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PART 3.

Agriculture.

NATAL WATTLE-BARK INDUSTRY.

Mr. W. Wayne, senr., writing to the "South African Mining Journal," says:—

Owing to the disturbed conditions now prevailing in Europe, the above industry has been practically brought to a standstill, on account of the wattle-bark buyer having centred this industry in Hamburg, Germany. Under these circumstances, the stripping of the wattle-trees during the present spring season will have to be delayed in consequence of the export market being closed. Last year's exports of wattle-bark totalled some 65,000 tons, which at a low average of £4 10s. per ton equals £292,500 deferred payment to the Natal wattle-growers for the season 1914 based on the 1913 returns. It has occurred to me to lay before you the forenamed loss, for the season 1914, with a view to calling the wattle-growers' attention to the necessity of forming themselves into a limited liability company for the purpose of raising capital to establish wattle-bark extraction factories in convenient centres of the Natal wattle-growing district. These factories would produce the tannin extracts in the right condition for British farmers' requirements. We find the British market object to handle the wattle-bark in its present exported condition as supplied to the Hamburg merchants. I observe, published in the "British South African Gazette," that tenders are being called for wattle extract plants. This journal states that the purchase of a plant costing £20,000 for manufacturing wattle

extract is to be taken in hand by a company formed for the purpose at Pietermaritzburg, Natal. The plant should be capable of dealing with 6,000 tons of raw material annually. Basing the provisional calculation on the above amount of £20,000 being capable of treating 6,000 tons, of raw bark, the present output of bark would require ten factories to treat the year 1913 quantity of bark. Ten factories at £20,000 each equals £200,000. Two hundred thousand pounds capital is required to manufacture their product into a marketable article suitable to British requirements. This would obviate the expense of long railage charges to the coast ports, and it would save the shipping expenses in bulk form to the port of Hamburg. The means of raising the capital for this object might possibly be secured on the following plan being adopted by all those engaged in the wattle industry:—(1) That for every acre of land under wattles the owner should guarantee to subscribe £1 or more to the company, such guaranteed amount to be deducted from the value of his wattle-bark returns when settlement was made; (2) the guaranteed amount could be extended over a period of one or more years, according to the discretion of the board of directors; (3) the capital being raised under the above guarantee would in course of time be returned to the original lenders, and in the meantime gradually bring a co-operative wattle-growers' manufacturers' extract company into permanent existence, and thus help to establish a profitable business for their growing industry. The present position in which the wattle-growers and buyers are placed to-day is one that requires every assistance to overcome this serious loss to those engaged in this industry. The present moment appears one favourable to proposing the flotation of these ten companies for this purpose, which should prove valuable to all concerned and of future benefit to the trade of the country. As a subscriber to your journal, I forward the above views on the wattle-growers' prospects for the year 1914."

"Durban, 5th September, 1914."

FODDER SUPPLIES FOR DAIRY STOCK.

Relative to providing fodder supplies for dairy stock, Mr. E. Graham, Dairy Expert, writes:—

The conservation of fodder by means of a silo would materially assist in providing the dairy stock with a ration of suitable food during winter months, or other period when the land is denuded of natural pastures, for it is known that silage properly cured, and prepared from an approved crop, constitutes the basis of a nourishing and succulent meal for the dairy cow.

Of the green crops to be recommended for winter feeding it is considered that field peas associated with skinless barley, cape barley, rye, and oats may provide the best rotation of crop.

The various crops would be ready for use in the order named if given equal opportunity for growth.

About half a bushel of field peas and one and three-quarters bushel either oats or barley to each acre should be planted, and the above quantity of field pea to one bushel of rye to the acre, is suggested.

Relative to Essex rape, all varieties of rape convey characteristic flavours to milk and cream, and these flavours in the absence of pasteurisation of the milk or cream are difficult of eradication. However, the tainting influence of this fodder is to be somewhat reduced by feeding it to cows immediately the process of milking is completed. The maximum degree of taint in the flavour of the milk occurs when fodders of this nature are fed to the dairy herd prior to or simultaneous with milking operations.

Acreage to be cultivated: An area of 10 to 16 acres is necessary to maintain a herd of fourteen (14) cows; and, naturally, the acreage cannot be definitely determined, as much depends upon the weather conditions prevailing during the time the crops are in the field.

According to the nature of the season the oat crop may or may not be required as green feed for the dairy stock, and should it be found that there is a surplus of green fodder on hand at the termination of the feeding season, the oat crop could, under such circumstances, be converted into hay, thereby avoiding any waste.

EXPLOSIVES ON THE LAND.

Mr. B. Stirling, of Mount Morgan, writing of his experience in the use of gelignite for blowing out stumps, says:—

“Having read a good deal in the Journal about clearing land, I give my experience with gelignite. Having some land which at one time teamsters used for a road, and was very hard, I decided to clear it of stumps, so I got a grubber and started digging. It took me two hours to get one stump out, so I decided to try gelignite. I can do more in two shots than I could in two days' work at grubbing, and those two shots would take me twenty minutes to bore, charge, and fire for very large stumps. To save gelignite, I blow the earth out from both sides, using two plugs for each side. The stump is generally cleared of earth to a depth of 3 ft., and very often so shattered as to be all ready to set fire to; the small stumps I have blown out with from one to three plugs of gelignite, thus getting rid of small stumps and saving very often ten plugs of gelignite, which would be required if the large stumps were blown out, and bringing the cost of clearing down very low, and, what is more, saving a lot of hard work at grubbing.

“For boring I use a 1-in. auger, 3 ft. long, with a brace at end for boring rapidly. I generally bore to a depth of 18 in., and very often only 12 in. for small stumps—under the stump, if possible; if not, then close to it. After boring out I ram the bottom of the hole firmly with a round wooden banister I use for a tamping rod. Then, if I decide to use three plugs, I break each plug in half, then press each half firmly until squashed solidly in the bottom of the hole. In the last half plug I place the cap with about 12 or 18 in. of fuse, according to the depth of the hole.

I then drop in fine earth, a little at a time, and press that down very gently until the hole is filled up. I next split the fuse, and place a little gelignite in the split and light it. It is wonderful how quickly and easily stumps can be blown out, and how quickly ground, even with green timber on it, is got ready for cultivation with no exhausting work.

“Let anyone in doubt take on grubbing for one day; then shoot out stumps next day. He will see the difference between hard work one day and a week’s work done on the next day with gelignite by just boring a few holes and charging and firing.”

Many people are afraid of explosives, but they are not half as dangerous, providing care is taken, as some think.

MARKET GARDENING.

CAULIFLOWER AND CELERY.

If it is desired to lift and store these vegetables on account of severe weather, or to cultivate the soil in preparation for the next crop, they may be lifted with as much soil as will cling to their roots, and be stacked upright in a cool shed to which light is admitted. The plants should be packed close together and the exposed side should be banked up with soil. In this way they will keep as long as in the open ground. The proper time to lift is about the end of October or during November for cauliflowers, and the middle of November for celery.

State Farms.

NOTES FROM KAMERUNGA STATE NURSERY, DECEMBER, 1914.

Rainfall for month, 5.71 in. Number of days on which rain fell, 10. During the last week of the month most trying weather was experienced, due to high winds from N.W. by W. A blow during the night of the 25th snapped off a number of bananas and papaws, besides more or less putting over some eighty coffee-trees, all of which had to be staked.

Coffee.—Trees all looking well. The green tips of primary branches of all young bearing trees were disbudded so that the tree would not be overtaxed; all the trees were topped, as, owing to the forcing season, the growth has been too quick.

Vanilla.—Having again had nice showers during the month, vines have continued to make good progress, and pods are swelling well.

C. E. WOOD,

Manager, Kamerunga State Nursery, Cairns, N.Q.

Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

MILKING RECORDS OF COWS FOR MONTH OF JANUARY, 1915.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Commercial Butter.	Remarks.
			Lb.	%	Lb.	
Nellie II. ...	Shorthorn...	20 July 1914	933	3.8	41.57	Natural pasture only.
Miss Jean ...	Ayrshire ...	24 Nov. "	849	4.0	39.85	
Honeycombe	Shorthorn	27 July "	808	3.8	35.99	
Lady Melba	Holstein ...	6 Mar. "	751	4.0	35.21	
Miss Melba...	"	22 Nov. "	1,082	2.8	35.19	
Butter ...	Shorthorn	20 Nov. "	880	3.4	34.97	
Simple	Jersey ...	24 Nov. "	643	4.6	34.84	
Interest						
Miss Lark ...	Ayrshire ...	31 Oct. "	735	4.0	34.46	
Madam Melba	Holstein ...	8 Sept. "	1,020	2.9	34.40	
Special	Jersey ...	19 Dec. "	625	4.5	33.12	
Edition						
Burton's Lily	Shorthorn	17 Nov. "	776	3.6	32.24	
Lady	Ayrshire ...	19 June "	721	3.8	32.09	
Margaret						
Daisy ...	Holstein ...	26 Nov. "	966	2.8	31.72	
Lucinda ...	Ayrshire ...	20 Sept. "	628	4.2	31.00	
Silver Nell ...	Shorthorn...	5 Oct. "	693	3.8	30.85	
Bluebelle ...	Jersey ...	27 May "	611	4.2	30.16	
Miss Edition	"	10 July "	470	5.4	29.98	
Burton's	Shorthorn...	23 July "	669	3.8	29.79	
Lady						
Sweet	Jersey ...	28 July "	446	5.6	29.52	
Meadows						
Rosebud ...	Ayrshire ...	20 Sept. "	770	3.2	28.72	
Lowla II. ...	Shorthorn-Ayrshire	23 Sept. "	636	3.8	28.32	
Lady Lil ...	Jersey ...	22 Aug. "	496	4.7	27.47	
Glen ...	Shorthorn...	26 Oct. "	775	3.0	26.98	
Miss Bell ...	Jersey ...	13 Aug. "	474	4.8	26.82	
Pauline ...	Shorthorn	12 Oct. "	757	3.0	26.41	
Lark ...	Ayrshire ...	27 July "	663	3.4	26.33	
Davidina ...	"	17 July "	557	3.8	24.78	
Rosine ...	"	23 Sept. "	502	4.2	24.75	
Dollie ...	Shorthorn	19 Dec. "	602	3.4	23.91	
Laurette II.	Ayrshire ...	10 Nov. "	682	3.0	23.82	
Countess of	Shorthorn...	27 July "	647	3.0	22.59	
Brunswick						
Lady Spec ...	Ayrshire ...	24 Oct. "	574	3.2	21.40	

RELATIVE TO ADDITION OF FISH OILS TO SKIM MILK, Etc.

In response to a letter to the Department addressed to Messrs. Barnes and Co., Ltd., Mr. G. Green, of Goomburra, relative to the addition of fish oils to skim milk as a cheap and valuable food for stock, in January last, Mr. E. Graham, Dairy Expert, wrote:—

Animals have a natural repugnance to highly rancid and offensive smelling oils, and for this reason some grades of fish oil are not suitable for the purpose in question.

