
*Z. officinalis*, var. *Cholmondeleyi*, *Baill.* Queensland. P.  
*Z. sp.* New Guinea. P.
- Zizyphus, *Juss.*; Rhamneæ—  
*Z. rugosa*. P.



## REPORT OF THE STATE NURSERY, KAMERUNGA.

SIR,—I have the honour to submit the Annual Report for the year ending 30th June, 1901.

The weather for the past year has again been unusual. The dry months during the early part of the year were very trying for many of the delicate plants, for not only was the weather hot, but the supply of water was at times short. The unusual length of the dry season resulted in the river being so low that the water at the pumping station was tainted by the salt water at high tides, and was therefore useless for irrigation purposes. For a short time the plants had to depend upon the supply of water in the rainwater tanks.

The rainfall for the year was 86·833 inches, which was 7·688 inches in excess of last year's fall, though still considerably below the average of the district. The greater part of this fell between January and May, 1901, during which five months 78 inches were registered.

Owing to steady and regular work last year much less trouble was experienced with weeds, but the weeding and keeping clean of the Nursery was nevertheless a large item.

The growth of trees and plants permanently planted out has been good, and the general appearance of the Nursery much improved thereby.

This involved considerable work in the direction of lopping and pruning, and disclosed many cases where valuable trees, having been planted too close, were over-growing one another, and becoming misshapen or unsightly by reason of over-crowding.

The general field work has been heavy, but the place nevertheless kept in good order. The pruning, potting, packing, and despatching of plants has been considerable, the applications and disbursement of plants having been considerably in excess of any previous year of the life of the Nursery.

The number of applications for plants and seed have been numerous, and from all parts of Queensland, southern colonies, Fiji, Samoa, India, New Guinea, and other countries.

The distributions have been as follow:—

Seed.—3 cwt. 0 qr. 27 lb. 8½ oz.

Seed in packets.—239.

Plants.—2,881.

Cuttings.—1,167.

Rhizomes.—5 cwt. 3 qr. 23¼ lb.

Bulbs and suckers.—148.

Cane.—6 tons 4 cwt. 1 qr.

Various.—Fruit, 20 lb.; ferns, 1 crate; fruit, 5 cases; cocoanuts, 30.

Besides these distributions some 7 cwt. of various seed, mostly divi-divi pods, are stored to be dealt with later on. Of the cane (which was included among the number of plants distributed last year) the varieties were mostly *Kewensis* and New South Wales canes.

The correspondence has been a heavy item in the work of the Nursery during the past twelve months, as so large a proportion consisted of information and advice on agricultural and horticultural matters. The incoming letters amounted to 682, and the outgoing to 800; reports on various matters, irrespective of monthly returns, accounts, &c., 22.

The fields into which the Nursery is divided up are occupied as follows:—

*Field 1, Sec. I.*—Citrus fruit trees, palms, rubber trees, kola-nut trees, coffee, cocoa, and other fruit trees. No. 1 (a) contains Manila hemp and a few other varieties of the *Musa* family.

*Field 2, Sec. I.*—On which cottages and offices stand, by tamarind and other fruit trees and ornamental shrubs. No. 2 (a) by yams of several varieties, cotton, castor oil, beds of citrus seedlings, &c. The ginger, arrow-root, and turmeric were removed from here during the year to Field 2, Sec. II.

*Field 3, Sec. I.*—On which the germinating house and meteorological instruments stand. Mangoes of varieties, *Annona* family, fibres and citrus-trees; also *Panicum maximum*, and other grasses.

*Field 1, Sec. II.*—Is under seven varieties of beans, partly to obtain supplies and stocks of seed, and partly to be ploughed in for manurial purposes. This field last year was under cane, which was dug out by mattock, there being neither horse-power nor implements available wherewith to plough out the old cane stools. The cane varieties were replanted in Field 3, Sec. III.

*Field 2, Sec. II.*—On which the bush-houses and stables stand. Para rubber, *Castilloa* rubber, arrowroot, turmeric, ginger, tobacco, &c.

*Field 3, Sec. II.*—Cow-pea varieties, Mauritius beans, three varieties of sweet potatoes, Liberian coffee, &c.

*Field 1, Sec. III.*—Entirely under Ceara rubber.

*Field 2, Sec. III.*—West African rubber and pa-paws, corn and sorghums.

*Field 3, Sec. III.*—New Guinea and other cane varieties, four varieties of pineapples, and Ceara rubber.

As already stated, the growth of trees all through the Nursery has been noticeable, and those planted on the borders of roads have in many instances attained sufficient dimensions to make handsome avenues. Of these, between Fields 1 of Sec. I. and II., the main drive, the avenue is almost entirely covered, the chief trees being *Albizia odoratissima*, *Ficus elastica*, and *Cassia grandiflora*. On the road between Fields 3, Sec. I. and II., the avenue consists of palms, which are as yet small. The road between Fields 1 and 2, Sec. II., is bordered by divi-divi trees which, though not tall trees, lend themselves very well to avenues over footpaths. Between Fields 2 and 3 of Sec. II. are *Cassia fistula* and *Sieberiana* and *Poinciana regia*. The avenue between Fields 1 in Sec. II. and III. consists of *Spondias dulcis* and a few *Terminalia catappa*, the autumnal tints of the foliage of which makes it a desirable tree in landscape gardening. The mango avenue between Fields 1 and 2 of Sec. III. would have been more ornamental had the trees been planted somewhat further apart. The avenue of palms between Fields 2 of Sec. II. and III. is the most handsome of any, having *Caryota urens* on the one side and *Areca rubra* on the other, all of which are now growing rapidly and well. On the eastern border of Field 1, Sec. III., are *Cocos nucifera* and *Elæis Guineensis*, and on the south side of Fields 1 and 2 of the same section are varieties of mangoes, which not only shade the walks, but, while keeping permanent specimens of valuable trees, add greatly to the appearance of the Nursery.

**SUGAR-CANES.**—These show much better growth, generally, since replanting into Field 3, Sec. III. Some of the original varieties seem to have been lost some few years back, which is to be regretted, as there would appear to be some valuable canes among them, especially in the New Guinea collection. No special work has been done among these canes, and even the names or numbers wherewith they were labelled when the Nursery was taken over would seem in some instances to be of doubtful correctness. A general re-identification and weeding out might be of advantage, or at any rate a selection made and information recorded regarding the more useful varieties that may be distributed. Possibly the collection might be completed from some of the departmental or other institutions where specimen plants were also sent originally.

**CITRUS-TREES.**—Frequent spraying and attention has considerably reduced the amount of scale and other pests on the trees, and painting the stems with limewash has also improved them. The crop would have been fair had fruit fly and moths not spoiled the greater part. Flying foxes were also troublesome in this and other fruit during the earlier part of the season. A secondary crop was obtained from some trees which has ripened better. A large quantity of scions, grafts, and seedlings have been distributed.

**BANANAS** (*Musa*).—The New Guinea varieties have proved practically useless, and, not being named, very little beyond preserving a few of each variety has been done. One or two varieties, new to the Nursery, have been added to the list. Some suckers sent up from the head offices in Brisbane, also without names, are in bearing, but are too young as yet to determine their comparative value.

**COCOA** (*Theobroma cacao*).—Several other trees besides the one mentioned last year have come into bearing from which seed was obtained and germinated. A special tree in Field I, Sec. I., on which pruning experiments were carried out is conspicuous among the others for size, shape, and healthiness. A number of plants were distributed, and a small charge of 6d. each was made. It is anticipated that more will be available this year.

**MANGOSTEEN** (*Garcinia mangostana*).—The two trees from the bush-house have been transplanted to the new clearing, but have not done well. None of these trees seem to have adapted themselves kindly to the climate or soil, and it is to be feared that the prospects of acclimatising and propagating this most excellent of fruit are not good.

**PALMS** (VARIOUS).—A number of new varieties have been added to the list of palms at the Nursery. Among the most useful of these ornamental as well as useful trees may be mentioned the wine palm, West African oil palm, date, bastard sago and sugar palms, not forgetting the cocoanut. There are many other varieties of palm-trees of very great economic value that it would be useful to have in the Nursery—for instance, the palmyra palm of India. A large number of both plants and seed of the several varieties of palms have been distributed during the year.

**BREADFRUIT** (*Artocarpus incisa*).—Of some fifteen known varieties of this tree only one is growing at the Nursery. This one is seedless, and is supposed to be the best of them. A fair crop was obtained this year, of which some were sent down to Brisbane. The trees, which were much damaged by frost in 1899, have rapidly recovered, though they have not yet made up the height lost. No frost was experienced this year. Seed of another variety has recently been obtained.

**SPICES** (VARIOUS).—It is to be regretted that seed or plants of nutmeg, cloves, cardamoms, &c., could not be obtained. A few seed of the latter were obtained from Samoa, and five plants raised with some little difficulty. These are doing well so far, but will take another year to come into bearing. The cinnamon is growing well, and plants of this are available.

**ALGAROBA OR MESQUIT BEAN** (*Prosopis juliflora*).—The tree is strong and healthy, and has attained a height of some 30 feet. The crop was good, and applications for seed, though numerous, have been met this year. Plants have also been raised, and several more planted out permanently. Both plants and seed are available.

**KOLA-NUT** (*Sterculia acuminata*).—No crop was obtained again this year, but the trees are strong and healthy. One or two show signs of blossoming now, and it is hoped that they will bear when older. The climatic conditions of the locality, however, do not seem favourable to crop bearing, the trees making a great deal of wood and no blossom. Experiments in pruning are being conducted.

**RUBBERS**.—*Manihot Glaziovii* (Ceara) is doing well, and the trees are growing steadily. Two are of fair size but seem very brittle, and, unfortunately, the largest was lost by being blown down. There are not enough large trees to tap yet and for any experiments in that direction to be carried out. A quantity of seed has been distributed, mostly out of the colony. *Hevea brasiliensis* (Pará) has made good growth also. Trees planted out the season before last are 12 to 20 feet high, but very slender. *Castilloa elastica*.—These seem slow-growing, but are healthy. Planted early in the year, they are only 2 to 3 feet high. *Ficus elastica* (Assam Rubber).—These rubber-bearing fig-trees have adapted themselves very readily to the conditions obtaining here, and are strong-growing and large. Though having plenty of milky sap, they do not yet seem old enough to contain much true rubber. The unnamed West African rubbers have grown well. Several have blossomed and have shown a pure-white waxy flower of sweet scent. Only one tree, of some 8 or 9 feet in height, has borne, giving a spherical fruit about 3 inches in diameter which, when ripe, turned reddish-brown in colour. It is anticipated that a number of fruit will be obtained during the coming year, which, it is hoped, will also be larger, the weight of the fruit obtained being only some 8 oz.—considerably short of the weight they are supposed to attain—namely, 2 lb. Two or three indigenous plants that seem particularly strong in rubber are being cultivated with a view of experimental tapping when old enough.

**FIBRES**.—All varieties are thriving. Sufficient only is being kept for propagating purposes; there being no decorticator available, it was not possible to undertake any experiments *re* crop per acre, value, &c. Small quantities of several varieties were extracted by hand, for exhibition purposes only.

**PINEAPPLES**.—A supply of three varieties was obtained from the head office during the year, and another variety obtained locally. Suckers will be available for distribution.

**SORGHUMS**.—The season has not been a good one for sorghums. Sufficient for a supply of seed, however, has been grown, for which there has been considerable demand. The giant Honduras has again proved itself much the most useful; of the others the following are good:—Sorghum saccharatum, amber cane, early orange cane, planter's friend, white Kafir corn, and red Kafir corn. The first of these has in the second generation disclosed a number of apparently different varieties from black to light-brown and amber.

**COW PEAS AND BEANS**.—White's perennial cow pea has proved the best in point of quantity of greenstuff per acre of the cow peas, running to nearly 11 tons. Of beans the Mauritius bean—green, mottled, and black—in the order mentioned, covered the ground best, the green running to nearly 21 tons per acre, the Florida velvet bean being next in order with over 13 tons. The harico bean is also good at covering the ground, and produced over 11 tons of greenstuff per acre.

**ROOT CROPS**.—Bermuda arrowroot, turmeric, and Jamaica ginger have all done well in the new field. A considerable amount of arrowroot has been distributed. Jamaica ginger, for which the demand has been hitherto much in excess of the supply, has cropped well, and will be available for distribution this year.

The addition to the Nursery, consisting of 3½ acres of scrub land that was brushed last season, has been fenced in during the year. The posts were split and erected by contract, but the three lines of barbed wire and gate put up by our own labour. About half of this, or about 1½ acres, has been pitted 2 x 2 feet, and planted with about 300 cocoa-trees, raised on the Nursery. The plants did well, but considerable trouble was experienced from grubs, which cut through the roots and stem of the young plants just below ground. From this cause a number died and had to be replaced. These are doing well now. A record is being kept of the cost of work in connection with this cocoa, and it is proposed to work the experiment carefully out in detail, to cure and ship the crop as produced, and report on the value and returns as obtained.

On the other portion of this clearing 134 cuttings of *Vanilla planifolia*, obtained from Fiji, have been planted and are doing, so far, exceptionally well. Some cuttings of *Piper nigrum* are coming on slowly. Plants of *Piper methysticum*, from the root of which the New Guinea "Kava" drink is made, are doing fairly well.

The mangosteins, as have already been mentioned, are not thriving.

Cuttings of *Monstera deliciosa* would, however, seem to appreciate the new conditions of partial shade obtained in this clearing.

Ginger and tobacco, grown for seed, are doing exceptionally well, especially "Comstock Spanish" tobacco.

Plants or seeds of the following have been added to those already at the Nursery during the year:—Red banana, smooth-leaved, rough-leaved; Ripley queen and red Mauritius pineapples, cherry and gooseberry guava, *Yun-tau* and *Wampee* (Chinese fruit), *Aberia caffra*, *Anona cherimolia*, *Kentia exorrhiza*, *Phoenix carariensis*, *Thea chinensis*, *Physalis peruviana*, *Erythroxylon coca*, *Moringa pterygosperma*, *Terninalia robusta*, *Ficus indic*; mango varieties, *Garcinia cochinchinensis*, *Hymenaea courbaril*, *Elettaria cardamomum*, *Glycine hispida*, *Dotichos lab-lab*, *Eugenia malaccensis*, and several varieties of wattle and other trees

The pump and machinery have been working well during the season. The fire-bars had to be replaced and a new iron chimney put in, and besides this a few small repairs in piping, &c., that were mostly done by the Nursery labour.

The germinating house, built early in the year, has been of great advantage and in use throughout the whole season. Many delicate seeds and plants having been germinated and propagated therein. It is to be regretted that it was not possible to paint this small building when erected. The painting of most of the buildings is necessary, as already reported, and should be done during the first half-year, when dry weather may be anticipated, to save deterioration.

