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Agriculture.

THE ADVANTAGES AND OBJECTS OF AGRICULTURAL CONFERENCES.

For some years, in the early days of agriculture in the State of Queensland, meetings of agriculturists were held in different centres, notably in East Moreton, under the auspices of the East Moreton Farmers' Association, which may be said to have formed the nucleus of the present splendid National Agricultural and Industrial Association of Queensland. In his introductory speech at the Agricultural Conference at Bundaberg in May, 1891, Mr. Peter McLean, who was at that time Under Secretary for Agriculture, said "that the gatherings of farmers in the past had been evidently more for amusement than for education. The present conference, and others recently held, had for their object the education, not the amusement, of those who took part in them, or who read the proceedings generally published afterwards. The first conference, held at Beenleigh, had been a most gratifying success,

and the papers read and the discussions thereon had been printed and widely circulated in Queensland and the sister colonies. The department was desirous, by means of these gatherings, to disseminate useful and practical information upon agricultural subjects. This was attained in two ways; first, by opening up a subject by the reading of a paper upon it, but more particularly by the discussion which these papers stimulated. The proceedings would be printed and circulated in the different parts of the colony. The discussions are very often found to be the most important part of the conference. The object of the papers was principally to broach the subject, touching upon the most salient points. It was found at Beenleigh that the discussions elicited more information than was given in the papers read by delegates. Therefore the circulation of the reports of the conferences would do a great deal of good. He (Mr. McLean) had been identified with farming for twenty-seven years, and therefore had some experience of the value of such aid as it was the object of these conferences to offer. There had existed for too long a time an apathy in connection with farming which was dangerous to the industry. The object of the department was to break down this apathy and isolation, and also to bring farmers together to exchange ideas and experiences on the great question of the farming industry. He held that they were just on the fringe of this important question of agriculture. There was no occupation or profession where more intelligence was required than in farming. There was more to be understood, and greater scope for investigation, in agriculture than in any other occupation on which human attention is bent. The Department of Agriculture may do a great deal, and indeed has done something, but unless they could get the sympathy and assistance of the farmers the department could not succeed. These gatherings would break down the apathy and disturb the isolation which, unfortunately, existed amongst farmers. Let them unite, then, and make the conference a success, and compel them to acknowledge that it was good for them to be there."

It was at this conference that the first mention (as we believe) of dynamite being used in the cultivation of orange-trees was made by Mr. J. Falconer. He called the operation

Subsoiling with Dynamite.

Once at Moolboolaman he had an orange-tree which was badly blighted. He bored a hole to a depth of 9 inches with an auger disagonally towards the roots, cleaned the hole out, put in a charge of dynamite, fixed the fuse, and exploded the dynamite. The soil was loosened for 20 feet round the tree, and in three weeks the blight had disappeared and the tree became healthy and bore well ever afterwards.

This statement was received with laughter and incredulity, nothing being then known of an operation which, of late years, has been very largely employed in Queensland in subsoiling land amongst growing fruit trees, and in preparing the holes for new plantations. If an Agricultural Conference were held to-day, much valuable information would be given on the beneficial effect of using explosives in the orchard, and there would neither be laughter nor incredulity exhibited.

COMPLETE FERTILISERS FOR FARM, ORCHARD, AND VEGETABLE GARDEN.

TOBACCO.

This crop requires a light, sandy loam, containing a large amount of humus. As it is a very exhaustive crop, it must get a liberal supply of artificial fertilisers. The texture, aroma, and burning quality of the leaf is greatly influenced by the fertilisers used, and rank, coarse, organic manures, and also manures containing chlorides, like kainit and muriate of potash, must be avoided.

An artificial fertiliser containing from 4 to 5 per cent. water or citrate soluble phosphoric acid, 5 per cent. of nitrogen, and 8 to 10 per cent. of potash (as sulphate) should be used in quantities from 6 to 10 cwt. per acre, and even such large amounts as 2,000 lb. of this mixture per acre have been found profitable in some of the tobacco countries.

The following fertiliser mixtures may also be used, increasing the amounts on poorer classes of soils:—

(1.) 1 to 2 cwt. superphosphate
1½ to 3 cwt. sulphate of potash
1 to 2 cwt. nitrate of lime or dried blood } per acre;

(2.) 2 to 3 cwt. Thomas phosphate
1½ to 3 cwt. sulphate of potash
1 to 2 cwt. nitrolim or nitrate of soda } per acre;

(3.) 1 to 2 cwt. superphosphate
1½ to 3 cwt. sulphate of potash
2 to 6 cwt. cotton-seed meal } per acre.

TOMATOES.

Tomatoes are frequently grown by orchardists in their orchards before they come into bearing. The fact that tomatoes are very gross feeders should never be lost sight of, and they undoubtedly impoverish the soil very rapidly, unless artificial fertilisers are supplied to the ground when planting.

Tomatoes do best on rich sandy loam, well drained and subsoiled. Use an artificial fertiliser containing 7 to 10 per cent. phosphoric acid, 8 per cent. potash, and 4 per cent. nitrogen, and apply at the rate of 8 to 10 cwt. per acre, or 8 to 10 lb. per 43 square yards, or 3 to 4 oz. per square yard.

Complete fertilisers can also be made up as follows:—

4 to 5 cwt. superphosphate
1 to 2 cwt. sulphate of potash
1 to 1½ cwt. nitrolim or sulphate of ammonia or nitrate of soda } per acre;

or,

3 cwt. fine bonedust
2 cwt. superphosphate
1½ cwt. sulphate of potash
2 cwt. nitrate of lime or nitrate of soda } per acre,

the nitrate of lime or nitrate of soda to be applied as topdressing in two lots at beginning and during growing seasons.

TURNIPS.

Turnips, like beets, require a fairly rich, well-worked soil, and the same class of artificial fertiliser.

WATER MELONS.

Use the fertilisers recommended for cucumbers or for marrows.

WHEAT.

Wheat may be grown on different classes of soil, and very large areas of country in Queensland are eminently suited for the culture of wheat. A clayey loam, with a fairly porous clayey subsoil, combined with a rather dry climate, gives the best results.

The demand for artificial fertilisers is only moderate, still light dressings with complete manures have given in many localities excellent results. In South Australia, the application of small amounts of superphosphate, ½ cwt. per acre, has increased the yield very considerably.

A complete fertiliser for wheat could be made up as follows:—

½ to 1½ cwt. superphosphate
½ to 1 cwt. sulphate of potash
½ to 1 cwt. nitrate of lime, or nitrolim, or nitrate of soda } per acre,

or a fertiliser containing 7 to 8 per cent. water soluble phosphoric acid, 4 per cent. of potash, and 3 to 4 per cent. of nitrogen, may be used at the rate of 1 to 3 cwt. per acre.

EGG PLANTS OR EGG FRUITS.

This vegetable is as hardy and easy to grow as the closely allied tomato, and requires a fairly rich sandy loam.

Apply per acre from 8 to 12 cwt. of a fertiliser containing 5 to 7 per cent. soluble phosphoric acid, 4 per cent. nitrogen, and 8 to 9 per cent. of potash, or use the following mixture:—

4 to 6 cwt. of superphosphate
1½ to 2 cwt. of sulphate of potash
1½ to 2 cwt. of nitrolim or sulphate of ammonia or nitrate of soda } per acre;

or the same quantities in pounds to every 43 square yards.

ORCHARD.

APPLES.

Apple trees prefer a fairly rich sandy loam, and also do well on the coarse sandy granitic soil of our coastal tablelands, in the Southern portions in which the winter temperature is low enough to give the trees a complete rest during the winter months. Our orchard soils are generally fairly rich in potash, but rather deficient in phosphoric acid, nitrogen, and humus; and mulching of the trees is of utmost importance.

A good fertiliser for apple trees grown on our sandy soils of average quality would be—

1½ lb. bonemeal
1½ lb. superphosphate
1 lb. sulphate of potash
1 lb. nitrolim
} per tree.

This quantity is for young trees; for large trees over eight years old, the quantity can be about doubled.

APRICOTS.

This fruit tree requires a fairly rich, well-drained, sandy loam, and does very well on our coastal downs country.

A tree in full bearing requires an annual application of—

3 lb. superphosphate
1½ lb. sulphate of potash
1 lb. nitrolim
} per tree.

Young trees can be started with one quarter of this amount, gradually increasing the quantity from year to year until the above amount is reached. For very old big trees, grown on poorer soil, the quantity may be safely increased to 7 or 8 lb. per tree.

BANANAS.

Bananas require a deep, well-drained scrub soil or rich alluvial loam, in sheltered position, free from frost, near the coast. The soil must contain a large amount of humus. The humus content of the soil must be kept up by mulching with green-manure crop, leaf mould, stable manure, &c.; and any acidity in the soil must be overcome by liming with lime, in form of carbonate of lime, as limestone, shell sand, limestone screenings, &c.

Even on exhausted soil, as long as the soil is in good physical condition and contains humus, bananas may be successfully grown by the aid of artificial fertilisers, applying from 5 lb. to 7 lb. of complete mixed fertiliser to each stool twice a year.

The following manure mixtures will be found beneficial, and will pay the grower by better returns of large bunches:—

Superphosphate, 3 to 4 cwt.
Sulphate of potash, 2 to 3 cwt.
Nitrate of lime or nitrate of soda, 2 to 3 cwt. } per acre;

higher or lower amount according to age and quality of soil;

or,

Superphosphate, 1½ cwt.
Bonemeal, 1½ cwt.
Sulphate of potash, 2 cwt.
Nitrolim or nitrate of soda, 2 cwt. } per acre;

or,

Superphosphate, 3 cwt.
Sulphate of potash, 2 cwt.
Dried blood, 2 cwt. } per acre.

The artificial manure to be applied in two dressings—one towards the end of summer, at the end of rainy season; and the other at the end of winter. Some soils contain a very small amount of salt, and in that case bananas will benefit by a slight dressing of common salt, at the rate of 1 to 2 cwt. per acre.

CHERRIES.

The successful growth of this fruit is confined to a few localities in this State, as it requires a well-defined cold winter and rather rich, deep, well-drained loam. In suitable localities the use of artificial fertilisers is particularly profitable for this crop, and in accordance with the size of the tree and expected crop the following quantities should be applied per tree:—

2 to 4 lb. of superphosphate;
1 to 2 lb. of sulphate of potash;
1 to 1½ lb. of nitrolim, or sulphate of ammonia;

or,

1 lb. of superphosphate;
2 to 4 lb. bonemeal;
1 to 2 lb. of sulphate of potash;
1 to 2 lb. dried blood;

or,

from 5 to 10 lb. of a mixed fertiliser containing from 6 to 12 per cent. soluble phosphoric acid, 3½ to 4 per cent. of nitrogen, and 5 to 6 per cent. of potash.

CUSTARD APPLE (Cherimoyer).

This tree is easily grown on most parts of coastal Queensland, or any fair class of soil. Apply, in accordance with the age of the tree:—

1 to 3 lb. superphosphate
2 to 6 lb. meatworks manure (with blood)
1 to 2 lb. sulphate of potash } per tree.

GRAPES.

Grapes may be successfully grown over a great part of Queensland, extending from the coast to the interior. Any soil, from a light loam to a clayey soil, is suitable, as long as it contains plenty of sand and gravel, and is well drained.

Improved methods of cultivation and the use of artificial fertilisers increases yield and quality of the fruit considerably. Excellent results have been obtained in South Australia with a yearly application of—

1 cwt. superphosphate
¼ cwt. sulphate of potash
¼ cwt. sulphate of ammonia
} per acre;

or applying about 3 oz. of the mixture to each vine.

COWPEAS.

The great value of cowpeas as a green manure is well understood in Queensland; and the growing and ploughing-in of this legume are largely practised, especially in the sugar districts. A correspondent of the "Journal of the Jamaica Agricultural Society," understanding that allowing cowpeas to ripen and picking them does not interfere with the nutritive powers of the peas as a green dressing, asked if it would not be a benefit if the peas could be grown and used as food without detriment to the rest of the crops as a green dressing. Following is the reply by the Editor of the above journal—a reply which will be endorsed by all acquainted with this use of the cowpea:—

It surely is obvious that taking away the mature cowpeas, which are the quintessence of the plant, to the extent of 10 to 15 bushels per acre, weighing 60 lb. to the bushel, and which are rich in nitrogen, must take a large proportion of the nitrogen from the soil that the cowpeas were purposely grown to add. If, on the other hand, the cowpeas are cut down when in blossom, or just setting pods, just when the whole powers of the plant are concentrated on making seed, then all the nitrogen, which is the most valuable element, would be added to the soil. The cowpea, in common with other legumes, has the power of absorbing nitrogen from the air; it does not add potash or phosphoric acid to the soil, except that legumes are, as a rule, vigorous growers and deep-rooted, and may utilise stores of potash and phosphorus which more superficially rooted plants would not get at; and thus legumes make these plant foods available for crops, say bananas.

The planter must calculate whether adding so much nitrogen to the soil for the benefit of his bananas or selling his cowpeas will pay him best. He does get benefit in additional humus added to the soil from the dry vines and roots of the cowpeas, together with a modicum of additional nitrogen, no doubt; but all the cowpeas sold off the land

represent so much available fertility lost to his bananas or cocoa or other staple crop.

It has been estimated in the United States that one average acre of cowpeas contains 65 lb. of nitrogen, 111 lb. of potash, and 20 lb. of phosphoric acid; of this the roots and stubble contain 8 lb. of nitrogen, 18 lb. of potash, and 13 lb. of phosphoric acid. A fair crop of 12 bushels of dry peas weighs 720 lb., and of this 18 per cent., or 40 lb., is nitrogen. You get, therefore, 8 lb. of nitrogen in the roots and stubble left, and 17 lb. in vines; and you lose 40 lb. in the peas taken off. You also, however, lose potash and phosphoric acid taken off in the peas—viz., 93 lb. of potash and 7 lb. of phosphoric acid—according to these figures. Adding a fertiliser, especially made up for cowpeas, to the soil when planting the cowpeas would enable a crop of peas to be taken off and still benefit the bananas.

A fertiliser for cowpeas, as laid down in a treatise of the United States Department of Agriculture, should contain about the following proportions:—8 per cent. available phosphoric acid; 6 per cent. actual potash, applied at the rate of 400 to 500 lb. per acre. Nitrogen is not needed for this crop, unless the soil is so very poor that the peas start off with a very weakly and sickly looking growth. This condition would require about 75 lb. of nitrate of soda added to the soil per acre.

A USE FOR SEA ISLAND COTTON.

Sea Island cotton finds an important use in the manufacture of motor tyres. The "Times" contains a striking advertisement notifying the fact that the Goodrich Company, Limited, entirely uses Sea Island cotton as the fabric for the foundation of their tyres. It is stated:—

> "There is as much difference between the value of the best cotton and the worst as between cotton and silk. The very finest cotton is the true Sea Island variety. Its quality in length and fineness of staple is extraordinary."

The above advertisement is one of the first that has been noticed in regard to the virtues of Sea Island cotton. The best Sea Island in the world is produced in the Island of St. Vincent, in the West Indies.—"Journal of the Jamaica Agricultural Society."

