

# QUEENSLAND AGRICULTURAL JOURNAL

VOL. IV.

AUGUST, 1915.

PART 2.

## Agriculture.

### NOTES ON THE 1914 WHEAT SEASON AND PROSPECTS FOR 1915.

The position in Queensland during 1914-15, as far as the bread cereal is concerned, presented some unique features. First and foremost, the 1914 harvest estimates were somewhat conflicting owing to the appearance of rust in the late crops at the southern end of the Downs, and to the serious check the wheat crops experienced in the spring months along a stretch of the Western line, which extends from Gowrie Junction to the Warra district. However, the first fruits of the harvest served to indicate that in localities favoured by decent weather conditions individual yields of grain left nothing to be desired, and the quality proved to be exceptionally good.

Then the all-important question of aggregate yields and prospective supplies cropped up.

Reckoning on  $5\frac{1}{2}$  bushels of grain per head of population, Queensland would require approximately 4,000,000 bushels of wheat to meet

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her food supplies. How far was the new crop going to carry on? Stand-over stocks of previous season's grain were very limited and the position in the South was critical. It was only too patent to the most sanguine optimist that only about  $1\frac{3}{4}$  million bushels of wheat would be secured in the State. Where was the balance to come from? New South Wales legislators took an extreme view of the situation in their State and commandeered stocks at 5s. per bushel. Buying in Queensland commenced at 4s. 6d. per bushel, and at no period in the previous history of the State have such extraordinary prices obtained.

Farmers were faced with a dilemma! Obligations had to be met. Drought and high prices for all classes of food on the one hand, and all the uncertainty due to Southern legislation on the other. Some political advisers held meetings and counselled farmers to hold stocks on a rising market. Millers were buying to the utmost limit. Southern buyers, attracted by prime quality and a certainty of profit, purchased over 100,000 bushels, thus seriously depleting stocks. From 4s. 6d., the market quickly worked up to 7s. 6d., and even touched 7s. 9d. The board appointed to control food prices experienced increasing difficulties in making adjustments to meet the situation. In the early part of the year steps were taken by the Government to secure shipments of wheat to ensure a supply of foodstuffs.

Following on immediately after the elections the newly appointed Premier and Cabinet were faced with extraordinary economic conditions and a Wheat Commission was appointed to settle once and for all the complex problems that had arisen.

It is here that cognizance should be taken of "the wheat extension scheme" brought into being by the late Government. Requirements in the way of breadstuffs to meet our own needs of the future had to be faced. A scheme was initiated to encourage farmers to put larger areas under crop and several officers of the Agricultural Department were deputed to canvass different districts to explain its objects, and to arrange not only direct monetary advances to meet individual exigencies, but also to purchase and to make recommendations as to the supply of seed wheat for the 1915 planting season. Here the Government itself came into competition with other buyers, as they were committed to a scheme obligatory upon themselves, which entailed purchasing only the primest wheat obtainable. A wide interpretation was given to the several forms of assistance under this particular wheat scheme, and over 50,000 bushels of wheat were subsequently distributed to farmers. Those participating obtained the grain at cost price (after grading and cleaning) plus 5 per cent. interest; repayment to be made at the end of 1915. Although other factors may have had a bearing on the situation, it can safely be taken for granted that this scheme has resulted in a direct increase of 50 per cent. in the area under wheat in 1915, and at no time in the previous history of cultivation in Queensland has the land been worked up so early in the season. One provision relating to new land intended for cropping distinctively

inferred that such should be ploughed before the 28th February. Such an arrangement, borne out by the experience of Australia's seasons, proved an incentive to others, and in this way cultivation became general. Had the usual monsoonal rains been experienced, it is certain that the stores of moisture which should have found their way into the subsoil would have been sufficient to meet the needs of the new crop. However, dry conditions, which have been so pronounced in the South, seemed to be spreading from the pastoral districts in this State to portions of the wheat-growing belt. Rainfalls were markedly erratic. Lands which were prepared early demonstrated the efficiency of the practice, as the moisture which had fallen was readily absorbed, and as the planting season came round in due course, those favoured fields soon showed a decent germination of grain. Heavy soils which did not possess the property of readily absorbing moisture soon lost in many instances the limited amounts which were precipitated, and once again the heavy black soil country on the Western line and in the Pittsworth district seemed doomed to suffer. Welcome rains were experienced in the latter part of the month of May along a strip of country extending from Toowoomba to Pittsworth on the one side and bearing away to the Warwick district and beyond, practically as far as Goondiwindi. Farmers in these favoured localities who had not already sown their seed in a "dry" seedbed pushed on with seeding operation as rapidly as possible. Their efforts were soon rewarded by the green fields which seemed to spring up as if by magic. In nearly every instance where the rainfall was sufficient a good germination followed, and the prospects in these localities are now of the brightest, assuming, of course, that further rains are experienced to carry on the crops to a successful issue.

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### FARMING WITH DYNAMITE IN THE WEST INDIES.

On 13th December, 1912, Mr. Harry Vincent told the members of the Trinidad Agricultural Society, in his paper on explosives for cultivating the land, entitled "The Agricultural Revolution by the New Cult": "I read my first paper on the subsoil blasting by dynamite to the members of this society,\* and this was followed in September, 1913, by a report on the practical experiments that had been carried out. As, in these trials, only 15 acres had been subsoiled in poor patches covering about twelve districts in the colony, the tangible results were hardly striking, except to those who had witnessed the operations. I have now much pleasure in stating to the members that during the past twelve months 218 acres in Trinidad and Tobago have been thoroughly subsoiled—viz., 177 acres of cocoonut cultivation and 41 acres of cacao. I might here mention that nearly a year ago I subsoiled on the Chaguanas Estate 45 acres of growing cocoonuts, and blasted holes in a 12-acre piece for planting young nuts. These were shortly after planted, and the whole acreage operated on forms now a splendid object lesson

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\* We are indebted to the report of the "Proceedings of the Trinidad Agricultural Society" for the report of this interesting paper.

for agriculturists. This is the opinion of several well-known planters who have personally inspected it. It is not possible at the present time, though I hope it may be later on, to bring specimens of either the coconuts or cacao produced on these areas for the inspection of the members, but I can show ears of corn grown on dynamited and undynamited land. This was grown on land at Manzanilla belonging to Mr. G. A. Frost. The field in question was dynamited last June, and shortly afterwards the corn was planted. After reaping, the dynamited portion showed a yield of 41 barrels to the acre, and the undynamited 19 barrels, and, as the members will see, there is a great difference in the appearance of the ears. I should also mention that the field is planted in coconuts and cacao, and the dynamited portion has also tannias, yams, cush-cush and plantains, which were planted shortly after the corn, and are now showing a most vigorous growth. In addition, this was the second crop of corn, as it had already given one before being dynamited. On the other hand the undynamited portion had not been planted before. It was its first crop, and, as no other vegetables were planted, presumably all the plant food went to the corn. Messrs. Cunliffe and Ward have kindly taken photographs of the ears, and from these the members will kindly note the comparison. In the same field Professor Cunliffe has applied some of the fertilisers to two different patches of cacao—one dynamited and the other undynamited. The returns from these trees will be carefully noted.

“ The majority of planters with whom I have conversed, while agreeing that dynamite is a great aid to agriculture, evidently think that the cost is prohibitive, seemingly oblivious of the fact that it creates a permanent soil improvement for at least six years (in Canada and the United States they reckon ten years). So it is evidently the primary outlay that frightens them.

“ Well, let us take the case of this land of Mr. Frost in Manzanilla. It cost him in the vicinity of 35.00 dollars the acre, because he had it thoroughly subsoiled. Against this prime cost he has to offset 41 barrels of corn at 5s. the barrel (more than covering the cost of the dynamite), the value of the vegetables when reaped, and the general improvement, lasting, as I have previously stated, for a period of five years at least.

“ I have just learned from Mr. Davis, the Director-General of the Panama-California Exposition to be held at San Diego in 1914, that they had used over 60 tons of dynamite on their grounds for planting trees, and that they will undoubtedly use a great deal more. He states that it has been found necessary to use dynamite to plant every tree that has been set out on the grounds. At this present moment they have set out over 100,000 trees, and have nearly a million more, which have to be set out during the next nine months.

“ Now, here in Trinidad, we are fortunate in having very productive land, and even those soils we call poor would be snapped up with avidity by the Connecticut farmer, or, to come nearer home, the Barbadian peasant, and made to bloom like the rose, by means of the handy-man—

dynamite. As an old Trinidad planter I should like to see in the land of my adoption every agriculturist using the aforesaid handy-man for the undermentioned five operations on plantations here.

*“ Firstly.*—If used to clear the land, the operation of removing stumps and breaking boulders can be conducted quickly and economically. With an earth auger a hole is quickly bored under a tree or stump, a charge of dynamite put in, and the stump is out, all broken up so that it can be easily handled. In the case of boulders they can be mud-capped with dynamite and the broken pieces used for roads and the foundations of buildings.

*“ Secondly.*—In swampy lands that require draining the planter can make with a punch a line of holes, 2 to 3 ft. apart, where he wishes his drain to be, the depth of the holes to be regulated according to the depth of the drain required, and one or two dynamite cartridges placed in each hole. The primed cartridge in the centre of the line is detonated, the explosion spreads from cartridge to cartridge, and 2,000, 3,000, and 5,000 ft. of drain through mud, slime, roots, and rocks has been dug in the twinkling of an eye, and the land drained and made tillable.

*“ Thirdly.*—Cacao, cocoanut, citrus or other fruits are to be planted, and trees to form a wind-break or make shade. Under the old method, the roots were wadded into a spade-dug hole, and the tender rootlets found difficulty in spreading into the hard surrounding earth, especially clay. The up-to-date planter bores a hole, drops in half a cartridge of dynamite, and the soil for many feet is rendered fine and loamy, so that the delicate roots are enabled to reach out and draw sustenance from several times the area that could be reached by the roots of the spade-planted tree; and this planter discovers that his trees grow stronger, fruit earlier, stand dry weather better, and bear much more heavily than those of his neighbour, who did not employ that greatest of all hired men—dynamite.

*“ Fourthly.*—Wells have to be dug—a very simple matter with dynamite, and they can be lined with broken rocks or boulders. The roads can be put into shape by blasting out the hill sides and filling in the hollows. If rocks remain from the clearing they can be crushed and used as top dressing for roads.

*“ Fifthly.*—Land should be prepared preparatory to planting crops like sugar-cane, cotton, corn, &c.; neither plough nor fork penetrates very deep into the soil, with the result that only a few inches of the surface soil is utilised. Again the auger is put to work, and holes are drilled down into the subsoil at intervals of 10 to 15 ft. over the entire field. Half a cartridge is then dropped into each hole and exploded, the entire field thus rendered mellow to a great depth, the larvæ of injurious insects killed, and the soil, which has been made porous, holds the water of the rains in the many minute channels created by the explosion of the dynamite, and feeds the waters thus held to the thirsty plants in the dry season, when those in the fields prepared in the old fashion are withered and dying.

“ In conclusion, I should say that, although both soil and cultivation derive undoubted benefit when the fields in growing crops are dynamited, it is preferable when possible to prepare the land before planting, so as to give the plant every possible advantage during the most delicate stages of its life. While recently operating on a cocoanut plantation amongst old trees, the initial blast (a whole  $\frac{1}{2}$ -lb. cartridge sunk at a depth of 3 ft.) disclosed at a depth of 14 in. a solid stratum of limestone rock, varying in thickness from 9 in. to 2 ft.—a very solid impediment to the young roots of any tree.

“ I still have over a ton of cartridges on hand, and I am prepared to undertake the task of dynamiting land for the planting of cocoanuts at 10 dollars per acre, and for my sugar friends, who look as if they were going to have a good time in the near future, I will thoroughly prepare their heavy clay lands, cracking up the subsoil to a depth of 30 in., at 35 dollars an acre.

“ The price sounds big, but when it is remembered that an acre will take between 1,500 and 2,000 plants, and the yield will be increased by at least a ton of sugar, the output will well justify the extra expense. These prices will cover the cost of explosives and my instruction and supervision, the estate providing the labour for holing, &c.”—“ Tropical Life.”

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## COMPLETE FERTILISERS FOR FARM, ORCHARD, AND VEGETABLE GARDEN.

### CAULIFLOWERS.

Cauliflowers require a very rich loam, and, like cabbages, a heavy dressing of farmyard manure.

When using from 10 to 15 tons of stable manure per acre, when the ground is being prepared, the following mixture of artificial fertilisers should be applied, per acre, when planting:—

- 4 to 6 cwt. of superphosphate;
- 1 to 2 cwt. of sulphate of potash;
- 2 to 3 cwt. of nitrate of lime;

the latter to be applied in two dressings.

Without farmyard manure use—

- |   |   |          |
|---|---|----------|
| 6 cwt. of superphosphate                  | } | per acre |
| 2 cwt. of sulphate of potash              |   |          |
| 2 cwt. of nitrolim or sulphate of ammonia |   |          |

when planting, and two or three topdressings of 1 cwt. of nitrate of lime each.

### CARROTS.

Carrots do best on a rich sandy loam, deeply cultivated and well drained. Stable manure should never be applied immediately before this crop is grown, but rather the preceding year.

Apply per acre—

- 4 to 6 cwt. of superphosphate;
- 1 to 2 cwt. of sulphate of potash;
- 2 cwt. of nitrolim or sulphate of ammonia;

and two topdressings of 1 cwt. of nitrate of lime each.

### CELERY.

This vegetable requires a deep, rich, vegetable mould in a moist situation. When preparing beds or trenches, lay in at the bottom about 4 in. of well-rotted stable manure, which is to be well forked in. A heavy dressing of an artificial fertiliser containing from 6 to 10 per cent. of soluble phosphoric acid, 6 to 8 per cent. of potash, and 4 to 6 per cent. of nitrogen, should also be applied, using about 6 cwt. per acre, previous to planting out, and two or three topdressings of 1 cwt. each.

The use of liquid manure and sprinkling with a little salt are also to be recommended.

Instead of the ready mixed fertiliser, the following mixture may be used with advantage:—

- |   |   |          |
|---|---|----------|
| 3 cwt. superphosphate                   | } | per acre |
| 1½ cwt. sulphate of potash              |   |          |
| 2 cwt. nitrolim, or sulphate of ammonia |   |          |

at the time of planting, followed by two topdressings with a mixture of—

- |                           |   |           |
|---------------------------|---|-----------|
| 1 cwt. superphosphate     | } | per acre. |
| ½ cwt. sulphate of potash |   |           |
| 1 cwt. nitrate of lime    |   |           |

In this case muriate of potash may with advantage replace the sulphate of potash.

### CORN (MAIZE).

Corn does best in a deep, sandy loam, rich in humus, and not containing too much clay. This crop makes a heavy demand on plant foods, particularly when grown for **ensilage** or **green fodder**, and farm-yard manure used in combination with artificial fertiliser gives the best results. Apply in the drills, when planting, any of the following mixtures:—

- |  |   |           |
|--|---|-----------|
| 2 to 4 cwt. of superphosphate                  | } | per acre; |
| ½ to 1½ cwt. of sulphate of potash             |   |           |
| 2 to 1 cwt. of sulphate of ammonia or nitrolim |   |           |

or,

- |   |   |           |
|---|---|-----------|
| 3 to 5 cwt. of bonemeal                         | } | per acre; |
| ½ to 1½ cwt. of sulphate of potash              |   |           |
| 1 to 1½ cwt. of dried blood, or nitrate of lime |   |           |

or,

from 3 to 5 cwt. of a fertiliser mixture containing 7 to 10 per cent. phosphoric acid (chiefly water-soluble), from 3 to 4 per cent. of nitrogen, and from 6 to 8 per cent. of potash. Part of the manure, 2 to 3

cwt., may be applied when sowing, and 1 cwt. or more between the drills before hilling.

When maize is grown for grain, the amounts of artificial fertilisers may be varied, and in a rich soil the manure supplying nitrogen left out altogether, using per acre—

- 3 cwt. of superphosphate;
- 1 cwt. of sulphate of potash.

In a poor soil about  $\frac{1}{2}$  cwt. of dried blood or of nitrolim may be added.

### COWPEAS.

This crop is chiefly grown as a green manure crop, but makes a very nutritious hay and chaff, and the pods may be eaten as a vegetable. This leguminous plant prefers a fairly rich sandy loam, which must contain a liberal amount of lime.

Apply per acre from 5 to 6 cwt. of a mixed fertiliser containing from 7 to 9 per cent. of soluble phosphoric acid, and 9 per cent. of potash, or use one of the following fertilisers:—

- 2 cwt. superphosphate
  - 3 cwt. kainit
- } per acre;
- or,
- 2 cwt. superphosphate
  - $\frac{3}{4}$  to 1 cwt. muriate of potash
- } per acre;
- or,
- 3 cwt. Thomas phosphate
  - $\frac{3}{4}$  to 1 cwt. of muriate of potash or sulphate of potash
- } per acre.

One half of the manure can be broadcasted and the other half applied in the drills when planting.

Although as a rule no nitrogen needs to be applied, in many instances, when grown as a green manure on poor, exhausted soils, the addition of a little nitrate of lime, or of nitrolim, in the drills, at the rate of  $\frac{1}{2}$  cwt. per acre, may be very beneficial.

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### WEEDS IN YOUNG LUCERNE.