The fence round the Nursery also needs a number of new posts. Negotiations with the Railway Department for sleepers for this purpose fell through, and the work will be done by resident labour during the coming dry season.

A supply of pots was received, and these have been of great utility. Large pots for slow-growing plants and shrubs, too large for the bush-house, and yet too small or delicate to be planted out in the open field, would be of great service.

Small charges on plants and seeds distributed have been made in some instances, sufficient only to cover postages, packing, and railage, or cartage. The total amount charged amounted to £8 1s. 6d., of which £7 13s. 3d. has been collected and remitted.

For cocoa-trees, as already mentioned, a small charge of 6d. each was made, and a number distributed. The charges for these were in most cases paid directly to the head office in Brisbane.

A number of plants of shade and ornamental, as well as useful trees, have been distributed free of any charges to Government institutions, such as public schools, parks, recreation grounds, and hospitals.

The State Nursery sent trophies to the following exhibitions during the year, which were much appreciated:—Mackay show in July, 1900; Port Douglas show in August, 1900; Cairns show in September, 1900; and Townsville show in 1901.

Mr. G. B. Brooks, the overseer, was transferred during the year, leaving on the 27th April, at very short notice, to take charge of the Biggenden State Farm. No overseer has yet been appointed in his place, but the leading hand, Mr. J. G. Malcolm, has been appointed foreman with a slight increment of salary.

HOWARD NEWPORT, Manager.

SCHEDULE A.

ABSTRACT of METEOROLOGICAL OBSERVATIONS for YEAR ended 30TH JUNE, 1901, taken at the State Nursery, Kamerunga, Cairns.—Readings at 9.20 a.m.

Thermometer Readings.	1900.						1901.						Totals and Averages.
	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	
Mean maximum ...	78.37	81.93	83.61	85.33	88.30	87.86	89.1	84.97	87.06	84.78	79.03	78.65	Mean average maximum, 84.074.
Extreme maximum ...	83.5	86.5	88.5	90.0	92.0	101.5	97.0	89.0	92.0	87.5	85.0	82.0	Extreme maximum, 101.5.
On date ...	28th	19th	13th	30th	25th	12th	12th	27th	13th	1st	2nd	6th	On date, 12th December, 1900.
Mean minimum ...	61.74	60.82	67.6	65.70	71.01	72.1	71.6	71.41	71.46	68.73	65.69	61.51	Mean average minimum, 67.447.
Extreme minimum ...	51.0	51.5	61.0	61.0	65.5	68.0	65.5	68.0	63.0	62.0	51.0	49.0	Extreme minimum, 49.0.
On date ...	1st	7th	6th	21st	2nd	20th	19th	1st	31st	30th	2nd	27th	On date, 27th June, 1901.
Mean temperatures ...	70.05	71.37	75.6	75.51	79.65	79.98	80.35	78.14	79.26	76.75	72.36	70.08	Mean average temperature, 75.76.
Rainfall—Inches ...	0.180	0.030	1.420	1.975	1.280	2.375	19.906	22.362	12.990	9.570	13.180	1.565	{ Total rainfall for 1899-1900—79.145. " " " 1900-1901—86.833.
Number of days on which rain fell	6	1	4	8	7	16	18	17	20	14	21	6	{ No. of days rain fell, 1899-1900—142. " " " 1900-1901—138.

SCHEDULE B.

PLANTS AND SEEDS GROWN AND AVAILABLE FOR DISTRIBUTION AT KAMERUNGA STATE NURSERY, CAIRNS.

Common.	Botanical.	Plants or Seeds Available.	Common.	Botanical.	Plants or Seeds Available.
Para Rubber ...	<i>Hevea braziliensis</i>		Papaw ...	<i>Carica papaya</i> ...	Seeds
Ceara " ...	<i>Manihot Glaziovii</i> ...	Seeds & plants	Persimmon ...	<i>Diospyros kaki</i> ...	Seeds & plants
Assam " ...	<i>Ficus elastica</i> ...	Cuttings	Jack Fruit ...	<i>Artocarpus integrifolia</i>	" "
Mexican " ...	<i>Castilleja elastica</i>		Bread Fruit ...	" <i>incisa</i> ...	Plants
African " ...	Unnamed		Mangosteen ...	<i>Garcinia mangostana</i>	
Ramie Fibre ...	<i>Bœhmeria nivea</i> ...	Plants	Pomegranate ...	<i>Punica granatum</i> ...	"
Sisal " ...	<i>Agave rigida</i> ...	"	Guava (4 vars.) ...	<i>Psidium guava</i> ...	Seeds & plants
Manila Hemp ...	<i>Musa textilis</i> ...	"	Litchi ...	<i>Nephelium litchi</i> ...	" "
	<i>Fourcroya gigantea</i> ...	"	Madagascar Plum	<i>Flacourtia ramontchi</i> ...	" "
Annatto ...	<i>Bixa Orellana</i> ...	Seeds & plants	Brazilian Cherry ...	<i>Eugenia uniflora</i> ...	" "
Mango ...	<i>Mangifera indica</i> ...	" "	Carob Bean ...	<i>Ceratonia siliqua</i>	
Sour Sop ...	<i>Anona muricata</i> ...	" "	Date Palm ...	<i>Phoenix dactylifera</i> ...	Plants
Bullock's Heart ...	" <i>reticulata</i>		" " ...	" <i>rupicola</i> ...	Seeds & plants
Star Apple ...	<i>Chrysophyllum cainito</i>		Sugar " ...	<i>Arenga saccharifera</i>	
Algaroba Bean ...	<i>Prosopis juliflora</i> ...	Seeds	Bastard Sago Palm	<i>Caryota urens</i>	

## SCHEDULE B—continued.

PLANTS AND SEEDS GROWN AND AVAILABLE FOR DISTRIBUTION AT KAMERUNGA STATE NURSERY, CAIRNS—continued.

Common.	Botanical.	Plants or Seeds Available.	Common.	Botanical.	Plants or Seeds Available.
Wine Palm ...	Diplolhemium martimum	Plants	Cotton ...	Gossypium arboreum ...	"
West African Oil Palm	Elæis guineensis	Seeds & plants	Tobacco ...	Nicotiana tabacum ...	"
Cocconut Palm ...	Cocos nucifera	" "	Rice ...	Oryza sativa ...	"
Royal " ...	Oreodoxa regia	" "	Russell River Grass	Paspalum galmarra ...	"
Seville Orange ...	Citrus vulgaris ...	" "	Red Natal Grass ...	Panicum teneriffæ ...	"
Sweet " ...	" aurantium	" "	Guinea Grass ...	" maximum ...	"
Mandarin " ...	"	" "		Paspalum dilatatum ...	"
Japanese " ...	" trifoliata	" "	Vi Apple ...	Spondias dulcis ...	Seeds & plants
Sweet Lemon ...		" "	Tamarind ...	Tamarindus indica ...	" "
Tea ...	Thea bohea ...	Seeds	Fijian Almond ...	Terminalia catappa ...	" "
Maté Tea ...	Ilex paraguayensis	Cuttings		" robusta ...	" "
Vanilla ...	Vanilla planifolia	"	Fig ...	Ficus carica ...	Cuttings
Pepper ...	Piper nigrum	"	Divi-divi ...	Cæsalpinia coriaria ...	Seeds & plants
" ...	" methysticum	"	Candle Tree ...	Parmentiera cereifera ...	Plants
Candle Nut ...	Aleurites moluccana	Seeds	Sugar-canes ...	Large number of varieties	Cuttings
Bauhinia ...	Bauhinia variegata	Seeds & plants	Kumquat ...	Citrus japonica ...	Plants & seeds
Sappan ...	Caesalpinia sappan	" "	Lemon ...	" medica, var. limonium	" "
Cassia ...	Cassia grandiflora	" "		Citrus medica, var. limetta	" "
" ...	" fistula	" "	Lime ...		" "
Cocoa ...	Theobroma cacao	" "	Pigeon Pea ...	Cajanus indicus ...	Seeds
Coffee ...	C. arabica	" "	Kola Nut ...	Sterculia acuminata ...	Plants
" ...	C. liberica	" "	Cow Peas (10 vars.)		Seed
" ...	C. maragogipe	" "	Cinnamon ...		Plants
	Monstera deliciosa	Cuttings	Black Mauritius Bean		Seed
Rain-tree ...	Beaumontia grandiflora	"	Green Mauritius Bean		"
	Albizzia saman ...	Seeds & plants	Mottled Mauritius Bean		"
Kafir Doom ...	" stipulata	" "	Florida Velvet Bean		"
	Hyphene thebaica	" "	Narico Bean ...	Dolichos lab lab	"
	Poinciana pulcherrima	" "	White Sword Bean		"
	" regia	" "	Red " "		"
Banana ...	Musa, several var.	Suckers	Poor Man's " "		"
Weeping Fig ...	Ficus Benjaminea	Cuttings	Dwarf Lima " "		"
Striped Bamboo ...	Bambusa	"	Climbing Lima " "		"
Taro ...	Colocasia esculenta	"	Madagascar " "		"
	Antignon amabile	Plants & cuttings	Small Madagascar Bean		"
Mulberry ...	Morus nigrum	Cuttings	Pineapples (4 vars.)		Suckers
Teosinte ...	Euchlæna luxurians	"	Yung Tan ...	Averrhoa carambola	Seed
Sorghum and Kafir Corn (10 vars.)		Seed	Wam Pee ...		"
Black Gram ...	Cicer arietinum	"	Kei Apple ...	Aberia caffra	"
Alexandria Palm ...	Ptychosperma Alexandriæ	Seeds & plants	Cheri Moya ...	Anona cherimolia	"
Fan Palm ...	Sabal Blackburniana	"		Kentia exorrhiza	"
Areca ...	Areca rubra	"		Phoenix canariensis	"
Kentia ...	Kentia monostachya	Seeds & plants	Tea (China) ...	Thea chinensis	"
New Grenada	Martinezia caryotæfolia	"	Cape Gooseberry ...	Physalis peruviana	"
	Cocos plumosa	" "	Coca ...	Erythroxylon coca	"
Arrowroot ...	Maranta arundinacea	"	Horse-radish Tree	Moringa pterygosperma	"
Turmeric ...	Curcuma longa	Rhizomes		Ficus indica	"
Ginger ...	Zingiber officinale	"		Garcinia Cochinchinensis	"
Cassava ...	Manihot aipi	Cuttings	Copal Tree ...	Hymenaea courbaril	"
Yams ...	Dioscorea (5 vars.)	Rhizomes	Cardamon ...	Elletaria Cardamomum	"
Peanut ...	Arachis hypogæa	Seeds	Soy Bean ...	Glycine hispida	"
Granadilla ...	Passiflora quadrangularis	"	Okra or Bandakai	Hibiscus esculentus	"
Passion Fruit ...	Passiflora edulis	"	Rose Apple ...	Eugenia malaccensis	"
Rosella ...	Hibiscus sabdariffa	"			
Castor Oil ...	Ricinus communis	"			

## REPORT OF THE STATE FARM, WESTBROOK.

SIR,—I have the honour to submit the Annual Report for the year ending 30th June:—

Owing to the change of managers taking place last January between this and the Hermitage State Farm, my report must necessarily be somewhat abbreviated.

WEATHER.—These conditions, though very dry in the earlier part of the season, gave every promise of a good harvest; but, as in the preceding year, we experienced heavy late frosts, which inflicted severe damage to the crops of wheat, vines, &amp;c. The following table contains the number of days it rained, and the amount registered for each of the last twelve months:—

Month.	Wet Days.	Rainfall.	Month.	Wet Days.	Rainfall.
July	7	1.85	January	2	1.88
August	8	1.18	February	2	0.73
September	9	0.60	March	12	4.37
October	1	0.04	April	5	3.37
November	9	4.59	May	4	0.74
December	4	1.35	June	7	3.47

Total number of wet days, 70. Rainfall, 24 inches 17 points (24.17).

CEREALS.—The following crops were harvested, the yields being very poor, owing principally to the previous mentioned circumstances:—

Eight acres of Canadian blue-stem wheat, the seed of which was from an imported stock, was so badly mixed that only a small portion was hand-weeded and reserved for grain, the rest being cut for hay.

From 4 acres of Sea of Azov barley only 21 bushels were saved, but 18½ bushels was the result of 1½ acres of Hallet's pedigree.

Three acres of rye were cut and saved for hay, which, when chaffed with cow pea, made an excellent fodder.

The following table shows the details of the experiment with wheats:—

STATE FARM, WESTBROOK.  
WHEAT EXPERIMENTS.