[With reference to the virtues of Sea Island cotton, there is a cotton grown in North Queensland, evolved some years ago, by Dr. David Thomatis, called "Caravonica." Of this there are three grades —Caravonica Silk, Caravonica Wool, and Kidney-seed Caravonica. The first of these more than possessed the qualities ascribed to Sea Island (of which it is a hybrid), and brought in the European markets a higher price than the latter.—Ed. "Queensland Agricultural Journal."]

HOW CAN CROPS BE GROWN WITHOUT POTASH MANURE?

The "Journal of the Board of Agriculture" (London) for August, 1915, contains a long and very interesting and instructive article dealing with the above subject, with a view to finding out the best courses to be adopted in the circumstances. It is incidentally mentioned that potash manures are only of recent use in the United Kingdom, and they were not imported in any quantity until about 1890. All the good farming of the sixties was done without them. The crops which most urgently need potash are potatoes, mangolds, and the leguminous crops (clovers, lucerne, vetches, peas, beans, &c.) How, then, is it possible to arrange a supply of potash for them?

Two methods may be adopted:—

(1) Other sources of potash can be used instead of the ordinary Stassfurt salts; and

(2) The supplies of potash in the soil can be made available.

SOURCES OF POTASH OTHER THAN STASSFURT SALTS.

(*a*) Various Ashes, Etc.—Attempts to utilise various potash minerals which occur in quantity in different parts of the world outside Germany have not materialised. Consequently, none of these can help. Since the war, however, attention has been directed to various sources of supply which are or could be brought immediately within the reach of farmers. These sources are included in Table 1:—

Table 1.—Sources of Potash other than Stassfurt Salts available on the Farm.

Material.	Percentage of Potash (as K_2O).*	Further information is given in :—
Ashes of seaweed	16	This Journal, Vol. 17, p. 464.
Ashes of bracken	2·5	This Journal, Vol. 15, p. 481.
Ashes of hedge trimmings ..	10	This Journal, Vol. 21, p. 694.
Ashes of waste cavings and waste from threshing	8 to 10	This Journal, Vol. 21, p. 694.
Ashes of wood waste, sawdust, &c.	5 to 7	Gimingham, Long Ashton, Rpt., 1914.
Fluedust from sawmills	up to 10	Gimingham, Long Ashton, Rpt., 1914.

* Kainit contains 12 per cent. of potash as K_2O.

In all these cases except the last the potash is present as carbonate—a very soluble and highly available fertiliser. Its drawback is that it is rather too soluble, so that the ashes have to be kept dry and, above all, carefully shielded from rain, or they may lose half their value in a single night. They can safely be mixed with superphosphate before distribution, and applied at the rate of about 3 cwt. per acre.

Attention having recently been directed in this Journal to most of these substances, it is unnecessary to do more than emphasise once again the urgent necessity of preserving them carefully, and, when practicable, of increasing the supplies by collecting hedge trimmings, prunings, dead bracken, and other waste vegetation for burning and conversion into ash.

Seaweed contains so much potash, and such good fertilising material generally, that we may yet hope to utilise it better than at present.

(*b*) FARM PRODUCTS.—Farm crops contain considerable proportions of potash, as shown in Table 2. Mangolds easily head the list, a 40-ton crop containing in the roots alone no less than 400 lb. of pure potash, equivalent to 30 cwt. of kainit, while the leaves contain an additional 150 lb. of potash, equivalent to 11 cwt. of kainit. It is evident that the leaves represent a useful source of potash, and should not be wasted; they should be spread evenly on the soil and ploughed-in; decomposition rapidly begins, and the potash is set free. They are relatively free from insect and fungoid pests, and there is little (if any) risk of introducing harmful organisms into the soil to injure the next crop:—

TABLE 2.—APPROXIMATE POTASH CONTENT OF VARIOUS FARM PRODUCTS.

Crop or Produce.	Size of Crop per Acre.	Weight of Potash (K_2O) Removed per Acre.	Proportion of Potash in the Crop.	Weight of Potash in 1 Ton of Crop.	Approximate Weight necessary to furnish as much Potash as 4 cwt. of Kainit.
		Lb.	Per Cent.	Lb.	Tons.
Mangolds, roots ..	40 tons	400	0·45	10	5½
Mangolds, leaves ..	15 tons	150	0·45	10	5½
Turnips, roots	20 tons	110	0·25	5½	10
Potatoes, tubers ..	8 tons	108	0·6	13½	4
Clover hay	2 tons	68	1·5	34	1½
Hay from well-manured land*	2¼ tons	101	2·0	45	1¼
Hay from unmanured land†	1 ton	28	1·25	28	2
Ordinary meadow hay	1½ tons	54	1·6	36	1½
Oats, grain	60 bushels (2,400 lb.)	12	0·5	11	5
Oats, straw	32 cwt.	36	1·0	22	2½
Wheat, grain	40 bushels (2,480 lb.)	12	0·5	11	5
Wheat, straw	36 cwt.	32	0·8	18	3

* Rothamsted Park hay, Plot 16 (mixed mineral manure and nitrate of soda.)

† Rothamsted Park hay, unmanured. Analytical data given in Phil. Trans., 1900, Vol. 192, p. 199.

The potash in these crops is drawn partly from the original stock in the soil, and partly from purchased manures and feeding stuffs. If the crops are sold off the land, the potash is entirely lost to the farm, but more usually the mangolds, turnips, and part of the hay and straw are consumed on the farm. It is interesting to notice that these—the hay and root crops—contain by far the greatest proportion of potash. With the striking exception of potatoes, the crops sold off do not remove much potash, grain in particular taking away relatively very little.

Where the crops are consumed on the farm, a certain proportion of the potash finds its way into the manure, and so back to the land. It

thus keeps circulating between the soil, the crop, the animal, and the manure heap; and we must now inquire what losses arise during the process, and how they may be stopped.

Potash Retained by Live Stock.—Potash is less retained by live stock than any other ingredient of manurial value in their food. Lawes and Gilbert, during their famous experiments of 1849-50, found that the increase of weight during fattening was found to contain 1·27 per cent. of nitrogen, 0·86 per cent. of phosphoric acid, but only 0·11 per cent. of potash; in other words, for every hundredweight of flesh laid on, a fattening animal retains only 2 oz. of potash. Milch cows retain more. Milk contains about 0·17 per cent. of potash, so that 100 gallons contain, approximately, $1\frac{3}{3}$ lb.

The Amount of Potash Passing into the Manure.—About 90 per cent. of the potash present in the animal's food is assimilated and passes into the animal's circulation. The animal does not keep it. What then happens to it? The answer is, that it is excreted in the urine, in which form it is a highly available fertiliser. . . . . The high content of potash is characteristic of urine, and is one of the reasons why especial care should be taken to save it at the present time.

There are three ways in which this can be done:—

(1) By using litter enough to soak it up;

(2) By protecting the manure heap against loss; and

(3) By adopting suitable means for collecting it.

Losses from the Manure Heap.—Farmyard manure contains its potash in two forms: the soluble compounds coming from the urine, and the insoluble compounds present in the litter. The sum of the two amounts to about 15 lb. of potash per ton of manure, or rather more than the quantity found in 1 cwt. of kainit or ¼ cwt. of sulphate of potash. The soluble part is liable to considerable loss by washing and drainage unless the heap is adequately protected from heavy rainfall.

At Rothamsted the following losses were found to occur:—

	Heap Sheltered from Rain; Drainage at a Minimum.	Heap Exposed to Rain; Considerable Drainage.
	Lb	Lb.
Potash originally present in heap	147	175
Potash left after three months' storage	130	123
Potash lost	17	52
	Per cent.	Per cent.
Potash lost, of total	12	30

The liquid draining away from the heap contains the potash; if it is carefully kept the loss is less serious. Hendrik has recently shown that on an average it contains 0·46 per cent. of potash, or 300 gallons contain about as much as is present in 1 cwt. of kainit, and in an admirable state of availability. Good results were obtained by applying it to grass land.

It appears, then, that the waste of potash on the farm need not be great. The chief points of leakage are the cattle yard and the manure heap, and the chief way in which loss arises is through wastage of the urine and of the brown liquid draining away from the manure. If these sources of loss are stopped, the circulation of potash between the soil, the crop, and the manure heap can be kept up without much loss.

It is now clear why potash did not enter more largely into the scheme of manuring on British farms prior to the more extended cultivation of the potato. A farm worked on the old four-course rotation, and selling only grain and meat, can be made largely self-supporting in the matter of potash supplies if the manure heap is properly managed and the liquid manure is preserved. The bulk of the potash taken up by the cereal crop remains in the straw, and does not pass into the grain: thus, so long as the straw is kept on the farm the supply is only slowly exhausted. Fattening and milking cattle only retain a small part of the potash supplied in the food, even a milch cow only passing some 10 per cent. into its milk; all the remainder goes out in the excretions.

Methods of Rendering the Potash Reserves in the Soil Available.—Although potassium fertilisers are easily soluble in water, they do not readily wash out from the soil, because they become absorbed or fixed by some of the soil constituents. Wherever high farming has been practised, and large quantities of potash salts, stable manure, or feeding stuffs have been imported on to the farm, the amount of potash supplies may well have been greater than the amount removed by the crop. A certain accumulation has, therefore, taken place in the soil, forming a reserve which can be drawn upon in the present emergency. The process is essentially one of liquidating capital, and if persisted in for many seasons might have bad effects, but as a war measure no harm need be anticipated.

Two general methods may be adopted:—

(1) Dressings of sodium salts may be applied, such as agricultural salt or sulphate of soda; or

(2) The land may be limed.

Both processes liberate some of the locked-up potash, but they show certain differences that require discussion.

The use of salt or sulphate of soda as a liberator of potash has long been recognised by agricultural chemists. At Rothamsted sodium salts are successfully used on wheat and on mangolds, and analysis shows that they increase the availability of soil potash to the plant:—

TABLE 5.—EFFECT OF SODA IN CAUSING THE LIBERATION OF POTASH FROM THE SOIL (ROTHAMSTED).

Manurial Treatment.	WHEAT, BROADBALK FIELD, 1852-1871.			MANGOLDS, BARNFIELD, 11 YEARS, 1903-1914.*
	Yield of Grain per Acre.	Yield of Straw per Acre.	Total Potash taken by Crop in the 20 Years per Acre.	Yield per Acre.
	Bushel.	Cwt.	Lb.	Tons.
Ammonium Salts only ..	26	23	540	6·9
Ammonium Salts + Supcr.	28	26	569	7·1
Ammonium Salts + Super. + Sulphate of Soda	34	32	832	23·8
Ammonium Salts + Super. + Sulphate of Potash	34	34	1,084	23·0

* 1908 omitted, as swedes were grown instead of mangolds. Rape cake formed part of the dressing in each case.

We have not space to give the entire text of this most valuable article, but have selected the most salient points which seem to us to be of interest to Queensland agriculturists. The article concludes thus:—

"The continued lack of potash may be met in two ways:—

(1) Greater care must be taken of the sources of potash already available on the farm: wood ashes, damaged straw, mangold and other leaves, liquid manure, &c., which are often allowed to waste in normal times. These contain considerable quantities of potash which, in the aggregate, would help materially in coping with the present shortage. Moreover, the ploughing up of leys and grass land leads to the liberation of the potash stored up in the roots, stems, and leaves, causing it to become available for the next crop.

(2) On most well-managed farms there are supplies of potash in the soil which can now be made available. Two agencies may be adopted:—(*a*) Sodium salts, especially salt and sodium sulphate; and (*b*) lime or chalk. The former can be used for mangolds and for cereals when necessary; lime and chalk are more suitable for leguminous crops (clover, &c.) There might be some risk in using either for potatoes, and growers would probably do best to put all their supplies of potassium salts on this crop.

"Neither lime nor salt actually *supplies* potash, and the method only works where potash is already stored up in sufficient quantity in the soil. On meadow land poor in potash it may prove better to apply liquid manure, as is often done successfully in the north."

COTTON-GROWING IN AMERICA AND QUEENSLAND.

There is a very erroneous impression amongst some Queensland farmers that cotton is still grown in the United States by black labour. This is not the case. Cotton is grown there, as here in Queensland, by white labour, and farm hands in the States of America are quite as alive

to the "living wage" as are those of this State. It has long ago been shown that cotton can be grown in Queensland to perfection, not only on the coast lands, from South to North, but also in the inland districts far distant from the coast. In times past cotton was grown here on a large scale, and there are to-day, since the failure, owing to the drought of the last few months, of the wheat crop, indications that the drought-resisting cotton will be largely planted during the coming season. In the old days of cotton-growing no account was taken of the seed. This was left to rot in heaps wherever cotton gins were at work. Its value was not realised by either the grower or the ginning owners. By-products, such as linters, hulls, oil, cake, &c., were never taken into consideration.

Now, take the American cotton-seed industry. In twenty-five years the value of cotton-seed in the States has risen from £4,000,000 to £27,000,000, and to-day the cotton fields of the United States have, to a large extent, replaced in their economic system the olive groves of the Mediterranean olive districts. Cotton-seed oil is a good edible product, and cotton-seed oil cake is a valuable cattle food.

MARKET GARDENING.

THE PUMPKIN BEETLE.

This pest attacks pumpkins, marrows, melons, and cucumbers, settling and feeding on the leaves in great numbers. They may be to a large extent destroyed by hand-picking in the early morning. When quite young the plants may be protected by a covering of hessian, but as they rapidly grow and send forth runners, something else must be resorted to to keep down their numbers. It has been noticed that, although endowed with a ferocious appetite, the beetle (Banded Galerca) declines to consume foliage which has become soiled. Accordingly the plants may be more or less protected by dusting upon them fine wood ashes and air-slaked lime, with a little kerosene or carbolic acid sprinkled on. For poisoning, treat the plants with Paris green applied in the form of a fine spray, not exceeding 1 lb. to 160 gallons of water. This must be kept well stirred when in use, and should not be applied during rain, sunshine, or heavy drying winds, nor within a month of the time of gathering. Another good spray is made of white arsenic, 1 lb.; unslacked lime, 2 lb.; water, 3 gallons. Slowly slack the lime, add the arsenic, put in the water, and boil for an hour. Add 160 gallons of water, and it is ready for use. Where practicable, as in a small market garden, shake the beetles into a bucket containing a little kerosene or boiling water. Where they are feeding in great numbers, this would be a simple way of destroying considerable numbers, and be taking advantage of the habit this species has of feeding in company, and suddenly dropping off the leaves when alarmed.

Pastoral.

SHEEP ON THE DAWSON VALLEY COUNTRY.

Mr. W. G. Brown, Instructor in the Sheep and Wool Industry, Department of Agriculture and Stock, replying to a series of questions by an intending sheep-farmer at Deeford, says:—

I have no doubt whatever that sheep would do well on your country, especially the crossbred (say, Border-Leicester on Merino). I will answer your questions seriatim.

(1) Merino sheep on cultivation or artificial grasses will do well, but crossbreds will do very much better, as they are hardier in every way, and can stand up better against internal parasites than Merinos.

(2) The only diseases to fight in that district are parasitic, (*a*) stomach worms (*Strongylus contortus*), (*b*) nodule worms (*Oesophagastoma Columbianum*), (*c*) blow-fly pest. The cure is simple, and instruction will be given by an officer of this Department should it be desired.