Provided that young lucerne is well rooted, and has taken a firm hold, it may be cut at about 4 in. from the ground level. This will encourage it to branch out and form a "crown." It is customary to harrow after cutting a young crop choked with weeds, in order to get rid of them, and if the crop is sufficiently established to admit of a light harrowing, preferably with lever harrows—*i.e.*, those which can be adjusted to admit of the tines sloping back at an angle so as not to disturb the young lucerne—it will be found quite satisfactory.

## CORN-GROWING COMPETITION.

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A Corn-growing Competition, similar to the one of 1914-15, will be held for 1915-16.

Entries close with the Under Secretary, Department of Agriculture and Stock, Brisbane, on the 30th September next.

The Competition will be practically the same as that described on pages 61 to 64 of this issue, except that the districts or divisions will be somewhat altered. These divisions will be nine in number, and prizes to the value of £5, £2, and £1 will be awarded in each district. Three special prizes to the value of £10, £5, and £3 will be awarded to the competitors who come first, second, and third in the entire competition.

The Department will supply the necessary seed maize, and in no case shall a plot exceed one-tenth of an acre.

Competitors, who may be male or female, must not be more than eighteen years of age at the time of the closing of the competition.

An entrance fee of 2s. 6d. must accompany each nomination.

### REPORT ON CORN-GROWING COMPETITION, 1914-15.

In making known the awards in connection with the judging of the corn-growing competition, it is essential that the rules under which the contest was conducted should be stated. These read as follow:—

1. This competition will be open to all under the age of eighteen years, who are residents of the State of Queensland. An entrance fee of 2s. 6d. must be forwarded to the Under Secretary with the application to enter.

2. Applications to be enrolled in the competition containing the following particulars must reach the Under Secretary, Department of Agriculture and Stock, Brisbane, not later than 12 noon on 21st September, 1914:—

- (a) Full name and address.
- (b) Age at last birthday and date of birth.
- (c) Occupation.
- (d) District in which applicant resides.

3. The area to be devoted to the planting of the seed maize shall be one-tenth of an acre, selected seed for which will be supplied free of cost; but one parcel only will be supplied to each competitor during the period of the competition.

4. Each competitor shall have absolute freedom in his choice of ground, and in the methods he may adopt in preparing, planting, and cultivating his plot, but in no case shall a plot exceed one-tenth of an acre, otherwise disqualification will be incurred.

The following table shows the length the rows must be to give the exact area according as 4, 5, 6 or more rows are planted:—

Number of Rows 4 feet apart.	Length of Rows in Feet.	Number of Rows 4 feet apart.	Length of Rows in Feet.
4	272 feet 3 inches	8	136 feet 1½ inch
5	217 feet 10 inches	12	90 feet 9 inches
6	181 feet 6 inches	16	68 feet
7	155 feet 7 inches		

5. Each competitor will be required to keep a record chart showing the dates and particulars of the different stages of work, and these charts are to be delivered, at the time of harvesting, to the officer appointed for superintending and verifying the yield. Duplicate forms for recording all work done and observations made on the plots will be supplied to each competitor.

6. Within seven days from the verification of the yield from the crop, each competitor shall select, without aid from other persons, ten

cobs of the maize from his crop and forward them to the Principal of the Queensland Agricultural College, Gatton. Labels for this purpose will be supplied.

7. Competitors must notify the Under Secretary of the date when the crop shall have matured and be ready for inspection.

8. No competitor shall be allowed to employ or permit any labour upon the competition plot standing in his name, other than his own personal labour, excepting in relation to the driving of horses, for which, owing to circumstances, such help may be needed.

9. The competition will close on the 30th June, 1915, and the prizes will be allotted thus: The competitors will be grouped according to the following districts:—

- (1) LOGAN.—From the Coast to Six Mile Creek, by railway line, then in south-west direction to Mount Lindsay, border of New South Wales.
- (2) WEST MORETON.—From the Logan boundary on the east to the Main Range, north to Yarraman, south-west to border of New South Wales.
- (3) DARLING DOWNS NORTH.—To and including Greenmount, Pittsworth, Jondaryan, Goombungee, Crow's Nest, Spring Bluff, Oakey, Drayton.
- (4) DARLING DOWNS SOUTH.—Including Nobby to Wallangarra, Texas, Goondiwindi, Killarney, Freestone, Leyburn, Condamine, Yandina, Darkey's Flat, Clifton, Allora, Millmerran.
- (5) MARANOVA.—From and including Dalby to Charleville, Mitchell, Morven, Cunnamulla, Mungindi, St. George, Surat.
- (6) MORETON.—From and including Nundah, North Pine, Nudgee, Caboolture, Woodford, Kilcoy, Sandgate, Samford, Samson Vale, Humpybong, Maroochy, Eumundi; northern boundary to include parishes of Kenilworth, Maleny, and Conondale, thence south by Mary River.
- (7) WIDE BAY AND BURNETT.—From the coast and including Biggenden, Kilkivan, Nanango, Gayndah, Tewantin, Degilbo, Pialba, Howard, Maryborough, Gympie, Bundaberg, Childers, Gin Gin, Isis, Mount Perry, Eidsvold. Northern boundary,  $24\frac{1}{2}$  degrees of latitude, Dawson River on west.
- (8) CENTRAL QUEENSLAND.—From  $24\frac{1}{2}$  degrees of latitude to and including St. Lawrence, Gladstone, Rockhampton, Mount Morgan, Emerald, Jericho, Springsure, Clermont, Aramac, Longreach.
- (9) NORTH QUEENSLAND.—North of St. Lawrence to and including Mackay, Bowen, Townsville, Cairns, Cooktown, Atherton, Charters Towers, Ravenswood, Winton, &c.

If there are more than ten competitors in any district three prizes will be awarded for competition in that district; less than ten competitors, one prize only.

The prizes shall be of the following value:—First, £5; second, £2; third, £1.

No money prizes will be given, but each successful competitor will be allowed to select some article to the value of his prize.

The prizes awarded in any district may be increased in number and value by donations from persons, firms, or societies who may be interested in the competition.

10. Three special prizes of the value of £10, £5, and £3 will be awarded to the competitors who stand first, second, and third in the entire competition.

These prizes may be increased in number and value in the same way as is indicated above in connection with the district competitions.

11. The aggregate points will be 100 and the judging will be based upon the following:—

- (a) Quality of the maize produced.
- (b) Yield of plot.
- (c) Notes and records of plot.

12. Arrangements will be made for such of the competitors as may so desire to travel by rail to the Agricultural College during the week when the judging is decided, when instruction in corn-growing and judging will be afforded.

13. The Principal of the Queensland Agricultural College will be the sole judge of the competition, and his decision shall be final.

That the contest created keen interest is shown by the numerous entries received from the various maize-growing areas throughout Queensland, as follow:—

			Entries.		Adjudicated.
Wide Bay and Burnett	..	..	85	..	28
West Moreton	..	..	61	..	29
Darling Downs (North)	..	..	38	..	11
Darling Downs (South)	..	..	24	..	6
Moreton	..	..	19	..	5
Central Queensland	..	..	18	..	6
North Queensland	..	..	18	..	4
Maranoa	..	..	24	..	5
Logan	..	..	9	..	5
Totals	..	..	296	..	99

Unfortunately, during the growing period adverse climatic conditions prevailed over the whole area represented, and this was the means of reducing the yields to such an extent that many of the competitors did not make application to have their plots adjudicated. Several lots of cobs came to hand without any name attached, thus creating some trouble in tracing the owners, while five lots from inspected plots failed to reach us. Two competitors were disqualified through a flagrant breach of the rules. No fewer than fifteen girls entered the lists, two of them securing prizes. It may be pointed out that this contest is a corn-growing and not a corn-cob competition, as erroneously spoken of by several. The scale of points allotted in the two cases would be quite

distinct. The awards were made in accordance with Rule 11, the points given being as follow:—

	Points.
Yield .. .. .	76
Quality .. .. .	14
Notes and Records .. .. .	10
	<hr/>
Maximum .. .. .	100

In regard to yield, 70 points were allotted for a crop of 100 bushels per acre; this made provision for a maximum yield of 108 bushels, which was not exceeded. The crops from the respective plots were harvested and weighed in husked cobs in the presence of an officer of the Agricultural Department. Instead of giving the weight of cobs, I have set out in the award sheet the yield as bushels of shelled corn per acre. This conversion is arrived at by deducting 14 per cent. for core or pith. The cobs, on the whole, were very good, but the unfavourable season was evidenced in many cases by the poorly filled tips. Many competitors made the mistake of forwarding the ten largest cobs for judging, irrespective of quality. This was pointed out to some twenty-five contestants who visited the College during the week the awards were made. Although a number of the competitors gave a fairly full description of the various operations carried out, together with the difficulties experienced, yet the majority contented themselves with simply entering the dates of cultivating, planting, and harvesting. The following are the awards:—

#### DISTRICT PRIZE WINNERS.

West Moreton—		Points.	£	s.	d.
J. R. C. Hart, Blackbutt .. .. .	86.4	5	0	0	
F. A. Bade, Rosewood .. .. .	65.8	2	0	0	
A. M. Bachmann, Marburg .. .. .	60.7	1	0	0	
Darling Downs (North)—					
N. S. Smoothy, Pinelands .. .. .	77.1	5	0	0	
H. W. Abel, Geham .. .. .	74.9	2	0	0	
F. Franke, Cawdor .. .. .	72.2	1	0	0	
Darling Downs (South)—					
Albert Gonchee, North Killarney .. .. .	72.5	5	0	0	
Archibald Gonchee, North Killarney .. .. .	49.5	2	0	0	
A. E. Ernst, Spring Creek, Clifton .. .. .	44.1	1	0	0	
Maranoa—					
F. R. Rowland, Bell .. .. .	29.7	5	0	0	
(Less than ten competitors; one prize only.)					
Moreton—					
R. Rudd, Upper North Pine .. .. .	56.4	5	0	0	
F. Woodward, Samford .. .. .	49.9	2	0	0	
S. R. Hulse, Yandina .. .. .	48.3	1	0	0	
Logan—					
F. M. Birt, Nerang .. .. .	46.8	3	10	0	
E. L. Marshall, Gramzow .. .. .	46.8	3	10	0	
R. A. Tulloch, Veresdale .. .. .	41.3	1	0	0	

	Points.	£	s.	d.
Burnett and Wide Bay—				
A. Fittell, Eel Creek, Gympie .. ..	63.9	5	0	0
F. H. J. Hayden, Kingaroy .. ..	59.5	2	0	0
E. Hayden, Kingaroy .. ..	51.1	1	0	0
Central Queensland—				
R. J. Philp, Mount Larecom .. ..	58.1	5	0	0
Isabella Wilson, Yeppoon .. ..	57.9	2	0	0
F. Williams, Barmoya .. ..	44.4	1	0	0
North Queensland—				
Mary R. Dougherty, Malanda .. ..	72.4	5	0	0
J. D. Gellweiler, Kulara, Cairns .. ..	58.7	2	0	0
R. Vance, Barrine .. ..	47.2	1	0	0

SPECIAL PRIZE WINNERS, ENTIRE COMPETITION.

J. R. C. Hart, Blackbutt (West Moreton) .. ..	£10
N. S. Smoothy, Pinelands, Crow's Nest (Darling Downs, North) ..	£5
H. W. Abel, Geham, Crow's Nest (Darling Downs, North) ..	£3

The following is a complete record of the points allotted in the competition:—

WEST MORETON DISTRICT.

Name and Address of Competitor.	Age of Competitor.	YIELD.		QUALITY.	Notes and Records.	Total Points.
		Maximum Yield.		Quality of Grain and Uniformity of Cob.		
		76 points.		14 points.		
		Bushels.	Points.		10 points.	100.
J. R. C. Hart, Blackbutt ..	16	92	64.4	13	9	86.4
F. A. Bade, Rosewood ..	13	69	48.3	12	5.5	65.8
A. M. Bachmann, Marburg ..	10	56	39.2	12	9.5	60.7
W. N. Strasburg, Walloon ..	12	53	37.1	10	7.5	54.6
A. Tapsall, Coominya ..	14	41	37.7	10	4.0	51.7
S. J. Griffiths, Rosewood ..	16	52	36.4	10	5	51.4
W. Peters, Glenore Grove ..	16	48	33.6	9	7	49.6
Alf. Henning, Toogoolawah ..	14	52	36.4	9	4	49.4
D. A. Logan, Bundamba ..	16	49	34.3	9	5	48.3
Arthur Henning, Toogoolawah ..	12	49	34.3	9	4	47.3
N. D. Alexander, Ipswich ..	12	45	31.5	10	4	45.5
W. J. Zabel, Minden ..	13	43	30.1	8	4	42.1
J. B. Campbell, Milora ..	13	38	26.6	10	5	41.6
R. S. Turner, Grantham ..	13	34	23.6	10	5	38.8
G. Osborne, Mount Alford ..	13	32	22.4	10	6	38.4
N. H. Bade, Rosewood ..	13	36	25.2	8	4	37.2
F. H. Beduhn, Rosewood ..	12	33	23.1	9	5	37.1
F. Muller, Engelsburg ..	15	32	22.4	8	5	35.4
W. Campbell, Milora ..	12	32	22.4	8	4	34.4
E. Semph, Hatton Vale ..	12	33	23.1	7	4	34.1
C. V. Smith, Ma Ma Creek ..	11	31	21.7	8	4	33.7
H. F. Nitz, Forest Hill ..	17	27	18.9	8	6	32.9
W. J. Muller, Rosewood ..	15	21	16.4	9.5	5	30.9
A. F. Scott, Grantham ..	16	28	19.6	7	4	30.6
H. Rosenberg, Ma Ma Creek ..	13	26	18.2	7	4	29.2
A. W. Hunt, Dugandan ..	16	20	14	9	4	27
A. H. Evans, Ma Ma Creek ..	9	17	11.9	8	5	24.9
Bertha Ziebell, Hatton Vale ..	13	18	12.6	8	4	24.6
J. K. Martin, Helidon ..	13	13	9.1	7	4	20.1

## WIDE BAY AND BURNETT DISTRICT.

Name and Address of Competitor.	Age of Competitor.	YIELD.		QUALITY.	Notes and Records.	Total Points.
		Maximum Yield.		Quality of Grain and Uniformity of Cob.		
		76 Points.	14 Points.	10 Points.	100.	
		Bushels.	Points.			
A. Fittell, Eel Creek, Gympie	14	67	46.9	13	4	63.9
F. H. J. Hayden, Kingaroy	14	55	38.5	12	9	59.5
E. Hayden, Kingaroy ..	13	48	33.6	12	7	51.1
W. Norman, Biggenden ..	17	41	29.1	10.5	5	45.6
C. H. J. Strandquist, Murgon	12	40	28	9.5	6.5	44
G. Bubke, Biggenden ..	13	38	26.6	9.5	6	42.1
B. W. D. Wadsworth, Gin Gin	14	38	26.6	10	5.5	42.1
H. Frehmann, Binjour Plateau	13	40	28	9.5	4	41.5
A. F. Birt, Kingaroy ..	16	33	23.1	10	8	41.1
E. C. Andersen, Tingooora ..	14	37	25.9	11	4	40.9
W. Weick, Memerambi ..	10	40	28	9	3.5	40.5
H. V. Horne, Coolabunia ..	14	33	23.1	10.5	6	39.6
W. A. Strandquist, Murgon	10	37	25.9	9.5	4	39.4
L. E. Nystrom, Boobie ..	13	35	24.5	8	6	38.5
A. Nielsen, Bundaberg ..	14	33	23.1	7	4.5	34.6
J. J. Nielsen, Bundaberg ..	15	31	21.7	8	4.5	34.2
J. Kincaid, Wongarra ..	16	25	17.5	9.5	6	33
W. C. Andersen, Tingooora ..	14	23	16.1	10	5	31.1
H. E. Horne, Coolabunia ..	12	23	16.1	12.5	No chart	28.6
R. Buttsworth, Taabinga Village	15	15	10.5	7	8	25.5
M. R. Jackson, Biggenden ..	13	13	9.1	7	6.5	22.6
F. E. Faint, Dallarnil ..	11	9	6.3	4	4	14.3
C. Bischoff, Murgon ..	17	24.6	16.8	16.8	7	..
J. K. Clark, Kalkie, Bundaberg	15	24.5	16.8	No cobs came to hand.	5	..
J. V. G. Poulsen, Kingaroy	13	27.5	18.9		6½	..
Allan Kenny, Gayndah ..	13	20.6	14		6	..

## DARLING DOWNS (NORTH).

N. S. Smoothy, Pinelands ..	16	83	58.1	11	8	77.1
H. W. Abel, Geham ..	15	82	57.4	11.5	6	74.9
F. Franke, Cawdor ..	14	76	53.2	13	6	72.2
L. J. Abel, Geham ..	12	70.2	49.1	11.5	7	67.6
W. G. Stark, Pinelands ..	14	68.9	48.2	10	5	63.2
A. F. Abel, Geham ..	14	65.9	46.1	11.5	5	61.6
S. Fitch, Pinelands ..	15	49	34.3	10	6	50.3
N. Kruger, Bergen ..	13	41	28.7	8.5	4	41.2
R. Littleton, Pinelands ..	14	39	27.3	8.5	4	39.8
E. M. Scheffe, Bergen ..	16	28	19.6	8	9	36.6
I. E. R. Elliot, Cambooya ..	12	29	20.3	10.5	4	34.8

## DARLING DOWNS (SOUTH).

Albert Gonchee, North Killarney	17	74.7	52.5	12	8	72.5
Archibald Gonchee, North Killarney	15	44.5	31.5	10	8	49.5
A. E. Ernst, Spring Creek, Clifton	13	42.8	30.1	10	4	44.1
E. W. Wagland, Spring Creek, Clifton	13	33	23.1	9	10	32.1
F. Bishop, King's Creek ..	13	30	21	9	5	35
P. Clegg, Pratten ..	10	12	8.4	8	6	22.4

MORETON DISTRICT.