No.	Kind of Experiment.	How Sown.	When Sown.	Area.	Depth of Sowing.	Fertilizer,	Quantity per Acre.	How Applied.	Harvested.	Yield.	Remarks.
1	Unmanured ...	Drilled and rolled	1 June	½ acre	3 In.	Unmanured ...	Nil	...	12 Nov.	Lb. 355	Block 20 complete series; yield, 615 lb.; seed sown 3 inches deep.
2	With fertilizer ...	do. ...	1 "	do.	3	Sulphate of ammonia ...	50	With seed ...	12 "	475	
3	ditto ...	do. ...	1 "	do.	3	Aust. potash ...	50	do. ...	12 "	498	
4	ditto ...	do. ...	1 "	do.	3	Superphosphate No. 1 ...	200	do. ...	12 "	655	
5	ditto ...	do. ...	1 "	do.	3	Sulphate of ammonia and Aust. potash	50	do. ...	12 "	627	
6	ditto ...	do. ...	2 "	do.	3	Sulphate of ammonia and superphosphate	50	do. ...	12 "	545	
7	ditto ...	do. ...	2 "	do.	3	Aust. potash and superphosphate	200	do. ...	13 "	620	
8	ditto ...	do. ...	2 "	do.	3	Sulphate of ammonia, Aust. potash, and superphosphate	25	do. ...	13 "	508	
9	ditto ...	do. ...	2 "	do.	3	ditto ditto ...	50	do. ...	13 "	531	
10	ditto ...	do. ...	2 "	do.	3	ditto ditto ...	100	do. ...	13 "	544	
11	ditto ...	do. ...	2 "	do.	3	Bonedust, sulphate of ammonia, Aust. potash, and superphosphate	120	do. ...	13 "	582	
12	ditto ...	do. ...	2 "	do.	3	Blood, Aust. potash, and superphosphate	70	do. ...	13 "	505	
13	Drilled V, broadcast ...	do. ...	2 "	do.	3	Shirley's No. 3 cereal manure	244	do. ...	14 "	527	
14	ditto ...	Broadcast	14 "	do.	3	ditto ...	224	do. ...	14 "	495	
15	Ploughed 6 inches deep	Drilled ...	14 "	do.	3	ditto ...	224	do. ...	14 "	498	
16	do. 10 do.	do. ...	14 "	do.	3	ditto ...	224	do. ...	14 "	544	
17	Subsoiled 16 inches	do. ...	14 "	do.	3	ditto ...	224	do. ...	14 "	508	
18	Different quantity seed— ½ bushel to acre	do. ...	18 "	do.	3	ditto ...	224	do. ...	14 "	574	
19	ditto	do. ...	18 "	do.	3	ditto ...	224	do. ...	14 "	634	
20	ditto	do. ...	18 "	do.	3	ditto ...	224	do. ...	14 "	615	
21	ditto	do. ...	13 "	do.	3	ditto ...	224	do. ...	14 "	536	
22	1½ ditto	do. ...	18 "	do.	3	ditto ...	224	do. ...	14 "	381	
23	1¼ ditto	do. ...	19 "	do.	3	ditto ...	224	do. ...	14 "	267	
24	Different depth sowing— 1 inch deep ...	do. ...	20 "	do.	1	ditto ...	224	do. ...	14 "	321	
25	2 ditto	do. ...	20 "	do.	2	ditto ...	224	do. ...	14 "	328	
26	4 ditto	do. ...	20 "	do.	4	ditto ...	224	do. ...	14 "	541	
27	5 ditto	do. ...	20 "	do.	5	ditto ...	224	do. ...	14 "	548	
28	Cultivated aftersowing— Rolled ...	do. ...	28 "	1 acre	3	ditto ...	224	do. ...	28 "	500	
29	Harrowed 1 month after sowing (rolled)	do. ...	28 "	do.	3	ditto ...	224	do. ...	28 "	700	
30	Harrowed 1 and 2 months after sowing (rolled)	do. ...	28 "	do.	3	ditto ...	224	do. ...	28 "	882	
31	Harrowed 1, 2, and 3 months after sowing (rolled)	do. ...	28 "	do.	3	ditto ...	224	do. ...	28 "	671	
32	Monthly sowings— ½ bushel to acre	do. ...	22 Mar	½ acre	3	No manure ...	...	...	25 Oct.	236	
33	ditto	do. ...	29 April	do.	3	ditto ...	...	...	25 "	328	
34	ditto	do. ...	30 May	do.	3	ditto ...	...	...	15 Nov.	335	
35	ditto	do. ...	28 June	do.	3	ditto ...	...	...	28 "	158	
36	ditto	do. ...	28 July	do.	3	ditto ...	...	...	...	...	
37	Mowing as = to feeding off crop, harrowed	do. ...	22 Mar.	do.	3	Topdressed, Shirley's No. 3 cereal manure	224	Broadcast after mowing	28 Nov.	306	Yield of green feed, 6 tons (4 tons to acre). July 12 badly frosted after mowing; subsequent growth so irregular that both lots of wheat were cut and threshed, together yielding 306 lb.; sample very good. Block 32 completes. Allowed to grow.
38	Mowing as = to feeding off crop, harrowed	do. ...	22 "	do.	3	No manure ...	...	...	28 "	...	

The land on which the following cereals were sown had been lying fallow. To prepare the seed-bed, the land was worked with a Massey-Harris seventeen-tooth cultivator, leaving it in a fine tilth for the drill to operate upon. After the drill a heavy Cambridge roller was put over it, and afterwards lightly harrowed with a set of "Ajax Lever Harrows," the teeth being inclined backwards. By these operations, the seed was set firm in the ground, still leaving a fine mould on the surface. The seed was prepared by "Jensen's hot-water method."

Block.	Variety.	Acres Sown.	Amount of Seed per Acre.	When Sown.	When Up,
1	Canadian Bluestem	2	¾ bushel	16th May	26th May
2	"	2	¼ "	"	"
3	Marshall's-No. 3	4	1 "	"	"
4	"	3	1½ "	"	"
5	Barley—Hallet's Pedigree	6	1¼ "	17th May	24th May
6	Sea of Azov	6	1¼ "	"	"
7	Rye	1½	1 "	16th May	22nd May

A previous sowing of skinless barley was made on 20th March, and is now 3 feet high, giving a heavy yield of green feed.

A commencement has been made with a series of experiments with fertilisers sown with oats and barley (8 blocks of each), the results of which will be embodied in a future report.

The first block of a series of successional crops has been sown with Tartarian oats. This series will comprise five portions of 2 acres each, to be continued for five years, this period being considered short enough to get results of practical value from a system of rotation cropping.

MAIZE.—All the crops of maize, with the exception of the latest sown areas, have as regards grain yield been a practical failure, the weather conditions at the time of cobbing being very unfavourable.

The following experiments would, under the best conditions, have been rendered valueless, owing to the discharge of two main drains from the Reformatory, which formed quagmires, thus a large area was affected in these blocks.

## STATE FARM, WESTBROOK.

## EXPERIMENTS WITH MAIZE.

Block.	Experiments.	Name of Crop Operated upon.	Area.	How Planted.	MANURE APPLIED.		When Planted.	How Applied.	Treatment.	RAINFALL.			Remarks.
					Name.	Amount per Acre.				Oct.	Nov.	Dec.	
1	Uncultivated	Hawkesbury Champion maize	½-Acre	Drilled ...	Unmanured	...	19 Oct.	...	Weeds chipped, 29th	0.4	4.59	1.35	The mixture used contains 4½% nitrogen, 10% phosphoric acid, 7½% potash, ingredients consisting of—per ½-ton lot—Dried blood = 320, app. cost 16s.; bone dust = 250, app. cost, 11s. 6d.; Cost fertilizer 16s. 3d., superphosphate = 400, app. cost 17s.; sulph. of potash 150, app. cost £1. 10 cwt. £3 4s. 6d. 6s. 6d. blocks suckered except 13s. No. 16 on Dec. 22, and hand-hoed long drills; 19s. 6d., £16s., £1 12s. 6d., unsuckered.
2	Cultivated once	ditto	do.	Single grain	do.	...	19 "	...	Scuffled, 20 Nov.	"	"	"	
3	ditto twice	ditto	do.	18 in. apart...	do.	...	19 "	...	ditto 20 Nov.	"	"	"	
4	ditto thrice	ditto	do.	do. ...	do.	...	19 "	...	ditto	"	"	"	
5	ditto four times	ditto	do.	do. ...	do.	...	19 "	...	ditto	"	"	"	
6	Uncultivated	ditto	do.	do. ...	Mixture ...	2½	19 "	In drills with seed	Weeds chipped, 7 Dec.	"	"	"	
7	Cultivated once	ditto	do.	do. ...	do.	2½	19 "	do.	Scuffled, 20 Nov.	"	"	"	
8	ditto twice	ditto	do.	do. ...	do.	2½	19 "	do.	ditto 20 Nov.	"	"	"	
9	ditto thrice	ditto	do.	do. ...	do.	2½	30 "	do.	ditto ditto	"	"	"	
10	ditto four times	ditto	do.	do. ...	do.	2½	30 "	do.	ditto ditto	"	"	"	
11	ditto thrice	ditto	do.	do. ...	do.	1	30 "	do.	ditto ditto	"	"	"	
12	ditto	ditto	do.	do. ...	do.	2	30 "	do.	ditto ditto	"	"	"	
13	ditto	ditto	do.	do. ...	do.	3	30 "	do.	ditto ditto	"	"	"	
14	ditto	ditto	do.	do. ...	do.	4	30 "	do.	ditto ditto	"	"	"	
15	ditto	ditto	do.	do. ...	do.	5	30 "	do.	ditto ditto	"	"	"	
16	ditto	ditto	do.	do. ...	Unmanured	...	30 "	do.	ditto ditto	"	"	"	

In addition to the above, 5½ acres of early mastadon was cut and bound green and made into stover as a stand-by for winter feed.

Nineteen and a-half acres Hawkesbury champion variety appeared a fine healthy crop, but failed to cob; a few bushels only have been saved for seed.

Five acres Macleay river; result, nil.

Three acres golden superb; growth of this crop was somewhat stunted. Probable yield, 4 bushels to the acre.

A plot of Early Mastadon sown in December had a hard struggle for a time, but did comparatively well in the autumn. Estimated yield, 12 bushels.

Silver mine made poor growth, and yielded but few cobs.

SORGHUMS AND MILLETS.—Three and a-half acres of amber cane were sown in December, and ripened about half a crop of seed, which was cut by hand and tied in small bundles, being easier to handle in that way when threshed by the peg drum. The remainder was cut and bound and is being fed to stock.

Other varieties were as follows:—White Kafir, sorghum saccharatum, brown millet, planter's friend, red Kafir, Soudanese millet, and Dakota millet.

PUMPKINS.—Ten acres were under this crop, yielding about 30 tons. The following were the varieties sown:—Ironbark, Crown, Button, Premium, and Mammoth.

SQUASHES, &c., included the following varieties:—Japanese, Delmonico, early orange, grammar, long yellow, Hubbard, custard, Fordhook.

POTATOES.—Five acres were planted with Brownell's Beauty (which is still the best all round variety on the Downs for the main crop). A moderate yield was the result. Seed tubers were saved from this crop and planted on a piece of fresh land (three-quarters of an acre) late in February, as a chance crop, and has resulted beyond expectations. The tubers being a good size and ripening perfectly.

SWEET POTATOES (half-an-acre).—This crop did not grow well until the autumn, but has since produced some fine tubers.

LUCERNE.—A block of 5 acres was sown on the 25th March. It was well into the first rough leaf on the 18th April, and has been growing almost without a check since.

Cow PEA.—Upwards of 30 acres have been under this valuable crop. The season was too late to expect a full yield of pulse. The crop was mown with scythes, made into small cocks at once, and fielded for three weeks before stacking. The whole crop was well saved, put into two stacks, and is estimated to yield about 60 tons fodder.

BEANS.—Two sowings of "Canadian wonder," three-quarters of an acre each, were made, neither of which gave more than average returns.

Three-quarters of an acre of Lima beans were poor.

The "Tongan" bean is a very valuable plant, not only for the immense crop of fine edible pods for table use, but also for the large amount of stock feed it produces.

On 27th June an acre of broad beans and stratagem pea, which were sown a month previous, were looking well.

Five acres were under crop with the following:—

15 rows, Water Melon, Cuban Queen	4 rows, Cucumber, Long Green Prickly
8 " Rock Melon, Montreal Market	4 " " Crystal White
5 " " Delmonico	3 " Squash, Hubbard
2 " " Musk	2 " " White Custard
1 " " Shamam	

An acre of Tomatoes, including King Humbert, Trophy, Crimson Cushion, General Garfield, Large Yellow, Stone, and others.

On the 15th March 25 varieties of grasses were sown, but many of these failed to germinate. The variety which has done the best so far is *Paspalum dilatatum*, Prairie grass coming next. I am glad to be able to state that *Paspalum* has done so well from seed, as it has often been repeated that it is difficult to germinate.

SWEDES.—One-and-a-half acres of Anderson's Imperial Purple Top were drilled in at the rate of 1¼ lb. of seed to the acre in March. This is a splendid crop; it has done well from the start. The plants were singled out

with the hoe and scarified three times between the drills, which are 3 feet 6 inches apart. This and all the following crops are now being marketed at very remunerative rates. The plots of white turnips include white Nepaul, scarlet Kashmir (this variety was ready to pull six weeks after sowing), white Model, and red American.

The field plantings of cabbage, &c., began on the 21st of March, and have been continued on every favourable occasion. Seventeen thousand in all were planted out.

The following list shows the order of maturing good marketable heads, some of these weighing up to 25 lb.:—

*Cabbage—*

Sutton's Earliest	...	...	...	...	commenced cutting in	6 weeks.
"	Minature Marrow	...	...	...	"	6 "
"	Main Crop	...	...	...	"	8 "
White Brunswick	...	...	...	...	"	9 "
Succession	...	...	...	...	"	10 "
Marblehead Mammoth	...	...	...	...	"	12 "
Autumn King	...	...	...	...	"	13 "
Savoy	...	...	...	...	"	13 "
Red cabbage	...	...	...	...	late.	

*Cauliflowers—*

Sutton's 1st crop	...	...	...	...	commenced cutting in	8 weeks.
Anderson's White Queen	...	...	...	...	"	9 "
King Cauliflowers	...	...	...	...	"	13 "
Vetches Autumn Giant	...	...	...	...	"	13 "
Improved Asiatic	...	...	...	...	late.	

*Broccoli—*

Sutton's Autumn	...	...	...	...	late.
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The prices at auction from May to the present time have realised from 3s. to 6s. 6d. per dozen.

Comparatively little weed growth takes place while these crops are maturing, and no hand-labour has been employed in their cultivation, but they were horse-hoed three times.

These facts are well worth the attention of small farmers.

Amongst other crops which have been successfully grown are the following:—Brussel's sprout, curled kale; kohlrabi; lettuce—Tom Thumb, Salamander, Iceberg, Tender and True; Endive; Celery (four varieties); Salsafy; Carrots (9 varieties); Beet (6 varieties); Parsnips; Chicory; and Mangels.

ONIONS.—Three acres were sown with an ordinary grain drill regulated to sow from 1¼ to 2½ lb. of seed per acre, the drills being 14 inches apart. The land had been twice ploughed, the springtoothed cultivator, and then the harrow brought it down to a fine tilth, after which the roller was put over to make a firm bed before receiving the seed, then a light stroke of the harrows finished the operation. The crop is looking splendid, is about 6 inches high, and very even. It is divided into four parts, three of which are manured with bonemeal, dried blood, and superphosphate, leaving one unmanured. The growth of this crop is being watched with considerable interest in the neighbourhood. The following are the varieties sown:—

Brown Spanish	Silver Skin	Bulbs {	Tree Onions
Early Yellow Globe	Barletta		Potato
Market Model	White Multiplier		Eschalots and Garlic

MISCELLANEOUS.—The plants of Sisal Hemp continue to make fair headway. They seem to be quite hardy; so far it has not suffered from frost in the slightest degree.

Tagosaste or tree-lucerne is quite at home here, the gravelly nature of the soil being more suitable for it than the rich heavier soils of the Hermitage.

Old Man Saltbush (*Atriplex Mummularia*) cuttings were taken from the few plants we have, and planted out to form hedges. The season was too dry for the cuttings to strike, so they have not proved as satisfactory as was desired.

Another dwarf variety of saltbush from Goondiwindi, seedlings of which were planted out, have become well established, and it promises to become a valuable fodder plant.

The orchard and vineyard are making remarkable progress under the direction of their respective experts. Their cultivation has been regularly attended to, all weed growth has been kept down, and a fine free surface maintained.

C. ROSS, Manager.

REPORT OF THE STATE FARM, HERMITAGE.

SIR,—I have the honour to submit herewith a Report on the proceedings at this farm, for the year ending 30th June, 1901. My duties in the capacity of manager commenced on the 21st January, 1901, after transfer from Westbrook. This necessarily curtails some of the information I would otherwise be able to give.