(3) Rhodes grass is eminently suitable for sheep, and this matter, from information at my disposal, has gone past the experimental stage. Sheep, however, prefer a short bite, hence it is better that the Rhodes should not be too rank or coarse.

(4 and 5) Border-Leicester or Romney-Marsh on good plain-bodied Merino ewes. Good crossbred ewes are very scarce and expensive, but a Lincoln-Merino is an ideal first cross.

(6) The silage mentioned (a mixture of Rhodes grass, millet, maize, sorghum, and peas) forms a very high-class fodder, and sheep will eat it readily. A ewe suckling a lamb will keep in good condition on 4 lb. a day. If there is other rough feed, 2 lb. would suffice.

(7) I do not consider Prairie a high-class sheep feed. It cannot stand a dry spell as can Rhodes.

(8) A good stand of Rhodes grass will keep sheep in good condition at the rate of, at least, six sheep per acre.

ERADICATION OF THISTLES.

Although no efficacious remedy for exterminating Scotch Thistles is known, it may be of interest to note that in some parts of Queensland, where the pest has appeared, it practically was choked out by reason of the fact that when the weeds were in such excess quantities the immediately available supplies of moisture and plant-food were exhausted. The land also became "thistle-sick" from the exudation of toxins from the roots. In ordinary seasons the Rhodes Grass is able to exercise its well-known smothering tendencies, but where the thistles are well advanced, any other quick-growing grass, or seeds sown for a particular purpose and to get a "burn," would be equally impracticable.

Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

Milking Records of Cows for Month of September, 1915.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Commercial Butter.	Remarks.
			Lb.	%	Lb.	
Gretchen ...	Holstein	16 Aug., 1915	1,179	3·4	46·85	
Davidina ...	Ayrshire	21 Aug. ,,	819	3·9	37·47	
Sylvia II. ...	Shorthorn... ...	25 Aug. ,,	869	3·6	36·61	
Lennie ...	Ayrshire	23 July ,,	823	3·7	35·85	
Bluebelle ...	Jersey	20 June ,,	653	4·2	32·22	
Lilia ...	Ayrshire	19 Aug. ,,	734	3 6	30·96	
Noble Dot ...	Jersey	2 May ,,	499	5·1	30·06	
Iron Plate ...	,, ...	21 Feb. ,,	509	5·0	30·04	
Lady Dorset	Ayrshire	10 Aug. ,,	600	4·0	28·17	
Silver Nell...	Shorthorn ...	13 Aug. ,,	669	3·4	26 58	
Miss Bell ...	Jersey	2 July ,,	518	4·2	25·58	
Lady Twylish	,, ...	5 June ,,	475	4·5	25 17	
Rosine ...	Ayrshire	7 Aug. ,,	607	3·4	24·21	
Lady May ...	,, ...	7 Mar. ,,	499	4·0	23·45	
Miss Lark ...	,, ...	8 Sept. ,,	587	3·3	22·62	
Netherton Belle	,, ...	23 April ,,	449	4·2	22·15	
Lady Athol	Shorthorn... ...	29 May ,,	529	3·5	21·66	
Lady Melba	Holstein	6 Mar., 1914	437	4·1	21·05	
Auntie's Lass	Ayrshire	16 Feb., 1915	397	4·5	21 04	
Lady's Maid	Shorthorn ...	2 Feb. ,,	349	5 0	20·60	
Princess Kate	Ayrshire	9 July ,,	440	3·9	20·13	

Fed on natural pastures, supplemented by daily ration of 35 lb. of panicum ensilage per head.

COMMENT UPON HERD-TESTING OPERATIONS.

By E. GRAHAM, Dairy Expert.

During the year, herd-testing operations were conducted by the Herd-testing Officer (Mr. L. Andersen) in numerous districts throughout the State, and the particular localities comprised were:—Wellcamp, Cambooya, Greenmount, Swan Creek, Jondowae, North Arm, Yandina, Eumundi, Kenilworth, Goomboorian, Goondoon, Mount Larcomb, Gogango, Bushley, The Caves, Woowoonga, Byrnestown, Coulstoun Lakes, Goomeri, and Atherton Tableland.

It will be noticed that the activities of the Herd Tester extended over a considerable portion of the area utilised for dairying purposes, but there remain some important dairying centres which hold aloof from the adoption of systematic herd-testing. The principal inquiry for the services of the Herd Tester came from those who have recently entered into dairying as a means of livelihood; and the desire manifested by the later converts to dairying towards effecting an improvement in the quantity and quality of the milk yields of their dairy herds augurs well for the future of the industry, and shows plainly that in this particular at least numbers of the younger generation are fully appre-

hensive of the necessity to engage in their herds only animals capable of yielding milk in profitable quantities.

Under existing circumstances, with specially high prices offering for either fat or store conditioned stock, the "lodger" cow is not to be tolerated within the dairy herds; and the result of herd-testing positively indicates that every herd contains animals which do not produce butter fat in sufficient quantity to reimburse the owner for the cost of their agistment and the expense involved in the drawing of the milk.

In order to meet the full force of the opposition levelled at the industry in this State by competitors within other countries actively engaged in the production of dairy products, it is essential that no delay should occur in the eradication of all low-yielding and unprofitable milch cows from the herds. At the present time we find returns showing that in several rival countries the number of pounds of commercial butter produced on the average by the milch cows utilised exceeds the average number of gallons of milk yielded by the dairy cows of this State.

Estimating that it ordinarily requires at least 2¼ gallons of herd milk to produce 1 lb. of commercial butter, it is not a difficult matter to form an opinion as to which set of competitors is to hold supremacy until such time as the disparity in the productiveness of the respective herds is reduced considerably. The actual testing of a few herds in each district, although beneficial, will not lead to a rapid increase in the general standard of productiveness of the whole of the dairy herds of this State. The number of cows utilised for dairying purposes is far too great to be appreciably affected by the results of herd-testing operations conducted upon a limited scale. Queensland is credited with containing more than 380,000 dairy cows, and during the last year the animals submitted to the Herd Tester did not total 5,000 in number. The cows tested represented less than 2 per cent. of the animals employed for the purpose of dairying. Surely it is high time the owners of the remaining 98 per cent. of milch cows set out to determine the actual profit-earning capability of the individual cows within their herds.

In order to encourage a general submission of the dairy herds to systematic butter-fat testings, the Department of Agriculture long ago provided the machinery necessary for the performance of the work involved in the actual testing of the milk. Consequently the dairy farmers are solely responsible for the restriction in the number of cows tendered for testing purposes, as they are, as owners, privileged to either submit or withhold their herds from the application of the test. However, the existing mark-time attitude and apathy shown to herd-testing should be promptly abandoned by dairy farmers and favour shown to a policy more in keeping with modern teachings. No material progress is possible, or is a full measure of the benefits of herd-testing to be enjoyed, until the dairy herds are subjected to the scrutiny of the Herd Tester in numbers more in keeping with the full complement of the cows utilised for the purpose of dairying.

It must ever remain that a highly productive dairy herd is the king-pin of success in dairy farming.

Appended is a summary of the herd-testing operations for the year:—

Number of cows submitted for the purpose of testing .. 4,310

Daily average yield of milk per cow in the tested herds:—

Mean	14·3 lb.
Highest	25·7 lb.
Lowest	1·8 lb.

Daily average butter fat content of herd milk:—

Mean	4·1 per cent.
Highest	5·9 per cent.
Lowest	3·0 per cent.

Daily amount of commercial butter produced per cow:—

Mean	0·68 lb. commercial butter.
Highest	1·23 lb. commercial butter.
Lowest	0·11 lb. commercial butter.

The result of an analysis of the behaviour of the individual cows comprised within the dairy herds, when submitted to a Babcock test by the Herd Tester, indicates that it is unnecessary to cite hypothetical cases for the purpose of illustrating the great variance existing in the relative quantities of butter fat produced by individual animals, and the influence this factor is capable of exerting over the amount of profit to be won from the dairy farm. The specific test results of several dairy herds, herein quoted, provide convincing evidence in this direction.

As an example, we shall first take Dairy Herd K. This herd comprised 15 cows.

A summary of the record made by these animals, when subjected to a butter-fat test, carried out under identical conditions, as far as treatment, access to pasture, &c., are concerned, is as follows: —

Animal A, 27 days in milk, produced 1·52 lb. of commercial butter in 24 hours.

Animal B, 28 days in milk, produced ·60 lb. of commercial butter in 24 hours.

At the above rate of production Animal A, in a lactation period of 300 days, would produce equivalent to 456 lb. of commercial butter; while A's companion B, in the same time, would produce equivalent to 180 lb. of commercial butter, leaving a difference of 276 lb. of commercial butter in favour of A.

Within the same period (300 days), the five foremost cows of this herd, collectively, produced—

1,410 lb. of commercial butter.

The five cows next in merit as producers of butter fat yielded, collectively—

1,100 lb. of commercial butter.

The five cows within the herd yielding least butter fat were capable only of producing, collectively—

885 lb. of commercial butter.

Taking the value of commercial butter at 1s. per lb., we find that the commercial butter production of the respective groups of cows has the following values:

	£	s.	d.
5 foremost cows within the herd yield 1,410 lb. of commercial butter at 1s. per lb, equal to	70	10	0
5 cows next in merit yield 1,100 lb. of commercial butter at 1s. per lb., equal to	55	0	0
5 cows (lowest producers) yield 885 lb. of commercial butter at 1s. per lb., equal to	44	5	0

15 being the total number of cows contained in the herd.

For the purpose of estimating the net profit accruing from the several group associations made of the milch cows contained in this particular herd, let us assume that the entire cost of maintaining or attending a dairy cow is £6 per annum. We then get the following figures:—

	Sales of Com. Butter.				Cost of Maintenance.				Net Profits		
	£	s.	d.		£	s.	d.		£	s.	d.
5 foremost cows—gross receipts	70	10	0	less	30	0	0	..	40	10	0
5 cows next in merit—gross receipts	55	0	0	less	30	0	0	..	25	0	0
5 cows (lowest producers)—gross receipts	44	5	0	less	30	0	0	..	14	5	0

In reviewing the relative amounts of net profits, it is found that the five foremost cows are almost threefold as profitable as the five lowest producers in the herd.

Another point to be emphasised, and one which is frequently overlooked by those actively engaged in dairying, is that it is not necessary for an animal to produce three times as much butter fat as another in order to establish a threefold supremacy in profit earning. A comparison between the quantities of commercial butter above shown clearly indicates this, as, in volume, the amounts of commercial butter stand in the proportion of 1,410 to 885 or as 1·6 is to 1.

Example No. 2.

Actual test results connected with the testing of two cows comprised in Herd L are employed for the purpose of demonstrating the influence the percentage of butter fat in milk is capable of exercising over the quantity of commercial butter derivable from milk.

A comparison is made between the production of commercial butter by a cow giving milk of moderately high test with that of an animal yielding milk of a low percentage of fat; the milk yield in each case being very similar in quantity. The particulars are as follow:—

Both cows were 30 days in milk when testing operations were commenced.

Cow F yields an average of 23 lb. of milk, testing 2·6 per cent. of butter fat per day.

Cow G yields an average of 26 lb. of milk, testing 4·1 per cent. of butter fat per day.

In a lactation of 300 days the Cow G yields only 90 gallons of milk more than the Animal F; but the quantity of commercial butter produced by the former is 168 lb. in excess of that produced by the low testing Cow F.

Example No. 3.

In this instance the adoption of systematic herd-testing revealed the wide disparity which occurs in the relative productiveness of individual cows contained within the dairy herd. Such cases are not by any means unique, but are to be met with in almost every herd which has not been submitted to the scrutiny of a test.

The actual test records of two cows both fresh at their work, as quoted, are the results of testing operations conducted in Herd M:—

Cow H yielded daily average of 12 lb. of milk, testing 3·1 per cent. of butter fat for a period of 300 days.

Cow J yielded daily average of 28¾ lb. of milk, testing 4·1 per cent. of butter fat for a period of 300 days.

In the period taken—

Cow H produced 129 lb. of commercial butter, which, at 1s. per lb., equals £6 9s.;

Cow J produced 411 lb. of commercial butter, which, at 1s. per lb., equals £20 11s.;

leaving a difference of £14 2s. per annum in the gross earnings of the respective animals.

Assuming that the assessment of cost of maintaining and attending a milch cow is rightly estimated at £6 per year, it is evident that the Cow H is not a profitable animal to retain in the dairy herd.

In actual practice herd-testing has been the means of bringing to light innumerable animals incapable of producing butter fat in sufficient quantity to repay the owner for the cost of sustenance and attention involved in their maintenance; and the removal of animals found unprofitable for dairy purposes has been necessary in almost every herd tested. In some instances the percentage of animals necessarily to be culled from the herds has been comparatively small, being as low as 3 per cent. of the entire herd; but in other cases the eradication of as high as 56 per cent. of the cows has been necessary, in order to place the dairy herd upon a remunerative footing in so far as production of butter fat is concerned.

PRICKLY-PEAR AS A FODDER.

On this subject, Mr. R. O'Sullivan writes:—

"*Re* the above, I have pleasure in relating my experience, which, although only on a small scale, will prove that the prickly-pear is excellent for feeding cattle, and has the additional merit of being cheap. In the beginning of the big drought of 1902-3 I was living at Corinda, and a friend of mine, who is a surveyor in the Railway Department, suggested that we try prickly-pear for feeding our cows. I agreed, and

we got two of the local men to join in with us. We got a truckload of pear, as we wanted it, by rail from Nudgee, and divided it between us. To feed my cow, the course I adopted was as follows:—I put as much pear as I could cram into a kerosene tin, and then filled the tin with water. I then put the tin on the stove, and, after allowing the water to simmer for a couple of hours, I poured the liquid into another kerosene tin which contained about a quart of bran and one-third of the tin of lucerne chaff. Next morning I gave this to my cow, with the leaves, which were boiled; and although I experienced some trouble in inducing my cow to taste it, still, once she did so, she ate it afterwards most willingly. When I first started I used to cut off the big spikes, but I found that after being boiled they were quite soft. After that I boiled the spikes and all. I gave a similar feed every evening. My share of the pear lasted me over a month, and I am certain it did not cost me 10s. for the pear I used. I particularly noticed that, although I doubled the quantity of lucerne, when I ran out of the pear, if I had to wait a week or so for the fresh supply, my cow fell away in the milk, and came up again when I returned to the pear. A gentleman, whom I casually met in the train, informed me that he was feeding quite a number of cows on prickly-pear, boiled, but as he believed it would form a ball in the stomach he intended selling them when the drought was over. With regard to the 'ball in the stomach' theory, I am quite satisfied there is nothing in it, as I kept that cow for years afterwards, and I am certain it would have been hard to have found a healthier animal.

"I advised a well-known Sandgate milkman, who had the pear growing up against his fence, to try my method of using the pear, and he told me afterwards he found it good. I may say that this man thought he would improve on my way, and also save water by putting it through the chaffcutter, but he found his idea not feasible, as the pear, being greasy, clogged his machine. It often occurred to me, when I noticed the excessive—in fact, almost prohibitive—price of lucerne chaff, to publish in the Press my experience, but I refrained from doing so, as I dislike publicity; however, at a time like the present, I consider it is the duty of everyone to publish any information which may be useful."