Name and Address of Competitor.	Age of Competitor.	YIELD.		QUALITY.	Notes and Records.	Total Points.
		Maximum Yield.		Quality of Grain and Uniformity of Cob.		
		76 Points.		14 Points.		
		Bushels.	Points.		10 Points.	100.
R. Rudd, Upper North Pine	12	52	36.4	12	8	56.4
F. Woodward, Samford ..	17	47	32.9	11	6	49.9
S. R. Hulse, Yandina ..	13	47.6	33.3	11	4	48.3
L. Morrison, Samford ..	11	46	32.2	10	4	46.2
E. Brandenburg, Landsborough	16	37	25.9	9	4	38.9

MARANOVA DISTRICT.

F. R. Rowlands, Bell ..	17	22	14.7	10	5	29.7
R. J. Bullock, Chinchilla ..	9	7	4.9	9	7	20.9
N. C. Bullock, Chinchilla ..	12	8	5.6	8	7	20.6
F. W. Bullock, Chinchilla ..	14	7	4.9	8	7	19.9
J. S. Bullock, Chinchilla ..	16	5	3.5	6	7	16.5

LOGAN DISTRICT.

F. M. Birt, Nerang ..	16	41.2	28.8	12	6	46.8
E. L. Marshall, Gramzow ..	13	44	30.8	10	6	46.8
R. A. Tulloch, Veresdale ..	15	39	27.3	7	7	41.3
E. Wolff, Alberton ..	9	33	23.1	6	4	33.1
W. J. Schlorf, Buccan ..	13	27	18.9	5	7	30.9

CENTRAL QUEENSLAND.

R. J. Philp .. ..	16	72.9	51.1	No cobs.	7	58.1
Isabella Wilson, Yeppoon ..	17	62.3	43.4	9.5	5	57.9
F. Williams, Barmoya ..	14	41.9	29.4	10	5	44.4
R. V. Williams, Barmoya ..	11	41.3	28.7	9.5	5	43.2
F. Jones, Raglan ..	15	31	21.7	11	4	36.7
F. Stobart, Tanby ..	9	22	15.4	8	10	33.4
J. Williams, Stanwell ..	16	18	12.6	7.5	8	28.1

NORTH QUEENSLAND.

M. R. Dougherty, Malanda, Cairns	16	82	57.4	8.5	6.5	72.4
J. D. Gellweiler, Kulara ..	13	61	42.7	12	4	58.7
R. Vance, Barrine ..	13	46	32.2	9.5	6.5	47.2
F. G. Reid, Pearamon ..	15	44.3	31	7.5	7	45.5

G. B. BROOKS, Acting Principal,  
Adjudicator.

REFINERY LIME REFUSE FOR THE LAND.

Mr. J. C. Brünnich, Agricultural Chemist, says that the lime refuse of a sugar refinery makes a good substitute for limestone screenings, and should be applied at the rate of 2 tons per acre. With respect to artificial fertilisers, it is always advisable to vary such as are applied, from season to season. Apply one year, bonedust with an addition of potash; other years, meatworks manure and potash; and, again, superphosphates, nitrolim, and potash.

## Pastoral.

### THE VALUE OF GOAT'S MILK.

There is a widespread belief that goat's milk has some peculiar flavour, rendering its use for domestic purposes unpleasant. This impression, however, has been gathered in Switzerland, and apparently arose from some peculiarity in the feeding. In Switzerland goats are allowed to wander at will, and as they have a fancy for strange and pungent herbage, the flavour of this food is imparted to the milk. But this will not be found to affect the milk of goats in this country. Here it has no flavour to distinguish it from cow's milk, except perhaps its superiority in sweetness and creaminess, but if they eat young gum leaves or any plant with a pungent odour, the milk will be tainted. In Bryan Hook's book on milch goats the analyses of goat's and cow's milk is as follows:—

	Goat's Milk. Per Cent.	Cow's Milk. Per Cent.
Water .. .. .	83·21	87·56
Butter fat .. .. .	7·30	3·63
Casein .. .. .	4·18	8·81
Milk Sugar .. .. .	4·10	
Ash .. .. .	1·21	
	100·00	100·00

Thus, it will be seen that while the cow's milk contains 12·44 per cent. of solids, the goat's milk can boast of 16·79 per cent. Moreover, in the most important ingredient, *i.e.*, butter-fat, the goat shows a percentage nearly double that of the cow. The most important of all the qualities of goat's milk, especially in relation to its adaptability to the feeding of infants, is its immunity from the danger of carrying the germs of tubercular disease, thus obviating the necessity for boiling, the goat not being liable to tuberculosis. Goat's milk is very much easier of digestion than that of the cow, the reason being the extreme minuteness of the fat particles.

The making of butter from goat's milk is an important one to the goatkeeper. Goat's butter, though, perhaps, not superior in flavour to that of cows, is at least as good, and has, moreover, the advantage of freedom from the germs of tuberculous disease.

The methods in common use for churning fail to extract anything like the quantity of butter which analysis shows the goat's milk to contain. Of several methods tried for the production of goat's cream and butter, the best, according to Mr. Hook, is the ordinary Devonshire one of scalding the milk, as in this way greater time can be allowed for the cream to rise. The milk, having stood in the tin pan for twelve hours, is placed upon the stove until a ring appears upon the wrinkled surface of the cream of the size of the bottom of the pan. When this appearance is noticed, and just before the milk boils, it must be taken off and allowed to stand in the dairy for another twelve hours,

when it is skimmed, and the milk will be found sweet and drinkable. The cream thus obtained having soured in the cream bowl, can be whipped into butter in a few minutes with an ordinary egg-whisk. This butter is absolutely white and might be mistaken for lard, and as this appearance is disliked by many persons, a little butter-colouring may be added.

#### YIELD OF BUTTER.

From a goat yielding two quarts of milk daily, 17 oz. of butter will result from a week's milking. This seems a small quantity, but it must be remembered that the remaining skim milk, amounting to  $3\frac{1}{2}$  gallons, would be of a quality far superior to that obtained were the butter more perfectly extracted, and would be little poorer than ordinary new cow's milk.

Thus, it will be seen that a single goat, in full profit, would supply both butter and milk enough for the consumption of three persons.

#### GOAT'S MILK CHEESE.

Another use for the superabundant produce of the goat is the manufacture of cheese, which, by the use of rennet, is an extremely easy operation, and yields a very excellent result nearly resembling Stilton. The cheese will, however, not keep more than four or five weeks. The recipe is as follows:—The milk having been warmed to about the temperature it has when fresh drawn, the rennet is added, and quickly stirred in, and the milk allowed to stand for an hour, when it will have cooled, and set into a firm curd. This curd having been broken up with a fork, a kettle of water, rather hotter than the hand can bear, is added, and the whole well stirred. In a few minutes, the washed curd will have settled, and the whey and water may be strained off. The curd is then put into a butter cloth under pressure, the cloth being changed, the pressure increased, and the curd turned over every day. In three or four days the cheese will be made, and only requires to be ripened for ten or fifteen days on a shelf, being turned over daily.

The curd may be produced by the judicious application of heat, without the use of rennet at all, and this method, being inexpensive, is most desirable.

In Switzerland, no rennet seems to be used, the peasants turning the milk by placing it in huge cauldrons upon the fire.

#### THE GOAT'S RATIONS.

A full-grown goat at liberty will collect a wonderful amount of food in a short time, leaving its mastication to be accomplished at leisure. This hastily gathered food is stowed in a stomach on the left side, and a goat that has laid in a good stock of material for rumination presents an amusingly lop-sided appearance.

For goats which are constantly stalled, the morning ration consists of a double handful of bran (dry), to which should be added lucerne chaff. At midday, an armful of lucerne hay or coarse grass. The evening meal is the same as that for the morning. Grass is the natural staple diet of an animal at pasture, but the goat's love of change leads it to eat

leaves and twigs which come within its reach. The grasses most relished are those of a hard, wiry nature. Goats seldom suffer from eating poisonous plants, as they instinctively avoid noxious plants.

#### RETURNS.

Suppose a goat to yield daily 4 pints of milk. At 6d. per quart (the price of cow's milk in Brisbane) this amounts to about £1 10s. per month, whilst one-third of water may be added to the milk, and even then it is richer than cow's milk (excepting for the making of junket).

#### THE COST OF RATIONS.

This, as per quantities of feed above stated, amounts to about 7s. 6d. per month, when feed is at ordinary prices. How does the cost of producing goat's milk compare with that of cow's milk. For a family of four, with economy, 3 pints daily of cow's milk, at 6d. per quart, is sufficient, the cost for a month being £1 2s. 6d. But the goat gives 4 pints daily of a value of £1 10s. per month. The cost of feeding a cow having access to pasture is, on an average, £3 per month; of a goat 7s. 6d.

Then, as to butter, as before, with economy, a family of four will use about 2 lb. per week, at a cost of 2s. 2d. per lb. The goat produces over 1 lb. per week plus the milk, which the purchaser of butter does not receive.

Taking all the advantages claimed for the goat, it may well deserve the name of the "poor man's cow."

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#### LAMBING EWES DYING.

A correspondent lately wrote to the Chief Inspector of Stock, Brisbane, stating that some lambing ewes had died, that others appeared to be sick, walking round in one spot as if giddy, and that one fat ewe had tuberculous ulcerations, or what appeared to be such, on the intestines, the liver, moreover, being pale.

The District Inspector of Stock at Killarney, Mr. H. C. Hawthorn, advised that the sheep be placed on better feed, if possible, and be given salt. Mr. W. G. Brown, Instructor in Sheep and Wool, to whom the case was also referred, stated that the trouble is a very common one just now, and is directly attributable to the dry condition now prevailing over the greater part of Queensland. It is necessary that ewes about to lamb should have laxative food, such as green grass, lucerne, or any other growing fodder. In the absence of these, it is often advisable to drench the ewes with a 3-oz. dose of Epsom salts in the proportion of 6 lb. of Epsom salts to 10 gallons of water. If the sheep have access to salt, all the better, but add 5 or 6 lb. of Epsom salts to one bag of, say, 180 lb. salt.

The nodules, or apparent ulcerations, are due to the nodule worm (*Oesophagostona columbianum*), and these do not cause serious injury to the health of sheep. Tuberculosis is rarely found in sheep—certainly not in Australia.

### DISEASES OF CATTLE.

*Blackleg.*—All young cattle, where blackleg has once made its appearance, should be inoculated with blackleg vaccine, which can be obtained, with full particulars, from the Government Bacteriologist, Stock Experiment Station, Yeerongpilly.

*Disease of the Eye in Calves.*—The most common disease that affects the eye, in this State, is blight, and the treatment recommended is as follows:—Nitrate of silver, 5 gr.; distilled water, 1 oz. This lotion should be painted onto the affected eye daily with a feather.

*Footrot in Cattle.*—This may be brought about in several different ways. First of all, the cause should be found, and at once removed. The most common cause is sand and dirt becoming inserted between the hoofs and causing scalding. If this is the cause, the foot should be thoroughly washed in warm water; then, a pad of cotton-wool should be soaked in the following solution, placed between the hoofs, and kept in position with a bandage:—Bichloride of mercury, 1 dr.; water, 20 oz. After the disease has disappeared, the cleft of the foot should be filled with Stockholm tar, and the animal kept as dry and clean as possible.

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### THE STOMACH-WORM IN SHEEP.

[CONTINUED FROM JULY NUMBER.]

By W. G. BROWN, Sheep and Wool Expert, Department of Agriculture and Stock.

In last month's issue of this journal mention was made that Dr. Theiler, C.M.G., Director of Veterinary Research to the South African Government, had made a number of experiments with the object of finding a good vermicide.

The results of these experiments were given in the "South African Agricultural Journal" for October, 1912.

It is not proposed to give the whole set of tables, but only some of Dr. Theiler's conclusions on the results of his experiments.

The first part of the article gives the life-history of the wire (or stomach) worm on much the same lines as was given in this journal last month, so that it is not necessary to reproduce it. Dr. Theiler says (p. 574)—

"It must be stated that even the best medicine does not kill all the worms in the stomach of all sheep, and there are always some parasites which escape. Accordingly, a clean pasture will, in time, become reinfected, particularly in a moist warm season. It is here that the sheep farmer will be able to show his skill in handling his flock, so that during these periods the animals do not remain too long on the same pasture, but are systematically changed on to the clean veldt."

A method of testing whether worms are present in large numbers is given by the American scientist, Ransom, whom Dr. Theiler quotes: "We have been able to confirm the views expressed by Ransom that the mature young worms are able to crawl and to ascend perpendicular

surfaces, provided the atmosphere is saturated with moisture, which, of course, is frequently the case in a rainy season. Blades of grass, at the roots of which such young worms are placed, were found swarming with worms after remaining a few days in a saturated atmosphere under a glass bell. The young worms may also be seen with the naked eye crawling up the inner surface of a test tube, when some droppings containing eggs are placed in it. This is a convenient way of finding out whether a sheep is infected with worms, and to what degree this infection exists. The manure is placed in a wine-glass, covered so as to ensure a moist atmosphere in the glass, and within a few days white masses will appear along the walls of the glass. These masses consist of young wire-worms."

Dr. Theiler is a strong advocate of periodical burning. He says—  
 "One (of the methods) is the burning of grass. It has been stated above that the young worms crawl to the top of the grasses, from where they reach the stomach of their host. The South African farmers know the value of a 'brand' although they have not made a full use of that knowledge.

"Where no clean ground and no fresh brand is available, and sheep after dosing become reinfected, the repeated use of vermicides is the last resource. These vermicides reduce the numbers of worms in the stomach, and, although this treatment is the least satisfactory, it is nevertheless made the most use of. It ought to be supplemented by 'rotation of pasture' system, as indicated before, when the necessity of frequent dosing is reduced."

#### THE MEDICINES.

"A number of experiments were undertaken by us to test the two common medicines used for dosing sheep—*i.e.*, bluestone and Cooper's dip. The former was first recommended by the late Dr. Hutcheon in liquid form, but as the drenching of sheep was followed frequently by accidents due to traumatic pneumonia, many farmers considered it too dangerous to be recommended. Cooper's dip, for a long time, has had the reputation of being a good remedy for wire-worms, although the safe dose which could be given to the various classes of sheep has never been worked out properly. Since a combination of the two had already been adopted by many farmers, and which was highly recommended, it was thought advisable to give it our attention and to ascertain, in a series of experiments, the safe maximal dose."

"The results of these experiments were published in the 'Union Agricultural Journal' for August, 1912, and may be shortly summarised here:—

"Maximal safe dose for sheep of 4-8 tooth, 15 grains Cooper's dip and 15 grains bluestone; maximal safe dose for sheep 2-tooth, 10 grains Cooper's dip and 10 grains bluestone; maximal safe dose for lambs from five months, 7½ grains Cooper's dip and 7½ grains bluestone. Experiments proved that smaller doses than the maximal safe dose were equally effective; and accordingly the doses recommended were as follow:—  
 Sheep of 4-8 tooth, 10 grains Cooper's dip and 10 grains bluestone; sheep 2-tooth, 7 grains Cooper's dip and 7 grains bluestone; lambs, 6 to 9 months old, 5 grains Cooper's dip and 5 grains of bluestone. The effect of dosing with a mixture of Cooper's dip and bluestone was controlled in the experiments by counting the eggs passed by the sheep

before and after dosing; if the drug is effective it must kill off all the wire-worms and no more eggs will be produced."

Here follow tables, to which I must refer the reader. The net results appear to be:—

"The decisive effect of this experiment—(No. 1 Table) 15 grains Cooper's dip and 15 grains bluestone—on sheep is shown, but at the same time it can be seen that not all the worms were killed by even this maximal dose. No. 2 Table:  $7\frac{1}{2}$  grains Cooper's dip and  $7\frac{1}{2}$  grains bluestone. This table shows a decisive effect on the worms, but nevertheless eggs were still found in some of the dosed sheep on the seventh and tenth days."

"It may be stated here that we cannot expect to find a medicine which, given only once, would prevent a reinfection for any length of time. The effect of any drug will wear off, and this takes place after a comparatively short time. Accordingly, if the animals cannot be removed out of the infected pasture, recourse is taken to repeated dosing, and it is important to know at what intervals and how frequently this dosing can be undertaken without injury to the sheep. To settle these points further experiments were made, and the results appear below."

The tables are given, but for reasons of space must be omitted. The conclusions reached, however, are interesting. They are as follow:—

"The three control sheep which were not dosed gained, during the experiments, 3 lb. in weight; the examination of the droppings in the course of the experiments showed that they lost the worms without any treatment."

[TO BE CONTINUED.]

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### PREVENTION OF FOOTROT IN SHEEP.

In reply to an inquiry as to the best means of preventing footrot in sheep in a wet climate such as the Cairns district, Mr. W. G. Brown, Instructor in Sheep and Wool, advises:—

The first necessity in wet seasons or on soft ground in the treatment of sheep is a stony ridge or sandy ground to which they may retire from the wet conditions of flats. In the absence of such there will always be trouble with the animal's feet. It is also necessary that the feet be inspected periodically and trimmed. A pair of clippers, such as are used by orchardists for trimming fruit trees (secateurs) is suitable for the work. Sheep on hard or sandy country do not suffer from long hoofs, because the feet are worn as fast as they grow. After trimming the feet, the bluestone treatment is the best I know of, and is used as follows:—

A race is made about 12 ft. long and about 1 ft. 9 in. wide. The floor of this race is made into a shallow trench, about 3 in. deep, and then filled with a solution of bluestone in the proportion of  $1\frac{1}{2}$  lb. of bluestone to 4 gallons of water. The sheep are then driven through. To prevent the sheep carrying a sore foot, as they are apt to do, stones should be placed in the trough, so that the animals stumble, and place all four feet down in the solution. When trimming the feet, examine the gland between the toes, and see that it is not blocked up with grass seeds or mud. This blocking is often a cause of lameness, and so-called footrot. The real footrot is contagious and infectious, and does not, as far as I know, exist in Queensland.