However, the addition of either animal or vegetable oil to skim milk would increase its feeding value. Average cow's milk contains from $3\frac{1}{2}$ to 4 per cent. of butter fat, consequently that is the percentage of oil that is to be added to the skim milk in order to replace the amount of fat extracted from the milk by the process of "separation."

In the actual feeding of added oil and skim milk to swine, there is usually a difficulty in getting the oil to emulsify with the skim milk, but this trouble is possibly easiest of adjustment by pouring the oil on a little dry pollard and allowing the pollard to absorb it; then mix the oil-laden pollard with the skim milk in the required proportion. Coconut-oil cake is specially valuable for the purpose of feeding to lower animals in conjunction with skim milk, as the oilcake contains a considerable amount of nitrogenous matter in a form that is easily to be assimilated.

Concerning molasses and its sugar-content: Sugar-mill molasses contains from 45 to 60 per cent. of sugar, and the molasses may be fed to swine in conjunction with other food, but as the molasses has a laxative influence, it is not to be fed in excessive quantities.

CREAM AND BUTTER FAT.

In reply to a letter from a correspondent, relative to the difficulty experienced in making the cream yield up its butter fat, Mr. E. Graham, Dairy Expert, says:—

There are several causes influencing the churning of cream, and in the absence of a full knowledge of the particulars governing the specific case under review, it is possibly best to treat briefly with the causes that are most probably responsible for the trouble.

Occasionally it happens that a churn of unsuitable pattern is employed for the service of churning cream. In a general way hand-power churns are to be classified under three headings—viz., the plunger, dash, and paddle principle, the firstnamed being the least satisfactory.

Again, the cream may not contain sufficient acidity at the time its churning is attempted, and in this case the remedy most likely to be effective is to allow the cream to ripen for another day before churning operations are commenced.

Further, there is a possibility that the butter-fat content of the cream may be unduly low and the process of churning retarded as a consequence. An adjustment of the cream screw of the separator would remove this difficulty, and result in the production of a "thicker" cream. Should the cream, after attention has been given to the above matter, still maintain its reluctance to churn, then place the churn containing the cream in a bath of warm water for several minutes, and renew churning operations.

If the above measures prove ineffective in inducing the cream to churn, it is obvious that the cause arresting the churning of cream is attributable to the stage of growth of the pastures to which the cows have access, and only a change in the nature of the fodder consumed by the dairy stock will restore the cream to a normal condition.

Poultry.

REPORT ON EGG-LAYING COMPETITION, QUEENSLAND AGRICULTURAL COLLEGE, JANUARY, 1915.

Five thousand two hundred and nine eggs were laid during the month. Owing to some of the birds having broken into moult, there has been a slight falling off; but, taken altogether, the output of eggs has been very good for this time of the year. One of Mr. Fanning's White Leghorns died of heat apoplexy, and has been replaced. Mr. E. V. Bennett's White Leghorns win the monthly prize with 158 eggs. The following are the individual records:—

Competitors.	Breed.	Jan.	Total.
A. T. Coomber	White Leghorns ...	131	1,328
Moritz Bros., S.A.	Do.	154	1,306
Loloma Poultry Farm, N.S.W.	Do.	149	1,298
T. Fanning	Do.	115	1,287
Geo. Tomlinson	Do.	136	1,238
Cowan Bros., N.S.W.	Do.	137	1,221
Loloma Poultry Farm, N.S.W.	Rhode Island Reds ...	124	1,205
R. Burns	Black Orpingtons (No. 1)	130	1,205
A. F. Camkin, N.S.W.	White Leghorns ...	141	1,202
Kelvin Poultry Farm	Do.	104	1,197
A. H. Padman, S.A.	Do.	149	1,192
Mrs. Munro	Do.	141	1,188
E. Le Breton	Do.	137	1,186
Marville Poultry Farm, Victoria	Do.	153	1,185
T. Fanning	Black Orpingtons ...	143	1,168
R. Burns	Do. (No. 2) ...	136	1,158
E. V. Bennett, S.A.	White Leghorns ...	158	1,158
Derrylin Poultry Farm	Do.	138	1,158
Mrs. Bieber	Brown Leghorns ...	132	1,157
R. Burns	S. L. Wyandottes ...	122	1,144
F. McCauley	White Leghorns ...	142	1,140
J. T. Coates	Do.	139	1,137
J. R. Wilson	Do.	115	1,132
J. Franklin	Do.	122	1,132
J. T. Coates	Black Orpingtons ...	110	1,121
J. M. Manson	Do. (No. 1) ...	136	1,117
G. E. Austin	Do.	121	1,111
J. Kilroe	Do. (No. 2) ...	137	1,105
R. Jobling, N.S.W.	Do.	109	1,097
J. Zahl	Do.	145	1,090
J. Gosley	Do.	121	1,087
Range Poultry Farm	Do.	128	1,080
D. Moreton, N.S.W.	Do.	131	1,073
J. D. Nicholson, N.S.W.	Do.	118	1,063
Mrs. Bradburne, N.S.W.	Do.	105	1,035
J. N. Waugh, N.S.W.	Do.	135	1,027
C. M. Jones	Do.	105	1,026
J. Murchie	Do. (No. 1) ...	106	1,018
J. Murchie	Brown Leghorns ...	124	1,017
J. M. Manson	White Leghorns (No. 2)	130	1,001
Totals ... ..	...	5,209	45,790

The Orchard.

A FINE PEACH.

We have been shown by the Director of the Intelligence and Tourist Bureau a very fine peach grown by Mr. H. M. Jones, of Rural Retreat, weighing $10\frac{1}{4}$ oz. It is a very handsome freestone fruit, and Mr. Jones's

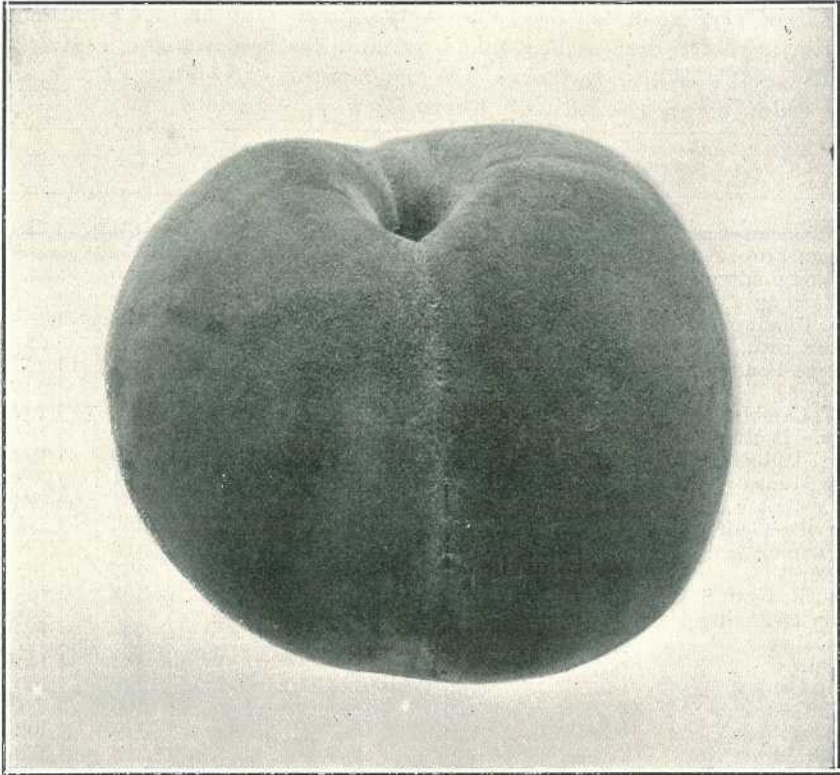


PLATE 5.—PEACH GROWN AT STANTHORPE BY MR. H. M. JONES, RURAL RETREAT; WEIGHT, $10\frac{1}{4}$ OUNCES.

peaches were awarded first prize in their class at the recent Stanthorpe Show. A model cast of this peach has been made for permanent exhibition at the Bureau. Some time ago we were asked in London 5s. each for peaches of this class.

SUGAR BANANAS AT SUNNYBANK.

Mr. M. McLaughlin, who grew the bananas here depicted, says:—
“ This hand of fourteen bananas, weighing 3 lb., cut from a bunch of seven dozen and a-half, have had no watering and only 2 in. of rain during the past six months. I attribute the size to the formula advised

in the "Agricultural Journal," viz., one part sulphate potash and two of superphosphate of lime and blood and bone with a little stable manure in two dressings annually of 3 lb. each. The plants are 12 ft. apart, and grown in groves do better than in single lines because of the shade one row casts on the roots of the other."



PLATE 6.—SUGAR BANANAS GROWN AT COOLIBAR, SUNNYBANK, BY MR. J McLAUGHLIN.

REJUVENATION OF BANANA PLANTATIONS.

“No other cultivated plant exhausts the soil to such an extent as bananas,” writes Mr. J. C. Brünnich, Agricultural Chemist, in a paper read before the International Congress of Tropical Agriculture. Isolated cases of abandoned old banana fields being replanted and yielding good crops, even without the aid of manures, have been reported in Queensland.

On this subject a very interesting article is published in “The Philippine Agriculture Review,” vol. vii., 1914, entitled “The Rejuvenation of Depleted Abacá Fields,” by F. P. Nickles, Agricultural Inspector.

The Abacá is the species of banana known as *Musa textilis*, from which Manila hemp is obtained. What holds good in the renovation of an Abacá plantation, will, it is reasonable to suppose, hold good with any variety of the *Musa* family. The article referred to is well worth the attention of banana growers in Queensland, and reads as follows:—

“The methods generally used at the present time for the production of abacá are practically the same as they were many years ago when the fibre began to be an important article of commerce in the Philippine Islands. During these years great advances have been made in agricultural pursuits, and the question may well be asked as to whether the methods used to-day for the production of abacá are the best that may be had with our present knowledge of the science of agriculture.

“In January, 1912, the Bureau of Agriculture started a series of experiments at the La Carlota Experiment Station, in Occidental Negros, to determine some of the many points in which it seemed probable that improvements might be made. These experiments are far from completed at the present time, but already they have proved instructive. Individuals, also—notably in the Moro Province—have attempted certain changes in their usual methods and with considerable success. Based upon results of tests and investigations made by the Bureau of Agriculture, and upon methods adopted to advantage by various individual planters, certain methods have recently been devised for the production of abacá which are decidedly superior to the general practice now in use. For the purpose of bringing them before the abacá producers, demonstration work was recently started in the Bicol Provinces, and it is hoped that eventually these methods may be generally adopted throughout the abacá-producing provinces. It is the purpose of this paper to fully describe them so that they may be sufficiently understood to put them to practical use.

“First, the conditions as they exist in the industry to-day should be described so that the application of any system of improvements may be better understood. If the old abacá fields are compared with those more recently planted or with those which are more favourably situated with respect to soil fertility, one quickly realises that a very large percentage of the abacá land is producing much less fibre than it could. In many districts there are, of course, large areas of virgin soil, suitable

for abacá, which might be planted and which would produce a superior crop for several years. Most of this land is inaccessible, however, and with the common methods in use it would eventually degenerate to a state similar to that existing at present. Improvements should be applicable to the older abacá fields as well as those to be planted for the first time.