SUDAN GRASS FOR PIGS.

Sudan grass has been most successfully grown at the Queensland Agricultural College. As a pasture grass it is highly recommended, especially as a pasture for pigs. It has been reported from the State of Kansas, U.S.A., that pigs were turned into a field partly sown with Sudan Grass and partly with Rape. It was naturally expected that the pigs would prefer the Rape, but, on the contrary, they left the Rape, and ate down the Sudan Grass, to the point of killing it out. This is good enough for Queensland farmers. Roots of Sudan or seed can be obtained from the Q.A. College; seeds at 4s. per lb., in small quantities, not exceeding 2 lb. to any one purchaser.

Poultry.

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

Seven thousand five hundred eggs were laid during the month—an average of over 141 per pen. C. E. Bertelsmeier's White Leghorns win the monthly prize with 161 eggs. The following are the individual records:—

Competitors.	Breed.	Sept.	Total.
Jas. McKay	White Leghorns	132	778
Mrs. J. Jobling, N.S.W.	Black Orpingtons	124	764
J. Gosley	White Leghorns	150	744
Mrs. Munro	Do.	146	740
C. E. Bertelsmeier, S.A.	Do.	161	736
J. D. Nicholson, N.S.W.	Do.	147	720
S. E. Sharpe	Do.	148	715
J. M. Manson	Black Orpingtons	150	715
A. W. Bailey	White Leghorns	145	712
Kelvin Poultry Farm	Do.	149	708
J. R. Wilson	Do.	135	700
E. F. Dennis	Do.	155	698
A. H. Padman, S.A.	Do.	154	696
King and Watson, N.S.W.	Do.	140	690
C. T. Clark	Do.	141	671
T. Fanning	Black Orpingtons	147	668
E. Le Breton	White Leghorns	142	667
J. M. Manson	Do.	153	663
A. T. Coomber	Do.	145	664
H. Hammill, N.S.W.	Do.	136	661
O.K. Poultry Yards	Do.	151	654
E. V. Bennett, S.A.	Do.	139	649
C. Knoblauch	Do.	148	647
E. A. Smith	Do.	150	647
R. Burns	Black Orpingtons	137	642
T. Fanning	White Leghorns	130	640
W. Purvis, S.A.	Do.	152	637
W. Parker	Do.	151	633
W. Meneely	Black Orpingtons	131	633
G. Tomlinson	White Leghorns	140	632
F. Clayton, N.S.W.	Do.	140	628
R. Jobling, N.S.W.	Do.	130	626
Cowan Bros., N.S.W.	Do.	137	622
R. Burns	S. L. Wyandottes	138	617
R. Jobling, N.S.W.	Do.	121	616
Moritz Bros., S.A.	White Leghorns	142	614
Cowan Bros., N.S W.	Black Orpingtons	134	611
Derrylin Poultry Farm	White Leghorns	133	607
W. Lindus, N.S.W.	Do.	147	604
W. Lyell	Do.	137	600
E. A. Smith	Black Orpingtons	152	585
G. H. Turner	White Leghorns	142	574
J. Zahl	Do. (No. 1)	145	572
J. Aitchison	Do.	127	569
J. G. Richter	Do.	144	563
J. Zahl	Do. (No. 2)	125	556
J. H. Gill, Victoria	Do.	155	549

Competitors.	Breed.	Sept.	Total.
Loloma Poultry Farm, N.S.W. ...	Rhode Island Reds ...	146	540
E. Pocock	White Leghorns ...	144	524
F. Clayton, N.S.W.	Rhode Island Reds ...	140	461
S. Chapman	Brown Leghorns ...	130	458
W. H. Forsyth, N.S.W.	White Leghorns ...	141	434
J. R. Johnstone	Plymouth Rocks ...	121	317
Totals	...	7,500	33,371

Statistics.

RAINFALL IN THE AGRICULTURAL DISTRICTS.

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

Divisions and Stations.	Average Rainfall.		Total Rainfall.	
	Sept.	No. of Years' Records.	Sept., 1915.	Sept., 1914.
North Coast.	In.		In.	In.
Atherton	0·46	13	Nil	2·15
Cairns	1·04	27	Nil	1·75
Cardwell	1·32	27	0·10	0·73
Cooktown	0·57	27	0·04	1·25
Herberton	0·44	27	0·04	1·50
Ingham	1·16	22	0·24	0·47
Innisfail	3 03	27	Nil	8·75
Mossman	0·79	5	Nil	1·85
Townsville	1·30	30	0·06	Nil
Central Coast.				
Ayr	1·90	27	0·48	0·04
Bowen	1·15	27	0·01	0·23
Charters Towers ...	0·84	27	0·47	0·18
Mackay	1·75	27	0·20	0·92
Proserpine	2·21	11	0·01	3·60
St. Lawrence ...	1·29	27	1·71	0·85
South Coast.				
Biggenden	1·48	14	2·65	0·73
Bundaberg	1·81	27	0·28	0·84
Brisbane	2·03	64	1·57	0·82
Childers	1·95	19	3·28	1·31
Crohamhurst ...	2·24	22	4·93	2·26
Esk	2·30	27	2·36	0·96
Gayndah	1·63	27	1·04	0·78
Gympie	2·22	27	3·18	1·46
Glasshouse M'tains	1·56	6	2·76	1·59
Kilkivan	1·77	27	0·79	Nil
Maryborough ...	1·78	27	2·94	2·35

Divisions and Stations.	Average Rainfall.		Total Rainfall.	
	Sept.	No. of Years' Records.	Sept., 1915.	Sept., 1914.
South Coast—continued:	In.		In.	In.
Nanango	1·96	27	2·43	0·15
Rockhampton ...	1·34	27	2·33	0·54
Woodford	2·14	27	2·71	0·82
Yandina	2·14	21	2.68	1·23
Darling Downs.				
Dalby	1·79	27	1·55	0·38
Emu Vale	1·86	17	0·67	0·45
Jimbour	1·75	24	1·20	Nil
Miles	1·43	27	0·93	0·50
Stanthorpe ...	2·23	27	1·81	1·04
Toowoomba ...	2·13	27	0·83	0·41
Warwick	1·98	27	0·61	0·34
Maranoa.				
Roma	1·49	25	0·67	0·31
State Farms, &c.				
Gatton College ...	1·66	14	1·12	0·48
Gindie	0·95	13	1·07	Nil
Kamerunga Nurs'y	1·13	23	Nil	3·44
Kairi	...	...	Nil	1·86
Sugar Experiment Station, Mackay	1·63	16	0·53	1·68
Bungeworgorai ...	0·77	3	0·91	0·58
Warren	0·14	3	0·08	Nil
Hermitage ...	1·56	7	0·73	0·33

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

State Farms.

STATE FARM, BUNGEWORGORAI.

The Manager furnishes the following report on the institution for the month of October:—

Meteorological.—Since submitting the previous report 61 points of rain have been recorded, but the benefit derived therefrom was of little consequence owing to the subsequent hot weather and strong drying winds. This month's record brings the rainfall for 1915 to a total of 504 points.

Winter cereals.—These crops are curing off, due to the fact that there is not sufficient moisture in the soil to meet the plant's requirements. Even with exceptionally favourable conditions prevailing from now on the yield will be extremely light and the grain of poor quality.

Harvesting operations should be commenced within the next fortnight.

Summer crops.—The crops mentioned as having been sown in last report germinated well, but are now in a precarious condition.

During the period under review another 10 acres have been sown with cow-peas and sorghums, bringing the total under summer crops to 29 acres.

Vineyard.—Splendid growth has been made in this section and the majority of the varieties give indications of heavy yields under congenial conditions.

Orchard.—Citrus: These trees are again exhibiting unmistakable signs of distress, and the prospects of this season's crop are anything but good. Deciduous: The apricots, so far as fruit is concerned, are a complete failure, but they are with one or two exceptions in a flourishing condition. The same remarks apply to the plums and other deciduous fruits.

Grasses.—Teff grass: The 7 acres sown with this grass is now tinged with green, a good germination having taken place. For this block alone it is hoped that rain will be experienced very shortly, so that the plants' behaviour on clayey and sandy soils under field conditions can be ascertained. Rhodes grass: This is again showing signs of the continued dry spell.

Miscellaneous sowings.—The crossbred cow-peas have been sown and a good germination was obtained, but owing to the depredations of the cut and wire worm, practically the whole of the plants have been destroyed.

Potatoes.—Three (3) drills of this tuber have been planted and are now above ground.

Cucurbitaceæ.—Small sowings have been made of water-melons, rock melons, and pumpkins.

Stock.—The horses look exceptionally well considering, and the cattle appear to be holding their own, with the exception of the cows, which have recently calved, these having fallen away a little.

The Orchard.

THE FIJI BANANA TRADE.

(From the "Fiji Planters' Journal.")

Our banana-growers have frequently been threatened with disaster in various forms. There have been floods and hurricanes, Queensland growers and Australian taxation—not to mention increased freights, Government inspection, and incomprehensibly small returns by account sales when the Australian market seemed otherwise normal.

Recently another shadow has risen upon the Fijian banana-planters' horizon which bids fair to develop serious proportions. We refer to the Tweed River banana trade. There is no doubt whatever that bananas of excellent flavour and sufficient size to hold their own against the Fiji-grown fruit are now being shipped by the Tweed River planters; and this fruit has the additional advantage of cheaper freight, no duty, and can reach the market 24 hours instead of 9 to 10 days after cutting.

With these facts before them, there is no doubt the Fiji banana-planters will see the necessity for looking to their laurels speedily, or they will be ousted from the field.

The age of competition has passed, and commercial concerns all the world over are succeeding or failing to succeed by their power of co-operation.

If the Fiji banana trade is to continue, there must be some co-operative effort on the part of our planters to handle their fruit to the best possible advantage, and stop all the present leakages by which thousands of pounds, which should go directly into the growers' pockets, are being diverted into other channels or absolutely lost.

Anyone who knows the Sydney banana market will admit that the best banana purchasable to-day is an inferior article compared to the best banana of ten years ago. This is, without doubt, due to the fact that in their effort to avoid loss by over-ripeness growers are cutting fruit in a less mature state than was the custom prior to inspection days.

This may be altered by having carrying facilities of a kind that can assure the delivery of the fruit in Sydney in exactly the same condition in which it is received by the carriers in Fiji. There is nothing Utopian about the suggestion. It is done all the world over, and argument as to possibility and advantage is superfluous.

Additional attention must be given to the packing of the best grade of fruits, in order that it may be delivered to the purchaser with the least possible handling. There is always a market for a limited supply of the finest fruit that can be grown at the very topnotch price. A price can be obtained in Australia for selected bunches of bananas carefully

packed in cases in Fiji, which will more than repay for the additional expense.

The present system of consigning to many small agents in Sydney, with absolutely no supreme supervision on the spot, is extremely foolish and alarmingly wasteful.

Bananas are piled out on the Sydney wharf with classification as to brand only, and there sold. . . .

Fruit graded according to quality, repacked for sale and country orders, and, where immature, placed in a warm room for ripening, would bring very considerably better returns than the same fruit sold in broken heaps even by auction.

Queensland fruit-growers now consign all their Sydney shipments to one man, who, while selling none himself, supplies the wholesale dealers with the quantities that in his opinion they can handle to advantage. In this way, if account sales on one shipment from a certain agent are without reason unsatisfactory, the Sydney manager is able to refuse to supply that agent with further fruit. The result is claimed to be most satisfactory to the Queensland growers.

An alternative scheme could be the opening up of a banana market in Sydney by the Fiji growers, where all fruit could be received, graded, repacked, &c., and sold by auction. Such market to be, of course, in the hands of a man whose continued employment depends upon his satisfactory returns, and who could be dismissed for failure to obtain the best possible results for his employers.

There may be other practical methods suggested; but, whatever scheme should be decided upon, to insure success it must be, as we have stated, a scheme of co-operative handling as against the present competitive sales.

BANANA MANURING.

By R. G. BARTLETT, H.T., State School, Buderim.

By experiments carried out in different places, it has been conclusively proved that potash is most essential to ensure successful results from the manuring of bananas. Owing to the war, potash cannot be obtained, as Germany was the sole source of supply. Growers are therefore in rather a quandary as to what is the best thing to do under the circumstances. Numerous inquiries on this subject have led the writer to give a short résumé of his investigations on this subject, with acknowledgments to J. C. Brünnich and Alfred E. Stephens.

The Influence of Lime.—The chief function of lime is a mechanical or physical one on the soil texture. Heavy clayey soils are rendered more friable and less tenacious, whilst, on the other hand, light, sandy soils are made more retentive by its use. It is the chemical action of lime,

however, which concerns us more closely at present. Lime counteracts any acidity and destroys the ill-effects of certain soluble iron salts.

It, again, *liberates valuable mineral plant foods,* chiefly *potash, existing in unavailable form,* and helps in the decomposition of organic (vegetable, &c.) matter.

Lime favours bacterial activity by counteracting the formation of excessive and undesirable acidity. Particularly does it assist the valuable bacteria of nitrification, which change ammonia salts into nitrates, and in making the nitrogen available to plant life. It is only by the action of the myriads of bacteria, with which every fertile soil teems, that the different plant foods in organic materials are made available to the crops.

Lime, as a direct plant food, is commonly present in most comparatively virgin soils in sufficient quantities. With constant cropping, cultivation, and the action of the continuous use of certain fertilisers, such as sulphate of ammonia, superphosphate, dried blood, &c., *the lime becomes gradually removed,* so that the soil, besides becoming possibly actually deficient in lime as a plant food, also acquires an acidity or sourness unfavourabe to successful plant growth.

It therefore follows that, where orchards have been previously manured heavily with potash and dried blood, sulphate of ammonia, or superphosphate, without periodical applications of lime, great results may be expected from applying heavy dressings of lime, followed two months later with applications of dried blood and superphosphate.

In order to demonstrate this, the bananas on the school plot were given a heavy dressing of lime—4 to 5 lb. per stool—at the end of July, while this month (October), 2 lb. of dried blood and 1½ lb. of superphosphate were applied to each stool.

Slaked lime (agricultural lime) is recommended in preference to limestone screenings which, though cheaper, are slower in action.

It must not be inferred that potash manures can be dispensed with altogether, but that, so long as sufficient potash is present in a soil, either naturally or as a result of previous heavy potash manuring, liming and manuring as above will help to temporarily dispense with the necessity to use further potash.

Remarkable improvement is noticed in the school vegetable plot from the use of lime this year. Hitherto only very average results have been obtained, even when manuring the vegetables with farmyard manure, with the addition of dried blood, superphosphate, and potash. So much has this been the case, that successful vegetable growing under ordinary conditions was almost despaired of. Lime has changed all that. Light dressings of lime before digging up the beds and the addition of small quantities of lime to the water-tank and the vegetables, now bear comparison with the best, even though artificial fertilisers have been dispensed with.

FRUIT-GROWING IN QUEENSLAND.

In the very early days of fruit-growing, with special reference to citrus fruits and pineapples, very good returns rewarded the growers, notwithstanding the want of experience in the business, and the absence of any expert assistance. This refers to the early sixties, when the only remedy for citrus pests was what was known as Gishurst's compound. But as time went on, the Agricultural Department, recognising the probable great future of this industry, stepped in to assist the fruit-growers by the appointment of instructors, whose life business it had been to study the causes of failures and the best means of combating the multifarious fungoid and insect pests which militated against success in the fruit-growing industry.