# Dairying.

## THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

MILKING RECORDS OF COWS FOR MONTH OF JUNE, 1915.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Commercial Butter.	Remarks.
Noble Dot ...	Jersey ...	2 May, 1915	Lb. 630	% 4.6	Lb. 34.74	In addition to grazing on natural pastures, the cows received a daily ration of ensilage.
Iron Plate ...	" ...	21 Feb. "	443	5.4	28.31	
Lady Athol	Shorthorn...	29 May "	748	3.2	27.91	
Netherton	Ayrshire ...	23 April "	564	4.2	27.83	
Belle						
Lady Twylsh	Jersey ...	5 June "	496	4.7	27.47	
Lady May ...	Ayrshire ...	7 Mar. "	605	3.6	25.51	
Cocoatna ...	Jersey ...	6 Mar. "	377	4.9	21.78	
Madame	Holstein ...	8 Sept., 1914	498	3.4	19.78	
Melba						
Thornton	Jersey ...	27 Mar., 1915	344	4.7	19.05	
Fairetta						
Nellie II. ...	Shorthorn...	20 July, 1914	463	3.5	18.95	
Lady Melba	Holstein ...	6 Mar. "	430	3.7	18.64	
Miss Melba	" ...	22 Nov. "	492	3.2	18.35	
Lady Loch II.	Ayrshire ...	8 Feb., 1915	318	4.8	17.99	
Nina ...	Shorthorn...	18 Feb. "	478	3.2	17.82	
Bella ...	Ayrshire ...	19 Jan. "	434	3.5	17.76	

### ABERDEEN-ANGUS AS MILKERS.

By P. R. GORDON.

Very little attention has been paid to the milking properties of the Aberdeen-Angus in Australia, and it is not very widely known in the Commonwealth that two of the breed won the championship at the London Dairy Show in 1892 and at the Dublin Dairy show in 1904, in addition to many subsidiary honours at these exhibitions. In the middle of last century the Aberdeen-Angus cattle were noted for their great milking properties throughout a great part of Scotland. Their chief claim lay in the richness of their milk. Youatt mentions that the polled cows of Buchan, small as they were, gave from 12 to 16 quarts, and sometimes even as much as 28 quarts. Several tribes are excellent milkers even to the present day—the most notable of which is the Fyvie Flower, and any of the strain, whether in pure or crossbred form, are eagerly purchased by the dairymen around Aberdeen. In fact their fame is equally great around Edinburgh, where the industry is practically one of cow feeding: That is, a cow enters the stall in full milk, and leaves it fat. The early breeders specialised to some extent in milking qualities—in fact, good milking properties were considered

absolutely necessary in the formation of the Keilor herd of Hugh Watson. A few years ago the Earl of Airlie, in a letter to the "North British Agriculturist," wrote: "I have at present seventeen pure Aberdeen-Angus cows in my dairy. The greater number of these give from 18 to 21 and sometimes 24 quarts a day for a considerable time after calving. The milk is admitted to be much richer than that of either the Shorthorn or the Ayrshire. As regards the length of time during which they will continue to give milk, my cow, Belle of Airlie (1959), as pure a polled animal as any in the herd book, used to be milked all the year round. Last year when I was from home, they left off milking her about a month before she calved and she died of milk fever, induced by the circumstance that she had not been relieved of her superabundant milk." At a later date he wrote: "When I wrote on the subject I had some cows that (newly calved) gave 21 quarts. I have now some cows that are giving as much as 18 quarts daily though quite three months calved." A friend of mine sent me some particulars of the Fyvie stud, where the milking reputation of the breed was well maintained until the dispersal of the stud. Charlotte of Fyvie was a marvellous type of a dual-purpose cow, and was equal to her 3½ lb. of butter per day, and her granddaughter won the second prize at the great Smithfield beef show. Duchess of Fyvie was also a great butter cow, and found her way into the stud of the Earl of Southwick, who also purchased two of the heavy milkers at 88 and 89 guineas at the sale. A cow of more than passing interest to Australia, bred at Fyvie, was Mary Grace, said to have been "as sweet a cow as ever was looked upon. She was the mother of Knight of Fyvie that came to Australia and was owned by the late Mr. David Syme, of Melbourne. Some of his progeny turned out exceedingly good milkers, and from Mr. Syme's catalogue we read of some of them giving as high as 20 quarts per day, although three months calved. Lizzie of Fyvie was a fine milker and went to Mr. Argo, of Cairdseat, and Fifty of Fyvie, also a good producer, was purchased by Sir William Forbes, of Craigievar. Annie Laurie, of the Fyvie Flower tribe, turned out a topnotcher in the dairy of Mr. Fraser, of Skilmafilly, and also bred many prize-winning stock. There can be little doubt that the Fyvie Flower and Pride of Aberdeen strains were from the indigenous stock of the Fyvie district, in addition to having an ancestor in the bull Angus, who was by Old Jock and out of Old Favourite, both bred by Hugh Watson. This further intensifies the belief that the Angus "Doddies" were a branch of the Aberdeenshire Buchan "Hummlies" that flourished in Fyvie and Buchan in pre-historic ages. How the one strain kept up its dual-purpose characteristics, as it does to the present day, while others went exclusively to beef, is just a matter of cultivation. But one thing is certain, the most exclusive "Pride" bull could never

shake the milking properties of the Fyvie Flowers, as example the Knight of Fyvie, a first cross of the two strains. The late Mr. James Smith, of Burnshangie, one of the oldest breeders of Aberdeen-Angus, wrote in regard to the old Buchan cows:—"The nearest approach to the best types of old Buchan cows that I can recollect is old Charlotte of Fyvie and Mr. Auld's 270-guinea cow, Pride of Aberdeen 9th." Now that dairying is assuming important dimensions in Scotland, and more especially in Aberdeenshire, it is not surprising to note that one of the first factories established in the country was at Fyvie. This shows the great local influence of the early labours of the breeders that is still being felt, although most of them have found a resting place in the green kirkyard on the banks of the Ythan, celebrated for its trout and pearls. The Aberdeen-Angus have much to commend them to Australia, as it is very doubtful if there is a breed of cattle on earth that serves a better dual purpose. The days of slaughter of the dairy calves are past, and beef will be beef for many years, and it is doubtful if a better all-round farmers' cow—a frugal, easily kept, rich butter cow—can be obtained than by crossing the Aberdeen-Angus on the Jersey, Short-horn, or Ayrshire breed. We are verging into new circumstances, and these circumstances are similar to those of the dairymen around Glasgow, where the Aberdeen-Angus bull is extensively employed in Ayrshire dairy herds. The farmers are getting good male calves that fetch good prices—in fact, one year an Aberdeen-Angus-Ayrshire took second prize in the crossbred section of the Smithfield Show. And, from the prices that are being paid for the females of the composite dairy strain, it cannot even be hinted at that they are losing their milking qualities.

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### FEEDING DAIRY COWS.

Dairy cows should be fed immediately after milking, particularly if the fodder should be of a character likely to convey any taint to the milk.

Relative to the mixing of molasses with green fodder, it is difficult to decide the influence molasses will have when mixed with the fodder unless the nature of the fodder is stated. However, it is to be said that molasses is generally used for the purpose of making the dryer fodders more appetising for the dairy cows, and, when used in this way, it is found that the dry fodders are more readily consumed by the animals.

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### DESIGN FOR A CO-OPERATIVE BUTTER FACTORY.

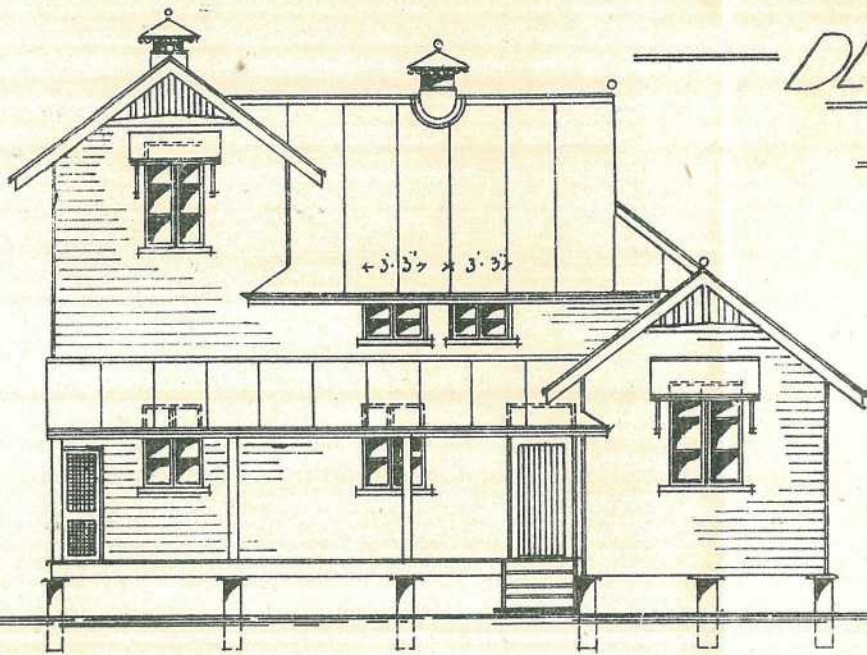
In response to inquiries we have from time to time received, as to the most up-to-date butter factory buildings, Mr. A. Morry, surveyor, Department of Agriculture and Stock, has prepared the accompanying plans for a modern factory, having a capacity of an output of 5 tons weekly. These plans so clearly show the whole scheme, that any additional explanation is superfluous.

# DESIGN FOR A CO-OPERATIVE BUTTER FACTORY

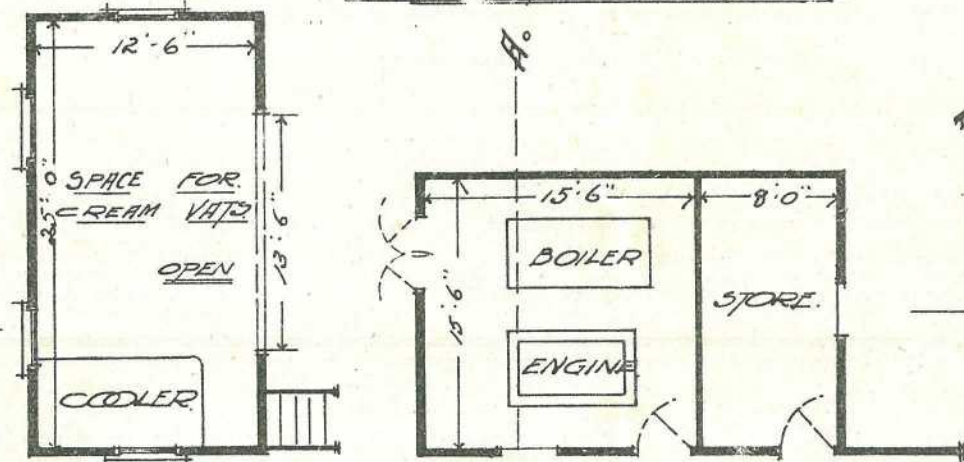
CAPACITY 5 TONS PER WEEK.

SCALE OF FEET TO ONE INCH.

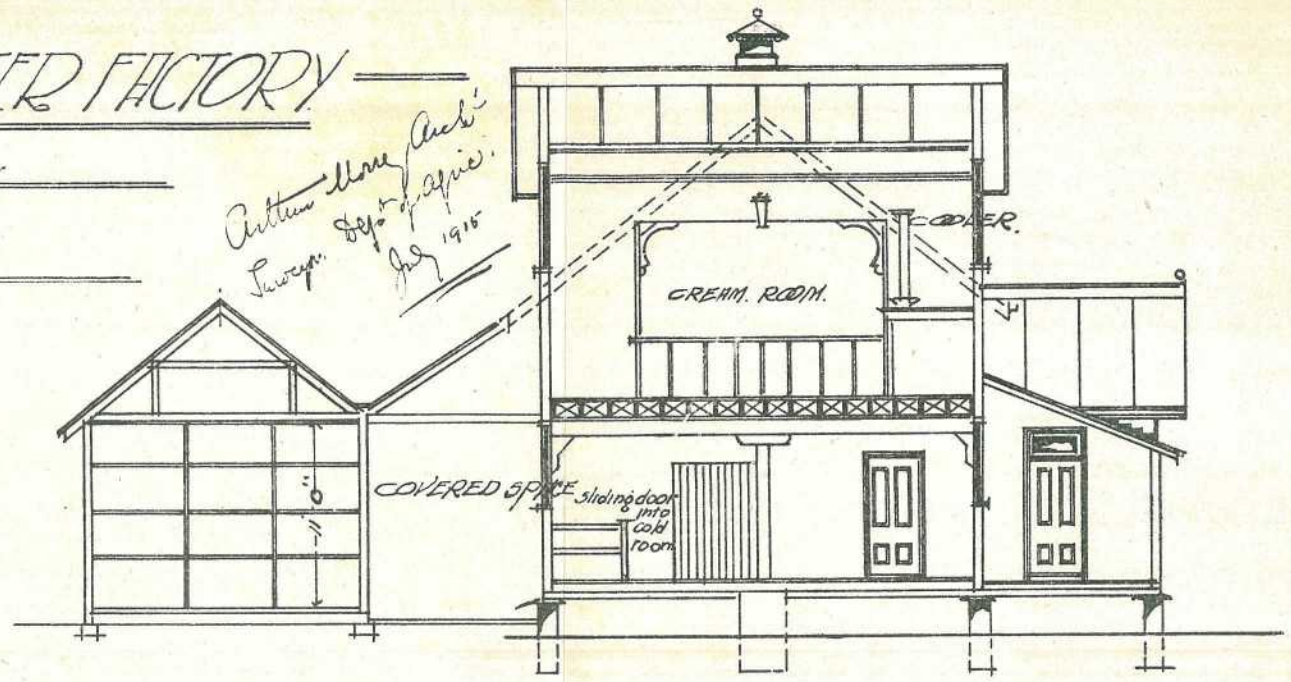
*Arthur More Archt.  
Savoy Dept. of Agric.  
July 1915*



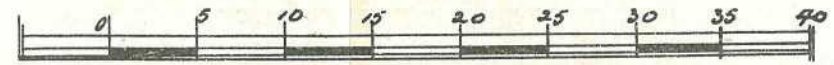
FRONT ELEVATION.



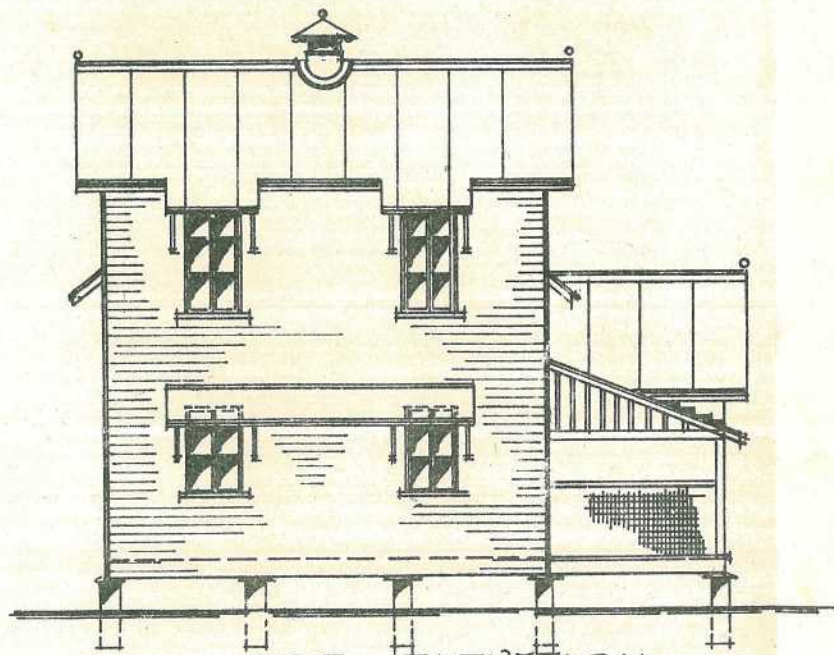
PLAN OF CREAM ROOM



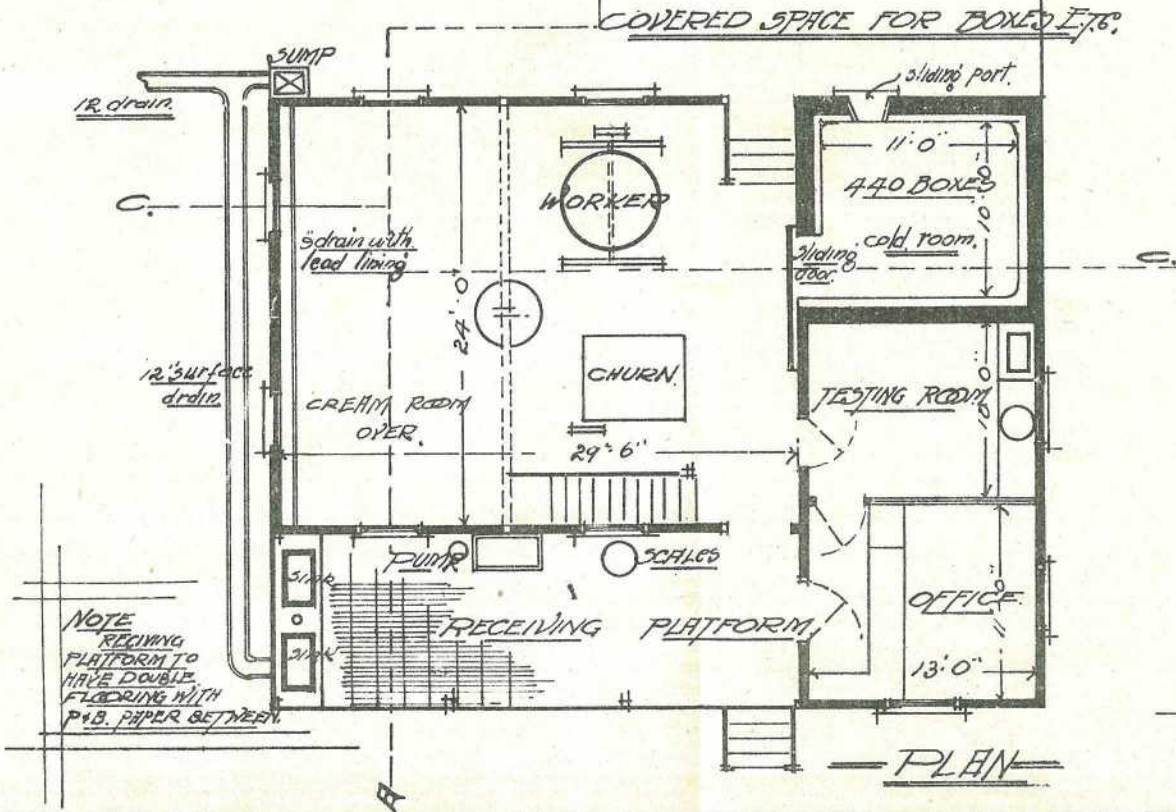
SECTION A. A.