“ In considering the present methods for growing abacá, the lack of any process which can be called genuine cultivation, using the word in its narrower sense, should be noted. The nearest to it that may be found in the abacá fields is a spasmodic cutting of grass and weeds with the bolo. The life of the abacá plant is twelve to twenty years. When the plants die they are replaced by transplanting a few single plants to the spots left vacant, and the planting is done unsystematically and too closely. There is practised neither cultivation, rotation of crops, nor fertilisation in any form. That they produce as well as they do is a proof of the fertility of Philippine soils.

“ Naturally, then, cultivation is the first and most logical way to bring about the desired increase in the yield of plantations. At present there does not seem to be any crop which may be grown extensively in rotation with abacá. As for fertilisation, the usual practice of applying commercial fertilisers or animal excrement is, in the majority of cases, too expensive to be justifiable. From cultivation an elimination of foreign vegetation, a more rapid conversion of plant food in the soil into a form available to abacá and a great improvement in the physical condition of the soil may be expected. These results would tend directly to increase the growth of the plants. Cultivation, however, necessitates the expenditure of money. Since the returns per hectare are relatively low in this industry, the problem is to keep this expenditure down to a point where it is justified by the increase in profits. This has been accomplished by using cowpeas (*sitao*) as a cover crop and green manure. The principle features of these methods are, *absolutely clean preliminary cultivation*, and the *planting of cowpeas as a cover crop and green manure*.

“ The best time to start the preliminary cultivation is the last part of the dry season when the hot sun and the generally dry conditions greatly assist in the killing of weeds and the burning of trash. By the time the preparation is finished, the rainy season will be at hand and the field may be planted.

“ The clearing of the field is the first operation. All trees, brush, and old abacá should be dug up and removed or burned. Exception may be made to a few varieties of trees which are beneficial to abacá for their shade. It is better, however, to remove all trees. Shade-trees may be planted later in a systematic manner. When the larger vegetation is removed, the field should be ploughed, the number of times depending on conditions, but not less than three times will always be necessary. A period of one week may advantageously be left between ploughings in order that weeds and grass lying exposed may be killed by the sun. The ploughings should be at least 20 centimetres in depth.

If light ploughs are used, this depth may easily be reached by passing the plough twice in the same furrow. The field should finally be harrowed once or twice to smooth it.

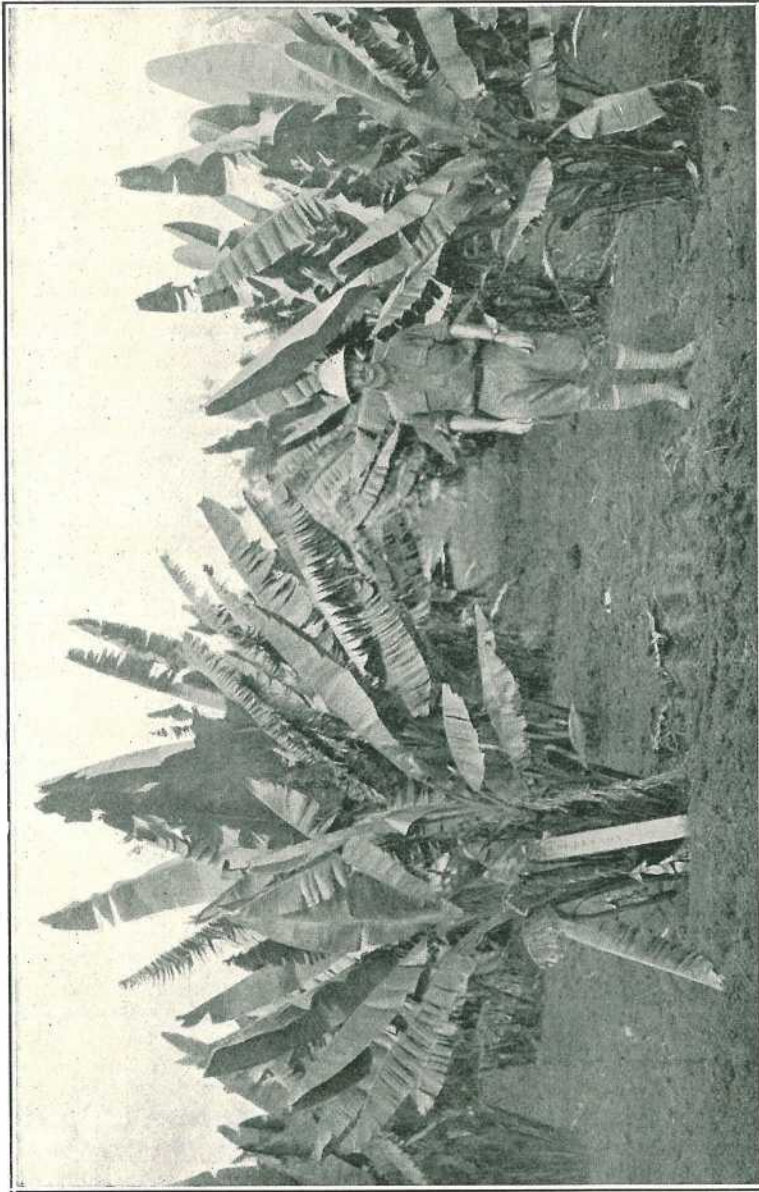


PLATE 7.—NEW, VIGOROUS, AND LUXURIANT ABACA GROWN BY THE NEW METHOD ON THE SITE OF OLD AND DEPLETED PLANTS LA CARLOTA EXPERIMENT STATION.

“ The best plough to use in large and comparatively level fields free from rocks is a heavy steel plough requiring the use of four animals. This ploughs a deep, wide furrow and is not easily broken on roots or stumps. Since many of the labourers in the abacá districts are not familiar with heavy ploughs or the handling of so many animals

together, the light steel ploughs requiring only one animal may be used. These would also be better in rocky and small fields. Ploughs of this type with a single handle are sold by two or three companies in Manila at very reasonable prices. The ordinary native plough, which merely scratches the top of the ground, is of no value in this work. Several types of harrows might be used but probably the best for the purposes of the abacá grower is the type called the 'Shear harrow.' This has the advantage of being comparatively light, and, since one is not apt to encounter heavy sod in abacá fields, it will do efficient work. Cultivators will also be necessary, to take the place of the harrow after the abacá has been planted. The only other tools needed are shovels to be used in planting the abacá, the round-pointed kind being the best.

" The planting should be done about the beginning of the rainy season or shortly before. In this connection, it is best to plant the cowpeas first. In case seed is not available at the time, they may, however, be planted after the abacá is up. The cowpeas should be sown broadcast, rather thickly, and harrowed in by the cultivator or smoothing harrow, care being taken that they are sown evenly. If the ploughing has been recent, the last smoothing may serve to cover them. In case it is necessary to sow the cowpeas after the planting of the abacá, it will be necessary to wait until the abacá is up, when they may be sown broadcast as in the first case and covered with the cultivator, passing the latter between the rows of abacá.

" The abacá should be planted immediately after the cowpeas or at least before they are up, in check rows at a distance of 3 metres. The first operation is to mark off the field. For this a tape and a supply of small, rough stakes will be necessary, the latter to mark the position of the hills of abacá. Where fields of some size are to be planted, a long wire tape would be useful. This may be made of light wire and every third metre marked by a ring, link, or in some other manner. With the tape, lay off a base line along the longest side of the field and mark it off into 3-metre lengths by the stakes. At one end of this line and at right angles with it, lay off another line along the end of the field, marking this line also into 3-metre lengths. Next, by placing one end of the tape at the second stake in the base line and passing it (the tape) through a point 3 metres from the farthest stake in the other line, a second row of stakes may be added. This row of stakes will represent the second row of abacá. If this process is continued across the whole field, it will be laid off into 3-metre squares, the corners of the squares (marked by stakes) being the positions of the hills of abacá. Holes, 20 to 30 centimetres in diameter and 30 centimetres in depth, should then be dug at the location of each stake for the reception of the plants.

" For planting, abacá rootstocks should be used—that is, the underground part of the stalk. These may best be secured by digging up the entire plant and then cutting off the stalk, the cut to be made about an inch above the crown of the root. The best rootstocks come from plants which are not too old, and rootstocks which are 12 to 15

centimetres in diameter at the top are better than larger or smaller ones. Each should have at least three healthy buds. In practice, when two or more fields are to be planted in one season, the clearing of the second field can be postponed until the first is planted. Rootstocks may then be secured from the second field to plant the first. In some cases, also, if the preparation is done quickly and is immediately followed by the planting, the rootstocks from the same field may be used for replanting. They will keep for some time. In planting the rootstocks, one should be placed right side up in each hole and covered, not too deeply, but at such a depth that the top will be about 5 centimetres from the surface of the ground.

“ It might be well to explain the reasons for using rootstocks instead of large or nearly mature plants as is the usual custom. Plants developed from the buds of a rootstock are usually much stronger and faster growing than those from a large plant. When the latter is transplanted, the roots are damaged and most of the energy of the plant goes to keep it alive. Rarely more than one or two suckers develop and they, being ill-nourished, make a slow growth. By the usual methods the use of large plants might be justified, since the little plants growing from a rootstock in the midst of grass and weeds would probably die unless mothered by an older plant until they were able to take care of themselves. There are no weeds, however, with these methods, and at the end of a year there would be several good-sized plants each with its own root system, while with the other method there would be one worthless stalk and a few small suckers.

“ At this point may properly come the question of shade-trees. There is no experimental evidence on this question. Their value in any case would depend largely on the season and on the usual distribution of humidity throughout the year. In the Bicol Provinces the consensus of opinion among the abacá growers is that they are of considerable value but not absolutely necessary. In those provinces there is a distinct dry season and sometimes droughts of greater or less severity. Probably a judicious use of shade-trees would be advantageous, not only for shade but for the protection they would give from high winds. If used, they may be planted at any time after the planting of the abacá, in check rows at a distance of 21, 25, or 27 metres, depending on the size that the tree will reach at maturity. These distances have been chosen so that the trees may be planted with the rows of abacá, giving as little trouble as possible in cultivating the field. The variety or varieties chosen should be from the three or four generally accepted as the best for this purpose. There are two varieties of dap-dap (*Erythrina indica*, Lam.), leguminous trees, which are good; and there are one or two other good varieties. A shade-tree to be of value should be deep rooted, quick growing, and have a wide low head which does not give too heavy a shade. It is almost necessary that they be leguminous. There is a growing custom in the Bicol Provinces of planting pili trees in the abacá fields. The pili tree is not a good shade-tree,

and it robs the abacá of food material, and would, therefore, be detrimental to the latter. It is possible, however, that the income from the nuts would more than offset the loss in abacá. This question will have to be left to the experience and judgment of the grower.

“ From the planting of the abacá, the field should need no attention (shade-trees excepted) until the cowpeas have matured—a period of three to three and a-half months. At this time it will be necessary to harvest the crop of cowpea seed so that it may be available for replanting. The pods may be picked by hand and afterwards threshed. The vines should at once be turned under with the plough to serve as a green manure. Some care should be taken in turning them under. If they are very rank, it would be well for a man to follow the plough to lay them along the furrow. Otherwise, they will gather in bunches in front of the plough, and those which are not covered will catch on the cultivator when the cowpea seed is covered.