All details of meteorological importance have been furnished from time to time to the Government Meteorologist. Appended is the rainfall for the past twelve months:—

Month—1900.	Number of Rainy Days.	Rainfall.	Month—1901.	Number of Rainy Days.	Rainfall.
July ...	7	2.70	January ...	2	2.57
August ...	7	1.13	February ...	4	0.23
September ...	3	2.11	March ...	14	5.35
October ...	1	0.10	April ...	3	2.84
November ...	5	3.56	May ...	3	0.62
December ...	8	2.00	June ...	7	3.00

In a *résumé* of the season just passed, it may safely be stated that some very trying periods have occurred which have more or less affected the welfare of the farming community in this locality. I particularly refer to the recurrence of frost on the 28th and 29 September, 1900, when 8 degrees and 5.5 Fahr. were registered, followed by an almost total absence of rain when needed most for filling out grain.

A valuable object lesson has been gained by the indication of the hardiest varieties of wheats.

Notwithstanding these drawbacks, the yield per acre has been above the average. With few exceptions in favoured localities, maize tasselling in February has resulted in an almost total failure on account of the low rainfall and drying conditions.

CEREALS: MAIN CROPS.—These have been grown for the purpose of supplying pure seed of standard varieties to applicants, after approved samples have been carefully graded. Particulars with reference to preparation of land have been given by Mr. Ross in his report for 1900.

Appended are the results:—

Variety.	Area.	When Sown.	Germinated.	After Treatment.	Yield in Four-bushel Bags.
	Acre.	1900.	1900.		Bags.
Marshall's No. 3 Wheat ...	10	First week, May ...	19th May ...	Harrowed and rolled. Eaten off with sheep in July.	48
Ditto ...	6	First week, June ...	20th June ...	Harrowed and rolled	36
Marshall's No. 8 ...	6	First week, May ...	19th May ...	Harrowed and rolled. Eaten off with sheep in July.	26
Canadian Bluestem ...	4	ditto ...	ditto ...	ditto ...	18
Budd's Early ...	8	Third week, May ...	6th June ...	Harrowed and rolled	28
Ditto ...	7	9th July ...	25th July ...	ditto ...	24
Allora Spring ...	11½	1st to 9th July ...	15th to 24th July	ditto ...	56
Belatourka ...	4	30th May ...	12th June ...	ditto ...	9

Several trials were included in the above, consisting of:—Broadcast *versus* Drilled: Various depths of sowing, also different quantities of seed per acre, but owing to frost and dry weather it was not considered advisable at the time to make any distinction. Late-sown crops suffered most from the dry weather during October.

BARLEY.—The following varieties were sown as detailed in last report, seed previously pickled by "Jensen" hot-water method. "Sea of Azov" resisted frost the best, but all were more or less affected by dry weather.

Variety.	Area.	When Sown.	Germinated.	After Treatment.	Yield in 4-Bushel Bags.
	Acre.	1900.	1900.		Bags.
Old-fashioned English ...	10	2nd June ...	13th June ...	Harrowed and rolled after drill	51
Sea of Azov ...	10	2nd " ...	13th " ...	" " "	34
Chilian ...	2½	12th " ...	26th " ...	" " "	6
Nepaul ...	1½	12th " ...	26th " ...	" " "	7
Hallets' Pedigree Chevalier ...	½	29th May ...	10th " ...	" " "	4

RYE.—An area of 3 acres was sown to provide straw for thatching purposes and grain. Yield in bags, 14. Part of the land occupied by this crop contains an excess of chlorine and magnesia, the former acting really as a plant poison.

NOMENCLATURE AND ARTIFICIALLY CROSS-BRED WHEATS.—Under these classes, 180 of the former and 200 of the latter were grown in 1900 for the purpose of selecting those varieties most suitable to this locality. Among the cross-bred wheats received from Mr. Farrar, of the New South Wales Department of Agriculture, are some of the utmost promise; a number of strains are still unfixed which require careful selection and observation during period of growth, in order to follow out the respective types and occasionally "sports." These have further been the subject for a detailed description based on the following lines:—Whether bearded or bald, height of straw, length of ear, colour of straw and texture, colour and conformation of ear, together with such notes as the peculiarities of individual varieties warrant.

This information has been availed of for culling out undesirable varieties, and classing the remainder into three grades, so that larger quantities of seed may be obtained.

All these "selected" have been sown in drills 2 feet apart, allowing single plants to develop about 9 to 12 inches apart. Commenced sowing on 1st June, 1901, and continued at intervals, as weather permitted, up to shortly after middle of month. Germination took place from the eighth to tenth day after.

In addition to these are several new crosses recently made by Mr. Farrar, sown in similar manner as above.

The following 17 varieties have been obtained from the New Zealand Department of Agriculture, who had previously procured the original strains from New South Wales. All have been tried here before, but this change may afford interesting comparisons. Names as follows:—Fultz, Talavera de Bellvue, Improved Fife, Sicilian Squarehead, White Tuscan, Beardless Quartzlee, White Velvet, Pearl Velvet, Golden Drop, Anglo-Australian, Darblay's Hungarian, Tall Neapolitan, Red Clawson, Hedgerow, Marshall's White Chaff, Blount's Lambrigg, Bearded Quartzlee.

STUD WHEATS.—The drilling in of the following forty-one varieties began on 12th May, 1900, the areas occupied varying from half-an-acre to smaller portions. Rate, three-quarter bushels of seed to the acre, previously pickled by "Jensen" hot-water method. Germinated 25th June. During July the young wheat was fed-off by sheep, but a spell of dry weather retarded growth to a great extent, and the frosts occurring on 29th September and two following days, affected some varieties more than others. Nos. 1, 8, 9, 12, 13, 14, 16, 18, showed a little smut; Nos. 1 to 10, also 15, 16, 20, 22, 23, 32, 33, 40, 41, withstood the effect of frost the best.

Appended are the names of varieties with yield per acre:—

No.	Names.	Yield in Bushels per Acre.	No.	Names.	Yield in Bushels per Acre.
1	Red Straw ...	22	22	Zealand ...	19
2	Early Baart ...	19	23	White Fife ...	8½
3	"R" ...	19	24	Armstrong ...	Cut for hay
4	85A1 B1 ...	23¾	25	Improved Allora Spring ...	11½
5	Australian Talavera ...	22½	26	Allora Spring ...	11½
6	Australian Wonder ...	22	27	Aspen ...	18½
7	Rattling Jack ...	22	28	F1 ...	4¼
8	Hudson's Early ...	20	29	Indian Fife ...	6½
9	White Essex ...	20	30	Steinwedel ...	15¼
10	84 BY ...	16½	31	Yandilla Improved Indian ...	12½
11	Best Strain ...	18½	32	Leak's RR ...	17¾
12	Steere's RR ...	20	33	Algerian ...	Failed to mature
13	Farmers' Friend ...	17¾	34	Yandilla ...	23½
14	Early Para ...	15½	35	Indian Early ...	12½
15	Talavera de Bellvue ...	Cut for hay	36	Indian D ...	18¾
16	White Lammas ...	20	37	Indian F ...	14
17	The Blount ...	20½	38	Clubbed Indian ...	16¾
18	White Tuscan ...	13½	39	Indian L ...	13¼
19	Battlefield ...	21½	40	Duluth ...	Failed to mature
20	White Naples ...	8	41	King's Jubilee ...	20½
21	Fillbag ...	21			



**EXPERIMENTS WITH FERTILISERS, SEASON 1900.**—The preparation of land consisted of ploughing and cross-ploughing after crop of cow pea had been harvested, followed by spring-tooth cultivator, harrowed twice, and rolled. Tilth excellent. Land divided off into quarter-acre blocks. The variety of wheat used being Budd's Early, previously pickled by "Jensen" hot-water treatment and drilled in at the rate of three-quarter bushels to acre, on 30th May, 1900. Germinated tenth day after. Rainfall during time occupied by crop 7.03 inches.

Harvested beginning of November.

Gas and stone lime was broadcasted over surface when seed was sown. On block 7 half of the nitrate of soda was drilled in with seed, the remainder used as top dressing, but did not receive sufficient moisture to make it dissolve.

No. of Block.	Fertilisers.	Quantity per ¼-Acre.	Yield of Grain in Bushel per Acre.	Yield of Straw per Acre.
1	Gas Lime	5 bags	Failed.	T. C. Q. L.
2	4 parts Dried Blood; 1 part Nitrate Soda; 1 part Kainit	56 lb.	21	2 7 1 0
3	2 parts Superphosphate; 1 part Kainit; 1 part Sulphate of Potash	56 lb.	23 $\frac{1}{3}$	2 10 0 20
4	4 parts Bonedust; 1 part Nitrate of Soda; 1 part Sulphate Potash	56 lb.	17 $\frac{1}{3}$	2 5 2 24
5	Kainit	56 lb.	22 $\frac{1}{3}$	1 18 3 0
6	Superphosphate	56 lb.	22 $\frac{2}{3}$	1 19 1 4
7	Nitrate of Soda (2 applications)	56 lb.	21 $\frac{5}{6}$	1 18 3 10
8	Stone Lime	5 bags	23 $\frac{2}{3}$	1 19 1 4
9	Unmanured		18 $\frac{1}{6}$	1 18 1 26

**MAIZE.**—An area of 40 acres was ploughed early in September, 1900, and after thoroughly harrowing planting operations were proceeded with, which, for want of a drill and marker, consisted of drawing out furrows 5 feet 6 inches apart, the paddock being marked off into eight blocks, and as many different varieties of maize hand-dropped in drills, then covered by Planet Junior, horse-hoe, afterwards harrowed again.

Scuffled three times during growth.

*Varieties sown*—Mastadon, Silver Queen, Pride of the North, Sybille, Leeming, King of the Forties, Ninety-day, and Golden King.

Whatever chance this crop had of setting good grain was spoilt by an almost unprecedented gale and hailstorm occurring on 2nd January, 1901, which ribboned the leaves and heeled over the stalks.

Silver Queen, on account of early-maturing qualities and shortness of stalk, escaped somewhat, but the yield is very light. Except in patches, the remainder have failed.

Eight quarter-acre blocks were marked out on the check-row system with the plough, and "Pride of the North" maize was sown, the following fertilisers being distributed by hand on each individual block. Date of sowing, 12th September, 1900:—No. 1, lime; No. 2, "superphosphate mixture," made up with two parts superphosphate and one part each of kainit and sulphate of potash; No. 3, "bone mixture," made up of four parts bonedust, one part each of nitrate soda and sulphate of potash; No. 4, "blood mixture," four parts blood and four parts soda and potash; No. 5, nitrate of soda; No. 6, sulphate of potash; No. 7, kainit; No. 8, superphosphate; No. 9, unmanured.

The crop was scuffled four times during period of growth, but the hailstorm referred to above battered it to pieces.

**PUMPKINS.**—Some 6 acres of land was occupied by the following varieties, which were sown on fallowed land in drills made by plough. After cultivation consisted of ploughing twice between drills and two cultivations with spring-toothed cultivator. Nipping off shoots after formation of fruit was practised with good results. The season proved too dry for anything but a light crop. Varieties named in order of excellence:—Mammoth Tower, Cut Yellow Netted, Orange, Long Tom, Mammoth, Calhoun Crown, Button, Ironbark, Turk's Cap, Japan Pie, Mexican Rio.

**SQUASHES.**—Several varieties grown, of which Golden and White Custard were the best of the early varieties, but Boston Marrow and Hubbard still maintain their good qualities and are hard to excel.

A number of varieties of water and rock melons were grown, but only serve to emphasise previous reports.

The same may be said of the collection of potatoes, beans, cabbage, cauliflowers, &c.

**SORGHUMS.**—Several varieties grown on quarter-acre blocks; Planter's Friend, *Sorghum saccharatum*, and Amber-cane yielding the most fodder. The early crop of seed was a failure, but after February rains an extra second growth was made with more satisfactory results. The varieties mentioned attained a height of from 9 to 10 feet.

**ASPARAGUS.**—Conover's Colossal and Purple Argentueil. Both these varieties have established themselves and yielded in a very profitable manner. They deserve to be in more general use, as a ready sale and paying prices can always be found.

**SEASON, 1901.**—The preparation of land for the following field crops consisted of ploughing to a depth of several inches, followed by a deep cross working with spring-toothed cultivator, and finally another application of the same implement previous to drilling in seed. It was found necessary to cross-plough portions occupied by Old English and Nepal Barley, also Canadian Bluestem Wheat and Rye. All seed was subjected to the "Jensen" hot-water method, and, with the exception of Chilian Barley, was drilled in 2½ inches deep at the rate of three-quarter bushels to the acre. It was found that the long awns interfered, so the barley was broadcasted and covered by spring-tooth cultivator and harrows.

The Cambridge roller being used throughout; all seed drilled in germinated from the seventh to ninth day after, but the broadcast was a week later, requiring a shower of rain.

Area.	Variety of Wheat.	When Sown.	Area.	Variety of Barley.	When Sown.
15 acres	Marshall's No. 8	7 May	7½ acres	Sea of Azov	14 May
7½ "	" No. 3	13 "	7½ "	Chilian	16 "
3 "	Canadian Bluestem	22 June	6½ "	Hallet's Improved Chevalier	24 "
2½ "	Common Rye	19 "	3¼ "	Old English	18 June
			2¾ "	Nepaul	19 "
			3 "	Nepaul for green feed	22 February

**STUD WHEATS—SEASON 1901.**—The land occupied by these wheats was ploughed to a depth of 7 inches, cross-ploughed 4 inches, then cultivated and harrowed, in order to ensure thorough eradication of any self-sown wheat, as well as give a good tilth. It was then subdivided into half-acre blocks 5 chains by 1, with 15 feet roadways throughout, except Nos. 35 and 36; also, 37 and 38, which occupy areas of a quarter and an eighth of an acre respectively. All seed was subjected to the "Jensen" hot-water treatment, and was drilled in 2½ inches deep at the rate of three-quarters of a bushel per acre, no fertilisers being used.

In order to furnish accurate information concerning the increasing quantities of selected acclimatised wheats, I again respectfully suggest that provision be made at an early date for their systematic testing in the laboratory. In addition, it is also within reasonable limit, that the effect of fertilisers on plants and products may also be determined.

Appended are the names of wheats. Sowing began on the 30th May and continued to 6th June. Owing to "broken" weather Nos. 25 to 38 had to be held over till the 17th June before completion.