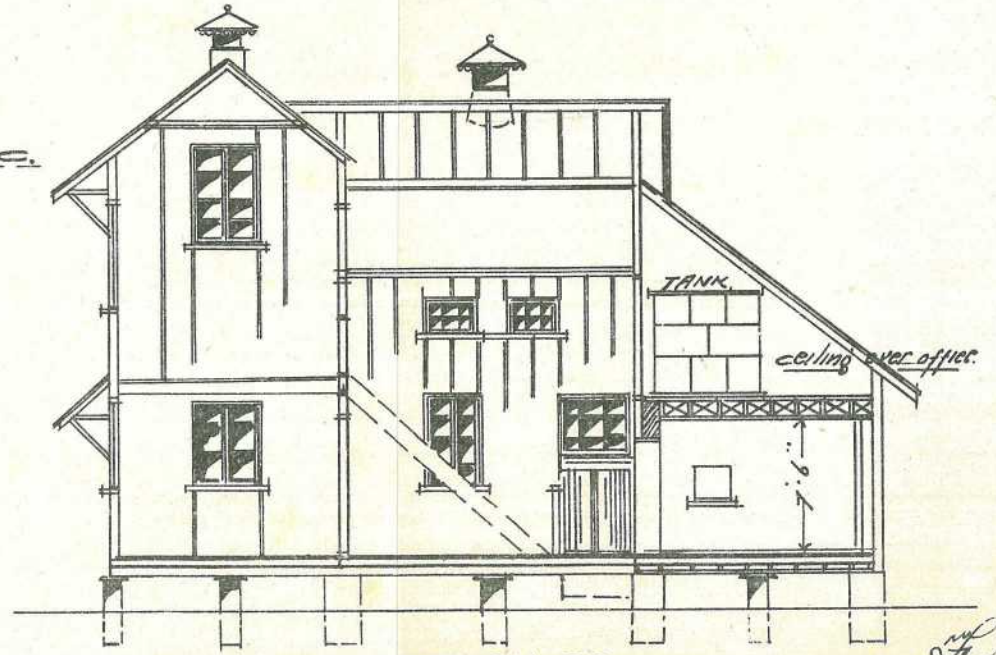
SCALE OF FEET.



SIDE ELEVATION.



PLAN



SECTION C. C.

*July 5th 1915*

NOTE RECEIVING PLATFORM TO HAVE DOUBLE FLOORING WITH P & B. PAPER BETWEEN.

# Poultry.

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

Five thousand one hundred and forty-seven eggs were laid during the month. Three of Mr. J. M. Manson's White Leghorns are now in moult. Since last report the pens owned by Messrs. C. E. Bertelsmeier and A. H. Padman have had a slight attack of warts, which has greatly affected their laying, especially in the case of the latter, two of whose birds appear to be breaking into moult. The weather has been very changeable—a few days very warm, followed by cold westerly winds lasting in one instance for ten days. This was very trying for the birds. R. Burns wins the monthly prize with 145 eggs. The following are the individual records:—

Competitors.	Breed.	June.	Total.
Mrs. J. Jobling, N.S.W.	Black Orpingtons	119	370
Jas. McKay	White Leghorns	132	363
Mrs. Munro	Do.	131	323
J. D. Nicholson, N.S.W.	Do.	110	318
G. B. Bertelsmaier, S.A.	Do.	93	310
J. Gosley	Do.	115	308
A. W. Bailey	Do.	110	296
A. H. Padman, S.A.	Do.	81	295
S. E. Sharpe	Do.	87	295
J. R. Wilson	Do.	108	293
King and Watson, N.S.W.	Do.	126	287
Kelvin Poultry Farm	Do.	123	280
E. F. Dennis	Do.	121	277
C. F. Clark	Do.	116	276
A. T. Coomber	Do.	102	273
J. M. Manson	Black Orpingtons	112	272
T. Fanning	White Leghorns	84	268
E. V. Bennett, S.A.	Do.	110	264
R. Jobling, N.S.W.	S. L. Wyandottes	104	260
C. Knoblauch	White Leghorns	95	258
H. Harnill, N.S.W.	Do.	99	253
O.K. Poultry Yards	Do.	92	252
J. M. Manson	Do.	86	248
R. Jobling, N.S.W.	Do.	103	248
E. Le Breton	Do.	123	242
F. Clayton, N.S.W.	Do.	94	239
Cowan Bros., N.S.W.	Do.	100	237
R. Burns	Black Orpingtons	145	231
J. Aitcheson	White Leghorns	123	231
Geo. Tomlinson	Do.	129	230
W. Meneely	Black Orpingtons	118	229
T. Fanning	Do.	119	227
W. Lyell	White Leghorns	86	219
Moritz Bros., S.A.	Do.	98	217
E. A. Smith	Do.	84	214
W. Parker	Do.	80	211
Derrylin Poultry Farm	Do.	84	211
W. Purvis, S.A.	Do.	79	211

Competitors.	Breed.	June.	Total.
R. Burns ... ..	S. L. Wyandottes ...	113	204
J. Zahl ... ..	White Leghorns (No. 2)	71	198
Cowan Bros., N.S.W. ... ..	Black Orpingtons ...	93	194
G. H. Turner ... ..	White Leghorns ...	93	186
W. Lindus, N.S.W. ... ..	Do. ... ..	103	174
J. Zahl ... ..	Do. (No. 1) ...	75	166
J. G. Richter ... ..	Do. ... ..	104	160
Loloma Poultry Farm, N.S.W. ... ..	Rhode Island Reds ...	80	153
E. Poccock ... ..	White Leghorns ...	64	147
J. H. Gill, Victoria ... ..	Do. ... ..	63	144
E. A. Smith ... ..	Black Orpingtons ...	92	132
S. Chapman ... ..	Brown Leghorns ...	86	110
W. H. Forsyth, N.S.W. ... ..	White Leghorns ...	27	65
F. Clayton, N.S.W. ... ..	Rhode Island Reds ...	62	63
J. R. Johnston ... ..	Plymouth Rocks ...	0	0
Totals ... ..	...	5,147	12,132

### FEEDING OF POULTRY.

Mr. Hindes, Poultry Expert at the Queensland Agricultural College, replying to a question on the above subject, says: "With reference to the quantities of food given to fowls, as I pointed out in the report on the egg-laying competition, it is impossible to lay down any hard-and-fast rule. The feeder must find out for himself the amount of food the birds require at any one time, as they eat far more when laying heavily than they do when not laying, or when any portion of the flock is laying. To make it, if possible, plainer, we will suppose that a fowl requires, say, 3 oz. of food per day to keep it in good condition when not laying. The same hen commences to lay, say, four eggs a week, each egg weighing 2 oz. That means that the hen is producing 8 oz. of eggs per week, or over 1 oz. per day. She will, therefore, require over 1 oz. more food per day than when not laying. We feed the same all the year round, but in varying quantities according to the way the birds are laying.

### WORMS IN FOWLS.

The adult worms (*Heterakis*) are generally found in the alimentary canal of the fowl, but sometimes occur in the intestines. They develop direct from the eggs, which are eaten by the fowls (Theobald). If present in large numbers they may cause death. The birds should be kept without food for twenty hours, when the following dose should be given:—One grain of santonine and 7 grains of freshly-grown arca nut. Miss two or three days, and then repeat dose. This should complete the cure.

## The Horse.

### TREATMENT OF STRANGLES IN HORSES.

Horses affected by strangles should be kept dry and away from draughts. They should be rugged at night. Any swelling that appears should be well rubbed with the following embrocation:—Strong ammonia, 1 oz.; turpentine, 1 oz.; water, 2 oz.; olive oil, 6 oz. A plentiful supply of cold water should be allowed, into which 2 dr. chlorate of potash and 2 dr. nitrate of potash should be put, morning and night. Soft, nourishing food should be given, and it is advisable to place this on the ground, so as to favour any discharge from the head. If a discharge makes its appearance, the head should be steamed with hot bran for an hour twice daily.

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### FOAL OUT OF CONDITION.

A nineteen months old foal, which, after being weaned, falls off in condition, but is otherwise in good health, should not be purged or bled. The best treatment to regulate the bowels and also to put condition on to the animal is to give it linseed jelly, which is made up as follows:—One teacupful of linseed should be placed in a billycan and just covered with warm water. This should be allowed to boil over a slow fire until the seeds have burst. One-half of the jelly should be mixed in a bran mash.

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### REMOVING LAMPAS FROM HORSES.

The palate should be lanced between the first and second bars. Upon no account should the knife be inserted beyond the second bar, as there is a large artery there, which, if cut, will give a great deal of trouble before bleeding is stopped.

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### CANARY SEED.

A heavy crop of canary grass will often yield over 3 tons of hay. The best month for sowing the seed is May, but it is possible to secure a catch crop by sowing as late as June, or even July; 15 lb. of seed will suffice per acre if drilled in. As for soil, excellent crops have been raised on the heavy brown, loamy soil at the Hermitage State Farm. The young crop may be grazed off by sheep provided they are not kept on it too long, particularly when late in the season.

## State Farms.

### NOTES FROM KAMERUNGA STATE NURSERY, CAIRNS, NORTH QUEENSLAND.

Mr. C. E. Wood, manager, reports as follows for the month of June:—

Rainfall for month, 1.99 in.; number of days on which rain fell, 9; rainfall from 1st January to 30th June, 19.84 in.; average rainfall for the same period, 1st January to 30th June, for the previous twenty-five years, 72 in. These figures will give some idea as to the dry conditions prevailing in this Northern district. I might also mention that the smallest rainfall for the above period during the twenty-five years was 38.12 in. in 1897 and 38.55 in. in 1902—practically double the rainfall so far experienced this year. Maximum temperature, 89; minimum temperature, 49. From the above figures it will easily be understood that many of our tropical crops, requiring as they do a good amount of rain, are either a complete or partial failure.

The effect on coffee, as noted here, has not been in reducing the number of cherries, as the setting of the fruit took place during October and November of last year, when conditions were favourable; but the fruit has undoubtedly ripened earlier, and the beans are small.

In bananas the effect has been not so much in reducing the number of hands, as bunches maturing now would have already been formed before they could be affected by the dry weather; but, excepting in very small bunches, the individual fruits or fingers have failed to swell to what would be their normal size, also the hands are closer together, thus giving the bunches a small and dumpy appearance as compared to what they would be under normal weather conditions.

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### LIVING IN TENTS.

A certain percentage of our population lives always in tents—some of them good tents that keep out the water and weather—others very indifferent tents. The quality of a tent depends largely on the quality of the material used, but also on the quality of the workmanship. It isn't everybody who knows how to make a really satisfactory tent, but there are a few who do, and one of these is G. Smith, of 170 Edward street, Brisbane. His tents have been "Standard" for many years. He specialises in tents, tarpaulins, flags, and oilcoats, and it has always been his endeavour to supply the public with the best quality of goods obtainable. See advertisement in this issue.

## Horticulture.

### INCREASING ORNAMENTAL-LEAVED BEGONIAS.

Were the ornamental-leaved begonias more difficult of cultivation, probably they would receive greater attention and be more appreciated. The ease with which they may be cultivated, and the remarkable colourings of their large leaves, entitles them to greater prominence than both amateurs and professionals allot to them at present in South Africa. The markings of their leaves are unique in shape, and wonderful for the large range of colours even a single leaf may contain. All shades from the deepest velvety black crimson to the purest silver white are to be found; and nothing relieves the green of a fernhouse or stoep with more harmonious effect.

Perhaps one reason that they are not popular is that the "man in the street" does not understand how to create young plants to follow his old ones when they naturally, during the course of time, become untidy. With the object of showing how simple their reproduction really is, we are featuring this process in our Pictorial Hints this month. First of all let us state that this class of begonia must be grown in partial shade, exposure to direct sunshine having an unfavourable effect upon the foliage.

The plants are suitable for either borders, pot culture, or growing on rockwork, an open soil composed of 8 parts fibrous loam, 4 parts peat, 4 parts leaf-soil, 2 parts thoroughly decayed manure, and 1 part coarse sand being satisfactory. During the winter the roots of the

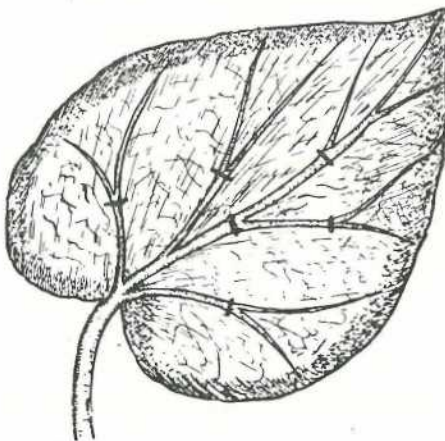


FIG. 1.

The underside of a Begonia leaf, the cross lines showing the proper positions in which to cut the notches in the principal veins before laying the leaf on the soil.

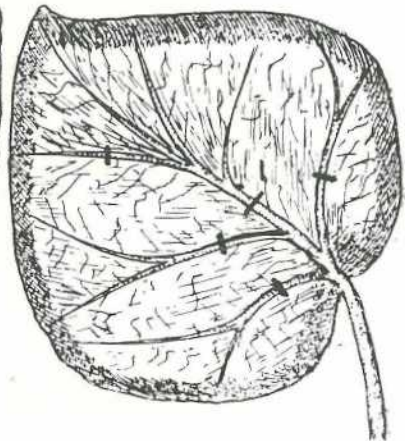


FIG. 2.

Another leaf of Begonia with the notches cut in the wrong positions, these being too far from the points from which the secondary ribs branch out.

plants should be kept on the dry side; but during the growing period plenty of water at the roots is essential, together with occasional applications of well diluted liquid manure.

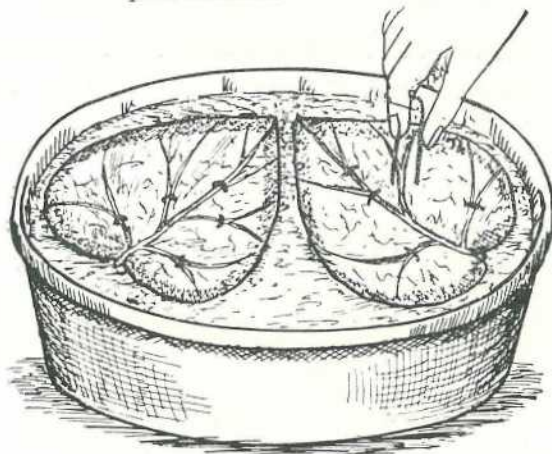


FIG. 3.

Two Begonia leaves cut as in Fig. 1 placed upon the pan of soil and held in close contact with the soil with small hairpins or layering pins.

### PROPAGATION BY LAYERING.

Although ornamental-leaved begonias can be increased by division of the plants, the most interesting method of propagation is by layering the leaves. Well-developed, sound leaves must be selected for this purpose, and after being removed from the plants turned underside upwards, so that cuts or notches can be made in the principal veins. The notches should be cut about half way through the veins at points where secondary veins branch out. A number of notches may, of course, be made in each leaf. At each cut the sap in the ribs will form a callus and foundation for the production and development of roots. A well-drained shallow pan of light sandy soil should be prepared, and after watering and allowing the soil to drain, the surface should be covered with a layer of sand. The prepared leaves should then be laid on the surface cut side downwards, whilst the leaf stem should be inserted in the soil; and to ensure the notches in the ribs coming in contact with the soil, hairpins or wire layering pins should be passed through the leaves near these points. Plunge the pan in cocoa fibre refuse in a propagating frame having a temperature of from 60 degrees to 70 degrees, shade from the sun, keep nicely moist but not wet, and after a time, if all is satisfactory, a tiny plantlet will be produced at each notch made in the veins of the leaves. As soon as the plantlets are large enough to handle they should be lifted and planted singly into small pots. The best time to increase foliage begonias by division is when the plants are repotted in the spring.