When Mr. A. H. Benson arrived in Queensland in 1896 and was appointed to the superintendence of this business, a radical change was effected. He brought to bear, on the citrus industry especially, his experience in America. He showed how fungoid and insect pests could be controlled by various means, and it was mainly owing to his work in Queensland, assisted by Messrs. Voller and Soutter, that to-day the fruit-growing industry from South to North is in a most thriving position.

Not to take a general view of the fruit-growing business in this State, we may cite, as one instance among many, the case of a fruit-grower (one of several) in the Blackall Range, who has so profited by the advice of the gentlemen named, and particularly by the advice of the Agricultural Chemist, Mr. J. C. Brünnich, who has done such splendid service to both citrus and banana growers throughout the State in advising as to the best manures to be applied to these crops.

In the instance above-mentioned, results of pineapple crops have been forwarded to Mr. Benson, and these have been verified.

The grower at Woodford planted 2 acres of rough pines three years and two months ago (December, 1911), and 1 acre of smooth pines one and a-half years ago, and the following is the account of pineapples sent to Brisbane by rail in 1915 (from this area of 3 acres) :—

PINEAPPLES SENT PER RAIL FROM WOODFORD, 1915.

——	CASES.	WEIGHT.			
		Tons	cwt.	qr.	lb.
Summer Crop, February to March	928	27	0	0	0
Winter Crop, June to 11th October	196	6	1	0	14
	1,124	33	1	0	14

In addition to the above, 15 cases were disposed of locally, and there were still a few cases to market.

The pineapples (2 acres) were planted between oranges and mandarins. Last summer, from 1 acre of "Smooths" (18 months planted), 225 cases of fruit were cut (case weight, net about 70 lb.). For the

winter crop, 182 cases were obtained, and still other fruits coming along. As shown by the above figures, up to the 30th September, 1915, the grower sent by rail this year 1,110 cases of pines, equal to 32½ tons from 3 acres, and still there would probably be 50 cases more to follow off the same area.

In addition to the freight (£11 17s. 10d.), freight was paid on a few cwt. of fertilisers.

These results are facts which can be verified by account sales, &c.

From our personal knowledge of the district, we can state that the soil, though of a deep, friable sandy nature, is by no means rich in plant food, but this only goes to strengthen the argument that by careful cultivation and judicious manuring, such results are almost certain to follow. As to the financial aspect, pineapple growers need not to be shown the profit on such transactions. They well know what expenses are incurred in manure, fruit cases, labour, &c.

DIRECTIONS FOR CANNING TOMATOES.

Select firm red tomatoes of uniform size; put into tray; and lower into boiling water for about 1 minute to make skins come off easily. Plunge into cold water to make fruit firm and peel promptly. Use a slender pointed knife to cut out the core, being careful not to cut into the seed cells.

All cans and utensils should be thoroughly sterilised by boiling for 20 minutes. Pack tomatoes in can as closely as possible to within ¼-inch of the top. Weigh cans; No. 2's should contain not less than 20 oz., and No. 3's not less than 33 oz., of tomatoes.

Mix sugar and salt in the proportion of one-third salt and two-thirds sugar. Put 2 level teaspoonfuls of this mixture in each No. 3 can of tomatoes, and 1 teaspoonful in each No. 2 can. Put the cap on the can, leaving the vent hole open; place cans in tray; and lower into boiling water, almost immersing, allowing cans to remain for 3 minutes to drive out the air. Tip the cans immediately after exhausting, and completely immerse in boiling water. No. 2 cans require 15 to 20 minutes' cooking; No. 3 require 22 to 30 minutes. Count from the time the water first boils, after immersing the cans, and keep it boiling constantly. Cool as quickly as possible.

If glass jars are used, put tops on loosely, set in water nearly to top and boil—pint jars 25 minutes, and quart jars 30 minutes. The top should be tightened as soon as the jars are removed from the water. Be careful in removing not to place jars in a draft.

In canning with a steam pressure canner, the cans are capped and tipped immediately after filling. Place in canner and process. No. 2 cans require 20 minutes at 228 degrees, 5 lb. pressure; No. 3 cans, 28 minutes at 232 to 235 degrees, 7 lb. pressure.—"Modern Farming."

Horticulture.

LIQUID MANURE.

Stable, cow, sheep manure, and poultry droppings can be used as liquid manure.

Many people have an aversion to using these because of the unpleasant odours.

For those who prefer the artificial manures we can recommend nitrate of soda, sulphate of ammonia, sulphate of potash, and Peruvian guano. The latter manure, when good, makes a first-class liquid manure, but we prefer the first three.

The ammonia and nitrate of soda produce luxuriant growth and must be used cautiously. A tablespoonful of either to two gallons of water makes a strong manure, and seldom requires to be used stronger. It is better to make the manure half the strength for most plants, otherwise there is a danger of killing the plants. We are now referring to ordinary garden plants.

Avoid wetting the leaves with the artificial manures. Some tender annuals can't stand such treatment.

If it is necessary to use sulphate of potash with either the ammonia or nitrate of soda, the amounts used must be lessened, say, half of each. Half a tablespoonful of each to about four gallons of water is quite safe.

Don't use these stimulants oftener than once a week. Once a fortnight is much safer.

Before applying the manure, wet the soil thoroughly, then apply the liquid manure some hours afterwards.

These tonics may be used on most of our spring flowers, roses, sweet peas, pansies, petunias, and most flowering plants in the conservatories.

If you want delicate and handsome blooms, use the liquid manures very sparingly.—"Garden and Field."

KEROSENE EMULSION.

Following is Professor Cook's formula for making kerosene emulsion, as given in his lecture before the Escondido Farmers' Institute:—"Dissolve from one-eighth to one-fourth pound soap in two quarts water. Remove from fire and add one pint of kerosene. Stir very vigorously, either by use of an egg-beater for small quantity or a force pump in case of a large amount. In the latter case use a small, single opening for nozzle, and pump the liquid back into itself. An emulsion will look like rich cream, and the kerosene will be permanently mixed. Now add seven pints of water, and it is ready for use. The application should be made with a force pump, and should be very thorough, as it must touch every insect.

Tropical Industries.

THE VALUE OF MANURE FOR SUGAR-CANE.

The "Journal of the Board of Agriculture" of British Guiana (Demerara) says that recent experiments conducted in various parts of Hawaii have shown that plant cane from an unmanured field will yield 25 to 30 tons of cane per acre, whilst by judicious manuring these figures reach as high as 40 to 42 tons per acre; and 4 to 6½ tons of sugar per acre were obtained from the completely manured plots against 3 to 4¼ tons where unmanured.

RUBBER IN MALAYA.

Notwithstanding the reduction in the price of plantation rubber of late, several plantations in Malaya and the Straits Settlements have returned handsome dividends to shareholders. Following is a statement published in "Grenier's Rubber News" of the results of the Bukit Rajah Rubber Company for the year ended 31st March, 1915, which must be highly gratifying to the shareholders:—

The company repeats its 1913-14 dividend of 50 per cent., writes off £5,000, by way of depreciation, against £3,000 the year before, and carries forward £8,003. The reserve account now stands at £21,000.

A statement is furnished of the crops of the various products and profits of the company for the last eleven years, and we quote the dividend distribution over this period:—

	Per cent.
1905-6	6
1906-7	30
1907-8	30
1908-9	55
1909-10	150
1910-11	150
1911-12	150
1912-13	125
1913-14	50
1914-15	50

The crop for last year came up to within 6,500 lb. of the estimate; and it is expected that a crop of 705,000 lb. will be harvested for the current year. The total area under rubber is 3,890 acres, of which 1,521 are not

in bearing, so that there is a splendid prospect before the company. It is not proposed to open any further clearings during the year. The average yield per acre last year was equivalent to 284 lb., as compared with 263 lb. in 1913-14.

All-in cost has been brought down to 11·82d., and is made up as follows:—

	d.
F.O.B., Port Swettenham	8·39
Freight, insurance, and selling charges	1·59
Directors' remuneration, income tax, and London charges	1.84
Total	11·82

GINGER.

Ginger may be planted from August to November, or as late as December, putting the sets about one foot apart each way. The white varieties do better if planted twenty inches apart, and eight inches apart in the rows, the yellow requiring more space. When planting, the sets should be merely covered with soil, or, better still, with old cow manure. The shoots will come above ground in twelve or fourteen days. The only cultivation needed is to keep the surface soil loose and clear, but not more than an inch of soil should be stirred. During the process the plants are all the better for a few shovelfuls of rich, old compost added to the surface; the yield is in proportion to the richness of the soil. The roots are ripe in about seven months from the time of planting. The white sorts are the richest in flavour. The smaller, or narrow-leaved, variety is that used for the dry ginger of commerce. For this purpose the roots are allowed to lie in the ground until the leaf stalks have withered. They are then dug up and washed, the outside skin is scraped off, and the roots are dried in the sun.

PRESERVED GINGER.

To make preserves, the roots are dug as soon as they are fully grown and before the leaves begin to wither; they are then washed and scraped, cut into slices, and put into jars with salt and water for a few hours, or just sufficiently long to take away any earthy flavour. Then the slices are rinsed in clean water, and are put into a jar with a thin syrup made from white sugar. Change the syrup in three or four days, or as soon as it shows signs of fermenting. Reboil it, adding more sugar, and pour it upon the ginger again. This may have to be done three or four times, until the ginger has lost all its wild flavour, and is perfectly sweet and aromatic. It can then be covered up for future use.

80 LB. OF RUBBER PER TREE PER ANNUM.

The above is no doubt an extraordinary yield, and throws absolutely into the shade anything recorded before, but one must remember, however, that the tree referred to is now thirty-seven years old, having been planted at Heneratgoda Gardens, Ceylon, in 1877. The tree stands within a few feet of a hard cabook road, and its neighbours (two) are within fifteen feet of it. The most remarkable fact regarding this giant Hevea is the tapping of renewed bark, in one instance after three years, and in another section of the tree after only a year and ten months. We mention this specially, as the opinion is growing stronger daily that even six years is not too long to wait before tapping renewed bark. This heavy bearer cannot, however, be taken as a criterion for determining the time that should elapse before renewed bark is to be tapped. One great difference lies in the fact that this tree was not tapped systematically till it was thirty-two years of age, while plantation Heveas are taken in hand from their fifth year as a rule, perhaps earlier.

A recent issue of a bulletin issued by the Department of Agriculture, Ceylon, gives full particulars regarding the tapping which was begun on 5th December, 1908, and continued daily, on a full herring-bone system of three V's, extending over one-half the circumference, the cuts being one foot apart, and the lowest cut one foot from the ground. On 21st May, 1909, this herring bone (section 1) had been completely tapped, and on the following day a similar herring bone on the opposite side of the tree was begun (section 2). On 24th January, 1910, the second section was completed, and on 26th January a third section was begun, on the same pattern, above the first. The third section was completed at the end of July, 1910, and was followed by tapping on a fourth section, on the opposite side of the tree, *i.e.*, above section 2, on 1st August. This fourth section was completed on 17th January, 1911. Each of the four sections consisted of an area three feet high, extending half round the tree.

The yields from these four sections were as follows:—

Section.	Duration of Tapping.	Days Tapped.	Total Rubber. Lb.	Oz.
1	168	153	43	9
2	248	185	43	7
3	188	137	34	13
4	170	125	50	3

Thus for twenty-five months the yield was 172 lb. The out-turn for 1909 was approximately 76 lb., and for 1910, 89 lb. Both knife and pricker were used for tapping, and the tree showed perfect renewal after the first paring and pricking.

RENEWED BARK.

Tapping was commenced on 1st April, 1911, on the renewed bark of section 1, which was then two years four months old, *i.e.*, from the beginning of the first tapping. The tree was tapped by the same method

as before, but after the first six tappings the pricker was discarded, and the Bowan-Northway knife alone used. Tapping was carried on daily during alternate months until 30th April, 1912, by which time this section had been completely retapped. The following is the results of this tapping:—

Duration of Tapping Days.	Days Tapped.	Total Rubber. Lb.	Oz.
396	209	100	10

100 lb. in thirteen months is more than double the yield of the same area from original bark. Tapping alternate months, as also the disuse of the pricker, may have had some influence on the result, while climatic differences must also be reckoned with.

In May and June, 1912, the tree was again tapped on sections 2 and 4, *i.e.*, on the side opposite to that on which the tapping was first begun, the renewed bark on section 2 being then about three years old, and that of section 4 a year and ten months old, counting from the beginning of the original tapping. This tapping was continued daily for thirty-seven tappings only.

On 1st November, 1912, tapping was begun on the renewed bark of section 3, which was then about two years nine months old, reckoning, as before, from the beginning of the tapping on the original bark. This tapping was on the original system, and was continued daily, with a rest of six weeks, until 19th August, 1913.

The total yield from this upper section was 97 lb. 4 oz. in ten months, almost the same as that of the renewed bark on the lower section (section 1), on the other side, though the latter was tapped more slowly.

With short intervals this tree was tapped over a period of four years nine months, and yielded as follows:—

	lb.	oz.
From original bark	172	0
From renewed bark, section 1, completely tapped	100	10
From renewed bark, section 2 and 4, partly tapped	22	9
From renewed bark, section 3, completely tapped	97	4
Total	392	7

It would appear that at the end of 1908 the girth at six inches from the ground was 13 ft.; at three feet, 8 ft. 6 in.; and at six feet, 9 ft. 5 in. The main stem branches into two at about 10 ft. from the ground, and this fact accounts for the greater circumference at six feet than at three feet from the ground. Though it has been styled the Heneratgoda giant, it is not the largest tree in the group. In December, 1911, the tapped tree measured 115 in. at three feet, while the other tree measured 125 in. In August, 1914, the girth of the tapped tree at three feet was 117 in.—"Grenier's Rubber News."

[There is a very old tree standing near old Government House at Port Moresby, Papua, which yielded a fabulous quantity of rubber in a year, but the above undoubtedly beats all records.—Ed. "Q.A.J."]

Botany.

CONTRIBUTIONS TO THE FLORA OF QUEENSLAND.

By J. F. BAILEY and C. T. WHITE.

NEW SERIES—No. 1.

Order MENISPERMACEÆ.

STEPHANIA, Lour.

S. aculeata, *Bail.* To the description in "Queensland Flora," p. 33, add: Female flowers minute in axillary or terminal panicles. Carpels orange-coloured, compressed, 2 lines long; pericarp succulent; putamen hard, transversely tuberculate-costate.

Order CRUCIFERÆ.

CAMELINA, Crantz.

Erect more or less hispid annuals with sagittate or auricled stem-leaves, and small yellow flowers. Pod obovoid, the partition broad, the valves very convex, with the midrib distinct, the edges flattened, forming a narrow margin round the pod. Styles slender. Seeds several.

C. sativa, *Crantz.* (False Flax.) Stem simple, or slightly branched, 1-2 ft. high. Lowest leaves stalked, upper ones sessile, stem-clasping with rounded auricles, lanceolate, entire or toothed, 1-2 in. long. Flowers numerous. Pods about 3 lines long on pedicels about twice that length in a long loose raceme.