Block.	Variety.	Block.	Variety.	Block.	Variety.
1	Early Para	14	Steinwedel	27	Budd's Early
2	Steere's RR	15	Fillbag	28	White Naples
3	Early Baart	16	Zealand	29	White Fife
4	Farmers' Friend	17	Leak's RR	30	Indian Fife
5	Hudson's Early	18	84 BY	31	FI
6	Australian Talavera	19	Yandilla Improved Indian	32	Yandilla
7	Battlefield	20	R	33	King's Jubilee
8	Rattling Jack	21	Aspen	34	Clubbed Indian
9	White Tuscan	22	Best Strain	35	Indian Z
10	White Essex	23	The Blount	36	Indian F
11	85A1 B1	24	Allora Spring	37	Indian Early
12	Australian Wonder	25	White Lammas	38	Algerian
13	Red Straw	26	Improved Allora Spring		

EXPERIMENTS WITH FERTILISERS.—These have been initiated with the advice of the Agricultural Chemist, and form the basis for permanent experiments with wheat. It is intended to add to these as soon as more land of the same character is cleared. Size of each block, half-an-acre; shape, long and narrow, with sufficient width of roadways allowed for field work and to keep each distinct. Each individual experiment is being carried out in duplicate.

Variety of wheat, Marshall's No. 3, previously pickled by "Jensen" hot-water method, and drilled in with fertilisers (except when stated) at the rate of three-quarters of a bushel to acre.

DATE OF SOWING, 24TH TO 26TH JUNE, 1901.

No. of Block.	Kind of Fertiliser.	Quantity per $\frac{1}{2}$ -Acre.	Remarks.	No. of Block.	Kind of Fertiliser.	Quantity per $\frac{1}{2}$ -Acre.	Remarks.
		Lb.				Lb.	
1	No manure			8	Thomas' phosphate ...	150	23 lb. nitrate of soda
2	Sulphate of ammonia	12	23 lb. to be afterwards		Sulphate of potash ...	21	as top-dressing
	Sulphate of potash ...	21	applied as a top-dressing	9	Nitrate of soda ...	23	
3	Superphosphate No. 1	127 $\frac{1}{2}$			Meat works manure	120	17 $\frac{1}{2}$ lb. nitrate of soda
	Sulphate of potash ...	21			Sulphate of potash ...	21	as top-dressing
4	Superphosphate No. 1	127 $\frac{1}{2}$	23 lb. sulphate of ammonia do.	10	Superphosphate No. 1	127 $\frac{1}{2}$	
	Sulphate of ammonia	12			Sulphate of potash ...	21	
5	Superphosphate No. 1	127 $\frac{1}{2}$	23 lb. sulphate of ammonia do.	11	Dried blood ...	56	
	Sulphate of potash ...	21			Thomas' phosphate ...	150	28 lb. sulphate of ammonia as top-dressing
	Sulphate of ammonia	12			Kainit ...	84	
6	Superphosphate No. 1	63 $\frac{3}{4}$	11 $\frac{1}{2}$ lb. sulphate of ammonia do.	12	Sulphate of ammonia	12	
	Sulphate of potash ...	10			Thomas' phosphate ...	75	11 $\frac{1}{2}$ lb. sulphate of ammonia as top-dressing
	Sulphate of ammonia	6			Kainit ...	42	
7	Superphosphate ...	127 $\frac{1}{2}$	23 lb. nitrate of soda as top-dressing		Sulphate of ammonia	6	
	Nitrate of soda ...	23					
	Sulphate of potash ...	21					

THE ORCHARD.—Work in this department has been under the superintendence of Mr. S. C. Voller.

Taking the season all through it is satisfactory to be able to report that the trees have made good growth and are clean and healthy.

Unfortunately, last season early fruit did not set on account of frosts. The gale and hailstorm occurring early in January, 1901, uprooted a number of trees and played great havoc with others. One and all still show the effect of hail, which was most severe.

Notwithstanding these and other drawbacks, the symmetrical appearance of the trees with the even distribution of fruit-bearing wood give the impression that if the next season be favourable there will be an abundant crop. During the past season the land between trees has been cultivated several times and harrowed four times, followed by hand-hoeing round trees.

The routine work of side pruning, suckering, spraying, &c., has been carried on from time to time.

THE VINEYARD.—Work in this department has been under the superintendence of Mr. E. H. Rainford.

From the very outset of the season, the effect of frost prevented and checked severely all early canes, causing considerable suckering and misdirection of vital energy. Some varieties have made very strong growth since. The crop was completely ruined by hailstorm referred to previously.

Cultivation has been carried on systematically, together with the necessary routine work.

In conclusion, I have the honour to report that the forthcoming season presents a very favourable outlook. A number of details of our work here are rendered each month in the usual Progress Report.

H. C. QUODLING, Manager.

#### REPORT OF THE STATE FARM, BIGGENDEN.

SIR,—I have the honour to submit herewith the Annual Report for the year ending 30th June, 1901.

My work in connection with this farm having extended only a little over a month, the following remarks will of necessity apply principally to the operations conducted during that period and to matters generally as I found them on taking over the management.

ORCHARD.—During the month of July 4 acres were planted out under various fruit trees. The land had previously been subsoiled to a depth of from 18 to 20 inches, and well pulverised. The trees are planted on the square 32 feet apart each way. Mr. Voller is in charge of the work carried out in connection with this department.

The following is a list of the varieties planted :—

Washington Navel	Med. Sweet	<i>Oranges.</i>	Foster
Valentia Late	Jaffa		Joppa seedling
Beauty of Glen Retreat	Scarlet	<i>Mandarins.</i>	Emperor
Parker's Special			
Sicily Lemon	Villa Franca	<i>Lemons.</i>	Lisbon
Belsir			
Tahiti	Genoa	<i>Limes.</i>	Messina

All seedlings from Redland Bay Experiment Orchard

*Custard Apples.*

All seedlings from Redland Bay.

*Loquats.*

Mammoth Loquat.

*Persimmons.*

Nightingale Seedless	Bell's Large Red	Large Flat
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*Figs.*

Poulette	Madeline	Black Genoa
San Pedro	Col de signur Nera	Brown Turkey
Smyrna	White Marseilles	Black Ischia
White Adriatic		

*Plums.*

Golden Beauty	Robinson	Helen
Lone Star	Wild Goose	Newman

*Peaches.*

Lord Palmertson	Mountain Rose	Brigg's Red May
Foster	Hale's Early	Early York
Arkansas Traveller	Wheat Land	Mary's Choice

A few misses occurred, the result of the dry weather experienced after planting. These have been filled up. Most of the varieties have made good growth, and look healthy. No disease has as yet manifested itself in the orchard.

VINEYARD.—The work in connection with this branch has been carried out under direction of Mr. E. H. Rainford, the Government Viticulturist.

In August the following varieties, mostly new to this district, have been added to those planted out the previous year :—

White Hermitage	Ferdinand de Lesseps	Riesling
Iona	Miles Goethe	Muscat
Hamburg	Alvey	

A small percentage of the cuttings failed to strike, owing to drought. Those planted out the previous year have made good headway. They have not yet been trellised, but the material for such is now on the ground, the erection of which is about to be carried out.

MAIZE.—On the 22nd August the following varieties were planted on the Manure Experiment Plots :—Golden King, Hawkesbury Champion, Early Mastodon, Red Nibbed, Nott's Horsetooth, 90-Day, Early Yellow Flint. For lack of moisture all these varieties were, with the exception of Golden King, a failure. This variety, in spite of the dry weather, gave a fair crop of well-filled cobs. Another sowing of Golden King and Early Yellow Flint was made on the 25th January upon another portion of the farm. This also suffered considerably from want of rain at the early stages of its growth, consequently the crop which is now being harvested is a light one.

Every fifth row was reserved for pumpkins, marrows, and squashes, but only a few vines survived the dry weather.

WHEATS.—A large number of varieties were experimented with. The best results were obtained from the hard and flinty Macaroni wheats, and from the cross-bred wheats of Mr. Farrar's collection.

BARLEYS.—Four varieties were grown, viz. :—Hallett's Improved, Chevalier, Sea of Azov, and Nepaul. All the above did fairly well.

POTATOES.—A few sets of each of the following varieties were planted out on the 25th of February :—

Circular Head	Satisfaction	Improved Early Rose
Early Vermont	Bliss's Triumph	Harbinger
Late Rose	Duke of Maloi Champion	Imperator
McCarthy's Snow Ball	Myatt's Prolific	Magnum Bonum.

Those giving best results were Early Vermont, Harbinger, Duke of Maloi Champion, Magnum Bonum, and Myatt's Prolific.

SWEET POTATOES.—Four varieties have been experimented with, namely—Spanish Giant, Yellow Spanish, Rosella, and White Maltese. All have given splendid returns, the Spanish Giant taking the lead as the heaviest cropper.

TOMATOES.—Our experiments with this valuable esculent were carried out with the following varieties :—

Democrat, Autocrat, New Peach, Green Gage, Duke of York, Dwarf Champion, Golden Apple, King Humbert, Golden Queen Trophy, Fileraggie, Large Trophy, Wonder of Italy, Acme, Crimson Cushion.

All have qualities to recommend them. The Democrat, Golden Queen, and Crimson Cushion produced some very fine specimens. For quality, the Wonder of Italy is perhaps the best. It is also a heavy bearer, and as an all-round tomato would be hard to beat.

SUGAR-CANES.—The climatic conditions existing on this farm cannot be said to be favourable for the successful raising of sugar-cane for crushing purposes. Cane raised in this locality might, however, prove of value for planting in the more humid districts, where a change of seed would be of benefit.

Some thirty varieties are being grown on the farm, but the amount of crushable cane even on the best does not exceed 4 feet in length. A New Guinea cane, called Mahova, shows most growth. This cane is known to many sugar-growers by the name of "Batoe," and will, under ordinary conditions, give a heavy crop as "plant cane," but as a ratoon it is a complete failure. Many farmers have found this out to their cost. The Batoe cane is darker in colour than this variety, more constricted at the joints, and has, moreover, a much harder rind.

The two old-established varieties, Rappoe and Striped Singapore, have stood out well, and show some 3 ft. 6 inches of marketable cane.

**COW PEA.**—Only a small area was under cultivation of this most useful crop. The following varieties were tested, viz.—Black, Clay, and Blackeye. The dry weather experienced during the early stages of their growth stunted the growth of the vines, but from all varieties a good supply of seed was obtained. The vines were harvested and chaffed for horse-feed.

**BEANS.**—Only two varieties suitable for green-manuring purposes were grown, viz.—the "Velvet" and "Small Mauritius." The Velvet Bean does not grow so luxuriantly here as in the tropical North, but the yield of seed is far greater. There is a very heavy crop of pods, which are just getting ripe and beyond the stage of being damaged by frost.

The Small Mauritius has, as a green manure, done much better than the Velvet, yet, although sown at the same time, no seed will be secured, the vines having fallen a prey to frost.

**GRASSES.**—*Paspalum dilatatum*.—This grass still holds to its reputation as being both an excellent fodder and pasture grass. Its capabilities are being tested in almost every district in Queensland. Hundreds of farmers and stockowners are giving it a trial, a large number of which have been supplied with rooted plants from this farm. It grows luxuriantly and delights in the most tropical heat of the North, while in the cooler southern districts it shows its resistance to cold and drought, producing heavy crops of rich nutritious feed. From the favourable reports from every quarter, it is safe to prophecy that in a few years our grazing areas will become far more valuable possessions than they are at the present time.

**MITCHELL GRASS** (*Astrelba pectinata*).—This well-known native of the Western districts has done well, but it does not possess the nice green succulent appearance of the *Paspalum dilatatum*. Although dry and wiry looking, cattle are said to be very fond of it, and as a drought resistant it is hard to beat.

**RUSSELL RIVER GRASS** (*Paspalum Gu'marra*).—As its name implies, this grass is a native of the tropical North. A row of seed was sown on the 25th February, which quickly germinated and made remarkably fast growth until cut down by frost on the night of the 22nd June—thus proving it was useless as a pasture grass in localities subject to low temperatures.

**FERTILISER EXPERIMENTS.**—In August last a series of experiments were initiated with a view of testing the effects of various manures on different crops, and if possible to find out what manure or combinations of manures were likely to yield the best results. The soil on which the experiments are being carried out is of a sticky clay nature, and has only been under cultivation for some two years. The land is divided into four rectangular plots of exactly the same size, and half-a-chain wide.

The manures applied to the respective plots are as follows:—

No. 1 Plot.—No manure	
No. 2 Plot.—84 lb. Superphosphate = to 5 cwt. per acre	} costing 23s.
56 " Kainit	
No. 3 Plot.—56 " dried blood = to 4 cwt. per acre	} costing 21s.
56 " bonemeal	
No. 4 Plot.—28 " superphosphate.	} costing 19s. 6d. per acre
28 " kainit = to 4 cwt. per acre	
28 " bonemeal	

On the 22nd August some eighty different varieties of crops were sown in rows extending right across the four plots, thus giving each crop the benefit or otherwise of the various manures. Owing to the excessive dry weather experienced after sowing, most of the crops proved a failure, and no results were obtained from the manures applied. The plots were again ploughed up independent of one another, thus preventing the soils getting mixed, and during the last week in February a large assortment of winter crops were again sown. No manure was applied in this instance, the object being to see whether they would feel to any extent the benefit of the first dressing. At the time of writing only a few of the crops sown have been harvested and exact results obtained. Those I give below, taking them in rotation from the south-east side:—

#### No. 1 EXPERIMENT.

*Paspalum dilatatum*—1 row planted 23rd October, cut 18th June—

	Yield.
No. 1 Plot (10 yards), no manure	38 lb.
2 " " kainit, superphosphate	46 "
3 " " dried blood and bonemeal	59 "
4 " " kainit, superphosphate, dried blood, and bonemeal	55 "

As will be seen, No. 3 manure combination gives a very substantial increase over the no-manure plot. This increase can, I think, be traced to the beneficial effect of the nitrogen contained in the dried blood.

#### No. 2 EXPERIMENT.

Lucerne sown 24th October, cut 18th June; 1 row—

No. 1 Plot	6½ lb.
2 " "	11½ "
3 " "	14 "
4 " "	7 "

No. 3 plot shows best results. The poor return from plot No. 4 is due to the heavy wash of soil from that part of the row during the March rains.

#### No. 3 EXPERIMENT.

English potatoes—6 rows. Variety, Circular Head. Distance between rows, 2 feet 6 inches. Planted 10th March; harvested 19th June.

Returns from respective plots (6 rows)—

No. 1 Plot, 84 lb. dressed potatoes, 15 small, total	99 lb.
2 " 110 " " " 16 " " "	126 "
3 " 116 " " " 18 " " "	134 "
4 " 100 " " " 17 " " "	117 "

Although No. 3 manure combination is not generally recognised as a well-balanced potato manure, yet it again heads the list as giving the best returns. To work out the above experiment, showing the results as at per acre, and taking the value of potatoes at say £4 per ton, a farmer would, by using 2 cwt. of dried blood and 2 cwt. of bonemeal per acre, at a cost of 21s., have reaped a profit of £5 over that obtained from the no-manure plot.