## VARIETIES.

Amongst the many varieties of ornamental-leaved begonias the following comprise some of the best:—*Begonia Rex*, deep green leaves of metallic hue, ornamented by a ring of silvery white; *B. Louise Gloson*,

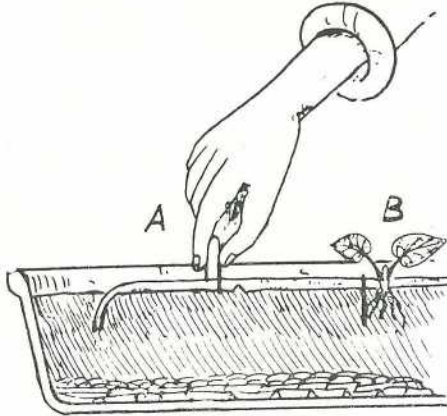
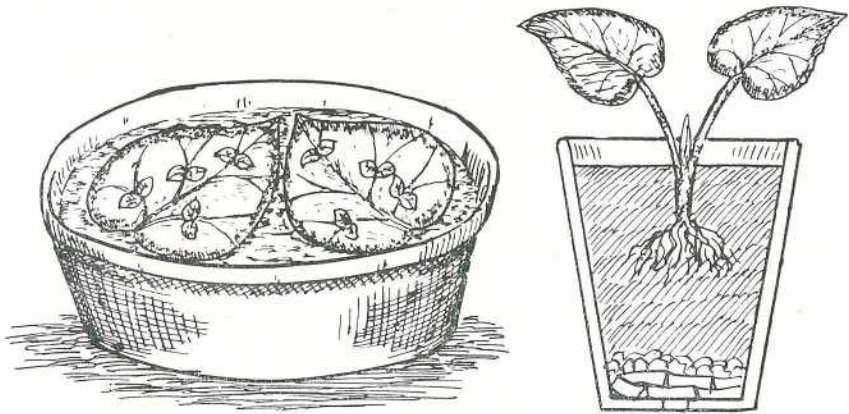


FIG. 4.

Shows the pan in section and the best position for pinning down the leaf, *i.e.*, over the rib a short distance from the notch. B shows the plantlet growing from the notch.

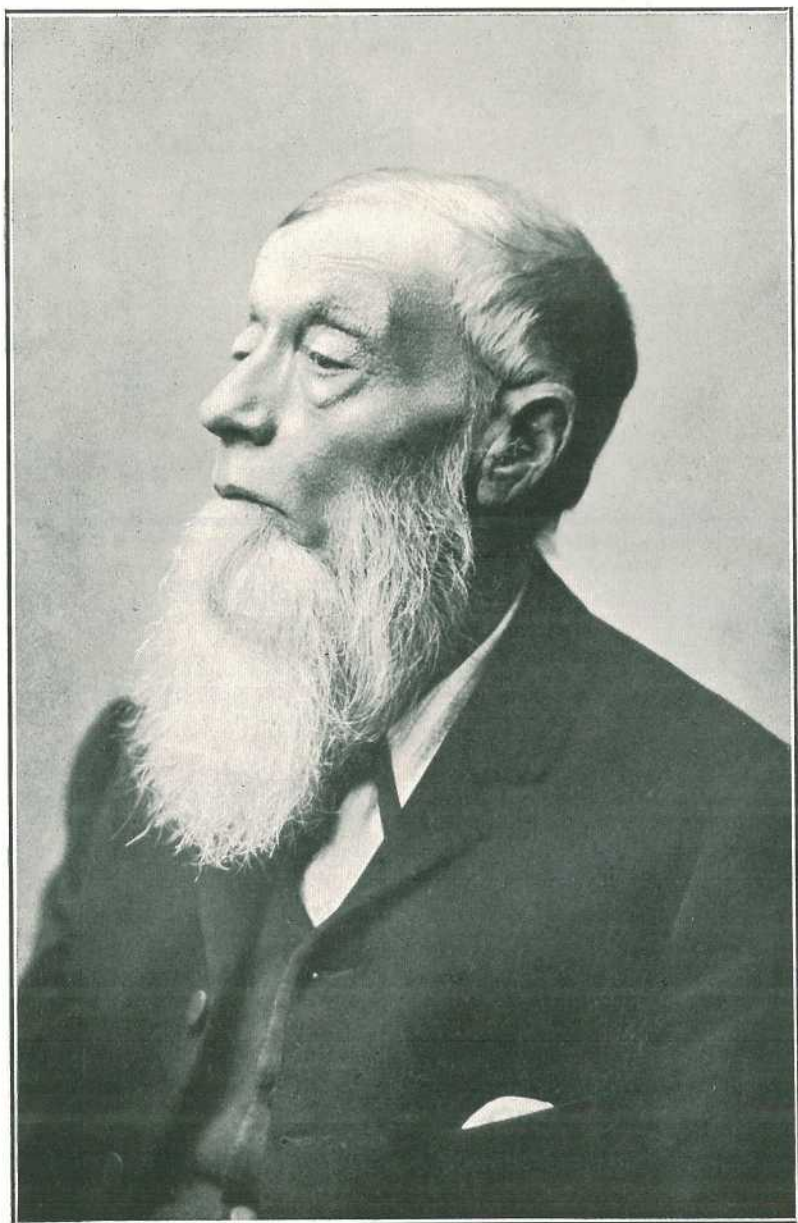
dark maroon foliage relieved by a crimson horse-shoe; *B. Eudoxa*, bronze leaves relieved by pink and white spots; *B. Comtesse de Louise Erbody*, silvery leaves margined with purple-lake and green veins; *B. Prince*



FIGS. 5 AND 6.

Fig. 5 portrays the result of our efforts, eight little plantlets growing from the leaves where they were cut, and Fig. 6 shows the plantlet removed from the leaf and properly potted into a small pot. Note that the head of the young plant only just protrudes from the soil.

*Charles of Denmark*, crimson leaves ornamented with a silvery horse-shoe; and *B. President Carnot*, silvery white variegated leaves.—“*South African Gardening and Agriculture.*”



THE LATE MR. F. M. BAILEY, C.M.G., F.L.S.

The accompanying portrait of the late much-esteemed Colonial Botanist, Mr. F. M. Bailey, was, owing to an oversight, omitted in our August issue. Mr. Bailey always wished to retain his original title of "Colonial," in preference to "Government," Botanist.

[*Frontispiece.*

**MR. F. MANSON BAILEY, C.M.G.,**

Late Colonial Botanist.

Last month it was learnt with profound regret that Mr. F. M. Bailey, Colonial Botanist, Queensland, had passed away at his residence at Kangaroo Point. The deceased scientist's illness was but a brief one, and only a few days prior to his death he was apparently in the best of health, and busied himself in his garden, despite the weight of his 88 years, up to the day of his death, when he became unwell and gradually lapsed into unconsciousness. He will be mourned by all, not alone for the loss which his death will inflict on the scientific world, though he leaves the nation a rich heritage in his compilations on botanical subjects, but because of his personal attributes.

The late Mr. Frederick Manson Bailey was lovable and kindly, and his life seemed to have been woven into the warp and woof of the fabric of Queensland. He leaves a gap that will be hard to fill. But his memory—the memory of a man who faithfully served his day and generation, and lived in charity with his neighbours—will be preserved green. Many a kindly remembrance of the old man will be called up from the galleries of the past. Frederick Manson Bailey first saw the light of day in London on 8th March, 1827. Hackney was the well-known old suburb in which his parents lived. His father, John Bailey, like his father before him, was a lover of nature, and studied it not merely for the sake of the living it yielded him, but because of an inherent love of plant life in its many forms. For many years in London the Bailey family conducted operations as nurserymen and seedsmen, and it was in the hope of making fresh conquests in the fields of botanic research, and of finding a larger and freer scope for his offspring, that John Bailey, in 1838, set sail for Australia with his family in the frigate "Buckinghamshire." She was the largest vessel that had ever sailed for the antipodes, her gross burthen being 1,500 tons. The vessel duly arrived in Southern waters, and on 22nd March, 1839, dropped anchor in Holdfast Bay, South Australia. John Bailey and his family set foot on the island continent full of hope as to the future. Colonel Gawler was then Governor of the Crown colony, and he nominated the new comer as Government Botanist. John Bailey accepted the position, and laid out the first botanical garden in the Southern capital. But times of stress came for South Australia, and Mr. Bailey resigned the position and established a nursery, Bailey's Gardens, as it was known, and the son Manson, now grown into manhood, took a hand in its management and control. But in the fifties there broke out the famous gold-rushes in Victoria, and young Manson Bailey, tempted by the fascinating lure of gold, threw up the garden spade to take up the miner's pick on Bendigo. Possibly he might have become a mining magnate had he not been recalled to Adelaide by the illness of his father. He resumed the old work for a time, but in 1858 resolved to go forth on a fresh quest. This time he made for New Zealand, where he took up land in the Hutt Valley, but was forced out of this fertile spot by the outbreak of the Maori war. So he set his feet towards Sydney, and after the briefest

acquaintance of New South Wales pushed on for Brisbane. He landed in the capital of Queensland in 1861, and established a seed business in a shop in Edward street, but there came a time of financial stress in the State, the shop was shut up, and the indomitable spirit of Frederick Manson Bailey had to look around for other avenues of living. Fate turned his steps in the direction of the position held by his father—that of Colonial Botanist. In 1875 a board was appointed by the Queensland Government to inquire into the causes of diseases affecting live stock and plants, and Mr. Bailey was appointed to deal with the botanical side of the problem. He took up the work with the enthusiasm and thoroughness typical of his nature, and pursuing his investigations far and wide throughout the State he contributed some valuable articles in regard to the native grasses of Queensland. He next was appointed to the charge of the botanical section of the Queensland Museum, and in 1881 was appointed to the proud position of Colonial Botanist of Queensland—a position he held and the duties of which he discharged with devotion and with benefit to the State up to the time of his death. During the years that followed his appointment as Colonial Botanist he travelled extensively throughout the State, and gained much valuable information regarding the flora of Queensland and its timber resources. The result of his researches was embodied in numerous volumes and papers, the most important of which is "The Flora of Queensland," an illustrated publication of seven volumes, dealing exhaustively with the vegetation of this fertile State. Mr. Bailey, who was recognised as a world's authority on botany, received the Clarke memorial medal, awarded by the Royal Society of New South Wales, in 1902, for researches in natural science, and fitting acknowledgment of his great services to Queensland came in 1911, when, his hair snow white with years, and his body bent by his labours, he was created C.M.G. by letters patent from the King. In reviewing a life so full of activity and so useful it may be pointed out that while paying attention to the systematic description of plants and their nomenclature he laid very great stress on their economic uses, and during the term of his official career he demonstrated the great value of native grasses, and emphasised the value of the timber resources of the State. He was a trained horticulturist, and his advice as a practical gardener, as well as a scientist, was always eagerly sought. He wrote interestingly regarding the garden plants and naturalised weeds. Another feature of his work was that he always kept his knowledge of the plant life of Queensland up to date. At one time he was indefatigable in travel in order to prosecute his research work, and in comparatively recent years he undertook a Northern tour and ascended the Bellenden Ker Range. In the official report dealing with the expedition he gave a full account of the plants of that region. He also studied plant life closely in the aspect of its medicinal value, and investigated the uses made of plants by the aborigines as food and for other purposes. As a scientific botanist he ranked high, and his information was always sought by botanists, Australian or foreign. He was not only in constant communication with the workers in this science, but prided himself on being a disciple of them—especially of the late George Bentham, the author

of the great work on Australian plants, "Flora Australiensis." Among his friends he numbered also Baron F. von Mueller, late Government Botanist of Victoria. As a worker he was tireless, and for years, after his official hours, was to be found at his desk in his own home pursuing the study of Australian plants. An illustration of his absorption in his work is found when, in the nineties, a period of retrenchment was ushered in, and Mr. Bailey's position as Colonial Botanist was abolished. Despite that fact he continued to attend his office and discharge his duties cheerfully, stating that the work must proceed whether he was paid for it or not; and there was such a protest from the public, who recognised the valuable work he was doing, that he was soon reinstated in his position with honour. By his sympathetic and genial disposition he made very close and intimate friends, and his character was such that whenever he made a friend he maintained that friendship throughout life. He had a fine memory and a splendid fund of anecdotes, his reminiscences of early life in South Australia being most interesting. He was very fond of flowers, of children, and of poetry, and his conversation was freely besprinkled with quotations from such authors as Pope, Gay, and Goldsmith. To the last he retained most of his faculties almost unimpaired, and was a fine example of an old English gentleman.

Of his writings the earliest, probably, was his "Handbook to the Ferns of Queensland," published in 1874; and among his numerous other publications were—"Synopsis of the Queensland Flora" (with three supplements), "Fern World of Australia," "Lithograms of Queensland Ferns," "Companion for Queensland Students of Plant Life," "Botany Abridged," "Notes for Guidance of Amateur Fruit Growers," "Catalogues of Plants in Brisbane Gardens," "Museum of Economic Botany," "Queensland Plants," "Queensland Woods," "Queensland Grasses," "A Sketch of the Economic Plants of Queensland," thirteen Botany Bulletins, and (in conjunction with Mr. P. R. Gordon, then Chief Inspector of Stock) "Plants Reputed Poisonous and Injurious to Stock." He also contributed monthly illustrated articles to the "Queensland Agricultural Journal," under the title of "Contributions to the Flora of Queensland and New Guinea." . . . He was a Fellow of the Linnaean Society. In 1856 he was married at Adelaide to Anna Maria, eldest daughter of the Rev. Thomas Waite, M.A., and his only son is Mr. John F. Bailey, the popular Director of the Botanic Gardens, who has inherited his father's taste for arboriculture.

We have taken the above notice of the late Mr. Bailey's life and work from the "Brisbane Courier." We may add that Mr. J. F. Bailey has now been appointed to succeed him as Colonial Botanist—a position he is in every way qualified to fill. His grandson, Mr. C. White, is also well advanced in botanical work, and as time goes on will doubtless follow in his footsteps.

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# Chemistry.

## ANALYSES OF FERTILISERS.

By J. C. BRÜNNICH, Agricultural Chemist.

Since the introduction of "*The Fertilisers Act of 1905*" it has been found that in several instances difficulties arose in the administration of the Act and its regulations, and for this reason the Act was repealed and replaced by "*The Fertilisers Act of 1914*," which came into operation on the 1st day of January, 1915.

Samples of artificial fertilisers were again collected by the inspectors under the Act, but on account of the extreme shortage of potash fertilisers the stocks of mixed fertilisers are very low, and only a comparatively small amount of fertilisers could be obtained, the **analyses** of which are given in this report.

In accordance with the Act all **dealers**, which includes all persons who manufacture, import, indent, sell, deliver, forward, or deal in fertilisers, have to be **licensed**, and have to **register** the fertilisers they deal in. During this year sixty dealers have been licensed, and a complete list of these dealers and registered fertilisers will be given in a future issue of this Journal.

Upon the sale of any fertiliser the dealer must supply the buyer with an **invoice certificate**, signed by the dealer or his agent, stating the full name and place of business of the dealer; the name, trade mark, brand, or sign used to identify such fertiliser; quantity of fertiliser or net weight; the composition of fertiliser, setting forth the respective amounts of nitrogen, phosphoric acid, and potash, and the respective form in which they occur.

To each bag or package of fertiliser must be attached a **label**, certifying to the number of net pounds of fertiliser in the package, the figure, trade mark, or other sign under which fertiliser is sold, and the chemical analysis stating the proportion per centum of nitrogen, phosphoric acid, and potash, and the form in which they occur.

A slight variation in the composition of fertilisers, from the registered standard, is allowed under the Act and the **deficiency** of the amounts of nitrogen or potash must not be more than 5 per cent. or 1/20 of the total amounts of nitrogen or potash certified to be present, and in the case of phosphoric acid, 7 per cent. of the total amount of phosphoric acid.

The samples analysed agree fairly well with the registered composition, with the exception of one sample of imported superphosphate, which is much below standard.

The Act provides for the statement of the fertilising ingredients in per centum amounts of **nitrogen** (N), **potash** ( $K_2O$ ), and **phosphoric acid** ( $P_2O_5$ ), thus avoiding the confusion of terms previously used, like : Bone phosphate, ammonia, ammonium sulphate, potassium sulphate, &c.

**Phosphoric acid** appears under four different headings—**water soluble**, **citrate soluble**, **citrate insoluble**, and **total phosphoric acid**.

In bones, and in most of the mineral or rock phosphates, the phosphoric acid exists in combination with lime, in the form of a calcium phosphate—**tricalcic phosphate**, which is insoluble in water, partly soluble in citric acid solution (particularly bone phosphate), and easily soluble in mineral acids. On account of the insolubility the action of bone and mineral phosphates is very slow, and may extend over years. The finer the bones or phosphates are crushed or powdered the quicker will be the action, and for this reason the **fineness** of the bone-meals is of importance, and has to be stated.