“ A second crop of cowpeas should be planted very soon after the vines ploughed under. This may be done in the same manner as before, by sowing them broadcast and covering them with the cultivator. If the supply of seed is insufficient for this, it may be sown in drills, three rows of cowpeas between each two rows of abacá. The drills may be marked out by the plough and the sowing and covering done in one operation, the covering being done by the feet. The first method is preferable, for in the latter weeds may spring up before the cowpeas completely cover the ground.

“ The process of replanting the cowpeas should be continued for a period of fourteen to eighteen months. When a crop of cowpeas matures it should be harvested, the vines ploughed under, and the crop promptly replanted. At the end of the eighteen months, or earlier in some cases, the abacá will be so large and the hills so wide that animals passing between the rows will break the abacá; furthermore, the grounds will be so shaded that the cowpeas will not grow.

“ It is well to note what would be accomplished by the use of the cowpeas. First, the field is thoroughly prepared and cleared of all weeds. Then follows the planting of the cowpeas and the abacá. Within a week the cowpeas will be well up, and within three weeks they will completely cover the ground.

“ Since the field was thoroughly cleared of weeds in the first place, they will not start for some time, and those that do spring up later will be choked by the thick matlike growth of the cover crop. If each crop of cowpeas is replanted as soon as mature, it will result in a field free from weeds for the whole period of eighteen months. The cost of this will have been the cost of harvesting, ploughing, and replanting the cowpeas three or four times a year—a very reasonable expense. From four to six crops will have been incorporated in the soil, each returning not only what it took out but the nitrogen which it absorbed from the air. The effect on the physical condition must also be considered. The vines, ploughed under, add so much decaying vegetable matter or humus to the soil—a substance making it light and friable and most favourable



PLATE 8—SIX-MONTHS-OLD ABACA PLANT GROWN ON AN OLD PLANTATION WITH THE NEW METHOD. COWPEA COVER CROP IN FOREGROUND. LA CARLOTA EXPERIMENT STATION.

for the growth of most of our domestic plants. Soil in this condition will absorb water readily, and a larger part of the heavy precipitations during the rainy season will soak into the ground instead of running off. In the case of a bad drought, this one factor might be of great value. No other crop can take the place of the cowpeas. Camotes, which are

frequently planted when new ground is cleared, while they help somewhat in keeping down the weeds, do not make the rank growth of the cow-peas, and, not being leguminous, they reduce the fertility of the soil rather than add to it. Peanuts and some other leguminous crops could be used but generally their growth is not heavy enough to give full protection from weeds. Mongo is probably the only substitute that could be used successfully, but this crop has not been proven entirely satisfactory in many localities. It is seen, then, that the cowpeas serve several purposes: They take the place of a large amount of cultivation that would otherwise be necessary; they act as a fertiliser, adding more plant food to the soil than they take out; and they improve the physical condition of the soil, indirectly also, and lessen the danger of a drought by increasing the absorption of moisture.

“ At the end of eighteen months the cowpeas may no longer be planted. The abacá will have attained considerable height, and the hills will have spread until practically all of the ground is shaded. The field should average not less than fifteen stalks to the hill. The stalks will not have attained their greatest size until a year or two later; but, what is of greatest importance, they will be in an actively growing condition. Well nourished from the beginning, they will develop much faster than abacá grown under ordinary conditions, and weeds, if they eventually creep in, will have less advantage over them. They will have a resilience, a latent force, to recover quickly after a severe drought, typhoon, or any other destructive force over which the planter has no control.

“ Cultivation may be discontinued from this period until after the fourth or fifth year or until the field has been harvested three or four times. The harvesting of the mature stalks allows the sun to penetrate to the soil and steps are again necessary to prevent the growth of weeds. This may best be accomplished by using the plough and cultivator. If, as the field grows older, the plough and cultivator are impracticable, regular and systematic use of the hoe may be resorted to. The bolo method which is practised at present has never been effective.

“ The above methods are based upon agricultural principles which have been well tested and which are successfully used to-day in actual practice. The only doubt that the abacá grower can have is one of financial success. Every crop has a limit where increased care and cultivation will not bring increased profits, but in the production of abacá care and cultivation are practically nil. A certain amount of cultivation, judiciously applied, should well repay itself. The average yield of fibre per hectare in the islands is less than 380 kilos (6 piculs), and it is doubtful if the best of the ordinary “lates” in the Bicol Provinces exceed 575 kilos (9 piculs) per hectare. By the above methods, under ordinary conditions, a planter should be able to harvest about 650 kilos (10 piculs) per hectare the third year, and 1,000 kilos (16 piculs), or more, thereafter. Just how long a field cultivated by the above methods would hold its superiority would depend upon how

clean it was kept, how heavily the abacá was cut, and other factors, but it should turn out more than the ordinary crop for a period of about fifteen years.

“ A planter considering the adoption of these methods should not think that he has to grow all his abacá under this system. Nearly every planter has a few “ lates ” which have been recently cleared and planted or which are favourably situated with regard to fertility, the yield of which is above the ordinary. He may also have some that are situated on steep hillsides or that are very rocky, which would make cultivation like the above exceedingly difficult. Such fields may be left while attention is given to the older and more impoverished. Almost without exception these are the ones which may be most easily cultivated. The best plan would be to clear and plant a number of hectares each year—say, from 5 to 10, according to the ability of the planter. Even 2 or 3 hectares a year, in ten years, would convert his worst “ lates ” into the best on the hacienda. It should be realised that after the second year returns will begin to come in, and by the fourth year a field should have paid for the original expense and any other expenses dependent upon the use of these methods.

“ The following is a fair estimate of the cost of clearing, planting, and cultivating 1 hectare of abacá up to the end of the eighteen months. Sixty-five centavos, without meals, has been taken as the daily wages for labourers.

	Pesos
Clearing	30
Ploughing and harrowing	10
Preparing rootstocks and planting cowpeas and abacá	25
	— Pesos.
Total preliminary expenses	65
Ploughing under and replanting cowpeas four to six times during the first eighteen months	20
	—
Total expense, clearing, planting, and cultivation during the first eighteen months	85

“ The aforementioned cultural methods have special reference to the renovation of old abacá fields. With slight modifications in the preliminary preparation, they may also be used advantageously in the planting of new land. It should be understood that the methods have not been described completely in every detail. These may be worked out by the planter himself to suit the peculiar conditions of his plantation. The main points, however, should be carried out, and the planter should not forget that absolutely clean preliminary cultivation is the foundation upon which these methods are based, and the proper use of the cowpeas is necessary for their successful operation.

1 hectare = 2.471 acres; 1 kilo = 2.2 lb.; 1 metre = 1.09 yards; 1 centimeter = 0.39 in. (about $\frac{2}{5}$ in.)

Horticulture.

AGRICULTURAL EXPERIMENT GARDENS IN CONNECTION WITH PUBLIC SCHOOLS.

By P. R. GORDON.

Reference was made, a few weeks ago, in the Brisbane Press, to a new and very prolific potato raised by the senior pupils of the public school at Drumwhindle, in the parish of Ellon, Aberdenshire. This school is situated a few miles distant from where I was born and spent the earliest years of my life, and I have taken a lively interest in it. The head master, Mr. Lewis Gavin, is an enthusiast on the subject, and his work has been recognised by the Education Department and his services requisitioned in the organisation of similar schools in other centres. His success in engendering in the youthful minds a taste for the cultivation of the soil, leading them to become, in after life, primary producers, instead of attracting them to cities and towns to join forces with the many engaged in secondary industries whose sole existence is dependent on the produce of the soil, has been very marked. But it is not in agriculture alone that the pupils receive instruction. Æsthetic taste is encouraged, particularly among the younger pupils in the cultivation of flowers, and many of them carry the work on at their homes, with the result that around many of the cottages in the district are neat flower gardens where formerly the vegetation consisted of "kale runts" or useless weeds. The objects of the school garden are many. Not only has the observation of the pupils to be trained and sharpened, but experiments have to be made to find out definite results for the successful cultivation of plants by observing their habits, their likes and dislikes so as to obtain their fullest fruition. Those experiments entail a great amount of care, accuracy, and watchfulness in the youthful gardeners, which early inculcates in them habits of method and desire for truth. Many experiments are conducted at the garden—some failures, many most interesting and useful to the farming community, as in root selection, in potato-growing, and in the use of artificial manures. In potato cultivation five definite results were arrived at:—The wider the tubers were planted the greater the yield. In fact, it was surprising to find no less than 4 tons per acre in yield between those planted in drills 3 ft. apart and 1½ ft. between sets. 2. Tubers "greened" and sprouted have a marked difference of being at least a fortnight earlier in maturity than those planted from the pit, and come above ground regularly with very few blanks, and greater in yield. 3. Tubers, whole, and about the size of a duck's egg show positively for the fourth year in succession a difference of 6 tons 9 cwt. 72 lb. per acre, in comparison with those cut and weighing practically the same before planting as the cut tubers. 4 (and very important). The drills ought to run north and south, as the drills are exposed on one side only if running east and west, and are not

acted on equally by the sun's rays, which play a very important part in the cultivation of good sound tubers. The difference in yield amounts to about $2\frac{1}{2}$ tons per acre. Each row shades its neighbour and prevents the growth of tissue and tuber as in rows running north and south. 5. From this it may be deduced that too deep planting has to be avoided, and by experiments, 4, 5, 6, and 7 in. deep, the yield from a depth of 4 in. is the most satisfactory. The following varieties were grown last year, and the results show the relative value in yields:—

	Per Acre.		
	Tons.	Cwt.	Lb.
1. British Queen	7	13	106 $\frac{1}{2}$
2. Ashleaf	5	8	4
3. Duchess of Cornwall	8	10	18
4. Balgownie Seedling	12	11	20 $\frac{1}{2}$
5. Faithlie	8	10	17
6. Snowdrop	15	16	0
7. Harbinger	3	15	73
8. Devanha Seedling	5	18	94
9. Fortyfold	6	15	5
10. Reading Russet	14	13	5
11. Drumwhindle (seedling)	17	11	13
12. Cottar	14	11	78
13. Crofter	14	11	0
14. Shetland Champion	14	0	100
15. Grampian	8	4	84
16. Up-to-date	15	10	12

It will be seen from the above that the school seedling (Drumwhindle) is the most prolific of the whole. It was sold by the pupils to a well-known firm of seedsmen for £40 per ton. They were tried at the Royal Horticultural Society's Station, in Surrey, and proved a remarkably good "cropper" and "cooker," a most marketable variety, having no deep eyes, and what there are are on the apex.