Hab.: A native of Southern Europe and temperate Russian Asia, widely spread as a weed of cultivation, especially in grain and flax fields, over the world; has lately established itself about Brisbane, coming up spontaneously with flax.

Order LEGUMINOSÆ.

CASSIA, Linn.

C. costata, *Bail. f. & White*, sp. nov. (Plate 22.) Shrub 6 ft. Glabrous. Stems costate with more or less prominent ribs. Leaflets 4-6 rather distant pairs, oblong-linear, ½ to 1½ in. long. Gland stipitate between the lowest 1 or 2 pair of pinnæ, but often wanting. Stipules small. Flowers in short umbel-like racemes in the upper axils. Peduncles about ¾ in. long. Bracts 1½ line long. Sepals unequal broadly ovate, 2-3 lines long. Petals unequal, 4-5 lines long. Stamens all perfect. Anthers equal, all on short filaments. Ovary sericeous. Pod glabrous, shortly stipitate, 3-4 in. long, curved sometimes into almost a circle. Seeds 15-20, black, shining, attached to a long funicle.

Hab.: Woolgar, *E. W. Bick*, August, 1915.

This new species belongs to Bentham's section *Psilorhegma*, and differs sufficiently in several details from all other species of that group to take specific rank. Its position in the Queensland species is between *C. glauca* and *C. retusa*.

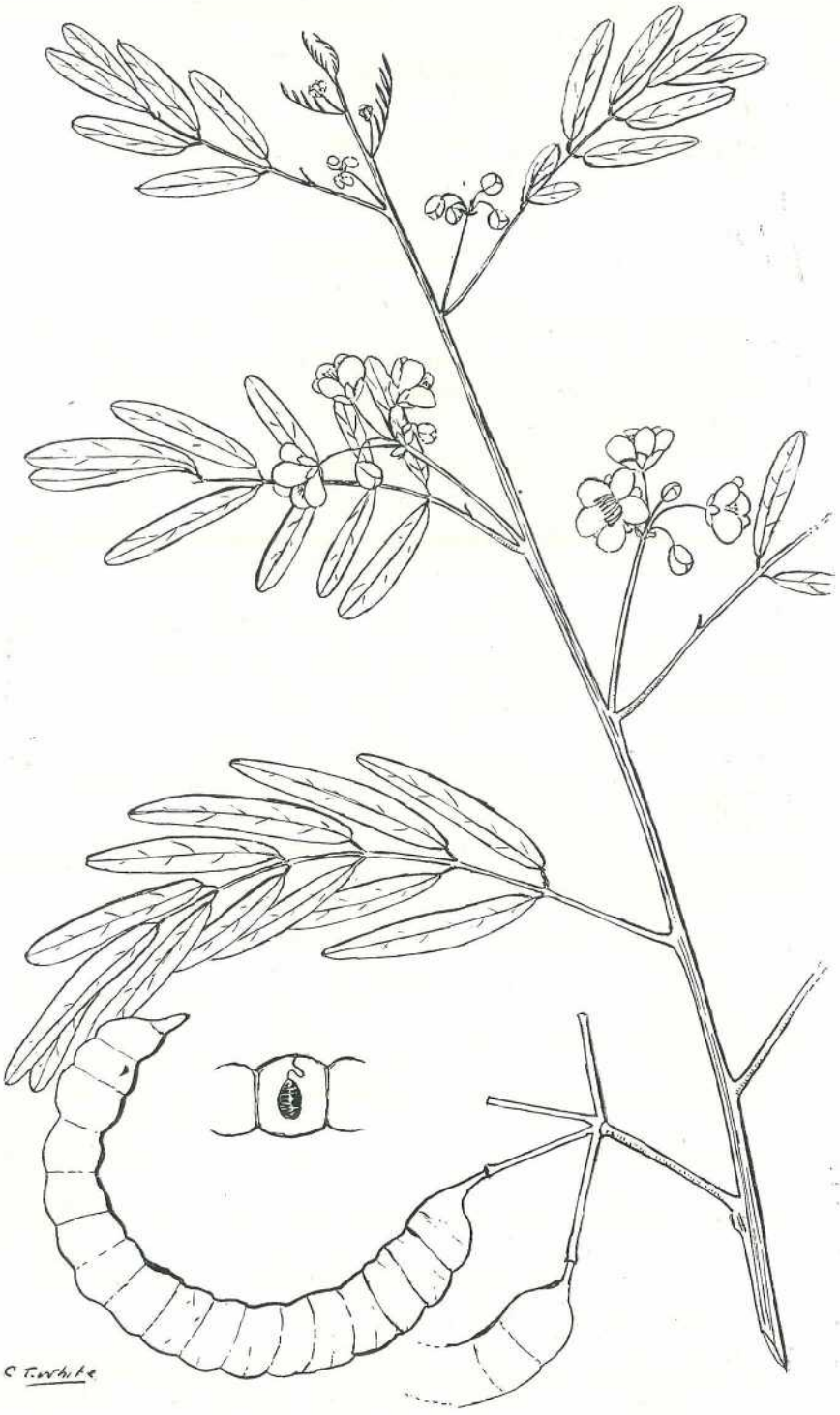

PLATE 22.—CASSIA COSTATA, *Bail. f. and White, n. sp.*

Order FUNGI.

The following additions to our Fungi have been determined at the Royal Botanic Gardens, Kew, England.

Agaricus (Clitocybe) decastes, *Fries.* prox.

Hab.: In grass land Botanic Gardens, Brisbane.

Megalonectria nigrescens, *Kalch. et Cke.*

Hab.: On dead stems of *Ficus pumila*, Botanic Gardens, Brisbane.

Uredo pelargonii, *Thuem.*

Hab.: On Pelargonium leaves, Brisbane, *F. Burtt.*

Pestalozzia breviseta, *Sacc* (?).

Hab.: On leaves of *Kennedya rubicunda*, Kedron Brook, *C. T. W.*

Monilia carbonaria, *Cooke.*

Hab.: On dead prickly-pear, Dulacca. On burnt stems of bamboo, Brisbane Botanic Gardens.

In "Queensland Agricultural Journal," Vol. III., n.s. (1915), p. 170, this is recorded as **Rhinotrichum pulchrum,** *Berk.* In a note since received from Sir D. Prain he says the correct identification is as above.

Science.

ANALYSIS OF ASH OF CROW'S FOOT ELM.

By J. C. BRÜNNICH, Agricultural Chemist.

With the present scarcity of potassic fertilisers the farmer must be on the lookout for substitutes, and utilise sources hitherto neglected.

The Department of Agriculture and Stock has repeatedly asked for samples of any material which, may be, contain appreciable amounts of potash.

A fairly complete list of wood and plant ashes was published in the list of analyses of fertilisers which appeared in the August number of this journal.

Mr. A. E. Stephen, the delegate of the Chilean Nitrate Committee of Australasia, collected a sample of the ash of crow's foot elm in the Atherton district, and from the analysis below it will be seen that such ash would be a highly valuable fertiliser for crops like maize, potatoes, vegetables, &c., on account of the fairly high amounts of potash and phosphoric acid contained in this ash.

The ash contains, in per cent.—

Lime	46.91
Potash	5.75
Phosphoric acid	6.24

Entomology.

NOTES ON EXPERIMENTS FOR THE CONTROL OF THE SUGAR CANE BEETLE.

By E. JARVIS, Entomologist, Bureau of Sugar Experiment Stations.

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

Experimentation against the grub stage of *Lepidiota albohirta* was carried on for a time, but discontinued about the middle of August owing to the majority of the grubs having ceased feeding preparatory to pupation.

Arrangements are being made to conduct a few initial experiments in connection with oviposition, and to resume research work instituted last season relating to the control of the adult beetle.

The period which immediately follows the primary emergence, and lasts about a month, is naturally of great economic importance, embracing as it does both adult and egg stages, and thereby affording possibilities of getting at the root of the trouble by preventing deposition of the eggs, or destroying them in the soil.

It is hoped that these experiments will to some extent test the value of the following remedial methods applicable to the beetle and egg stages:—

(1) Trapping beetles by means of artificial light.
(2) Trapping beetles by means of attractive odours.
(3) Preventing the laying of eggs by poisoning the adult female.
(4) Controlling oviposition by means of attractive ground traps.
(5) Preventing deposition of eggs by means of deterrents applied to the surface of the ground, or injected into the soil.

Preliminary trials respecting method No. 2 were started last November, but yielded negative results.

I have not hitherto alluded to these experiments, although of opinion that such work may prove of great value and is well worth following up.

This field of research is especially fascinating from a scientific standpoint, seeing that it calls for a knowledge, not only of entomology, but of biology, chemistry, physics, &c.

The subject is, of course, too complex to admit of full discussion in this report, but I may mention that the results obtainable are entirely dependent on certain influences arising from the operation of various

natural laws that govern the movements of insects. For instance, we find that artificial light, whilst repellent to some species, is more or less attractive to others. The moth or beetle that flies into the lamp flame, however, must not be held accountable for such action, as it is merely responding to the influence of forces over which it has no control. Similarly, decaying animal matter emits an odour that compels blow-flies and other insects to approach and settle on it, and, whilst under its domination, to deposit eggs that later on produce maggots destined to serve a useful purpose in the economy of nature.

We may, therefore, reasonably assume that the movements of our mealy-back cane-beetle are determined by forces that probably exercise important influences on the flight of the adult female prior to oviposition.

Canegrowers might render valuable assistance in this connection if they would occasionally watch the beetles whilst swarming at dusk and, in the event of noticing abnormal numbers congregating on the ground, either close to the house or in the field, as though attracted to a particular spot or portion of land, &c., communicate at once with the Entomologist at Gordonvale.

Methods 1 and 3 have already received a share of attention and appear worthy of further investigation, but Nos. 4 and 5 have not hitherto been studied.

PRICKLY-PEAR AS STOCK FEED—EXPERIMENTS IN INDIA.

Prickly-pear Feeding Experiments (Horn, E. W., Department of Agriculture, Bombay, Bulletin 58 of 1913, Bombay, 1914).

In order to determine the possibility of using prickly-pear (Opuntia) as fodder during times of famine, some feeding experiments were carried out at the Government Civil Dairy, Kirdee. Six bullocks were fed with a mixture of 100 parts of prickly-pear to 6 parts of cotton seed at the rate of 72 lb. per 1,000 lb. live weight per day for six months. The prickly-pear was prepared for consumption by first burning off the spines over a stove and then cutting the slabs into small pieces my means of a chaffcutter or a chopper; the burning was accomplished at various rates, from 30 to 100 lb. per hour according to the stove used.

The animals were in very poor condition at the beginning of the trial, and all improved markedly as time went on; four out of the six took the ration readily from the first, while the other two were longer in getting accustomed to it. The fodder was also fed successfully to a mixed dairy herd of cows and buffaloes in quantities up to 14 lb. per head per day and to young stock. Altogether, as a result of the trials, it may be said that the mixture of prickly-pear and cotton seed used will not only support life but enable an animal to regain condition even after it has become very poor from semi-starvation.—"Monthly Bulletin of Agricultural Intelligence and Plant Disease."

General Notes.

WOMEN AND THE WAR.

Every woman who, by working, helps to release a man or to equip a man does National War Service. In the country districts, the right kind of war work is to help in every way practicable to produce and harvest as much food as possible.

KEEPING MILK SWEET IN HOT WEATHER.

A pinch of carbonate of soda will keep milk or cream sweet in hot weather. In hot weather, when meat is likely to be tough, dip it in vinegar before cooking. This will make it tender. Milk will remove inkstains from carpets, tablecloths, &c., if applied directly.

DESTROYING TIMBER BY POISON.

Frilling trees and applying an arsenic solution gives good results. For the preparation of the poisonous solution the Agricultural Chemist recommends the use of caustic soda instead of washing soda, as no boiling is required. Mix dry arsenic (3 lb.) with caustic soda (1½ lb.) and add water slowly. Make up to 5 gallons; 5 lb. of saltpetre can be added to aid burning. Strong sulphuric acid mixed with nitric acid has been tried for the purpose, but found to be practically useless. Only in the case of very soft scrub timber does an injection of acid bring about decay. The addition of saltpetre to the arsenic solution facilitates burning.

PREVENTION OF HOG CHOLERA.

An American farmer, writing on this subject, gave his own experience of the use of wood-ashes as a cure for hog cholera:—"Now more than sixty years ago I read in a farm paper that wood-ashes would prevent cholera. At once I filled a lard tin with ashes and carried the ashes to the five hogs left, and they devoured the ashes as so much corn mush. I had lost then nearly 200 hogs. Since then I have given my hogs wood-ashes, and never have lost one. Before this when I killed my hogs I would have to throw away nearly all the livers because they were so diseased. I would find worms 10 in. long, and as large as a cedar pencil, in the entrails. Now livers are all good and sound, and there are no worms in bowels. Before using ashes the hogs were very hard to fatten; now I have no trouble in this respect."

It is stated that where sour milk is fed to hogs they seldom fall victims to hog cholera, when they are otherwise kept in good condition.

A HANDY DEVICE FOR GROWING FERNS.

It is surprising (says "South African Gardening and Home Life," 15th September) what an ingenious brain can do with only a few oddments, and an instance of this was brought to our notice a few days ago, when a friend introduced us to the method of growing ferns here described.

Out of an old porous land drain, a flower pot, and some virgin cork he had made one of the most effective fern holders we have ever seen. We were surprised at the success of this simple method, and have, therefore, decided to illustrate it at once.

Our friend takes a good-sized flower pot or fern basket, blocks up the hole at the bottom of the pipe, and then inserts it, as shown in Fig. 7. Round this he packs soil, ramming it in tight, so as to support the

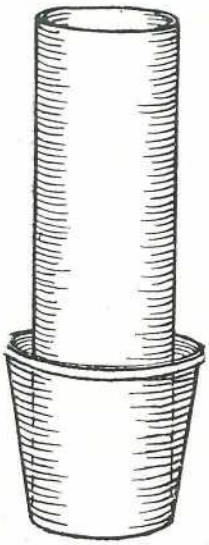

FIG. 1.

FIG. 2.

drain. If a basket is used, and it had been employed in several cases with great success, then the bottom end of the drain is plugged. The next thing to be done is illustrated in Fig. 2, when soil is clamped round the drain pipe and held in place by good broad pieces of virgin cork. The cork leans slightly away from the pipe, in order to form pockets in which to plant ferns. By careful selection of the pieces of cork used, this can be done quite naturally, because the rugged twisted surfaces lend themselves to this arrangement, and it is really easier to accomplish than it sounds. The cork should be fastened with stout wire round the pipe and securely fixed. It is important that this be carefully done, for, should the cork become loose when the ferns are at their best, the soil will be disturbed and the whole ruined.

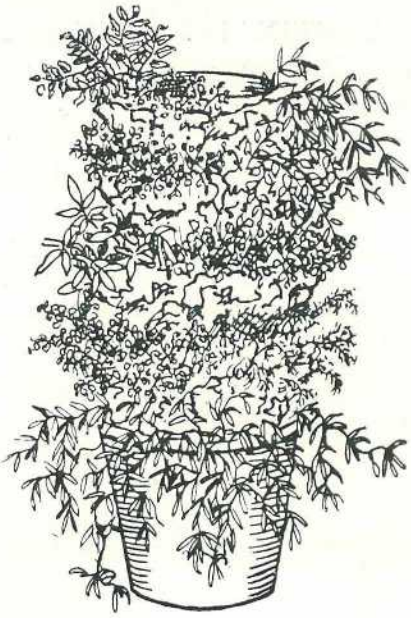

Fig. 3.