When strong sulphuric acid is allowed to act on tricalcic phosphate (bone phosphate), part of the lime combined with the phosphoric acid is split off, lime sulphate or gypsum being formed and the phosphoric acid is left in form of **mono calcium phosphate**, the important ingredient of **superphosphates**, which is readily soluble in water, and therefore immediately available to plant life. In superphosphates, more particularly such made from mineral phosphates, a change of the water soluble form of phosphoric acid into a less soluble form, called reduced or reverted phosphate, takes place after storing. The same would happen if superphosphates are mixed with lime or ashes, and also when applied to soils containing large amounts of lime, and a **dicalcium phosphate** is formed which is insoluble in water, but soluble in citric acid solution. Another form of lime phosphate is found in basic slag or Thomas phosphate, a **tetra calcium phosphate**, which is also insoluble in water, but soluble in saline solutions, particularly such which contain salts of citric acid. These last two compounds are, therefore, classed as citrate soluble phosphoric acid, which is fairly readily absorbed by plant roots, and comes close in its value to the water soluble phosphoric acid.

Thomas phosphates must be ground as fine as possible, and a good sample should nearly all pass through a sieve having 100 meshes to a linear inch.

**Nitrogen** is the most expensive of all fertilising ingredients of a manure, and is chiefly supplied in form of **nitrate nitrogen**, as in Chili saltpetre and in nitrate of lime, or in form of **ammonia salts**, as in ammonium sulphate, a by-product of gasworks, or in form of **organic nitrogen** as in blood, green bones, meatworks manure, &c. Nitrogen in the form of nitrate is in quick acting and readily available form, but nitrates are not retained or absorbed by the soil, and therefore liable to be washed away by heavy rains. Nitrogen in form of ammonia salts and organic nitrogen is not so readily available, as it has to be changed first into nitrates by the process of nitrification going on in the soil. Favourable conditions and lime salts are necessary

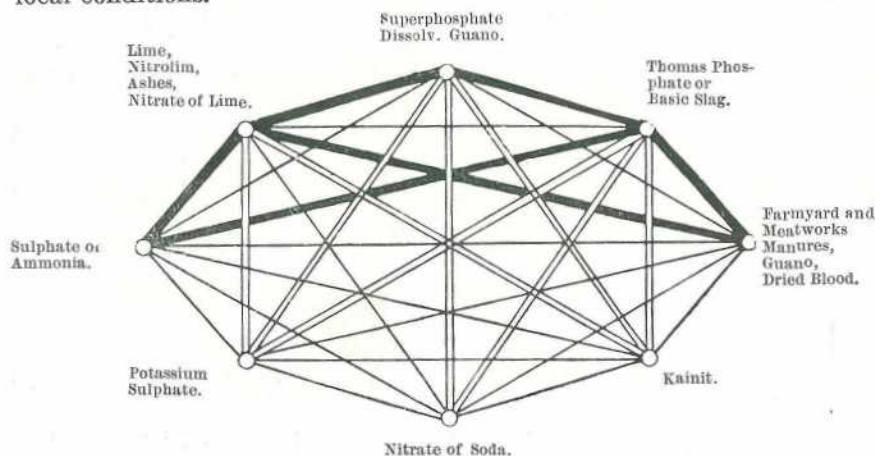
for this process, and in soils deficient in lime such manures may give poor or no results. Ammonium salts are retained and absorbed by the soil, and loss in the drainage water are not to be feared as is the case with nitrates. **Nitrolium or Cyananide**, an artificial fertiliser, actually produced from the nitrogen in the air, contains nitrogen in a form nearly as available as nitrate nitrogen.

**Potash** is generally used in the form of potassium sulphate, which at the present time cannot be obtained, as the only potash mines of commercial importance, worked so far, exist in Germany.

Attention is drawn to the analysis of ashes of various trees and plants, published at the end of fertiliser list, some of which contain fair amounts of potash, and may be utilised during the present shortage of potash fertilisers.

It is quite impossible to fix at the present day a monetary **manurial value per ton**, and therefore the usual unit values are omitted.

When **mixing fertilisers** together, such mixtures must be avoided which would lead to decomposition, which, for instance, would take place if ammonium sulphate was mixed with lime or with Thomas phosphates, superphosphate with lime; or which may cause caking, like mixing kainite with Thomas phosphate. A very simple guide for the mixing of manures is given in the accompanying diagram, devised by Dr. Geekens, which I slightly modified, however, to apply to our local conditions.



Manures joined by a heavy black line should *never be mixed* together; those connected by a double line must only be *mixed immediately before use*; and those joined by a thin single line may be safely *mixed together at any time*.

Any farmer in doubt about the quality of fertiliser purchased should at once apply to the nearest inspector under the Act, in order to let him draw a sample and submit same for analysis. All inspectors appointed under "The Diseases in Stock Act, 1896 to 1898," "The Diseases in Plants Act of 1896," or "The Dairy Produce Acts, 1904-1911," are officers under the Fertilisers Act.

ANALYSES OF FERTILISERS.

Lab. No.	Fertiliser.	Where Obtained.	Nitrogen N.	PHOSPHORIC ACID.			Potash, K <sub>2</sub> O.	Lime, CaO.	Per Cent. of Crude Ash in Wood or Plant.	Remarks.
				Water Soluble.	Citrate Soluble.	Total.				
			%	%	%	%	%	%		
<b>Superphosphates.</b>										
1412	Shirley's ... ..	Corser and Co. ... ..	...	16.10	...	...	...	...	...	
1584	Mount Lyell ... ..	Dalgety and Co., Brisbane	...	18.48	...	...	...	...	...	
1583	Shirley's ... ..	Paul and Gray ditto	...	16.98	...	...	...	...	...	
1582	Mount Lyell No. 1 ... ..	Charles Taylor ditto	...	19.05	...	...	...	...	...	
1580	Hassell's ... ..	Webster and Co. ditto	...	13.72	...	...	...	...	...	Under standard.
1605	Hassell's (2nd sample) ... ..	Ditto ditto	...	11.83	...	...	...	...	...	" "
1581	L. Gross and Sons ... ..	Ditto ditto	...	17.43	...	...	...	...	...	
<b>Bone, Meatworks Manure.</b>										
1586	Fertiliser ... ..	Baynes Bros. ... ..	...	4.98	...	18.40	...	...	...	
1409	Bone Dust ... ..	H. Baxter ... ..	...	3.55	...	22.93	...	...	...	
1576	Bone Dust, "Runcorn" ... ..	Dalgety and Co. ... ..	...	3.70	...	23.55	...	...	...	
1432	Bone Dust ... ..	J. W. Pohlman ... ..	...	3.61	...	27.62	...	...	...	
1350	Bonemeal, "Wattle Brand" ... ..	Walsh and Co. ... ..	...	3.22	...	26.40	...	...	...	
1577	Bonemeal ... ..	T. H. Wood ... ..	...	4.14	...	23.40	...	...	...	
<b>Mixed Fertilisers.</b>										
1411	Shirley's No. 3 ... ..	Corser and Co. ... ..	...	3.42	14.21	...	1.93	...	...	
1413	Ditto No. 5 ... ..	Ditto ... ..	...	3.27	12.20	...	5.53	...	...	
1414	Ditto No. 9 ... ..	Ditto ... ..	...	3.85	5.38	...	5.49	3.77	...	
1415	Ditto No. 11 ... ..	Ditto ... ..	...	...	9.85	...	10.40	7.91	...	
1410	Ditto No. 777 ... ..	Ditto ... ..	...	7.20	6.52	...	6.85	6.70	...	
1590	Ditto No. OR ... ..	Paul and Gray, Brisbane	...	2.24	...	8.60	17.19	6.36	...	
1592	Ditto No. 3 ... ..	Ditto ditto ... ..	...	3.55	12.40	...	12.90	1.79	...	
1591	Ditto No. 14 ... ..	Ditto ditto ... ..	...	2.41	5.01	...	16.45	5.93	...	
1589	Ditto No. 3 ... ..	Charles Taylor, Brisbane	...	3.68	11.88	...	...	2.06	...	
1588	Ditto No. 5 ... ..	Ditto ditto ... ..	...	3.32	11.90	...	...	5.67	...	
1351	Ditto No. 9 ... ..	Walsh and Co. ... ..	...	4.09	4.89	...	5.35	3.95	...	

## Simple Fertilisers.

1492	Sulphate of Ammonia ... ..	Brisbane Gas Company ... ..	20.98	...	...	...	...	...	...
1585	Nitrolim ... ..	Trackson Bros., Brisbane ... ..	19.12	...	...	...	...	...	...
1587	Sulphate of Potash ... ..	Webster and Co. ditto ... ..	...	...	...	52.50	...	...	...

## Wood and Plant Ashes.

Red Gum ... ..	...	...	...	...	...	38	4.17	...	...
Spotted Gum ... ..	...	...	...	...	...	10	70	...	...
Bloodwood ... ..	...	...	...	...	...	27	5.25	8.47	...
Ironbark ... ..	...	...	...	...	...	82	1.53	...	...
Blackbutt ... ..	...	...	...	...	...	04	2.02	7.27	...
Boxwood ... ..	...	...	...	...	...	87	1.85	...	...
Belar ... ..	...	...	...	...	...	02	4.95	49.10	...
Gidyea ... ..	...	...	...	...	...	90	1.10	48.70	...
Brigalow ... ..	...	...	...	...	...	...	.89	54.40	...
Bottle Tree ... ..	...	...	...	...	...	24	29.02	23.48	...
Apple Tree ... ..	...	...	...	...	...	34	4.45	29.85	...
Cedar ... ..	Works Department ... ..	...	...	...	...	71	71	48.50	1.00
Pine ... ..	Ditto ... ..	...	...	...	...	89	9.97	38.05	.82
Oregon Pine ... ..	Ditto ... ..	...	...	...	...	50	1.31	29.12	.77
Hardwood ... ..	Ditto ... ..	...	...	...	...	60	1.90	29.33	.31
Nettlewood ... ..	G. Matthews, Crow's Nest ... ..	...	...	...	...	4.14	6.46	28.05	3.36
Blue Mangrove... ..	A. F. Cutlock, Sandgate ... ..	...	...	...	...	2.52	2.14	16.72	...
Black Mangrove ... ..	E. Raage, Cairns ... ..	...	...	...	...	.56	1.34	35.88	...
Mangrove ( <i>Cerriops candoleana</i> ) ... ..	Ditto ditto ... ..	...	...	...	...	.76	3.28	36.80	...
Mangrove, twigs and leaves ... ..	A. F. Cutlock, Sandgate ... ..	...	...	...	...	2.12	4.42	12.30	...
Stinking Roger ... ..	G. Matthews, Crows Nest ... ..	...	...	...	...	15.81	20.00	27.18	2.62
Lantana ... ..	...	...	...	...	...	3.57	13.96	16.95	...
Lantana, twigs and leaves ... ..	A. J. Cutlock, Sandgate ... ..	...	...	...	...	3.50	11.78	11.52	...
Banana plant ... ..	...	...	...	...	...	1.48	36.64	21.32	...
Sisal Hemp ... ..	...	...	...	...	...	4.60	8.00	31.86	...
Pineapple plant ... ..	...	...	...	...	...	5.88	15.02	7.20	...
Cane tops ... ..	...	...	...	...	...	4.90	6.49	4.78	...
Cane trash ... ..	...	...	...	...	...	3.20	4.90	4.00	...
Prickly-pear ... ..	Dr. J. White, Dulacca ... ..	...	...	...	...	.48	9.48	19.92	...

From 1.2 to 2.6 in green plant.

# Entomology.

## REPORT OF MR. E. JARVIS

(Entomologist to the 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:—

With reference to work of a technical nature recently instituted at Gordonvale laboratory, I wish to state that during the past nine months a number of pinned and mounted specimens of insect pests associated with sugar-cane have been collected in this district, comprising 1,056 specimens, representing 425 distinct species. Forty-nine of these are more or less injurious to cane and 34 beneficial, while the remainder comprise miscellaneous species either closely related to the foregoing or incidentally associated with them. The work of rearing and studying the metamorphosis of scarabæidæ affecting cane is being continued, and experiments have been commenced with a view of acquiring information respecting parasitism in this connection.

Referring to the question of useful insects—a matter not hitherto dealt with in these reports—I may mention that the larval form of an eminently predaceous beetle belonging to the family *Elatæridæ* has been under continuous observation at the laboratory since November last. This elaterid is extremely voracious, attacking both adult and grub forms of our cane beetles. It occurs sparingly in volcanic and sandy soils around Gordonvale, and in general appearance is not unlike a very large but flattened “wire worm” with highly polished dark-yellowish-brown body and formidable sickle-shaped jaws.

A specimen collected on 6th November, 1914, killed and devoured no less than 126 large cane grubs and four grey-back beetles during a period of seven months, and is still (4th June) in the larval stage and as greedy as ever.

When first caught, it measured about  $2\frac{3}{4}$  in. in length, so had doubtless previously accounted for numerous grubs, but growth has been slow during confinement, in spite of so liberal an allowance of food, and the larva is now  $3\frac{1}{2}$  in. long. Additional smaller specimens were collected on 16th November, 1914, and up to the present two of these have between them killed and consumed 206 cane-grubs and a few adult albohirta.

I was fortunate in observing one in the act of eating a cane-beetle that had been placed in its breeding cage. About one-third of the larva was literally buried out of sight in the body of its unfortunate victim, whose neck had been entirely severed to enable the elaterid to push its head through the thorax into the abdomen for the purpose of imbibing its succulent contents. The record of mortality mentioned above was attained by larvæ confined at close quarters with their prey, in cages holding 54 cubic inches of soil. Under normal conditions, however, they would be compelled to hunt for grubs by tunnelling through the ground and might at times have to traverse several feet before locating one; so that, normally, the percentage of grubs destroyed would necessarily be much lower than this, and would also vary in different districts according to the degree of infestation. In localities such as "Green Hills," where soil conditions are congenial and grubs frequently occur in excessive numbers, this predator should be perfectly at home and capable of doing great execution. Field observations have not yet been undertaken, so that I am unable to speak definitely regarding the possibilities of augmenting its sphere of usefulness by artificial means; but apart from economic considerations, consider that the breeding and ultimate identification of this interesting beetle will prove of scientific value.

Mr. R. Illidge, of Brisbane, an authority on the habits of our coleoptera and other insects, informed me that four species of arboreal *Elateridæ*, belonging to genus *Alaus*, are predatory on various large wood-boring beetles. He has frequently observed larvæ of *Alaus gigas* inhabiting tunnels of its host (*Batocera* sp.) and attacking grubs, pupæ, and even newly emerged imagines of this beetle.

I may mention, too, that a predaceous elaterid (*Pyrophorus luminosus* Ill.) destroys grubs of "May Beetles" (*Lachnosterna*) in the cane fields of Porto Rico.

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### COMBATING THE GRUB PEST AT CHILDERS.

The General Superintendent of the Bureau of Sugar Experiment Stations has received the following interesting report from Mr. H. Epps, secretary of the Shire Council, at Childers, with reference to the grub pest:—

"Following on the failure of voluntary action in the endeavour to combat the ravages of the cane-grub, and consequent upon a poll taken to ascertain the views of the ratepayers on the matter, my Council undertook to levy a rate upon the whole of the cane-growing areas within Divisions Nos. 2 and 3, but excluding the Goodwood areas as being too remote and but little if any affected. Such rate was to be

utilised as a fund for the destruction of the pest either as a grub or beetle or in any other way calculated to attain the object sought, the fund to be administered on the recommendations of an advisory board representative of the several interests concerned, who had no executive powers outside those permitted by the Council from time to time.

“The fund raised by the way of rates was further augmented by endowment from the several mills to whom cane was supplied at the rate of 50 per cent. of the rates paid by the contractor to the particular mill, the total sum so raised being further endowed by the Department of Agriculture at the rate of a further 50 per cent.

“The procedure so far adopted for dealing with the pest is as follows:—

“*Receivers.*—Cane-growers were appointed in suitable districts whose duty it was to receive from collectors the grubs or beetles delivered, and after measuring and destroying same to hand to the collector a voucher entitling him to payment on the basis authorised by the board from time to time, on presentation at the office of the local authority on specified dates.

“The particulars as to the origin of the pests so collected have been duly recorded, and it is anticipated will in time lead to the compilation of sufficient data as to the incidence of this pest, and so have some value in the work of combating the pest in future years.

“One factor already appears to be conclusively established, and appears to indicate most clearly the permanent value attaching to systematic collection of the beetle of the pest. Early in 1896 a ‘beetle board’ was formed in the Isis, which operated only over an area to the south-east of Childers, and which paid for the collection of beetles only. Operations continued until about 1909, and then languished, ceasing altogether in 1910.

“Following on the compilation of data referred to above, it is now demonstrated that only a very small—indeed, almost negligible—quantity of grubs or beetles are being received from this area as against the numbers from areas not previously dealt with in this way. A further illustration of this arises in connection with a large estate in the district. I am advised that the picking of the grub from this property has never been carried out, but very large expenditures have been incurred in treating with various deterrents, notably carbon bisulphide, moth ball, &c., notwithstanding which the fields presented a very bad appearance, and within the last three months about £100 has been paid out for grubs collected from this property; practically as much as has been paid for pests over the whole of the Isis for the year. It is, of course, not safe to dogmatise on a matter of this sort, but the facts so far seem to emphasise the permanent value attaching to sustained effort along the lines hitherto pursued, pending the discovery of more efficacious methods. This is the more important from the fact that not the least of the difficulties encountered in dealing with the grub pest arise from the impossibility of demonstrating tangible results from the action taken.”