The experiments with artificial manures (which were gifted to the school) gave very interesting trials in the various plots, containing potatoes, cabbages, eschalots, parsley, and turnips, to determine the effects of the various manures on each of these. The results are given in the following table:—

Manure.	Potato.	Cab'ge.	Eschalot.	T'tl.
	Lb.	Lb.	Lb.	
Sulphate of Potash	61 $\frac{1}{2}$	84	3 $\frac{3}{4}$ —149 $\frac{1}{4}$	
Superphosphate	66	76	3 $\frac{1}{8}$ —145 $\frac{1}{8}$	
Nitrate of soda	61 $\frac{3}{4}$	90	2 $\frac{1}{4}$ —154	
Sulphate of ammonia, + sulphate of potash	66 $\frac{1}{4}$	92	5 $\frac{1}{8}$ —163 $\frac{3}{8}$	
Sulphate of potash, + superphosphate	56 $\frac{1}{2}$	72 $\frac{1}{4}$	3 $\frac{3}{4}$ —132 $\frac{1}{2}$	
Sulphate of ammonia, + superphosphate	66	82	3 $\frac{7}{8}$ —151 $\frac{7}{8}$	

The effect was seen in the various colours of the leaves, those treated with nitrates especially being of a very dark green, but having a tendency in the tuber crop to grow too much to stem. Of grasses, small patches were sown with home svalof (Sweden), grown samples

of clover, timothy rye, and cocksfoot, and in each case the sward seed was much stronger and the produce much freer from obnoxious weeds.

One can easily imagine the beneficial effects of these experiments on the pupils in developing correct observation and their reasoning faculties. But the greatest value of these studies is that they have attracted the youthful mind to settlement on the soil. The pupils are not only allowed to conduct their experiments—of course, under surveillance—but they are entrusted with the sale of their products, so that a healthy rivalry is set up between the different groups of youthful experimenters; the money from sales being devoted to garden work.

Statistics.

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF JANUARY IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING JANUARY, 1915 AND 1914, FOR COMPARISON.

Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.		Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.	
	Jan.	No. of Years' Records.	Jan., 1915.	Jan., 1914.		Jan.	No. of Years' Records.	Jan., 1915.	Jan., 1914.
<i>North Coast.</i>					<i>South Coast—continued:</i>				
Atherton ...	In. 14.97	13	In. 2.56	In. 7.23	Nanango ...	In. 4.78	27	In. 2.15	In. 3.25
Cairns ...	18.83	27	3.23	21.69	Rockhampton ...	9.51	27	4.26	0.74
Cardwell ...	17.54	27	10.02	21.68	Woodford ...	7.40	27	2.78	4.06
Cocktown ...	15.24	27	8.19	33.93	Yandina ...	10.45	21	6.23	6.95
Herberton ...	10.49	27	0.90	6.41	<i>Darling Downs.</i>				
Ingham ...	16.95	22	13.95	17.36	Dalby ...	3.75	27	2.40	3.28
Innisfail ...	25.28	27	7.97	15.52	Emu Vale ...	3.32	17	3.83	1.95
Mossman ...	22.71	5	6.32	32.30	Jimbour ...	4.13	24	1.90	2.27
Townsville ...	13.70	36	9.33	14.90	Miles ...	4.17	27	0.38	2.60
<i>Central Coast.</i>					Stanthorpe ...	4.16	27	3.36	2.06
Ayr ...	12.11	27	2.12	10.11	Toowoomba ...	5.69	27	2.33	3.73
Bowen ...	11.05	27	0.34	6.83	Warwick ...	3.89	27	1.74	1.52
Charters Towers ...	6.45	27	1.58	2.95	<i>Maranoa.</i>				
Mackay ...	15.73	27	2.94	22.52	Roma ...	3.77	25	0.43	1.13
Proserpine ...	18.23	11	1.02	11.19	<i>State Farms, &c.</i>				
St. Lawrence ...	11.23	27	1.73	7.97	Gatton College ...	4.48	14	2.42	5.40
<i>South Coast.</i>					Gindie ...	3.82	13	0.06	2.66
Biggenden ...	5.18	14	3.23	1.33	Kamerunga Nursery	17.98	23	2.73	28.97
Bundaberg ...	10.62	27	3.86	1.39	Kairi ...	...	...	3.96	11.05
Brisbane ...	6.52	64	2.11	3.90	Sugar Experiment Station, Mackay	14.70	16	...	24.88
Childers ...	9.01	19	2.43	2.20	Rungeworgorai ...	...	...	0.27	0.92
Crohamburst ...	13.44	22	5.78	6.71	Warren ...	...	...	2.08	0.75
Esk ...	5.71	27	5.43	2.58	Hermitage ...	2.71	7	1.92	1.41
Gayndah ...	5.76	27	5.59	4.13					
Gympie ...	7.55	27	4.97	5.05					
Glasshouse M'tains	10.09	6	8.66	6.27					
Kilkivan ...	6.49	27	3.10	1.52					
Maryborough ...	8.33	27	3.39	2.07					

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for January this year and for the same period of 1914, having been compiled from telegraphic reports, are subject to revision.

Bracewell, Mount Laram, rainfall for January, 1915, 3.00 in.

The tropical disturbance which occurred off the Queensland coast between 9th and 11th February last resulted in the following very heavy rainfalls, especially in the Southern Coast Division:—

CENTRAL DIVISION.

	Pts.		Pts.
Coastal—			
Emu Park ..	5	Mount Chalmers ..	11

SOUTHERN DIVISION.

	Pts.		Pts.		Pts.
Coastal—		Hillview ..	154	Tiaro ..	305
Brisbane ..	552	Howard ..	407	Toogoolawah ..	412
Bundaberg ..	603	Ipswich ..	312	Wallaville ..	92
Beaudesert ..	269	Isis Junction ..	371	Wondai ..	222
Beenleigh ..	510	Kilcoy ..	580	Woodford ..	1,146
Biggenden ..	158	Kilkivan ..	212	Woody Island ..	280
Boonah ..	175	Kingaroy ..	215	Woolooga ..	360
Booval ..	340	Laidley ..	239	Wooroolin ..	230
Burnett Head ..	272	Landsborough ..	1,095	Yandina ..	765
Bustard Head ..	2	Laravale ..	247	Yimbun ..	505
Cape Moreton ..	662	Lowood ..	386		
Caboorture ..	902	Many Peaks ..	43	Darling Downs—	
Caboonbah ..	441	Mapleton ..	1,275	Allora ..	21
Caloundra ..	681	Marburg ..	340	Bell ..	78
Camboon ..	2	Maryborough ..	370	Cambooya ..	65
Cleveland ..	772	Moore ..	465	Clifton ..	19
Colton ..	460	Mount Crosby ..	430	Dalveen ..	3
Childers ..	230	Mount Morgan ..	2	Dalby ..	61
Cooroy ..	783	Mount Perry ..	150	Emu Vale ..	25
Cowan Cowan ..	870	Mungar Junction ..	406	Gowrie Junction ..	100
Crow's Nest ..	287	Murgon ..	200	Greenmount ..	52
Degilbo ..	123	Nambour ..	866	Jondowaie ..	1
Double Island Point ..	202	Nanango ..	205	Jimbour ..	9
Dunwich ..	864	Nerang ..	495	Jondaryan ..	49
Eidsvoll ..	19	Oxenford ..	580	Killarney ..	15
Engelsburg ..	240	Palmwoods ..	1,170	Kuvura ..	16
Ernest Junction ..	440	Petrie ..	1,041	Malakoff ..	55
Esk ..	465	Pialba ..	408	Meringandan ..	155
Eumundi ..	765	Rockhampton ..	1	Oakey ..	72
Forest Hill ..	196	Rathdownie ..	140	Pittsworth ..	36
Gatton ..	258	Redbank ..	284	Spring Bluff ..	190
Gin Gin ..	65	Redcliffe ..	940	Toowoomba ..	153
Gladstone ..	12	Rosedale ..	62	Warwick ..	5
Goodwood ..	465	Rosewood ..	290	Yangan ..	26
Gayndah ..	65	South Passage ..	829		
Grandchester ..	270	Southport ..	300	Maranoa—	
Gundiah ..	335	St. Helena ..	997	Roma ..	14
Gympie ..	532	Tallebudgera ..	430	St. George ..	5
Harrisville ..	209	Tewantin ..	562	Wallumbilla ..	8
Helidon ..	200	Theebine ..	635		

METROPOLITAN.

Annerley ..	521	Goodna ..	375	Pinkenba ..	715
Ascot ..	694	"Huntingtower" ..	560	Rocklea ..	535
Bald Hills ..	954	Indooroopilly ..	503	Sandgate ..	960
Boggo Junction ..	530	Manly ..	870	Sunnybank ..	514
Botanic Gardens ..	593	Mayne Junction ..	700	Taringa ..	253
"Chiefswood" ..	570	Milton ..	565	Toowong ..	510
Coorparoo ..	572	Murarrie ..	720	Wynnum ..	735
Enoggera Rly. Sty. ..	652	Newmarket ..	550	Yeerongpilly ..	519
Enoggera Reservoir ..	647	Nudgee College ..	1,029	Zillmere ..	815
Gold Creek Reservoir ..	697	Nundah ..	795		
		Oxley ..	454		

Tropical Industries.

The General Superintendent of the Bureau of Sugar Experiment Stations has received the following monthly report from the Acting Entomologist to the Bureau (Mr. E. Jarvis) :—

FIELD WORK.

At the beginning of this month beetles emerged in sufficient numbers to make it worth while commencing observations relative to their movements at night time, principally with a view to testing the influence of artificial light of various colours on the adult female of *albohirta*.

Arrangements had previously been made to conduct these experiments at the Carrah Estate, Gordonvale, the manager of which, Mr. J. H. Greenaway, kindly offered to render any assistance in his power.

I was at first disposed to think that ordinary white light might prove disappointing, some entomologists being of opinion that it exercises little or no impression on this particular cane beetle, although it is undoubtedly attractive to related species of the genera *Anoplognathus*, *Xylotrupes*, &c. It was decided, nevertheless, to commence experimentation with the flame of an acetylene hand-lamp fitted with a burner of 28 litres capacity, placed in a beetle-trap specially designed by the writer for this branch of control. On the 5th instant, the trap was accordingly installed among young plant-cane, and the light directed towards scrub land about 100 yards distant, but beetles were evidently very scarce as only three were caught on this date and seven during two succeeding evenings. On the 9th and 11th instant, however, a few heavy showers fell, establishing soil conditions conducive to freer emergence of the beetles, and it was then that definite results were obtained, conclusively proving our grey-backed cane-beetle (*Lepidiota albohirta*) to be strongly attracted to white light. The following table recording observations during three successive evenings is not without interest :—

SKY CLEAR; NO WIND; NO MOON.			LEPIDIOTA ALBOHIRTA.		
Date.	Average Temperature.	Hours.	Beetles Caught.	Male.	Female.
14 December	76° F.	8 p.m. to 11 p.m.	51	40	11
15 " "	76° F.	8 " 9 "	57	46	11
16 " "	77° F.	8 " 10 "	62	45	17
			170	131	39

Other influencing meteorological conditions are omitted here for the sake of brevity, but it may be mentioned that on the 16th (when sixty-two specimens were captured) the trap was faced towards the centre of the field away from feeding trees with the object of attracting beetles that might be emerging among the cane. It was remarked that although they started to fly when the lamp was lighted at about 7.20 p.m., the first specimens entered the trap on each of these evenings exactly at 8 o'clock, from which we may infer that *albohirta* does not readily respond to the influence of artificial light until the last signs of day have faded and been replaced by a certain degree of darkness. The above habit has a practical bearing on this form of control, and will receive further investigation.