Fig. 3 shows the device planted. Most kinds of ferns are quite suitable for this purpose; Adiantums (Maiden Hair), Nephorolepsis, Aspleniums, Platyceriums (Stag's Horn), are perhaps the best.

Fig. 5.

Fig. 6.

In the top of the pipe a specimen fern, in a pot, of such size that the rim of the pot rests upon the rim of the pipe, is placed (Fig. 5); this gives the finishing touch to the ferny pillar. But, perhaps, some readers are thinking that it will be a hopeless task to keep the roots moist during the hot weather. This, however, is just where the device

scores, and less difficult watering is experienced than by growing ferns in the ordinary pots or tins. Every day the pipe must be filled up, as shown in Fig. 5, but no further thought need be bestowed on the ferns throughout the day. The water in the pipe oozes through to the soil round the pot, providing almost ideal watering, as the water does not lie about the crowns of the plants, but at the top of the roots, just where it is needed, and upon removing a portion of the soil from the side of one of the pipes we found that the roots of the ferns were clinging to the surfaces of the pipe. The prettiest arrangement we saw was that of *Asparagus plumosus* planted in the lower pot with a maiden hair fern up the sides of the pipe, and an ostrich feather fern in the pot at the top.

Fig. 4.

Another very pretty pole was made of a mixture of ferns, and, perhaps, for interest this might be considered the most desirable arrangement, for many classes and varieties of ferns were growing together. Side by side, for instance, were seen the fine pinnate fronds of the Maiden Hair and the solid horny ones of the Stag's Horn fern; Bird's-nest ferns, with their stiff upright fronds, formed a striking contrast to the Spider ferns (Pteris). In short, in this wonderful device we had a regular fernery, and by no other means with which we are acquainted could such variety of plant life be suitably collected into natural surroundings.

Some readers may prefer the use of the hanging basket instead of a pot at the base of the pipe; and, when it is desired that the whole shall hang, the chain or the iron supports of the basket should be opened, fastened to a piece of wire run round the pipe towards the top, and the wires run from this over the head of the pipe, jointed together, and fastened to a hook in the usual way for hanging. The advantage of this method is that a much longer pipe can be used, as, of course, in this case, the fernery will hang and not have to stand, as when a pot is employed. Both methods, however, have their particular advantages. When a pot is used at the base, the pot at the top is more easily removed, because there are no strands of wire to get in the way, but the hanging arrangement is certainly more artistic, especially if advantage is taken of the chains or wires that support the basket, to train up varieties of climbing subjects, such as *Smilax, Asparagus plumosus nana,* &c.

LONG MOTOR TOUR.

2,650 MILES THROUGH QUEENSLAND.

What is perhaps one of the longest motor tours ever undertaken throughout Queensland has just been completed by Mr. G. W. Whatmore, director and manager of the Ford Motor Company, accompanied by his brother, Mr. J. S. Whatmore, of Sydney, the latter coming to Brisbane expressly for the trip, the object of which was to personally visit the "Ford" Agents throughout Central and Western Queensland.

Mounted on a 20-h.p. "Ford" single seater car they left Brisbane on Saturday afternoon, the 25th September, Mr. T. R. Hall, of Brisbane, accompanying them as far as Toowoomba, where a halt was made for the night. Miles was reached the next evening; thence the journey was continued and the subsequent days' drives finished at the following towns.—Roma, Morven, Charleville, Listowel Downs, Blackall, Longreach, Winton, Mackinlay, Cloncurry, Gilliatt, Hughenden, Muttaburra, Aramac, Banchory Station, Emerald, Planet Downs, Taroom, Miles, and Brisbane, covering in all a distance of 2,650 miles.

Considering the drought conditions, taken as a whole, the roads may be classed as excellent, and the journey, which occupied three weeks, was completed without any difficulty whatever. Generally speaking, the condition of the country, which is in the grip of one of the severest droughts on record, is perhaps as bad as it is possible to imagine; in fact, the city folk have not the faintest conception of the appalling conditions which exist. The stock, both sheep and cattle, is being seriously depleted. Even with the millions of stock in the country it is a struggle which cannot endure indefinitely, and unless the drought terminates at an early date there will be still greater losses. Certain of the localities mentioned have been favoured with light to moderate rains during the past few months, and the wonderful response of grass and herbage is reflected in the condition of the stock, but unless further rains occur the spring herbage will be dried up by the summer heat, with the consequences which need not be described.

Conspicuous use has been made of scrub timbers in an endeavour to keep life in the starving stock. For hundreds of miles mulga, mallee, and coolabah scrubs have been cut down, but, unfortunately, in many localities only small quantities of the above edible scrubs are left standing, so that unless rain falls at a very early date the position of the stockowners can be better imagined than described. Indeed, so desperate have matters become that endeavours are being made to keep life in the stock by feeding them on prickly-pear, which, unfortunately, abounds in some of the richest country in Queensland. Whilst on this question it might be interesting to the community to know that the prickly-pear pest is rapidly spreading over all parts of Central Queensland. Its insidious growth is so vicious that once it takes root it is almost impossible to eradicate it. Practically the whole of the country from Toowoomba to Morven, a distance of 350 miles, is thickly infested to such an extent that the road in places is almost impassable. A slight idea of the seriousness of the situation may be gathered when it is mentioned that the cost of clearing the pear is greater than the value of the land, the consequent result being that the pest is allowed unrestricted freedom to spread in all directions, and this vast area forms a propogating nursery whereby the seed is disseminated to germinate in localities situated hundreds of miles distant, being conveyed by passing cattle, birds, and wind: in fact, heavy growths of prickly-pear were seen as far north as Springsure. The only serious attempt at eradication appeared to be at Dulacca, where the syndicate controlled by Mr. Roberts has been endeavouring to exterminate it by means of poisonous gas. For upwards of 10 miles the effect of gas was apparent on the pear leaves. Its effect is to cause a brown discolouration which, outwardly, indicates a withering and dying of the leaf, but the treatment does not apparently penetrate into the sap, as on all sides can be seen the spring growth of young healthy off-shoots. The community at large have no conception of the great pear curse which, apparently uninterruptedly, is spreading itself over millions of acres of the best of Queensland country.

For upwards of 2,000 miles rabbit-proof fences were seen, though, strange to say, not one single rabbit could be seen, the drought apparently being responsible for this.

It is not, then, to be wondered at that the price of beef and mutton is extraordinarily high.

Even the wheat growing, in so far as the attempts which have been made between Toowoomba and Roma are concerned, are melancholy failures, and the "looked for" fields of grain have been converted into temporary pasturage for starving stock. On one station passed through 1,000 sheep were found in one flock suffering through eating heart-flower scrub, a poisonous weed growing near Aramac.

Many rivers were crossed, including Maranoa, Langlo, Barcoo, Thompson, Alice, Alpha, Nogoa, Comet, Dawson, and Warrego, &c., but all were rivers in name only,

being, in fact, nothing but dry sand beds to negotiate which, however, did not offer much difficulty to the "Ford" car.

One of the significant features observable during the trip, and more particularly in the drought-stricken area, is the common use of motor cars and motor lorries against old time horse teams, owing to the fact that the country is so abnormally dry, and, in the absence of natural grass, horses have to be stable fed. It can be easily understood, therefore, that with chaff costing upwards of 4d. per lb., it makes the use of horses almost prohibitive, and the timely intervention of the motor car to the man located, in many cases, hundred of miles from the nearest railway, is a boon not measured by words. Any taxation therefore on the motor car should receive very careful consideration at the hands of the Legislators before being imposed.

Mr. Whatmore was more than pleased at the results of his visit, and speaks in glowing terms of the wonderful demand for "Ford" cars in all parts of Queensland, in connection with which it may be mentioned that two vessels—the "Kilpurney" and the "Howth"—are coming direct to Brisbane and are now due with no less than 314 "Ford" cars, all for Queensland. The significant feature lies in the fact that the bulk of the above shipment is already sold. The Queensland Motor Agency, Limited, who are the agents for the "Ford" cars in Queensland, however, have further large shipments coming regularly to Brisbane, including the steamer "Bericklaw," which is coming direct to Brisbane, *viâ* Panama Canal, with 84 "Ford" cars for this State.

SCRUB TICKS AFFECTING DOGS, FOALS, CALVES, AND SHEEP.

By W. G. BROWN, Instructor in Wool and Sheep.

In consideration of the losses sustained from the scrub tick pest, too much prominence cannot be given to a cure. Mr. A. H. Cory, Chief Inspector of Stock, advises me that the treatment given below is an excellent remedy against scrub-tick poisoning.

Scrub ticks cause a great deal of trouble to stockowners in certain districts, with a large percentage of mortalities. It has been stated that these ticks do not harm the animals during the first four days' attachment, so it is recommended that, where scrub ticks are prevalent, valuable animals should be thoroughly examined every second or third day.

It has been proved that trypan blue, injected under the skin, is a specific for this disease in the dog. The paralysis soon improves, and in a few days the animal thoroughly recovers. One dose of the trypan blue is usually sufficient.

A 2 per cent. solution (about 9 grains to a fluid ounce of water) is made by dissolving the trypan blue in boiling water. A sediment falls as the solution cools, and this should be removed by filtering through a funnel, in which a properly folded filter paper is placed, or a fine piece of clean linen which has been previously boiled.

The hypodermic syringe and needle, before being used, should be placed in a dish containing cold water, then placed over the fire and the water boiled for some ten minutes; this thoroughly sterilises the syringe and needle, which is now ready to use when the solution to be injected has cooled.

The injection can be made anywhere under the skin, but the best positions are either in front of the chest or behind the shoulder, the skin in these positions being loose a fold of which is easily caught up by the finger of the left hand, whilst the needle is inserted with the right hand.

It is advisable to clip off the hair and disinfect the spot chosen before introducing the needle.

The dose for dogs, according to age and size, varies from 1 to 5 drachms or 1 to 5 teaspoonsful. The dose for calves, foals, and sheep, according to age and size, from ½ oz. to 2½ oz. or 1 to 5 tablespoonsful.

DESTROYING ZAMIA PLANTS.

With reference to the destruction of Zamia Plants, Mr. T. Kitchen, Cattle Creek, Mount Morgan, writes:—

I read in my last Journal (1st October) Mr. J. F. Bailey's mode of destroying the Zamia Plant. Having myself had some experience of destroying Zamia without the use of poison, I am forwarding you the method I use. Get a blacksmith to put a sharp chisel point on a 5-ft. crowbar, weld a ring 18 in. from top of bar, slip over top of bar a piece of piping and weld head on top to keep piping in place. Sew a piece of

leather over the piping, which prevents any jar on the hands when the bar is ready for use. Drive the bar in a slanting direction into the plant close to the ground, repeat on the opposite side and lever the top off the plant. Next drive the bar down the middle of the petals and lever from side to side, which will burst all the remaining butt and always proves fatal. The idea of the bar is to get easier driving power and better leverage. My neighbour, Mr. Jones, has cleared upwards of 2,000 acres, and I myself have cleaned my paddocks with one operation. I can recommend the above as a quick and effective way of destroying Zamia.

THE QUEENSLAND TREASURER'S FINANCIAL STATEMENT.

We have to acknowledge receipt, by the courtesy of the Hon. the Treasurer, of the Financial Statement for the year 1914-1915.

Answers to Correspondents.

MANGE IN HORSES.

J.O.B., Boonooroo—

Wash the affected parts with warm water and soap, and, when dry, rub in the following dressing twice a week:—Sulphur, 1 lb.; spirits of tar, 2 oz.; olive oil, 1 quart.

POWDERY MILDEW ON ROSES.

"Inquirer," Dalby—

Some varieties of roses are more susceptible to the attacks of mildew than are others. In these cases, it is advisable as a preventive to, every now and again, dust flowers of sulphur over the plants. Nicholson recommends the following preparation for the disease:—

Boil 1 lb. of flowers of sulphur (or in the proportion required) and 1 lb. of quicklime in 5 pints of water in an earthenware pot for ten minutes. Constantly stir while boiling; then, allow to settle, and pour off the clear liquid for use. The plants should be syringed with a mixture of this preparation diluted with 100 times its bulk in water.

TIMES OF SUNRISE AND SUNSET AT BRISBANE—1915.

(From which those at places west of Brisbane can be reckoned.)

COMPUTED BY D. EGLINTON, F.R.A.S.

Date.	SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.	
	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.
1	6·4	5·33	5·30	5·47	4·59	6·4	4·46	6·27
2	6·3	5·33	5·29	5·48	4·58	6·4	4·46	6·28
3	6·2	5·34	5·28	5·48	4·58	6·5	4·46	6·28
4	6·1	5·34	5·27	5·49	4·57	6·6	4·46	6·29
5	6·0	5·35	5·26	5·49	4·57	6·6	4·46	6·29
6	5·59	5·35	5·25	5·50	4·56	6·7	4·46	6·30
7	5·58	5·36	5·24	5·50	4·55	6·8	4·46	6·30
8	5·57	5·36	5·23	5·51	4·54	6·9	4·47	6·31
9	5·56	5·37	5·22	5·51	4·53	6·10	4·47	6·32
10	5·55	5·37	5·21	5·52	4·53	6·11	4·47	6·33
11	5·53	5·38	5·20	5·52	4·52	6·11	4·47	6·34
12	5·52	5·38	5·19	5·53	4·51	6·12	4·47	6·35
13	5·50	5·38	5·18	5·53	4·51	6·12	4·48	6·36
14	5·49	5·39	5·17	5·54	4·50	6·13	4·48	6·36
15	5·48	5·39	5·16	5·54	4·50	6·14	4·48	6·37
16	5·46	5·40	5·15	5·55	4·49	6·15	4·49	6·38
17	5·45	5·40	5·14	5·55	4·49	6·16	4·49	6·38
18	5·44	5·41	5·13	5·56	4·48	6·16	4·50	6·39
19	5·43	5·41	5·12	5·56	4·48	6·17	4·50	6·39
20	5·42	5·42	5·11	5·57	4·48	6·18	4·51	6·40
21	5·41	5·42	5·10	5·57	4·48	6·19	4·51	6·40
22	5·40	5·43	5·9	5·58	4·47	6·20	4·52	6·41
23	5·39	5·43	5·8	5·58	4·47	6·21	4·52	6·41
24	5·37	5·44	5·7	5·59	4·47	6·21	4·53	6·41
25	5·36	5·44	5·6	5·59	4·47	6·22	4·53	6·42
26	5·35	5·45	5·5	6·0	4·47	6·23	4·54	6·42
27	5·33	5·45	5·4	6·0	4·47	6·24	4·54	6·42
28	5·32	5·46	5·3	6·1	4·47	6·25	4·55	6·43
29	5·31	5·46	5·2	6·1	4·47	6·26	4·55	6·43
30	5·30	5·47	5·1	6·2	4·47	6·27	4·56	6·44
31	...	...	5·0	6·3	...	...	4·56	6·44

PHASES OF THE MOON, 1915.