The remaining crops growing on the experimental plot are mostly vegetables, and are being used principally for show purposes. The following is a list of such, with a few remarks on each, as to the effect of the manure:—

Canaigre (tanning agent) Plot 1: Poor crop, other plots looking well.  
 Mangolds: 5 varieties. Fine crop all over. Plots 2 and 3 best.  
 Beetroot: 9 varieties. Good crop. Heaviest on 2, 3, and 4.  
 Egg Plant: 2 varieties. Both cut down by frost.  
 Parsnips: Very irregular crop. No difference in plots.  
 Carrots: 4 varieties. Little difference in various plots, all doing well.  
 Cabbages: 12 varieties. Marked difference in favour of manure.  
 Cauliflowers: 6 varieties. Result same as cabbages.  
 Kholi Rabi: 2 varieties. Heaviest crop on 2 and 3.  
 Turnips: Failure on No. 1. Good crop on other plots.  
 Eschalots: Slight difference in favour of manure.  
 Garlic: No perceptible difference between various plots.  
 Tree Onion: Not far enough advanced to show any difference.  
 Leek: Plots 3 and 4 look best.  
 Lettuce: 2 varieties. Decided improvement on manured plots.  
 Radishes: 9 varieties. Result same as turnips.  
 Cucumber: Very irregular crop. Best on No. 2.  
 Spinach: This crop shows in a most marked manner the beneficial effect of the manure applied. The plants on the no-manure plot are poor and stunted, while on the manured the growth is most luxuriant.  
 Broad Beans: 3 varieties. As yet little difference between manured and unmanured.

The results obtained from the above experiments seem to indicate that nitrogen is the substance that has been of most benefit to the crops experimented with. To arrive at certain conclusions, however, the different manures would have to be experimented with singly, and the experiments carried out in duplicate and over a succession of seasons.

IMPLEMENTS.—No new implements have been added to the farm during the past year.

BUILDINGS.—The residence has been painted, a veranda room added, which is used as an office.

A large and varied collection of the products grown on the farm has been exhibited at the Gympie, Maryborough, Degilbo, and Biggenden shows. The exhibits created a good deal of interest and favourable comment.

G. B. BROOKS, Manager.

#### REPORT OF THE STATE FARM, GINDIE.

SIR,—I have the honour to submit herewith my Report of the work done and the experiments carried out for the year ending 30th June, 1901.

The failure of the cereal crop last year was caused by late frosts and want of moisture. The total rainfall from the 30th June, 1901, to the present time was 13.55 inches. The only occasion on which sufficient rain fell to be of much service was in July, 3 inches, and February, 2 inches.

With reference to the wheat, the greater part of it was cut for hay, but sufficient grain was thrashed to answer our requirements for seed purposes for this season; a few bags were sold and some retained for horsefeed, part of which is on hand at present. When putting this grain through the thrasher I found the return too light to warrant my continuing it, as the yield would hardly cover thrashing expenses, so I concluded that it would be better to use the balance of that which was harvested for feed purposes.

The Barley was also a light crop. A few bags were thrashed for seed and feed.

The Field Peas grew splendidly, and up to the time they came in blossom there was every prospect of a crop; but, in consequence of the continued dry weather, they failed to pod. The straw was carefully harvested and used for feed. A small patch of Rye and Oats which was tried did very badly, and was grazed off by the cattle and horses. A portion of the wheat that was too light to cut was utilised in the same way. During the summer, planting of maize and cow pea has been made. Notwithstanding the very dry weather that we experienced, the maize looked well, and held its own right up to the time of cobbing; but, as we did not get rain at that time, it failed to yield grain. This crop was also fed off by the cattle and horses.

One small patch of cow peas did very well and yielded a fair quantity of hay. Those planted on the land set apart for a vineyard did not do quite so well.

In July about 6 acres of vines were planted by Mr. Rainford, but, owing to the dry weather, they failed to strike. This land has been well worked, and at present date is ready for replanting.

About 200 assorted fruit trees were also planted. Considering the season, they have done very well. There were a considerable number of "misses," principally among the citrus fruits; these have been replanted, and the balance will be put in later on. The small flock of 200 sheep on the farm have done fairly well. I sheared them, and the wool realised £14 18s. 8d. This amount will help somewhat to reduce the first cost of them. Owing to various causes, there has been no increase in the flock.

I regret to say that there has been considerable loss amongst the cattle, notwithstanding the fact that all the straw which was saved from last year's wheat crop was given to them. Previous to the unemployed being put on here I had scrub cut for them. You will see by this that I did all I could to pull them through. As they are very poor, I have not attempted to muster them to find out the exact number that are dead, but I put them down at 50, principally adult cattle, and I am afraid that if they are not removed from here at once there will be a further loss.

The crops planted to present date are as under:—

	Acres.
Barley ... ..	5.25
Prairie grass ... ..	6.09
Wheat ... ..	132.32
Lucerne ... ..	9.00
Fruit trees ... ..	4.00
Total ... ..	156.66

Owing to the various conditions of the land on different parts of the farm, different methods have been employed in putting in the wheat. A part has been drilled in in the usual manner, some sown broadcast and ploughed in, and other portions have been broadcasted and harrowed and rolled. The above-mentioned crops are all above ground, but are at a standstill for want of moisture. A further area of 100 acres has been taken in for future cultivation. This is partly fenced. I anticipated being able to break up a good portion of this land during the winter, but in consequence of a scarcity of feed I have had to send some of the horses away. It would be too costly to keep them here, as all the feed for a time will have to be purchased. This will prevent me from getting as much of this land broken up as I anticipated.

The only permanent improvements carried out during the year has been the deepening of the well at the stables and the erection of a windmill over it. A well has also been sunk to a depth of 40 feet in the sheep paddock. As no water was struck at this depth, tenders were called for putting it down a further depth of 20 feet; but, owing to the stubborn nature of the rock, it has been abandoned by the person who took it.

A vast amount of good work has been done here in the shape of clearing portions of the paddock. Part of this work is of an experimental nature, and it will remain to be seen if it will be of service or not. On the other hand, some hundreds of acres of good land that was comparatively useless in its original state, owing to the large quantity of fallen timber that was on it, has been burned off and the green timber ringbarked.

In conclusion, I beg to state that it is with extreme regret that I have to place before you such an unfavourable report of the proceedings of the farm for the year that is passed.

I have endeavoured to the best of my ability to battle with the adverse season that we have had to contend with, and I can assure you that my position here has been anything but an enviable one, and I trust that the year upon which we have just entered will be in every respect a successful one.

ROBERT JARROTT, Manager.

STATE FARM, GINDIE.

RETURN FOR YEAR ENDING 30TH JUNE, 1901.

Area ploughed	...	...	...	...	...	...	...	166 acres.
Area under crop	...	...	...	...	...	...	...	156·66 acres.
Details of crop—								
Wheat	...	...	...	...	...	...	...	132·32 acres.
Barley	...	...	...	...	...	...	...	5·25 "
Lucerne	...	...	...	...	...	...	...	9·00 "
Prairie Grass	...	...	...	...	...	...	...	6·09 "
Fruit trees	...	...	...	...	...	...	...	4·00 "
Total	...	...	...	...	...	...	...	156·66 "
Stock—								
Horses	...	...	...	...	...	...	...	17 head.
Cattle	...	...	...	...	...	...	...	170 "
Sheep	...	...	...	...	...	...	...	196 "
Improvements made during the last year—								
Erection of a 16-ft. Airmotor.								
$\frac{3}{4}$ of a mile of 3-wire Fence.								
Implements added during year—								
1 Spring-tooth Harrow.								
1 Three-furrow Plough.								

REPORT OF THE CHIEF INSPECTOR OF STOCK AND REGISTRAR OF BRANDS FOR THE YEAR 1900.

SIR,—I have the honour to submit the following Report of this branch of the Department for the year 1900 :—

DISEASES IN SHEEP ACTS.

The number of sheep in the State at 31st December last, adapted to the pastoral districts from the Registrar-General's returns under "The Stock Returns Act of 1893," show the numbers in each district compared with those in 1899.

DISTRICT.	1900.	1899.	INCREASE.	DECREASE.
Burke	1,448,057	2,227,212	...	779,155
Burnett	28,670	26,531	2,139	...
Cook	170	193	...	23
Darling Downs	2,183,109	1,946,479	236,630	...
Gregory North	603,701	1,327,922	...	724,221
Gregory South	139,210	359,363	...	220,153
Kennedy	689,832	815,728	...	125,896
Leichhardt	474,432	552,868	...	78,436
Maranoa	1,211,366	1,303,845	...	92,479
Mitchell	2,254,877	4,440,517	...	2,185,640
Moreton	7,536	19,855	...	12,319
Port Curtis	81,209	39,574	41,635	...
Warrego	1,212,408	2,160,316	...	947,908
Wide Bay	4,608	6,076	...	1,468
Total	10,339,185	15,226,479	280,404	5,167,698

This shows a total decrease of 4,887,294, equal to 32 per cent., as against a decrease of 13·2 per cent. in 1899.

This, however, does not represent the actual decrease, as heavy mortality from drought occurred subsequently to the date of making the returns, and in many instances the numbers were given by approximation.

The introduction of sheep from the Southern States during the year was—

By sea	...	5,497
By the borders	...	98,470
		<u>103,967</u>

The numbers exported were—

By sea	...	922
By the borders	...	487,012
		<u>487,934</u>

The number of sheep operated on at the various meat establishments were as under—

<i>Frozen—</i>			
Messrs. Birt and Co. ... ..	682		
The Queensland Meat Export and Agency Co., Ross River...	483		
The Queensland Meat Export and Agency Co., Brisbane ...	30,693		
C. Q. M. E. Co., Lake's Creek ... ..	19,351		
			51,209
<i>Canned—</i>			
Messrs. Baynes Brothers ... ..	4,558		
Traills, Limited ... ..	3,400		
North Q. M. Export Co. ... ..	22,385		
Q. M. E. and A. Co., Ross River ... ..	3,045		
Q. M. E. and A. Co., Pinkenba ... ..	14,916		
C. Q. M. E. Co., Lake's Creek ... ..	27,214		
			75,518
<i>Extract—</i>			
Q. M. E. and Agency Co., Pinkenba ... ..	312		312
<i>Boiled—</i>			
Traills, Limited ... ..	8,690		
Q. M. E. and A. Co., Ross River ... ..	14,680		
Q. M. E. and A. Co., Brisbane ... ..	10		
C. Q. M. E. Co. ... ..	194		
			23,574
<b>Total</b> ... ..			150,613
Exported by sea and the border as above ... ..			487,934
<b>Total output</b> ... ..			638,547

as compared with 987,677 in the previous year.

As in previous years, the sheep in the State continue to maintain complete immunity from diseases of contagious nature. The mortality during the year has been due solely to drought. Considerable losses occurred in sheep taken to the coast watershed, the pasturage there being unsuitable to sheep, and deaths have there occurred from anæmia. A considerable number of deaths have also occurred among sheep returned to their Western pastures from poisoning, principally from eating the young shoots of the *Euphorbia Drummondii*, that and other weeds being the first to appear on a fall of rain following on severe drought. In ordinary seasons, when grass is plentiful, this and many other reputed poisonous plants cause no losses in stock.

#### DISEASES IN STOCK ACTS.

The number of cattle in the State at 31st December, sorted into the various pastoral districts from the returns under the Stock Returns Act are given below:—

DISTRICT.	1900.	1899.	INCREASE.	DECREASE.
Burke ... ..	823,112	909,344	...	76,232
Burnett ... ..	403,506	420,151	...	16,645
Cook ... ..	206,468	196,608	9,860	...
Darling Downs ... ..	253,694	260,995	...	7,301
Gregory North ... ..	178,303	496,453	...	318,150
Gregory South ... ..	31,896	217,030	...	185,134
Kennedy ... ..	523,977	612,231	...	88,254
Leichhardt ... ..	587,696	642,895	...	65,199
Maranoa ... ..	171,528	248,266	...	76,738
Mitchell ... ..	46,139	135,064	...	88,925
Moreton ... ..	384,950	363,389	21,561	...
Port Curtis ... ..	259,175	277,602	...	18,427
Warrego ... ..	83,902	146,878	...	62,976
Wide Bay ... ..	123,845	126,930	...	3,085
<b>Total</b> ... ..	4,078,191	5,053,836	31,421	1,007,066

This shows a decrease of 975,645, equal to 19.3 per cent. on the figures of the previous year.

It has to be observed, however, that most if not the whole of the returns of cattle have been made by approximation, and in the case of the Western runs, severe losses have been known to occur in the earlier part of the present year, subsequently to the rendering of the returns.

The number of cattle introduced into the State during 1890 was—

By sea ... ..	49
By the borders... ..	9,321
	9,370

The number of cattle exported was—

By sea ... ..	34
By the borders... ..	68,303
	68,337

The number of cattle operated on at the various meat-curing establishments were as under—

<i>Frozen—</i>		
Messrs. Birt and Co. (at Queensport) ... ..	21,836	
Bowen Meatworks ... ..	14,515	
Q. M. E. and Agency Company, Ross River ... ..	11,431	
Do. do. Pinkenba ... ..	34,900	
Gladstone Meatworks ... ..	25,164	
C. Q. M. E. Company, Lake's Creek ... ..	14,407	
		122,253

*Canned—*

Endeavour Meat Company	2,741
Baynes Brothers	7,695
Traills, Limited	2,406
Redbank Works	8,971
Mooraree	210
North Queensland M. Export Company	12,921
Broadsound Meatworks	8,159
Q. M. E. and A. Company, Ross River	6,415
Do. do. Pinkenba	15,712
Gladstone Meatworks	3,230
C. Q. M. E. Company, Lake's Creek	27,472
	<hr/>
	95,932

*Extract—*

Endeavour Meatworks	8,185
N. Q. Works, Barron Branch	1,900
Redbank Works	627
Burdekin River Works	1,934
Bowen Works	2,089
Q. M. E. and A. Company, Ross River	521
Do. do. Pinkenba	520
Gladstone Works	551
	<hr/>
	16,327

*Boiled—*

Endeavour Works	129
Traills, Limited	1,802
Bowen Works	25
Broadsound Works	82
Q. M. E. and A. Company, Ross River	390
Do. do. Pinkenba	239
Gladstone Works	781
C. Q. M. E. Company, Lake's Creek	283
	<hr/>
	3,731

Manufactured into Australian "Pemmican," Burpengary, for the British Army	461
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Total	238,704
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Exported by sea and the border, as above	68,337
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Total output for the year	307,041
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as compared with 594,839 in the previous year.

## HEALTH OF CATTLE.

Apart from the mortality from drought in the West, and from ticks in the Central and Southern coast watershed, the health of the cattle stock has been good.