Having obtained satisfactory proof of the attractiveness of artificial light, the movements and flight of the beetles whilst under its influence were carefully studied, this being an important consideration, seeing that no form of light-trap can be of much use unless constructed with view to taking full advantage of the mode of approach manifested on such occasions.

It is unnecessary at present to allude in detail to these observations, but I feel sure that comparative failure during past years has been mainly due to lack of this essential knowledge. Certain practical conclusions were arrived at regarding the kind of design best calculated to produce a really serviceable trap, and the precise conditions under which such a trap might reasonably be expected to achieve payable results. It is but fair to state that the total figures tabled above represent only six hours' catch, and would doubtless have been higher had the the experiment on each evening been prolonged throughout the night; moreover, the single trap used scarcely illuminated one cardinal point of the compass, and it was believed that the beetles had not appeared in full numbers. It will be interesting to note during future research whether a few days' exposure to the sun whilst feeding renders adults of this species indifferent to the influence of artificial light. I am inclined to believe that under favourable circumstances reaction towards the latter is likely to be continuous, but in any case they are certainly susceptible during their first flight immediately after leaving the soil, and if captured at that time oviposition is prevented.

Unfortunately the measure of success obtainable by light-traps is determined by prevailing climatic and other conditions, the beetles at times being disinclined to fly for perhaps several consecutive nights, and then suddenly appearing on the wing in vast numbers.

Knowledge of this fact, however, need not deter us from attempting to utilise a method of control which, practised systematically, can hardly fail to be remunerative on badly infested areas. It would be a simple matter to compile a table of directions based on reliable data from which farmers could tell at a glance when to use such traps, and so be saved the time and expense of lighting them to little or no purpose.

These investigations, and others of more importance, relative to the control of this insect during its adult stage, will be continued as long as the beetles are in evidence.

LABORATORY NOTES.

Recent experimental work with the Samoan fungus (*Metarrhizium anisopliae*, Metsch) has resulted in a 50 per cent. infestation of grubs of our cane-beetle (*Lepidiota rothai*) after a period of twenty-eight days, the first larva being killed and covered with fungus spores nine days after infection, and others succumbing to its attacks a fortnight later.

Young larvae of *albohirta* will be procurable in about five weeks, when it is hoped to commence a series of experiments similar to the above, to be continued throughout the larval stage of this species.

Methods of infection proving successful in the laboratory will, if possible, be tested in the field at a time of year when weather conditions are propitious to a speedy development of fungus diseases.

Referring very briefly to the work of breeding and studying life-histories of economic insects of sugar-cane, I may mention that during the past month adults of four additional species of lepidopterous insects not hitherto recorded have been reared from larval forms.

Three of these butterflies, of minor importance, belong to the family Hesperidae, the caterpillars of which were found destroying foliage of cane plants near Babinda and at Gordonvale; while the fourth is a most interesting moth-borer, not yet identified, that was observed tunnelling the centre of young shoots of ratoon cane on a plantation at Mount Pyramid, occasioning injury identical in character to that caused by our noctuid moth-borer (*Phragmatiphila truncata*, Hamps).

RECORD SHIPMENT OF BUTTER.

By the s.s. "Carpentaria," which left Brisbane on the 12th February for London, there were despatched 35,953 boxes of butter, all of which had been inspected and passed for export by officers of the Department of Agriculture and Stock. This constitutes the largest shipment of butter which has yet been despatched in one ship, and represents 2,013,368 lb.

A VALUABLE COW.

What is claimed to be the champion dairy cow of the world was sold recently in the United States for £1,020, which is believed to be the highest price ever paid for a dairy cow. This cow, Mayrilma—a Guernsey—has a yearly record of 19,673 lb. of milk, containing 1,073 lb. of butter fat.

Plant Pathology.

PINEAPPLE CULTIVATION.

The following report on "Alleged Diseases in Pines at Woombye" was received during last year by the Under Secretary for Agriculture and Stock from Mr. H. Tryon, Government Entomologist and Vegetable Pathologist. It will serve to allay any fears which some pineapple growers entertain as to the presence of supposed disease in the plant:—

1. In prosecuting the investigation the pineries of the following growers claimed attention:—Messrs. Blagden, Clayton, Collier, H. Davis, S. Davis, F. Fairley, J. Foote, W. Furlong, Garrod, Innes, R. Kerr, Kerslake, A. G. Reynolds, J. Rose, senr., C. Rose, Skene, Southwick and Sons, T. Smith, C. T. Whittaker, and Wilks; the several plantations referred to ranging from 35 acres to $\frac{1}{2}$ acre in extent.

2. As, generally speaking, they were kept in a clean condition, and occupied sloping ground so as to be seen individually from many vantage points, a satisfactory general inspection was practicable without the long expenditure of time, beyond that mentioned; at the same time these features would especially conduce to the discovery of any abnormal state of growth if present.

3. As the outcome of this inquiry, it was found that almost without exception (*vid.* paragraph 9) the rows of plants exhibited a remarkably uniform, even, and vigorous condition, and elsewhere where evenness had not characterised their appearance, this was traceable either to a relatively inferior character of soil or defective cultivation (*vid.* paragraph 11).

4. In explanation of this favourable state of things, it may be mentioned that these soils reposing on gentle slopes conduce to effective aeration and drainage, and although evidently varying in fertility within small limits, were on the whole remarkably alike in texture, being "warm," free sandy loams—such soils indeed as prove congenial to the plant in question wherever my extended observations have shown that it is grown successfully.

5. On traversing the different plantations the conclusion derived from a general survey was sustained on examination of individual rows and their component plants; no instance of disease—of insect or fungus origin—claimed attention, but notwithstanding there were grounds for concluding that Mealy Bug (*Dactylopius Droncliae*) was present sporadically in small amount.

6. As evidence in support of this finding, all the growers interrogated appeared satisfied with their circumstances and prospects, holdings had recently changed hands at improved values, areas under cultivation were being increased, and both yield and prices were being maintained.

7. Previous to the inquiry, it had been brought under notice that the behaviour of pineapple plants derived from a Woombye farm and grown in another district had led it to be inferred that they were infected with some disease that occurred on this farm at the time when they were received, and such an explanation might seem quite plausible when no other one of the occurrence was conceived; but the outcome of an examination—in the course of this inquiry—of the pineapple cultivations on the farm in question, and even of the bed of these plants, whence, as it was stated, the suckers referred to had been derived, was to show that it was untenable. For, as a matter of fact, not only was no disease discoverable, or evidence of the presence of one existing in the past forthcoming, but the grower himself was actually, at the time of our visit, using—as was pointed out—plants from the very source that was under suspicion, for increasing the area of his own cultivation; and these, moreover, I found to be quite healthy.

8. With respect to a second farm, it was pointed out by local pineapple growers that an instance of failure was afforded by pineapple plants growing in a small area amongst such as were apparently quite healthy, and that immediately surrounded them; and that this occurrence had already been brought under the department's notice by its proprietor. This failure I found, as alleged, to be quite local, in a cultivation of several acres in extent, where the pines were characterised by vigour and healthiness. Evidently, too, that it was a case of root-poisoning, and therefore not a disease proper. Also that the plants implicated had grown normally, and in many cases produced fruit immediately before their decadence had commenced. In explanation of this very exceptional occurrence, as regards the Woombye district and its pineries, it was noted that immediately above the small area occurred a stratum of impervious clay (such as is occasionally seen interstratified with the Ipswich sandstone, the geological formation of the district) that traversed almost horizontally the small hill, in one slope of which the plants grew, near its summit, and indeed virtually formed a basin-like receptacle for the "drainage." On the heavy rainfall being experienced that had preceded the incident under consideration, the accumulated stagnant water had obviously overflowed and percolated through the soil beneath, and, spreading out in a fan-like manner as it progressed, had come in contact with the roots of the plants in this area affected, had injured these, and so with their destruction the plants themselves had gradually ceased to grow or even died—with top rot as a symptom.

9. Such an occurrence might have been repeated whenever analogous conditions of the land occurred, but a second one did not come under notice. However, a clay band was seen outcropping in land destined for an additional pinery, and the proprietor shown how to drain off the poisonous ferruginous water which issued where this was so, as had been already the pineapple grower above alluded to.

10. Another cultivation—a very small one, with respect to which a distant prospect suggested disease occurrence—was also visited. Here it was found that the land had never been properly tilled, or even broken up by a plough or spade; and that in places, accordingly, such friable soil as had occurred superficially had almost entirely been removed by surface drainage. As a result, the plants included in this area were small and depauperated, but though at a standstill as regards growth, were otherwise perfectly healthy.

11. Having witnessed elsewhere the effects of disease in seriously injuring pineapple cultivation, and in bringing this local horticultural industry to a standstill, where indeed not rendering it wholly impracticable, I ventured to counsel those growers I met, and pointed out to them the imperative obligation they were under to maintain their plantations in the healthy condition in which I had found them, and to avoid, therefore, as far as possible all risks of introducing disease that was inseparable from the admission of further pineapple plants from without; but, rather, having already in their possession a good and profitable plant, to render it still better by the adoption of the most approved methods of horticultural practice as applied to the pineapple. And that the condition of the Citrus cultivation of the district, the outcome of a diametrically opposite policy being pursued, was a striking object lesson pointing to the expediency of compliance in this respect with my teaching.

WOOL GROWN ON THE COAST.

Mr. Alec Hay (Coolangatta) writes:—"Your report of the wool sales on the 12th instant records the fact that 7,287 bales were sold, including private transactions. The highest prices reported were as follows:—New Zealand Loan, 6 bales at 13d.; Australian Mortgage, Land, and Finance Company, 8 bales at 13½d.; Australian Mortgage, Land, and Finance Company, 9 bales at 13½d.; Winchcombe, Carson, and Co., 7 bales at 13½d.; Winchcombe, Carson and Co., 7 bales at 13d. The Coolangatta Estate forwarded to this sale 83 bales, 43 of which were sold at 12½d.; so that out of this large catalogue of 7,287 bales, only 37 bales beat the coastal grown wool. Messrs. Schute, Bell's report of 5th November, 1907, states:—'A. Hay, Coolangatta, 16 bales 14d., 11 bales 13½d., good, useful quality, dry condition, fair length'; this being the top price obtained at the sale. The wool sold on the 12th instant was grown on the same indifferent coastal country as that sold in November, 1907, with a frontage to the ocean from the Crookhaven River to the north head of Jervis Bay, and it has been continuously used for sheep for the past ten years, and most of the wool recently sold is from locally-bred sheep. There are many millions of acres along our seaboard of far superior quality to the land used in the present instance, and more adaptable to sheep and wool growing, yet one hears repeatedly the old fallacy that coastal lands are unsuitable for sheep. It might be interesting to the public if some of our experts would take the trouble of reporting on this question and the suitability of the coastal country, and so enlighten those who would, if certain of the results, take up and improve some of this cheap land for the production of crossbred wool."—"Sydney Morning Herald," 17th February.