On or about the 150th Meridian, East Long.

			H.	M.	
2 Sept.	☽	Last Quarter	12	56	a.m.
9 „	●	New Moon	8	52	p.m.
16 „	☾	First Quarter	5	21	„
23 „	○	Full Moon	7	35	„

The moon will be at its least distance from the earth, roughly about 226,000 miles, on 14th September; and at its greatest distance, about 252,000 miles, on 2nd and 30th September.

1 Oct.	☽	Last Quarter	7	44	p.m.
9 „	●	New Moon	7	42	a.m.
15 „	☾	First Quarter	11	51	p.m.
23 „	○	Full Moon	10	15	a.m.
31 „	☽	Last Quarter	2	39	p.m.

The moon will be at its least distance from the earth on 11th October, and at its greatest distance on the 27th.

7 Nov.	●	New Moon	5	52	p.m.
14 „	☾	First Quarter	9	3	a.m.
22 „	○	Full Moon	3	36	„
30 „	☽	Last Quarter	8	10	„

The moon will be at its least distance from the earth at midnight on 8th November, and at its greatest distance on the morning of the 24th.

7 Dec.	●	New Moon	4	3	a.m.
13 „	☾	First Quarter	9	38	p.m.
25 „	○	Full Moon	10	52	„
29 „	☽	Last Quarter	10	59	„

The moon will be at its least distance from the earth on the morning of 7th December, and at its greatest distance on the morning of the 21st.

For places west of Brisbane, but nearly on the same parallel of latitude—27½ degrees S.—add 4 minutes for each degree of longitude. For example, at Toowoomba the sun would rise and set about 4 minutes later than at Brisbane if its elevation (1,900 feet) did not counteract the difference in longitude. In this case the times of sunrise and sunset are nearly the same as those for Brisbane.

At St. George, Cunnamulla, Thargomindah, and Oontoo the times of sunrise and sunset will be about 17 m., 28 m., 36 m., and 47 minutes, respectively, later than at Brisbane at this time of the year.

At Roma, on 1st September, the sun will rise about 6·19 and set about 5·51; on 1st October t will rise about 5·46 and set at about 6·4; on 1st November it will rise about 5·18 and set at about 6·20; on 1stDecember it will rise about 5·7 and set at about 6·41.

The moonlight nights for 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 the moon 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 generally 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.

The Markets.

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

Article.		OCTOBER. Prices.
Bacon	lb.	1s. 2d. to 1s. 3d.
Bran	ton	£4 15s.
Broom Millet	,,	£38 to £40
Butter	cwt.	140s.
Chaff, Mixed	ton	£7 10s.
Chaff, Oaten	,,	£7 10s. to £9
Chaff, Lucerne	,,	£10 to £12
Chaff, Wheaten	,,	£4 to £5
Cheese	lb.	11d.
Flour	ton	£17 10s. and £12
Hams	lb.	1s. 3d.
Hay, Oaten	ton	£9
Hay, Lucerne	,,	£6 to £7
Honey	lb.	3d. to 3½d.
Maize	bush.	5s. 4d. to 5s. 5d.
Oats (Japanese)	,,	3s. 6d. to 5s.
Onions	ton	£9 10s. to £12
Peanuts	lb.	3d. to 4d.
Pollard	ton	£6 10s.
Potatoes	,,	£15 15s to £16 5s.
Potatoes (Sweet)	cwt.	3s. to 3s. 9d.
Pumpkins	ton	£8 10s. to £9 10s.
Eggs	doz.	1s. to 1s. 1d.
Fowls	pair	4s. to 6s.
Ducks, English	,,	4s. to 5s.
Ducks, Muscovy	,,	6s. to 7s.
Geese	,,	7s. to 8s.
Turkeys (Hens)	,,	11s. to 12s. 6d.
Turkeys (Gobblers)	,,	13s. to 14s.
Wheat	bush.	8s. 9d.
VEGETABLES.		
Cabbages, per dozen		3s. to 4s. 4d.
Cauliflowers, per dozen		...
Beans, per sugar bag		2s. to 3s. 6d.
Beetroot, per dozen bunches		6d to 9d.
Carrots, per dozen bunches		9d. to 1s 3d.
Chocos, per quarter-case		1s. 9d. to 2s. 6d.
Cucumbers, per quarter-case		1s. 6d. to 2s. 6d.
Custard Marrows, per dozen		1s. 6d. to 3s. 6d.
Vegetable Marrows, per dozen		1s. 6d. to 4s.
Parsnips, per dozen bunches		1s. to 1s. 3d.
Lettuce, per dozen		...
Peas, per sugar bag		3s. to 6s. 6d.
Celery, per dozen bunches		10d. to 1s. 6d.
Sweet Potatoes, per cwt.		3s. to 3s. 9d.
Table Pumpkins, per cwt.		8s. 6d. to 9s. 6d.
Tomatoes, per quarter-case		3s. to 7s.
Turnips, per dozen bunches		8d. to 9d.
Rhubarb, per bundle		1s. to 1s. 6d.

SOUTHERN FRUIT MARKETS.

Article.	OCTOBER. Prices.
Bananas (Queensland), per case	12s. to 15s.
Bananas (Fiji), per case	16s. to 18s.
Bananas (G.M.), per case	...
Loquats (Giant), per case	5s. 6d. to 11s.
Mandarins, per case	10s. to 12s.
Mangoes, per bushel-case	12s. to 14s.
Oranges (Navel), per case	...
Oranges, per case	11s. to 13s.
Passion Fruit, per half bushel-case	1s. 6d. to 9s.
Lemons, per bushel case	8s. to 9s.
Papaw Apples, per half-case	7s. to 9s.
Pineapples (Queens), per case	8s. to 12s.
Pineapples (Ripleys), per case	9s. to 11s.
Pineapples (Common), per case	8s. to 10s.
Strawberries (Queensland) per tray	4s. 6d. to 6s.
Tomatoes, per quarter-case	7s. to 10s.
Cucumbers, per bushel-case	6s.

PRICES OF FRUIT—TURBOT STREET MARKETS.

Article.	OCTOBER. Prices.
Apples (Tasmanian), per case	11s. to 13s.
Apples (Croftons), per case	...
Apples, Cooking, per case	10s. to 12s.
Bananas (Cavendish), per dozen	2d. to 4d.
Bananas (Sugar), per dozen	1¾d. to 2¾d.
Cape Gooseberries, per quarter-case	7s. to 10s.
Cocoanuts, per sack	12s. to 15s.
Cumquats, per quarter case	2s. 6d. to 4s.
Custard Apples, per quarter-case	5s. to 8s.
Granadillas, per quarter-case	...
Lemons (Lisbon), per case	6s. to 8s.
Limes (Choice), per case	2s. to 3s. 6d.
Loquats, per quarter-case	2s. 6d. to 3s. 6d.
Mandarins, per half-case	3s. to 5s.
Mangoes, per case	5s. to 7s.
Oranges (Navel), per case	6s. to 8s.
Oranges (other), per case	6s. to 7s.
Papaw Apples, per case	1s. 6d. to 3s. 6d.
Papaw Apples (Prime), per quarter-case	2s. 6d. to 4s. 6d.
Passion Fruit, per case	7s. to 10s. 6d.
Peanuts, per pound	3d. to 4d.
Rosellas, per sugar bag	...
Pineapples (Ripley), per dozen	8s. to 9s. 1d.
Pineapples (Rough), per dozen	3s. to 6s.
Pineapples (Smooth), per dozen	3s to 6s. 6d.
Strawberries, per dozen pint boxes	4s. 6d. to 10s. 6d.
Strawberries, per tray	4s. 6d. to 6s.
Tomatoes, per quarter-case	3s. to 7s.

TOP PRICES, ENOGGERA YARDS, SEPTEMBER, 1915.

Animal.	SEPTEMBER. Prices.
Bullocks	£20 to £31
Cows	£15 2s. 6d. to £18 7s. 6d.
Merino Wethers	40s. 9d.
Crossbred Wethers	66s.
Merino Ewes	33s. 6d.
Crossbred Ewes	42s.
Lambs	37s.
Pigs (Porkers)	39s.

LONDON QUOTATIONS.

Jute: October-November shipment, £25 per ton.

Cotton: The Liverpool quotation for Middling American cotton, October-November shipment, is 7.15d. per lb.

Sisal: October-November shipment, £34-£36 per ton.

Rubber: October-November shipment—Fine hard Pará, 2s. 5½d. per lb.; plantation first latex crepe, 2s. 6½d.; smoked sheet, 2s. 5⅞d. per lb.

Copra, South Sea: October-November shipment, £24 2s. 6d. per ton.

Danish butter, 205s. to 209s. per cwt. "The Grocer" states that the opening prices for Colonial butter may be 170s. to 180s. per cwt.

Orchard Notes for December.

By A. H. BENSON, Director of Fruit Culture.

THE SOUTHERN COAST DISTRICTS.

December is somewhat an off month for pines, though bananas should be improving both in quality and quantity. The purely tropical summer ripening fruits are not yet ready, and, consequently, there is only a limited supply of fruit in this part of Queensland during the month.

Early ripening varieties of grapes will mature, and care should be taken to market them in good order. The first fruit to ripen should be put up in small packages, as, if marketed in this manner, it will fetch a better price, but as it becomes more plentiful it can be packed in larger cases.

Pay particular attention during the month to all peaches, apples, pears, Japanese plums, or other fruits that are liable to be attacked by fruit fly, and see that no fly-infested fruits are allowed to lie about under the trees, and thus breed out a great crop of flies that will be ready to destroy the grape and mango crops as they mature.

If the month is dry, see that the orchard is kept well worked so as to retain moisture in the soil, and, in any case, even should there be a good rainfall, it is necessary to cultivate in order to keep down weed growth, as if weeds are not kept in check now there is little chance of their being kept in hand once the January and February rains set in.

The planting out of pineapples, bananas, and most kinds of tropical fruits can be carried out during the month, especially if there is any rainy weather; but, if the weather is dry, it is better to defer the planting out of tropical fruits till January or February.

The cyaniding of citrus trees can be continued when necessary, and where Maori or orange mite is showing it should be checked at once, as Maori fruit is of no use for the Southern markets, and is unsuitable for export to the old country.

THE TROPICAL COAST DISTRICTS.

Clean up all orchards and pineapple and banana plantations as long as you have the chance of fine weather, so as to have your land in good order when the wet season commences, as once the rain sets in there is little chance of fighting weeds. Watch bananas carefully for fly, and market the fruit in good order. Handle the crop of pines carefully; don't let the fruit get too ripe, as an over-ripe Northern pine is tasteless. The fruit should be cut as soon as it is fully grown, as even when quite green the rough-leaf varieties have usually developed sufficient sugar to suit most persons' taste. Pack carefully to prevent bruising, and they will carry South in good order.

Only send high-class mangoes South—bad-flavoured sorts, and stringy, carroty, or turpentine flavoured varieties are not worth shipping. High-class fruit will pay to handle carefully, but there is no demand for rubbish, and I am sorry to say that fully 90 per cent. of the mangoes grown in the State must be classed under the latter heading.

Tropical fruits of all kinds can be set out during suitable weather. Fruit pests of all sorts must be systematically fought.

THE SOUTHERN AND CENTRAL TABLELANDS.

December is a busy month for the growers in the Stanthorpe district. Early apples, plums, peaches, nectarines, &c., will ripen during the month, and must be marketed as soon as ripe, as they do not keep long once they are gathered. Handle carefully, and grade better; there is far too much early rubbish slumped on to the local markets, which tends to spoil the demand as well as the price. Watch the orchards very carefully for Codling moth and fruit fly, and take every possible precaution to keep these pests in check should they make their appearance, as the future cleanliness of the orchard depends very largely on the care that is taken now to keep these pests in check.

If the month is dry, keep the orchard and vineyard well cultivated. Watch the vines carefully so as to detect the first signs of Oidium or Anthracnose, and systematically fight these pests, remembering always that in their case prevention is better than cure, and that only prompt action is of the slightest value.

On the Darling Downs every care must be taken to keep the fruit fly in check, and on no account must infested fruit be allowed to lie about under the trees, as this is far and away the best method of propagating the pest wholesale.

In the Central District the grape crop will ripen during the month. Handle the fruit carefully. Cut it when dry, and where it has to be sent long distances to market pack in 6-lb. baskets rather than in larger cases. Where dry, keep the orchard and vineyard well cultivated; and where the citrus and other fruit trees require it, give them an irrigation. Don't irrigate grapes once the seeds have been formed, as it tends to deteriorate the quality, and to make the fruit tender and, consequently, to carry badly.

Farm and Garden Notes for December.

Too much care can scarcely be bestowed upon potatoes dug up this month to protect them from the sun. They should be dug or ploughed out as soon as the skin is firm, as they are liable to rot in the ground owing to the great heat.

Field.—The wheat harvest will be now nearing completion, and to all appearance the results are not likely to constitute a record, owing to the dry weather during the growing months, and the yield promises to be somewhat unsatisfactory to the wheat-growers. The principal factor operating against a still greater extension of the wheat-growing industry is, that many farmers who formerly grew wheat and barley have turned their attention to dairying, which offers larger and quicker returns.

The dry weather which prevailed during several months gave rise to grave fears for the harvest, but the subsequent timely rainfall came just in time to save the crop in some of the wheat districts. The estimates of the probable yield have varied so considerably that it will be well to wait until the harvest is over before calculating on the result.

Given favourable weather, maize, panicum, imphee, Kafir corn, and sorghum may be sown. Arrowroot, ginger, and sweet potatoes may be sown.

Kitchen Garden.—Gather cucumbers, melons, vegetable marrows, and French beans as soon as they are fit for use. Even if they are not required, still they should be gathered, otherwise the plants will leave off bearing. Seeds of all these may be sown for a succession. Sow cabbage and cauliflower seed. Great difficulty will be experienced in getting these to grow at this season, and the plants will consequently be more valuable in proportion. Tomatoes should be in full bearing, and the plants should be securely trained on trellises or stakes. Take up onions, and spread them out thinly on the barn floor until the tops wither sufficiently to pull off easily. They should then be graded into sizes, and sent to market or stored in a cool place. Where there is an unlimited supply of water, and where shade can be provided, lettuce and other salad plants may still be sown. All vacant ground should be well manured and dug two spits deep. Manure and dig as the crops come off, and the land will be ready for use after the first shower.

Flower Garden.—Keep the surface of the land well stirred. Do not always stir to the same depth, otherwise you are liable to form a "hard pan," or caked surface, beneath the loose soil. Alternate light with deep hoeings. A few annuals may still be planted, such as balsams, calendulas, cosmos, coreopsis, marigold, nasturtium, portulaca, zinnia, and cockscomb. Plant out whatever amaranthus may be ready. These may still be sown in boxes. Clear away all annuals which have done flowering. Bulbs should have all the dead leaves cut away, but the green leaves should not be touched. Stake chrysanthemums, and, as the flower buds develop, give them weak liquid manure. Coleus may now be planted and propagated from cuttings. Dahlias are in various stages, but the greater part will have been planted by this time. Give them liquid manure, and never let them dry up. Lift narcissus about the end of the year, but do not store them. Plant them out at once in their new positions. Top-dress all lawns.