Pleuro-pneumonia has existed in a few centres, but that disease is less virulent every succeeding year.

The carrying out of the provisions of the Live Stock and Meat Export Act at the various meat-preserving establishments, under duly qualified veterinary surgeons, and "The Slaughtering Act of 1898," at the various centres of population by specially trained inspectors, has afforded a fair opportunity of gauging the extent of tuberculosis in our herds; and I can only reiterate my last year's statement that, judging by the condemnations, tuberculosis does not exist in our herds to anything like the extent formerly believed to be the case.

The losses from ticks by deaths of cattle have been few during the year. The cattle in the North continue immune, no cases of tick fever having been reported in the Gulf and Northern districts, and what with our present knowledge seems unaccountable, is the fact that cattle arrive at the Northern works in the best of health and condition, although heavily tick-infested.

A considerable number of failures of inoculation to produce immunity have been reported, principally from the Wide Bay and Bundaberg districts; but, in view of the success that attended inoculation when carried out by the Department, the cause of failure can only be attributed to carelessness or want of knowledge in the selection of the blood.

Experiments in dipping have been continued, and the results communicated periodically to the Agricultural Department. A majority of the proprietary dips tested have been found valueless for the destruction of cattle ticks, and, so far, the only reliable dips experimented with have been those the basis of which is arsenic. Some doubt in certain quarters has been thrown on the use of arsenic as likely to injure cattle. At the strength at which it is generally used, *i.e.*, 8 lb. to 400 gallons of water, and as a full-grown bullock or cow only carries away 1 gallon of the mixture, and as half of that quantity is returned to the dipping-vat from the draining-yard, it will be seen that a full-grown animal actually carries away only 57.6 grains of arsenic distributed over the whole of its body.

The dips tested that have proved the most reliable were—Christian's Dip (the composition of which was given in my last annual report), the composition commercially known as Hide Poison, Little's Poisonous Dip, Thomas's Dip (Melbourne), and Cooper's Dip, with the addition of double its weight of soft soap. All of these dips are known to contain arsenic. In the case of the two last-named dips, however, they appear to be largely composed of sulphur, and as that has been found to have little, if any, effect on the cattle-ticks, the expense of the dips is thus considerably increased without any compensating advantages.

In the case of all dips the basis of which is carbolic acid the tests have proved most unsatisfactory.

It having occurred to me, as to many others, that a dip would be much more effective if applied warm, I made an experiment on a small scale with two badly-infested calves in the sheep-dip at In'ooroopilly, heating the dip to 120 degrees Fahr.; but there was no noticeable difference between the cold and hot bath.

Although it cannot yet be said that any known dips will destroy all ticks on cattle, so that after dipping they may with safety be passed on to clean pasture without risk of setting up fresh centres of infestation, still, with two dippings at intervals of from eight to ten days, and assuming that the medicaments have been properly prepared and carefully applied under official supervision, the danger would be very remote, provided the dipping was made on the extreme edge of the infested country.

But, apart from this, the periodical dipping of tick-infested herds, even if the operation does not destroy all the ticks on the cattle, cannot fail to check the increase of the pest by the destruction of the female ticks.



## HORSES.

The number of horses in the State at 1st January last, and their distribution in the various pastoral districts, are given in the following table:—

DISTRICT.	1900.	1899.	INCREASE.	DECREASE.
Burke ... ..	41,111	44,349	...	3,238
Burnett ... ..	28,883	28,824	59	...
Cook ... ..	27,979	26,605	1,374	...
Darling Downs ... ..	53,696	51,850	1,846	...
Gregory North ... ..	20,965	29,776	...	8,811
Gregory South ... ..	4,362	9,879	...	5,517
Kennedy ... ..	66,985	66,758	227	...
Leichhardt ... ..	46,361	44,912	1,449	...
Maranoa ... ..	19,900	22,248	...	2,348
Mitchell ... ..	21,423	28,060	...	6,637
Moreton ... ..	61,652	61,131	521	...
Port Curtis ... ..	32,984	29,323	3,661	...
Warrego ... ..	11,407	16,682	...	5,275
Wide Bay ... ..	19,080	18,730	350	...
Total ... ..	456,788	479,127	9,487	31,826

The above shows a decrease of 22,339, or 4.66 per cent. on the number of the previous year. But it has to be remembered that large shipments were made during the year to India, South Africa, and China, the last-named shipments having been made by the German Government.

## BRANDS ACTS.

The number of brands registered during the year was 848. The total number registered up to 31st December last, 40,874; the number transferred up to end of last year, 8,150; of which 930 were transferred during the year. The number of symbol or cheek brands registered under the Amendment Act of 1898 was 18, and the number of cancelled brands re-allotted during the year was 117.

A special effort was made during the year to eliminate from the Register all brands that had gone into disuse by decease of owners, departure to other places, and other causes, the result being that up to the end of the year 539 brands have been cancelled, and will, in due course, be open for re-selection.

The heavy and continuous work imposed on the inspectors in the tick zone, principally through the granting of permits to travelling stock, has greatly interfered with their duties under the Brands Acts.

## "THE MARSUPIAL BOARDS ACT, 1897, CONTINUATION ACT, 1900."

The drought, far-reaching in its effects, has been instrumental in reducing considerably the numbers of marsupial and dingo scalps paid for during the year ending 30th June, 1900, although it is certain that the deficiency has been more than made up by the direct effects of the dry weather. The chief feature and most regrettable is the suspension of operations by many Boards—in some cases extending over the greater part of the year—and had it been possible to provide funds to avoid this, a record would have been set up in the number of scalps destroyed.

The statement of operations of each Board is, as usual, appended hereto, and in order to allow a comparison, the figures, totals only, of the previous year have also been given.

As my reports under this heading apply only to the marsupial year ending 30th June, I have not before had the opportunity of referring to the Marsupial Conference held in Brisbane on 27th September, 1899. Only twenty-three Boards sent delegates. It is unnecessary, however, to make more than a passing reference to this matter, as a *précis* of the proceedings has already appeared in print.

## STATEMENT OF OPERATIONS FOR THE YEAR ENDING 30TH JUNE, 1900.

Board.	SCALPS DESTROYED.				TOTALS.		COST.
	Kangaroos.	Wallabies.	Others.	Dingoes.	1899-1900.	1898-1899.	1899-1900.
Adavale ... ..	18,034	1,234	2	385	19,655	*	£ s. d. 733 10 2
Aramac ... ..	152,378	6,051	1,213	798	160,440	157,748	3,633 10 9
Barcoo ... ..	4,108	2,191	23	449	6,771	183,097	1,411 18 2
Belyando ... ..	30,258	21,865	205	...	52,328	39,262	1,077 9 9
Booringa ... ..	9,767	42,478	1,206	471	53,922	108,296	1,079 18 10
Boulia ... ..	2,513	5	...	689	3,207	981	316 9 5
Bowen ... ..	5,225	3,739	113	1,432	10,509	11,625	551 17 8
Bulloo ... ..	49,298	...	...	1,311	50,609	46,158	954 4 6
Bungil ... ..	2,340	31,715	2,210	811	37,076	34,334	1,006 14 2
Burnett ... ..	8,606	28,217	1,762	1,705	40,290	48,782	1,078 13 11
Camooweal ... ..	153	...	...	265	418	491	70 1 6
Clermont ... ..	119,014	55,887	3,890	...	78,791	97,343	1,503 3 5
Cloncurry ... ..	615	10	5	413	1,043	4,232	118 16 8
Condamine ... ..	...	20,793	122	...	20,915	18,323	382 3 2
Dalrymple ... ..	4,429	10,811	71	871	16,182	9,578	460 12 9
Darling Downs ... ..	...	194,296	5,276	506	200,078	232,643	3,345 9 8
Dawson ... ..	6,412	7,099	301	...	13,812	18,634	283 12 8
Diamantina ... ..	...	...	...	314	314	300	80 4 6
Gogango ... ..	6,667	17,102	1,311	1,132	26,212	31,125	671 2 3
Gregory ... ..	44,297	361	17	121	44,796	30,686	1,131 17 6
Hughenden ... ..	19,276	5,025	527	576	25,404	21,633	860 6 1
Leichhardt East ... ..	5,820	5,175	116	...	11,111	15,544	288 4 1
Leichhardt South ... ..	9,468	45,442	3,341	2,239	60,490	43,653	1,614 17 8
Mitchell West ... ..	45,458	...	2	483	45,943	53,695	1,813 18 5
Paroo ... ..	600	...	...	...	600	181,183	1,343 17 10
St. George ... ..	41,523	17,991	1,040	1,611	62,165	49,829	2,152 1 10
Waggamba ... ..	4,537	36,470	493	952	42,452	52,388	1,201 7 4
Warrego ... ..	59,221	41,115	155	963	101,454	111,484	2,649 17 2
Western Downs ... ..	...	...	...	...	...	54,814	...
West Moreton ... ..	2,368	24,804	6,506	419	34,097	39,231	745 12 1
Windorah ... ..	81,838	233	5	1,415	83,491	41,215	2,757 2 11
Totals ... ..	634,223	620,109	29,912	20,331	1,304,575	1,735,307	35,318 16 10

\* New District previously included in Barcoo and Warrego.

## LIVE STOCK AND MEAT EXPORT ACT.

In consequence of the drought, several of the canning and extract works have been closed down, and the principal freezing and canning establishments were not able to work up to their full capacity. The latter are, however, now in active operation.

The reports of the various veterinary inspectors are appended hereto.

## "THE SLAUGHTERING ACT OF 1898."

From the monthly reports of the inspectors under this Act, it is apparent that, in all the centres in which the Act has been brought into operation, there has been a decided improvement in the sanitary condition of slaughter-houses, and the knowledge that all diseased animals would be condemned has made all buyers of fat cattle more careful than formerly in the selection of their purchases.

The Staff Inspector has been almost constantly employed in visiting the various inspectors' districts, and his report is given as an appendix hereto.

I have, &c.,

P. R. GORDON,  
Chief Inspector of Stock.

## APPENDICES.

## REPORT OF STAFF INSPECTOR.

The work performed by every officer acting under my supervision has been inspected at least once, and in the majority of cases more frequently, during the year 1900.

## BRANDS ACT.

Much has been done towards the revision of the Brands Directory, and the activity of the officers employed is proved by the large increase in the numbers of brands transferred and cancelled during the year.

The task is a heavy one, insomuch as it entails finding out the present whereabouts of every person who has registered a brand in the past twenty-eight years, or the addresses of his executors, if dead.

Claimants are constantly appearing for brands which inspectors believed to be out of use, and some time must still elapse before the lists of disused brands can be published.

Inspectors all report that they are constantly receiving application for cattle ear-marks, which they are debarred from granting by the provisions of "The Brands Act of 1898."

The custom of trucking stock to meatworks and saleyards without way-bills or delivery-notes is still persisted in although owners have been repeatedly warned that, unless the provisions of the Act are complied with in this respect, it is impossible to prevent persons so disposed from trucking cattle not their own; and there is good reason for believing that this method of stock-stealing is by no means uncommon.

## DISEASES IN STOCK ACT.

Although the drought prevented Western inspectors from patrolling regularly, they had to deal with enormous numbers of stock travelling eastward for grass, and returning.

Inspectors at East Moreton, Maryborough, Bundaberg, and Rockhampton have frequently been applied to for information and assistance in erecting and working dips.

Owing to the non-existence of dips at many places, hand-dressing of horses proceeding to clean country has still to be resorted to, and this method, unsatisfactory at best, is both difficult and dangerous when dealing with rough-coated half-broken bush-horses.

## DISEASES IN SHEEP ACT.

As anticipated in my last annual report, numerous cases of disputed ownership have arisen. Inspectors have unfortunately no power to impound straggling sheep, and all that can be done when an inspector sees strange sheep on a run is to locate the owners of the registered marks on the sheep and send them notice of the whereabouts of the animals.

No "disease" as defined by the Act exists in Queensland. Many of the Western sheep depastured on coastal country developed various maladies, which disappeared on the sheep returning to their own runs.

## SLAUGHTERING ACT.

Speaking generally, there is a steady if slow improvement in the condition of the slaughter-houses, inspectors inducing owners to make first one alteration and then another, and that without unnecessary friction.

The master butchers themselves now admit the benefits of the Act.

If the idea of erecting abattoirs were definitely abandoned or postponed for a given number of years, Brisbane inspectors would be enabled so decide whether action should be taken in the matter of certain small yards where improvements of so expensive a nature are necessary that they hesitate to order them, lest the yards should be subsequently closed.

From conversations I have had with owners, I gather that if the abattoir scheme were deferred for a definite period there would be a tendency to concentrate the killing in a limited number of yards, which would greatly facilitate inspectors' duties.

In other large towns the condition of the slaughter-houses is fairly satisfactory—the maintenance of an adequate supply of water being usually the chief difficulty.

The country yards, though frequently of primitive construction, are clean and wholesome.

## STOCK RETURNS ACT.

Every year there is the same difficulty in enforcing the provisions of this Act when dealing with owners of only a few head of stock.

In spite of the large number of defaulters against whom proceedings are taken annually (greater than the aggregate number of persons prosecuted under all the other Acts administered by this Department), owners still forget or neglect to furnish their returns, and the labour involved in locating defaulters and compelling them to comply with the Act is very great.

In some districts the police afford most valuable assistance, but in others the whole of this work devolves upon the inspectors.

F. H. SHEPHERD, Staff Inspector.

## MEAT INSPECTION REPORT OF THE BRISBANE DISTRICT.

(INSPECTOR QUINNELL.)

## EAGLE FARM WORKS.

QUEENSLAND MEAT EXPORT AND AGENCY COMPANY, LIMITED.

Stock.	Slaughtered.	Disease.	CONDEMNED.			PER CENT.			REJECTED.			PER CENT.		
			Bodies.	Fores.	Hinds.	Bodies.	Fores.	Hinds.	Bodies.	Fores.	Hinds.	Bodies.	Fores.	Hinds.
Bullocks ...	40,714	Tuberculosis	90	299	106	.221	.734	.260	801	166	445	1.967	.407	1.092
Cows ...	3,787	ditto ...	19	50	9	.501	1.320	.237	107	13	63	2.825	.343	1.663
Cattle ...	Affected with other diseases	...	6	5	11	.013	.011	.024	347	228	131	.779	.512	.294
Sheep ...	67,829	...	6	...	...	.008	...	...	...	...	...	...	...	...
Pigs ...	128	...	2	...	...	1.562	...	...	...	...	...	...	...	...
Calves ...	49	...	...	...	...	...	...	...	...	...	...	...	...	...

## QUEENSPORT.

(MESSRS. BAYNES BROS.)