[The above fully bears out the contention of the Queensland sheep and wool expert, Mr. J. G. Brown, that our coastal lands are perfectly suitable for sheep raising, right down to the sea shore, provided the right breed be selected, and proper attention be given to the flocks.—Ed., "Q. A. J."]

Answers to Correspondents.

PROPAGATION OF TAMARIND SEEDS.

"TAMARIND SEEDS," Mullet Creek—

1st. Seeds may be planted from September to February inclusive. If planted during the cooler months some protection should be afforded for the young seedlings.

2nd. It is advisable to sow the seeds in a well-prepared bed or in boxes, and transplant during moist weather when the seedlings are a few inches high. If only a few trees are required the seed may be sown in permanent positions where they will grow quicker if protected from injury.

3rd. A good sandy loam is preferable, but they will grow in a wide range of soils.

4th. The period before bearing varies in different localities (about five years).

5th. Little or no pruning is required except thinning out crossing or crowded branches and keeping a symmetrical shape.

PRUNING OF MULBERRY TREES.

A. H. HAVELL, Wondai—

The fruit is produced on the young wood of the previous summer's growth. About one-third of each shoot should be pruned off during winter. The remaining wood will produce finer fruit. Prune out crossing or crowded wood and keep your tree in good shape. Judicious pruning improves all trees.

REMEDY FOR WORMS IN MARES.

Worm powders, containing sulphate of iron 6 oz. and tartar emetic 2 oz.; the ingredients to be thoroughly mixed together and made into twelve powders, one to be given daily in food. This will hurt neither mare nor foal.

DEATH OF PIGS.

From the symptoms described, it appears that the animals are suffering from pneumonia. Cement floors are not so good for pigs as wooden ones. Pigs should always be kept dry and sheltered from wind and rain, as they are very susceptible to cold and pneumonia. Prevention in this case seems to be what is required. One drachm nitrate of potash and 1 drachm chlorate of potash should be given twice daily to each pig to relieve the cough.

HORN FORMATION ON COW'S BRAND.

Wash the wound thoroughly three times daily with warm water, and afterwards dress with boracic acid.

HOVEN.

From the symptoms described the animal is suffering from Hoven. Probably the food he is getting does not agree with him, and it would be advisable to change his diet. In the meantime, $\frac{1}{2}$ lb. Epsom salts with $\frac{1}{2}$ lb. treacle should be given, followed twice daily by 1 oz. bi-carbonate of soda dissolved in half a pint of tepid water.

HARVESTING COWPEAS.

Cut for hay when the crop is beginning to pod. Put the vines in cocks shortly after harvesting, otherwise the leaves will drop off.

TAMARINDS.

1. The best time to sow tamarinds is from September to February inclusive. If planted during the cooler months some protection should be afforded to the young seedlings.

2. It is advisable to sow the seeds in a well-prepared bed or in boxes, and transplant during moist weather when the seedlings are a few inches high. If only a few trees are required, the seed may be sown in permanent positions, when they will grow quicker if protected from injury.

3. A good sandy loam is preferable, but tamarinds will thrive in a wide range of soils.

4. The bearing period varies in different localities (about five years).

5. Little or no pruning is required except thinning-out crossing or crowded branches, and keeping a symmetrical shape.

COTTON.

R.J.H., Diddillibah—

The sample of cotton submitted is a tree cotton (perennial), apparently a Caravonica or Sea Island.

The demand for the latter is limited, and it is not advisable to grow it largely in Queensland, notwithstanding that, previous to the war, good Sea Island was worth from 15d. to 20d. per lb. ginned.

At present cotton is very low priced in the home market, Upland being worth barely 5d. per lb., and all the Sea Island cotton needed can be grown in the United States; $1\frac{1}{2}$ d. per lb. is paid by the Agricultural Department for seed cotton, and any profit made, after ginning, freight, and other expenses have been deducted, is handed to the seller.

The Markets.

PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR FEBRUARY, 1915.

Article.		FEBRUARY.	
		Prices.	
Bacon	...	lb.	11½d.
Bran	...	ton	£9 5s.
Butter	...	cwt.	124s. to 130s.
Chaff, Mixed	...	ton	£5 5s.
Chaff, Oaten	...	"	£7 to £7 10s.
Chaff, Lucerne	...	"	£4 to £5 10s.
Chaff, Wheaten	...	"	£4
Cheese	...	lb.	7½d. to 7¾d.
Flour	...	ton	£13
Hams	...	lb.	1s. 2d. to 1s. 3½d.
Hay, Oaten (Victorian)	...	ton	£9 10s.
Hay, Lucerne	...	"	£5
Honey	...	lb.	2d. to 3d.
Maize	...	bush.	4s. to 4s. 2d.
Oats	...	"	3s. 6d.
Onions	...	ton	£12 to £13
Peanuts	...	lb.	3d.
Pollard	...	ton	£9 10s. to £10
Potatoes	...	"	£5 to £6
Potatoes (Seed)	...	"	£8 to £13 10s.
Potatoes (Sweet)	...	cwt.	3s. 9d. to 4s.
Pumpkins	...	ton	£3 10s.
Wheat, Milling	...	bush.	6s. 2d.
Eggs	...	doz.	10d. to 1s. 3d.
Fowls	...	pair	3s. 9d. to 5s.
Geese	...	"	4s. 9d. to 5s. 9d.
Ducks, English	...	"	2s. 6d. to 3s. 3d.
Ducks, Muscovy	...	"	4s. to 5s. 6d.
Turkeys (Hens)	...	"	8s. 6d.
Turkeys (Gobblers)	...	"	16s.

VEGETABLES.

Cabbages	...	per dozen	1s. 6j. to 4s. 6d.
Beans	...	per sugar bag	1s. 6d. to 4s.
Peas	...	"	4s. to 7s.
Cucumbers	...	per dozen	3d. to 6d.
Custard Marrows	...	"	4d. to 9d.
Vegetable Marrows	...	"	1s. to 2s.
Tomatoes	...	per quarter-case	1s. to 4s.

SOUTHERN FRUIT MARKETS.

Article.	FEBRUARY.	
	Prices.	
Bananas (Queensland), per case	5s. to 10s.	
Bananas (G.M.), per case	21s. to 22s.	
Bananas (Fiji), per case	18s. to 20s.	
Mangoes, per case	4s. to 10s.	
Oranges, per case	5s. to 9s.	
Passion Fruit, per half-case	2s. to 4s.	
Papaw Apples, per half-case	6s. to 10s.	
Pineapples (Queens), per case	6s. to 8s.	
Pineapples (Ripleys), per case	4s. to 6s.	
Pineapples (Common) per case	4s. to 6s.	
Tomatoes, per quarter-case	3s. to 5s.	
Rockmelons, per double case	3s. to 5s.	
Watermelons, per dozen	4s. to 12s.	

PRICES OF FRUIT—TURBOT STREET MARKETS.

Article.	FEBRUARY.	
	Prices.	
Apples (American), Eating, per case	12s. to 13s.	
Apples (Local), per case	2s. 6d. to 5s. 6d.	
Apples Cooking, per case	3s. to 5s.	
Apricots, per quarter-case ... ..	...
Bananas (Cavendish), per dozen	2d. to 3d.	
Bananas (Sugar), per dozen	1½d. to 2d.	
Cape Gooseberries, per quarter-case ... ..	...
Cherries, per quarter-case ... ..	...
Cocoanuts, per sack	12s. to 15s.	
Cumquats, per case ... ..	...
Custard Apples, per quarter-case ... ..	...
Lemons (Local), per case	3s. to 7s.	
Lemons (Lisbon), per case	6s. to 7s.	
Limes, per case ... ..	...
Mandarins, per half-case	8s.	
Mangoes, per case	1s. to 4s.	
Nectarines, per quarter-case	1s. to 3s.	
Oranges (Japanese Navel), per case	20s.	
Oranges (other), per case	20s.	
Papaw Apples, per quarter-case	9d. to 1s. 6d.	
Passion Fruit, per quarter-case	1s. 9d. to 3s. 6d.	
Peaches, per quarter-case	1s. to 3s.	
Peanuts, per pound	3d.	
Pears (Victorian William), per case	6s. to 8s.	
Persimmons, per quarter-case	1s. 9d. to 3s.	
Pineapples (Ripley), per dozen	1s. 3d. to 3s.	
Pineapples (Rough), per dozen	4d. to 1s. 6d.	
Pineapples (Smooth), per dozen	1s. 6d. to 3s. 6d.	
Plums, per quarter-case	2s. 6d. to 4s.	
Rockmelons, per dozen	3s.	
Rosellas, per sugar bag ... ..	...
Strawberries, per tray ... ..	...
Strawberries, per dozen boxes ... ..	...
Tomatoes, per quarter-case	6d. to 1s.	
Watermelons, per dozen	1s. to 1s. 6d.	

TOP PRICES, ENOGGERA YARDS, JANUARY, 1915.

Animal.	JANUARY.	
	Prices.	
Bullocks	£16 to	£17 17s. 6d.
Bullocks (single)		£25 5s.
Cows	£10 5s. to	£14 10s.
Cows (single)		£17 2s. 6d.
Merino Wethers		22s. 3d.
Crossbred Wethers		22s. 9d.
Merino Ewes		20s. 3d.
Crossbred Ewes		24s. 6d.
Lambs		20s.
Pigs (Bacon) ... ..		...
Pigs (Porkers)		30s.

TIMES OF SUNRISE AND SUNSET AT BRISBANE—1915.

Date.	JANUARY.		FEBRUARY.		MARCH.		APRIL.		PHASES OF THE MOON, 1915. On or about the 150th Meridian, East Long. H. M.
	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	
1	4:57	6:45	5:22	6:42	5:41	6:20	5:58	5:46	1 Jan. ○ Full Moon 10 20 p.m.
2	4:57	6:45	5:22	6:42	5:42	6:19	5:58	5:45	9 " ☾ Last Quarter 7 12 a.m.
3	4:58	6:46	5:23	6:41	5:43	6:18	5:59	5:44	16 " ● New Moon 12 41 "
4	4:58	6:46	5:23	6:41	5:44	6:17	5:59	5:43	23 " ☽ First Quarter 3 32 p.m.
5	4:59	6:47	5:24	6:40	5:45	6:15	6:0	5:42	31 " ○ Full Moon 2 41 "
6	4:59	6:47	5:24	6:40	5:45	6:14	6:0	5:41	The moon will be brightest, under favourable atmospheric conditions, when in the last quarter, as it will then be nearer to the earth.
7	5:0	6:47	5:25	6:39	5:45	6:13	6:1	5:40	7 Feb. ☾ Last Quarter 8 11 p.m.
8	5:1	6:47	5:26	6:38	5:46	6:12	6:1	5:39	14 " ● New Moon 2 31 "
9	5:2	6:47	5:27	6:37	5:46	6:11	6:2	5:38	22 " ☽ First Quarter 12 58 "
10	5:3	6:47	5:28	6:36	5:47	6:10	6:2	5:37	There will be no actual Full Phase this month, two having occurred in January. The moon will be nearest to earth on 7th February at 11:18 p.m.
11	5:3	6:47	5:29	6:36	5:47	6:9	6:3	5:36	2 Mar. ○ Full Moon 4 32 a.m.
12	5:4	6:47	5:30	6:35	5:48	6:8	6:4	5:34	8 " ☾ Last Quarter 10 27 p.m.
13	5:5	6:47	5:30	6:34	5:48	6:7	6:4	5:34	16 " ● New Moon 5 42 a.m.
14	5:6	6:47	5:31	6:34	5:49	6:6	6:4	5:33	24 " ☽ First Quarter 8 48 "
15	5:7	6:47	5:32	6:33	5:49	6:5	6:5	5:32	31 " ○ Full Moon 3 38 p.m.
16	5:8	6:47	5:33	6:32	5:50	6:4	6:5	5:31	The moon will be nearest the earth on the 5th at 1 p.m., and farthest from the earth on the 21st at 11:12 a.m. The moon's distance from the earth at these times will be about 225,000 miles, and about 252,000 miles, respectively.
17	5:9	6:47	5:34	6:31	5:50	6:3	6:6	5:30	7 Apr. ☾ Last Quarter 6 12 a.m.
18	5:10	6:47	5:34	6:30	5:51	6:2	6:6	5:29	14 " ● New Moon 9 36 p.m.
19	5:11	6:46	5:35	6:29	5:52	6:0	6:7	5:28	23 " ☽ First Quarter 1 39 a.m.
20	5:12	6:46	5:36	6:28	5:53	5:59	6:8	5:27	30 " ○ Full Moon 12 19 "
21	5:12	6:46	5:36	6:28	5:53	5:58	6:8	5:26	The moon will be in perigee, or nearest to the earth, on the 2nd at 9:36 a.m., and on the 30th at 5:12 p.m. It will be in apogee, or farthest from the earth, on the 18th at 1 36 a.m.
22	5:13	6:45	5:37	6:27	5:53	5:57	6:9	5:25	
23	5:14	6:45	5:37	6:26	5:54	5:56	6:9	5:24	
24	5:15	6:45	5:37	6:25	5:54	5:55	6:10	5:23	
25	5:16	6:44	5:38	6:24	5:54	5:54	6:10	5:22	
26	5:16	6:44	5:38	6:23	5:55	5:53	6:11	5:21	
27	5:17	6:44	5:39	6:22	5:55	5:52	6:11	5:20	
28	5:18	6:44	5:40	6:21	5:56	5:51	6:12	5:20	
29	5:19	6:43	...	...	5:56	5:50	6:12	5:19	
30	5:20	6:43	...	...	5:57	5:49	6:13	5:18	
31	5:21	6:43	...	...	5:58	5:48	...	...

For places west of Brisbane, but nearly on the same parallel of latitude— $27\frac{1}{2}$ degrees S.—add 4 minutes for each degree of longitude. For example, at Toowoomba the sun will rise and set about 4 minutes later than at Brisbane, and at Oontoo (longitude 141 degrees E.) about 48 minutes later.

At St. George, Cunnamulla, and Thargomindah the times of sunrise and sunset will be about 18 m., 30 m., and 38 minutes respectively, later than at Brisbane.

The moonlight nights each month can best be ascertained by noticing the dates when the moon will be in the first quarter and when full. In the latter case it will rise somewhat about the time the sun sets, and the moonlight then extends all through the night; when at the first quarter the moon rises somewhere about six hours before the sun sets, and it is moonlight only till about midnight. After full moon it will be later each evening before it rises, and when in the last quarter it will not rise till after midnight.

It must be remembered that the times referred to are only roughly approximate, as the relative positions of the sun and moon vary considerably with regard to the ecliptic.

Orchard Notes for April.

THE SOUTHERN COAST DISTRICTS.

The gathering and marketing of citrus fruit, as well as of pines, bananas, custard apples, persimmons, &c., is the principal work of the month. In the Notes for March attention was drawn to the necessity for keeping all pests in check, particularly those attacking the ripening fruit. As it is the height of folly to look after the orchard thoroughly during the growing period of the crop and then to neglect the crop when grown, every possible care must be taken to keep fruit fly, peach moth, black brand, or other pests that destroy or disfigure the fruit in check, and this can only be accomplished by combined and systematic action. Citrus fruit at this time of the year often carries badly, as the stem is tender, easily bruised, full of moisture, and, consequently, very liable to the attacks of the blue mould fungus, which causes specking. The loss from this cause can be lessened to a considerable extent by carefully attending to the following particulars:—

- 1st. Never allow mouldy fruit to hang on the trees or to lie about on the ground. It should be gathered and destroyed, so that the countless spores which are produced by the fungus shall not be distributed broadcast throughout the orchard, infesting many fruit, and only waiting for a favourable opportunity, such as an injury to the skin by an insect or otherwise, combined with favourable weather conditions (heat and moisture), to start into growth.
- 2nd. Handle the fruit carefully to prevent bruising. Cut the fruit, don't pull it, as pulling is apt to plug the fruit—that is to say, to either pull the stem out or injure the skin round the stem—and a fruit so injured will go mouldy.
- 3rd. Sweat or dry the fruit thoroughly; if the weather is humid, laying the fruit out in the sun on boards or slabs is a very good plan.
- 4th. After sweating, examine the fruit carefully, and cull out all bruised or punctured fruit, and only pack perfectly sound dry fruit. It is better for the loss to take place in the orchard than for the loss to take place in the case in transit.
- 5th. If the mould is very bad, try dipping the fruit for a few seconds in a 2 per cent. solution of formalin. This will kill the spores, and if the fruit is placed in the sun and dried quickly before packing there will not be much chance of its becoming reinfested.

Don't gather the fruit too green, especially such varieties as the Beauty of Glen Retreat Mandarins, as immature fruit spoils the sale of the good article.

If the orchard has not been cleaned up after the summer rains, do so now; and do any other odd jobs that may be required, such as mending fences, grubbing out dead or worthless trees, cleaning out drains, &c.

Strawberry planting may be continued, and where new orchards are to be planted continue to work the soil so as to get it into the best possible tilth.

THE TROPICAL COAST DISTRICTS.

Clean up the orchards after the rainy season. Look out for scale insects, and cyanide or spray for same when necessary.

Go over the trees carefully, and when there is dead wood or water sprouts remove them. If bark fungus is showing, paint the affected branches with sulphur and lime wash. Clean up bananas, pineapples, and other fruits, as after the end of the month it is probable that there will not be any great rainfall, so that it is advisable to keep the ground well cultivated and free from weeds, so as to retain in the soil the moisture required for the trees' use during the winter months. Keep bananas netted; destroy guavas wherever found.

THE SOUTHERN AND CENTRAL TABLELANDS.

If the orchards and vineyards have not already been cleaned up, do so. Cultivate or plough the orchard, so as to get the surface soil into good tilth, so that it can absorb and retain any rain that falls, as, even though the trees will simply be hardening off their summer's growth of wood, it is not advisable to let the ground dry out. When citrus fruits are grown, attend to them in the manner recommended for the Southern Coast Districts; and, when grown in the dry parts, keep the land in a state of good cultivation. Should the trees require it, a light watering may be given. Do not irrigate vines; let them ripen off their wood.

Farm and Garden Notes for April.

FIELD.—The wheat land should now be ready for sowing the early wheats, and that which has not been prepared should be ploughed without delay, April, May, and June at latest being the months for sowing. The main potato crop, planted in February and March, will now be ready for a first or second hilling up. The last of the maize crop will now have been got in. Where cotton is grown, the pods will now be opening, and advantage should be taken of dry weather to get on with the picking as quickly as possible. Picking should not be begun until the night dew has evaporated nor during rain. Sorghum seed will be ripe. Tobacco also will be ripening, and either the leaves or the whole plant harvested. Lucerne may be sown, as the growth of weeds has now slackened off, but the ground must be thoroughly prepared and cleaned. Sow oats, barley, rye, wheat, mangolds, and Swede turnips. Plant out paspalum roots. Seed wheat of whatever variety soever should be dipped in a solution of sulphate of copper (bluestone) in the proportion of 1 lb. of sulphate to 24 gallons of water. The seed may also be treated with hot water by plunging it in a bag into hot water at 120 degrees Fahr. for a minute or two, and then into water heated to 135 degrees Fahr. Allow it to remain in this for ten minutes, moving it about all the time. Then plunge the seed into cold water and spread out to dry. This plan is

useful in districts where bluestone may not be obtainable. Another safeguard against bunt, smut, black and red rust is to treat the seed with formalin at the rate of 1 lb. of formalin to 40 gallons of water. Schering's formalin costs about 2s. 10d. per lb., and is sold in bottles. It is colourless and poisonous, and should be kept where no children or persons ignorant of its nature can have a chance of obtaining it. To treat the seed, spread it on a wooden floor and sprinkle the solution over it, turning the grain over and over until the whole is thoroughly wetted. Then spread it out to dry, when it will be ready for sowing. Instead of sprinkling, dipping may be resorted to. A bushel or so of seed is placed in a bag and dipped in the solution. During five minutes the bag is plunged in and out, and then the seed is turned out to dry. Formalin is less injurious to the grain than bluestone, but, while the latter can be used over and over again, formalin becomes exhausted. It therefore follows that only the amount required for immediate use for sprinkling should be prepared. Do not sow wheat too thickly. Half a bushel to the acre is sufficient—more on poor land and less on rich soils. On light sandy soil the wheat should be rolled. On sticky land it should only be rolled when the land is dry, otherwise it will cake, and must be harrowed again after rolling. When the wheat is 6 in. high go over it with light harrows. If the autumn and winter should prove mild and the wheat should lodge, it should be kept in check by feeding it off with sheep.

KITCHEN GARDEN.—Hoe continually among the crops to keep them clean, and have beds well dug and manured, as recommended last month, for transplanting the various vegetables now coming on. Thin out all crops which are overcrowded. Divide and plant out pot-herbs, giving a little water if required till established. Sow broad beans, peas, onions, radish, mustard and cress, and all vegetable seeds generally except cucumbers, marrows, and pumpkins. Early celery should be earthed up in dry weather, taking care that no soil gets between the leaves. Transplant cauliflowers and cabbages, and keep on hand a supply of tobacco waste, preferably in the form of powder. A ring of this round the plants will effectually keep off slugs.

FLOWER GARDEN.—The operations this month will depend greatly on the weather. If wet, both planting and transplanting may be done at the same time. Camellias, gardenias, &c., may be removed with safety. Plant out all soft-wooded plants such as verbenas, petunias, penstemons, &c. Sow annuals, as carnations, pansy, mignonette, daisy, snapdragon, dianthus, stocks, candytuft, phlox, sweet peas, &c. Those already up must be pricked out into other beds or into their permanent positions. Growth just now will not be too luxuriant, and shrubs and creepers may be shortened back. Always dig the flower beds rough at first, then apply manure, dig it in, and after this get the soil into fine tilth. Land on which you wish to raise really fine flowers should have a dressing of bonedust lightly turned in. Wood ashes also form an excellent dressing for the garden soil. Prune out roses. These may be planted out now with perfect success. Take up dahlia roots, and plant bulbs as recommended for March. Layers that have made sufficient roots should now be gradually severed from the plant, and left for a fortnight before potting, to ripen the young roots.