Stock.	Slaughtered.	Disease.	CONDEMNED.			PER CENT.			REJECTED.			PER CENT.		
			Bodies.	Fores.	Hinds.	Bodies.	Fores.	Hinds.	Bodies.	Fores.	Hinds.	Bodies.	Fores.	Hinds.
Bullocks ...	30,622	Tuberculosis	75	73	2	.244	.238	.006	129	110	85	.421	.391	.277
Cows ...	7,979	ditto ...	64	51	14	.802	.639	.175	44	31	36	.551	.388	.451
Cattle ...	Affected with other diseases	...	4	16	22	.010	.041	.057	18	62	50	.046	.160	.129
Sheep ...	58,036	...	8	...	...	.013	...	...	73	...	...	.125	...	...
Pigs ...	2,091	Tuberculosis	27	...	...	1.291	...	...	...	...	...	...	...	...
Calves ...	1,238	Immature	60	...	...	.484	...	...	...	...	...	...	...	...

NOTE.—This table includes stock slaughtered and inspected for the firm's town supply.

## REDBANK WORKS.

(QUEENSLAND CHILLING AND EXTRACT COMPANY, LIMITED.)

Stock.	Slaughtered.	Disease.	CONDEMNED.			PER CENT.		
			Bodies.	Fores.	Hinds.	Bodies.	Fores.	Hinds.
Bullocks ...	2,158	Tuberculosis ...	8	48	2	.370	2.224	.092
Cows ...	200	ditto ...	6	13	...	3	6.5	...

The stock treated were for preserving and extract only.  
These works closed down in July, 1900.

## MOORAREE WORKS.

(UHLMANN BROTHERS.)

Stock.	Slaughtered.	Disease.	CONDEMNED.			PER CENT.		
			Bodies.	Fores.	Hinds.	Bodies.	Fores.	Hinds.
Bullocks ...	2,186	Tuberculosis ...	3	26	...	.137	1.189	...
Cows ...	203	ditto ...	2	7	1	.985	3.448	.492
Sheep ...	8,548	...	...	...	...	...	...	...
Pigs ...	619	Tuberculosis ...	6	...	...	.969	...	...
Calves ...	101	Immature ...	10	...	...	9.90	...	...

The Company having no preserving or extract plant, all "rejects" went to the digestors.

## ZILLMERE BACON FACTORY.

(J. C. HUTTON.)

Stock.	Slaughtered.	CONDEMNED.			Per cent.	
		Disease.				Bodies.
Pigs ...	57,430	Tuberculosis ...	...	...	197	.343

**OXLEY BACON FACTORY.**  
(QUEENSLAND MILD CURE COMPANY, LIMITED.)

Stock.	Slaughtered.	CONDEMNED.		Per cent.
		Disease.	Bodies.	
Pigs ... ..	21,220	Tuberculosis ... ..	158	·744
Calves ... ..	83			

OX TONGUES CONDEMNED.				PIGS' HEADS CONDEMNED.			
Works.	Condemned.	Out of	Per cent.	Works.	Heads.	Out of	Per cent.
Eagle Farm...	1,043	44,501	2·343	Zillmere ...	3,439	57,430	5·988
Queensport ...	807	38,601	2·09	Oxley ...	1,780	21,220	8·388
Redbank ...	257	2,358	10·899	Eagle Farm	2	128	1·562
Mooraree ...	5	2,389	0·209	Queensport	139	2,091	6·647
				Mooraree ...	99	619	15·996

NOTE.—Tongues and pigs' heads were condemned for tubercular, actinomycotic, and ordinary abscesses; "Rejects" constitute stock not absolutely sound, though fit for human food. For example, in a case of localised tuberculosis (swine excepted) affecting one or more of the viscera, or if the lesions are confined to the carcass itself, such a body is immediately rejected for freezing or shop; then, when on a careful examination of the glands and other parts the carcass is found to be quite healthy, the diseased portions are removed and destroyed, and the rest of the carcass is permitted to be utilised for preserving only, thus ensuring thorough cooking and sterilisation.

**LIVE STOCK AND MEAT EXPORT ACT.**

GENERAL.

I.—REMARKS.

I am pleased to report that comparatively little disease among stock, with the exception of tuberculosis, has come under my observation.

Our reports indicate that tuberculosis in swine is steadily increasing, and in many instances it is found that certain localities maintain a larger percentage of tuberculous pigs than other districts.

The prevalent practice of feeding them upon the by-products of dairies, and especially the offal from slaughter-houses, being undoubtedly responsible for its dissemination.

To reduce the ravages of tuberculosis, two very necessary reforms are absolutely imperative—viz., the systematic and thorough inspection of dairies and the application of "*The Slaughtering Act of 1898*" to all slaughter-houses throughout the State. The subject deserves the earnest attention of the Government. The evil is progressive, and a positive source of danger to the health of the milk and meat consuming community.

Regarding the inspection of pigs at the various meat-preserving establishments, the recommendation of the Royal Commission on tuberculosis has been adopted—viz., "In view of the greater tendency to generalisation of tuberculosis in the pig, we consider that the presence of tubercular deposit in any degree should involve seizure of the whole carcass and organs."

II.—EXPORT OF LIVE STOCK.

The number of stock inspected, and for which certificates were issued prior to shipment, were:—Mares and geldings, 679; stallions, 3; bullocks, 1,000; Heifers, 26; sheep, 800.

III.—LECTURES.

During the past year a course of lectures and demonstrations have been given by me at the Queensland Agricultural College, the Brisbane and Ipswich Technical College.

IV.—MISCELLANEOUS.

Since making my last report certain districts have been visited by me, in accordance with instruction received.

I contributed a series of articles to the *Queensland Agricultural Journal*, principally on the diseases of the horse.

As inspectors of meat were required, the men were placed under me to receive the necessary training in meat inspection.

I have attended to matters and correspondence requiring professional advice submitted to me by the Department.

W. C. QUINNELL, M.R.C.V.S., L.

**GLADSTONE MEATWORKS.**

(INSPECTOR STANDEN.)

During the season 1900 (commencing 9th December, 1899, and terminating 25th August, 1900) 31,953 cattle were sent in for treatment, of which 27,228 were frozen, 3,903 preserved or extracted, 169½ used for rations and shipping supply, 61 sent direct to the boilers, 591½ were condemned, showing a percentage of 1·854 on cattle treated for food purposes; 5,479 sheep were also treated with the following results:—

Disease.	Number.	Percentage.
Tuberculosis ... ..	314½	1·00
Ill-condition ... ..	109½	·343
Actinomycosis, pleurisy, pneumonia, &c. ... ..	134½	·420
Bruise, Tumorfaction, &c. (Sheep) ... ..	31½	·010
Ill-condition ... ..	245	4·47

JAMES STANDEN, M.R.C.V.S.L.

LAKE'S CREEK MEATWORKS.  
(INSPECTOR O'BOYLE.)

Cattle slaughtered	...	...	...	...	...	...	...	42,500
„ condemned	...	...	...	...	...	...	...	1,345
Tuberculosis, local	...	...	...	...	...	...	...	2,331
„ gen.	...	...	...	...	...	...	...	223
Pleuro-pneumonia	...	...	...	...	...	...	...	237
Tick Fever	...	...	...	...	...	...	...	232
Hydatids, Pregnancy, Tumours, Cancer	...	...	...	...	...	...	...	141
Jaundice, Actinomycosis, Bruises, &c.	...	...	...	...	...	...	...	
Total	...	...	...	...	...	...	...	3,164
Pigs slaughtered	...	...	...	...	...	...	...	2,553
„ condemned	...	...	...	...	...	...	...	47
Tuberculosis	...	...	...	...	...	...	...	015
Pleurisy, Ulcers, Cancer, &c.	...	...	...	...	...	...	...	003
Total	...	...	...	...	...	...	...	018
Sheep slaughtered	...	...	...	...	...	...	...	46,456
„ condemned	...	...	...	...	...	...	...	63
Parturition, Poverty, Cancer, Hydatids, Abscess, Lymphadenoma, Jaundice, and Bruises	...	...	...	...	...	...	...	001

SUMMARY of CATTLE KILLED and CONDEMNED at GAVIAL PARK MEATWORKS for YEAR ended  
31st DECEMBER, 1900.

Month.	Number of Cattle Killed.	Carcasses Condemned.	Sides Condemned.	Quarters Condemned.	Total Condemned.	CONDEMNED FOR—		
						Tuberculosis.	Pneumonia.	Hydatids.
May ...	1,129	2	...	6	3½	3½	...	...
June ...	1,105	1	..	4	2	1½	¼	...
July ...	832	4	2	...	5	3½	...	1½
August ...	35	...	...	2	½	½	...	...
September ...	143	...	...	4	1	1	...	...
October ...	180	2	...	10	4½	4½	...	...
November ...	280	4	2	1	5¼	5¼	...	...
	3,704	13	4	27	21¾	20	¼	1½

PERCENTAGE OF CATTLE CONDEMNED.

Tuberculosis	...	...	...	...	...	...	...	5399
Pneumonia	...	...	...	...	...	...	...	0067
Hydatida	...	...	...	...	...	...	...	0406
Total percentage condemned	...	...	...	...	...	...	...	5872

SUMMARY of PIGS KILLED and CONDEMNED at GAVIAL PARK MEATWORKS for YEAR ended 31st DECEMBER, 1900.

Month.	Number of Pigs Killed.	Number Condemned.	Disease Tuberculosis.
August ...	12	...	...
September ...	20	1	1
October ...	12	...	...
November ...	5	...	...
	49	...	1

Percentages of Diseases—Tuberculosis, 2·04½.

SUMMARY of SHEEP KILLED and CONDEMNED at GAVIAL PARK for YEAR ended 31st DECEMBER, 1900.

Month.	Number of Sheep Killed.	Number Condemned.	Disease.
August ...	53	...	...
September ...	96	...	...
October ...	120	...	Nil.
November ...	40	...	„
	309	...	...

ALLIGATOR CREEK MEATWORKS.

*Cattle.*—The number of cattle killed during the season 1900 (commencing 10th of April and ending 25th July) was 12,885. Of these 1·389 per cent. were condemned for diseases, the percentage of which are as follows:—

	Per cent.
Tuberculosis	673
Texas fever	248
Pleuro-pneumonia	008
Bruises	132
Other diseases, as tumours, abscesses, gangrene, &c.	328

*Sheep*—22,835 sheep were treated during the season. Of these, a small percentage were rejected on account of emaciation, but none for disease.

H. O. BOYLE, M.R.C.V.S.L.

## BOWEN MEATWORKS.

(INSPECTOR MEEK.)

During the season of 1900 the number of cattle put through the above works numbered 16,623. Though this was a considerable reduction on previous years, yet owing to the terrible seasons it was by no means bad; and I am glad to report that the quality of the cattle put through was on the whole far superior to what has been previously the case. Several mobs were really all that could be desired in the shape of good quality beef, and I was exceedingly sorry that such went to Africa instead of the London market.

The number of condemnations, I am glad to report, were not so great as previous, but I think it only fair to mention that I mark all condemned that are not fit for freezing. Many of these rejections go into extract. In future I shall keep a separate account of rejections (namely, unfit for freezing), and condemned (namely, sent to the boiling down). During the season we have killed about 200 pigs (mostly suckers) for local use and use of meat boats. Only three were condemned for tuberculosis.

The amount of Extract manufactured during the season was not up to amount of last season, though in my opinion of a superior quality.

You will be pleased to hear that we are having a tinning plant put up. This will enable the management to make better use of rejections. From what I can gather at present we shall have a fairly good season, and I fancy somewhere about 20,000 to 25,000 will be put through. This is very good when one considers that so many inspectors are dismissed owing to works not slaughtering.

Condemned Stock shown on Schedule below:—

## Tuberculosis—

Bodies	...	...	...	...	...	603 = 603
Half-way	...	...	...	...	...	103 = 51½
Fore-quarters	...	...	...	...	...	143 = 35¾
Hind-quarters	...	...	...	...	...	42 = 10½
Total	...	...	...	...	...	700¾

## Pleurisy and Pleuro-pneumonia—

520 Fore-quarters = 130 ... .. = .781%

## High Colour and Jaundice, &amp;c.—

52 Bodies ... .. = .318%

## Plain and Unfit—

Bodies ... .. 701 = 701

Fore-quarters ... .. 31 = 7¾

Hindquarters ... .. 2 = 0½ = 709½

## Bruised, &amp;c.—

Bodies ... .. 85 = 85

Fore-quarters ... .. 67 = 16¾

Hind-quarters ... .. 69 = 17½ = 119

= .718%

## OTHER DISEASES.

Actinomycosis, 15; Abscesses, 46 H.Q.; Abscesses (various), 15; Scrotal Abscesses, 6; Redwater, 31; Parturient, 17; Bruises and Abscesses in Kidneys, &c., 18; Extravasation in Tissues, 5; Tumours (various), 2½; Melanosis, 4 = 125 = .751 on 16,623.

Tuberculosis	...	...	...	...	...	4.210
Pleurisy, &c.	...	...	...	...	...	.781
High colour and jaundice	...	...	...	...	...	.318
Plain and unfit	...	...	...	...	...	4 265
Bruises, &c.	...	...	...	...	...	.718
Other diseases	...	...	...	...	...	.751

----- = 11 043

N.B.—I think that it is only fair to point out in your report that the majority of plain and unfit were, of course, used for extract, and that in future you have instructed me to keep rejections and condemnations separate

BEN. D. MEEK, M.R.C.V.S.L.

## BURKETOWN MEATWORKS.

(INSPECTOR MYDDLETON.)

The season commenced 10th May and ended 21st December, during which period 8,517 bullocks and 2,513 cows were treated. Condemned stock shown on schedule below.

Cattle.	Condemned for—	Bodies.	Quarters.	Bodies.	Per cent.
Bullocks—8,517	Tuberculosis	62	146	81	1.679
	Actinomycosis	26	...	...	.30507
	Emaciation	14	...	...	.16436
	Pleurisy	11	...	...	.129
	Abscesses	1	4	4	.05870
	Cancer	4	...	...	.04696
	Tick Fever	4	...	...	.04696
Cows—2,513	Tuberculosis	39	41	28	2.66613
	Emaciation	22	...	...	.875
	Tick Fever	12	...	...	.04775
	Pleurisy	8	...	...	.03183
	Actinomycosis	11	...	...	.04377
	Abscesses	...	2	2	.00793
	Cancer	2	...	...	.00793
Tongues—11,030	Tuberculosis	220	...	...	2
	Unfit	127	...	...	1.4234
	Actinomycosis	33	...	...	.03
	Pleurisy	19	...	...	.01773
	Cancer	6	...	...	.00544

Actinomycosis, Emaciation, and Cancer.—The cattle condemned for these diseases were sent to the works for their hides and tallow, and not for treatment.

F. H. MYDDLETON, Inspector.

Price 1s. 5d.]

By Authority: GEORGE ARTHUR VAUGHAN, Acting Government Printer, William street, Brisbane.