## General Notes.

### A POSSIBLE QUEENSLAND INDUSTRY.

#### EUCALYPTUS OIL.

Through the courtesy of the Curator of the Technological Museum, Sydney, the Department of Agriculture and Stock has received the following information on the extraction of eucalyptus oils:—

“ The cost of a plant for extracting eucalyptus oil varies greatly according to the method adopted. A common plant much in use in New South Wales is to use two 400-gallon iron ships' tanks, the condensing being done in a long pipe laid in the bed of a creek. If sufficiently long, the condensation is perfect. Such a plant would cost about £25. If a boiler is used to supply steam, and larger digesters are employed, then the cost would be proportionately greater; in fact, a large plant might run into a considerable amount. This expenditure would only be warranted if the supply of the material were considerable.

“ The wholesale value of the oil varies with its constituents, and many classes of oil are obtainable from the eucalypts. The common peppermint oil used for the separation of metallic sulphides is worth about 6d. per lb. at the stills. The eucalyptus oils (those rich in eucalyptol, and not containing phellandrene), and used for pharmaceutical purposes, are worth about 1s. per lb. at the still; the Geranyl acetate oils, 10s. to 12s. per lb.; and the other kinds at various prices. Since the war, the demand for eucalyptus oils has fallen off. There should be a great demand for certain kinds of eucalyptus oils, and this will eventually be the case. The profit is largely governed by the law of supply and demand. The cost of production is made up by cutting the leaves (an expensive item where labour is dear), carting to the still, fitting up the still, and leaves and firing.

“ No particular skill is required to distil the oil, but it is necessary to know what material is obtainable from the species to be worked. Although it is now well known that each particular species yields an oil fairly constant in character, yet the products of species vary so much between themselves, and the yields of oil are so variable, that it is desirable to determine the species before work is done on it. The oils of about 160 species of eucalypts have been determined here, so that the data are somewhat complete, and any advice is willingly given here (Technological Museum, Sydney) to those who purpose embarking in the industry.”

#### TO MAKE SOAP.

1. Dissolve 2 lb. of caustic soda (98 per cent.) in about 7 pints of water. Heat to boiling point, and add 12 lb. fat and 3 lb. resin together. Keep boiling until dissolved.

2. The first advice is, not to try and make a caustic lye from ashes and lime, but get reliable caustic soda. Greenbank's 98 per cent. is the

right thing. Next, get a Beaume densometer to test the strength of the lye. Take 30 lb. of pure tallow, 10 lb. resin, and about  $4\frac{1}{2}$  lb. of caustic soda (98 per cent.); powder the resin finely, then melt the tallow, and while this is hot stir in the resin until it is melted and well mixed. Dissolve the caustic soda in about 3 gallons of water, making the lye to test 30 degrees Beaume. While the fat and resin are in a hot, melted condition, pour in the lye and keep the mixture stirred, and at a temperature of 180 degrees Fahr., or a little below boiling, for two hours, testing the soap from time to time on the tongue. If all trace of alkali (caustic) disappears, add more lye until the soap, when applied to the tongue, gives a slight biting sensation. If the alkali is too pronounced, add more tallow and stir well to insure perfect mixing. A good newly boiled soap should bite the tongue about as sharply as vinegar; but, as it is kept and matures, this, to a certain extent, passes away.

### TO MAKE BLACK PUDDING.

The pig's blood, when fresh caught, must be seasoned with salt and well stirred until quite cold, or it will congeal. Put a quart of grits or groats to soak in each quart of blood one night. Moisten the crumbs of a quartern loaf in rather more than 2 quarts of new milk made hot. Have ready the skins to be filled, perfectly clean. Chop finely a sprig of savory, one of thyme, and one of marjoram. Season with pepper, salt, a few cloves, some allspice, a mite of ginger, and a nutmeg grated. Mix with 3 lb. chopped suet, six eggs beaten and strained, the bread and milk being well beaten, and lastly the groats which were soaked in the blood. When all is well mixed and ready, cut into some dice-shaped pieces some hog's lard. As you fill the skins, drop this in, about every 2 in. Tie in links only half full, and boil them in a large kettle, occasionally pricking them with a fine skewer as they boil, or they will burst before being half-cooked. When boiled, lay them upon straw till cold, then hang them in bags in the kitchen. When wanted, scald them and put them before the fire in a Dutch oven. Some cooks boil the groats in the milk until swelled; then they add more milk when mixing. Leeks are sometimes very finely shredded and added to the other ingredients.

### PRICKLY-PEAR BUREAU.

A few years ago this department purchased a B. and H. pear-burner from the Pearsall Mercantile Company, Pearsall, Texas, U.S.A. There is no agent in Queensland for the burners in question, but they could then be landed in Brisbane at a cost of about £4 12s. The cost may, at the present, be somewhat increased. Gasoline for use in the burners is obtainable from the Vacuum Oil Company, Brisbane, at about 2s. 6d. per gallon, in drums containing  $3\frac{1}{3}$  gallons.

The gasoline is put into a small tank strongly made of brass and riveted. There is a cast brass head onto which all fittings are screwed. These tanks are tested to 100 lb. to the square inch, and have a small pump attached, like that on a Primus stove, for keeping the pressure

on the burner at about 15 lb. to the square inch. The tank is slung over the right shoulder of a man, lying under his left arm. There is a brass pipe, about 6 ft. long, connected with the tank on a double joint, on the end of which is the burner. In burning pear, the man brings the tank under his arm, takes the pipe in his right hand, and, working the pump, puts the pressure on the burner and lights it. He then moves about the pear, pressing the flame from the burner in and around the leaves of the pear. This he can do without coming in contact with the thorns himself. The tank is filled two-thirds full of gasoline.

The Pearsall Company states that, in the United States, a man provided fodder for 375 head of stock for ninety days with one burner.

The manager of the State Farm, Bungeworgarai, Roma, who used this burner, advises that it does the work claimed for it in an efficient manner when it is properly used. It is quicker and more effective than ordinary fire-scorching, and should prove of great value to persons desirous of feeding pigs on pear, or converting it into silage. He remarked, however, that the cattle would not eat the pear so treated.

#### **POTASH FROM MANGROVE TREES.**

Mr. J. C. Brünnich, Agricultural Chemist, states that the best samples of mangrove ash (leaves and twigs) would be worth about £2 per ton, with commercial potash at £14 per ton, and that at the present time the value would be nearly treble.

#### **BANANA STALKS AS PIG FOOD.**

The Agricultural Chemist states that if the stalks are chopped up into short lengths, and mixed with pollard, they will prove a useful pig feed. Some time ago, when staying at one of the orchards at Mapleton, Blackall Range, we noted that the horses were almost exclusively fed on chopped banana stems, and the animals were in splendid condition.

#### **TO DESTROY ALGÆ IN BORE WATER.**

A measured quantity of Portland cement mixed with a sufficient quantity of boiled linseed oil, to the consistency of thick paint, applied with a brush upon the surface of the iron. The paint should be properly laid on in two even coats. Twenty-four hours should be allowed to intervene between the first and second coats.

#### **"FORD" CARS.**

The advent of the petrol engine denotes a new era in the ramification of farm life. Hitherto farm work in all its branches was performed either by manual labour or horse traction. Now, however, the petrol engine has superseded this "old-time" method, and is used from ploughing down to cream separating; and the "one-time" cart has now given place to the motor lorry, whilst the family buggy has been put aside for the touring car. The "Ford" car, which is familiarly known throughout the world, is expressly suitable for farm use owing to its simplicity

of control, its abundance of power, and proved economy; whilst the extraordinarily low price is an added attraction, coupled with the fact that the "Ford" car is the only car that does not undergo an annual alteration, and consequently spare parts can be always obtained no matter how old the car might become. This to a country owner is a most important feature. As an indication of the manner in which "Ford" cars are being sold in Queensland, the Queensland Motor Agency, Limited, of Brisbane, who are agents for the "Ford," inform us that for the six months of the present year they have sold no less than 420 cars, which they claim to represent half of the total cars sold in Queensland.

## Statistics.

### RAINFALL IN THE AGRICULTURAL DISTRICTS.

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

Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.		Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.	
	June.	No. of Years' Records.	June. 1915.	June. 1914.		June.	No. of Years' Records.	June. 1915.	June. 1914.
<i>North Coast.</i>					<i>South Coast—continued:</i>				
	In.		In.				In.	In.	
Atherton ...	1.94	13	0.61	1.68	Nanango ...	1.96	27	0.26	3.25
Cairns ...	2.42	27	2.16	2.79	Rockhampton ...	2.08	27	Nil	5.33
Cardwell ...	1.75	27	1.19	3.75	Woodford ...	2.72	27	0.20	5.01
Cooktown ...	2.02	27	2.06	7.21	Yandina ...	3.89	21	0.34	9.33
Herberton ...	1.02	27	0.66	2.13					
Ingham ...	2.34	22	0.32	9.06	<i>Darling Downs.</i>				
Innisfail ...	6.60	27	6.35	8.45	Dalby ...	1.64	27	0.34	2.55
Mossman ...	3.46	5	0.60	3.50	Emu Vale ...	1.32	17	0.42	1.66
Townsville ...	1.45	30	0.02	4.55	Jimbour ...	1.49	24	0.27	2.03
					Miles ...	1.94	27	0.22	2.91
<i>Central Coast.</i>					Stanthorpe ...	1.92	27	0.91	2.03
Ayr ...	1.45	27	Nil	2.57	Toowoomba ...	2.24	27	0.67	3.32
Bowen ...	1.76	27	0.20	4.75	Warwick ...	1.69	27	0.67	2.15
Charters Towers ...	1.45	27	Nil	2.92					
Mackay ...	2.57	27	0.56	9.17	<i>Maranoa.</i>				
Proserpine ...	3.81	11	1.50	12.55	Roma ...	1.84	25	0.15	2.36
St. Lawrence ...	2.33	27	0.11	7.09					
<i>South Coast.</i>					<i>State Farms, &amp;c.</i>				
Biggenden ...	1.91	14	0.47	2.86	Gatton College ...	1.53	14	0.05	3.01
Bundaberg ...	2.87	27	0.58	2.89	Gindie ...	1.50	13	Nil	3.44
Brisbane ...	2.66	64	1.44	4.00	Kamerunga Nurs'y	2.85	23	1.99	2.80
Childers ...	2.36	19	0.26	4.53	Kairi ...	1.27	3	1.15	1.66
Crohamhurst ...	4.29	22	0.78	8.81	Sugar Experiment				
Esk ...	2.02	27	0.65	4.12	Station, Mackay	2.20	16	0.42	8.98
Gayndah ...	1.70	27	1.47	2.61	Bungeworgorai ...	1.71	3	0.03	2.38
Gympie ...	2.37	27	0.29	5.58	Warren ...	2.68	3	Nil	1.54
Glasshouse M'tains	4.68	6	0.23	7.85	Hermitage ...	2.01	7	0.40	2.34
Kilkivan ...	1.90	27	Nil	3.53					
Maryborough ...	2.87	27	0.82	6.44					

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

## Answers to Correspondents.

### FATTENING SHEEP.

J. W. EVANS, Rosewood—

Question.—I was thinking of fattening some sheep. What is a fair price to pay?

Mr. W. G. Brown, Instructor in Sheep and Wool, replies:—

“1. The price, as a rule, is governed by conditions. At present many sheepowners in the West are very short of feed, and consequently their spare stock is on the market at any decent price they can secure. At present you may buy good wethers in store condition at from 6s. to 8s. off shears; 6d. to 7d. per month may be added for wool grown since shearing.

“2. How long will they take to fatten on lucerne? On lucerne sheep should fatten in from four to five weeks if the supply of feed is kept up to them.

“3. From six to seven sheep can be fattened per acre easily at this time of the year (May).

“4. I recommend crossbreds if you can get them, and buy with good fresh mouths. Merinos will fatten, but more slowly. My quotation above is for Merinos.”

### COCHINEAL.

“COCHINEAL,” Gayndah—

Cochineal is used for dyeing purposes, producing a beautiful scarlet colour. In medicine it is only employed to give a pleasant tint to other preparations. It is imported from Mexico, the West Indies (particularly Jamaica), the Canary Islands, the United States, and Guatemala. More than 1,500,000 lb. have been brought annually to Europe. Some idea may be formed of the vast number of these creatures from the fact that each pound is supposed to contain 70,000 insects. It is a mistake to suppose that the insect will live on any variety of prickly-pear. Its principal food is the nopal plant, *Opuntia coccinellifera*. There are two principal varieties—silver cochineal, which has a greyish-red colour, the furrows of the body covered with a white bloom or fine down; and black cochineal, which is of a dark reddish-brown, and destitute of bloom. The former is of the most value. The male insect is winged, but the female is wingless, and when fully grown is about the size of a barleycorn, weighing about one-tenth of a grain. It is the dried body of the female which forms the cochineal of commerce. The insects are gathered about three times a year, when they are carefully brushed from the cactus leaves into bags, and are then killed by immersion in hot water, or by exposure to sun, steam, or the heat of an oven, losing by this process about two-thirds of their weight. The dried insects have been known to keep undecayed for sixty and even a hundred

years. The average price used to be from 6s. to 9s. per lb. We cannot say what the present price is. Probably aniline dyes have largely replaced the insect product.

The cochineal insect has been brought to Queensland and sent to that part of the State where a species of cactus is found on which it thrives. Write to Dr. Jean White Hanify, Experiment Station, Dulacca, or to the Under Secretary, Department of Public Lands, for information.

### PRUNING CUSTARD APPLES.

“PRUNING,” Cleveland—

Mr. C. Ross, F.R.H.S., Instructor in Fruit Culture, gives the following advice:—

“Nearly all trees of the custard apple family have a spreading or pendulous habit, and the lower branches will soon sweep the ground if allowed to do so. It is necessary that the superstructure of the tree be established on a fairly high stem—*i.e.*, the framework of the main limbs should start at a point not less than 3 ft. from the ground. The method of pruning found most satisfactory is as follows:—

“Lift the head of the tree by cutting away all the portions of the under branches within 12 in. or 18 in. of the ground. As the higher branches continue their downward tendency, this will be an annual operation. Be careful not to thin out the head of the tree too much, as the habit of growth provides for sufficient light and air; but, as the fruit is borne on the old wood, a modified system of long spur pruning is advisable. Side shoots, laterals, and some of the strong leaders may be shortened back to one-half or two-thirds of their length. It should be remembered that severe top pruning produces more wood and less fruit. Judicious pruning is always beneficial, but be more sparing with the knife on extra vigorous trees.”

### DRIFT SAND IN WELL-SINKING.

A correspondent writes that, in sinking a well, a layer of fine sand to a depth of 7 ft. or 8 ft. was met with at a depth of 20 ft., making it very difficult to continue sinking. Mr. A. Morry, Departmental Surveyor, in reply, states:—

“What is undoubtedly required is an iron cylinder in two sections of about 4 ft. each long. These would, however, be difficult to handle owing to their great weight. Wood cylinders about 1½ in. thick could be made to answer the purpose if constructed of silky oak or some other hardwood, and well tarred before fixing in position. This would last a long time. The cylinders should fit well together, or sand will flow constantly into the interior. Any cooper would soon put them together. If a good water supply is obtained, it may be worth while putting a concrete lining from the bottom to a point above the sand drift, which would be a permanent job. In putting down the cylinders, care must be taken to keep them perpendicular, or they will collapse.”

[A similar case occurred on a sugar plantation ("Ormeau," Pimpama) in 1869. A well was being sunk to obtain a supply of water for the mill. A stratum of fine drift mud, at a depth of 18 ft., prevented further sinking. An engineer who happened to be staying at the plantation advised the same course as the above. The cylinders were made of silky oak, the joints being treated with "chunam" (tar and ashes). Five years later the wooden casing, 2 in. thick, was in a perfectly sound condition.—Ed. "Q.A.J."]

### DRENCH FOR SHEEP.

"L.M.C.," Kia Ora, Baking Board—

In reply to a question as to the best drench for sheep with worms, Mr. W. G. Brown, Instructor in Sheep and Wool, advises:—

"The best drench I know is the arsenical, the composition of which is—2 oz. arsenic, 6 lb. Epsom salts, and 5 gallons of water. Take a 5-gallon oil-drum, and put about 2½ gallons of water in it, and place upon a fire. When the water is boiling add the arsenic and Epsom salts; boil them for three-quarters of an hour, stirring occasionally; then add water to the mixture to make 5 gallons. The drench is then fit for use.

"Dose.—2 oz. (fluid) for sheep over 18 months, 1½ oz. for sheep under 18 months, and 1 oz. for lambs up to 6 months.

"Young lambs sucking their mothers up to two months do not require drenching."

### A PLANT POISONOUS TO SHEEP.

J. E. MARKEY, Yandilla—

The plant forwarded by you, which you believe to be responsible for heavy mortality amongst your sheep, is stated by Mr. F. M. Bailey, Colonial Botanist, to belong to *Euphorbia Drummundi*, and is commonly looked upon in Queensland as poisonous to sheep. In Bailey and Gordon's book, "Plants Reputed Poisonous to Stock," appears the following:—

"This weed is unquestionably poisonous to sheep, but when in a dry state seems to be comparatively, if not entirely, innocuous. It has been observed when eaten by sheep in the early morning, before the heat of the sun has dried it up, it is almost certain to be fatal. It is seldom eaten to excess except by travelling sheep, and when grass is scarce."

### CITRUS TREES SUITABLE FOR THE BURNETT DISTRICT.

Mr. C. Ross, Instructor in Fruit Culture, in reply to a correspondent who proposes to establish a vineyard and citrus orchard on a frontage to the Burnett River, on the Gayndah Line, and asks for information as to the best variety of citrus fruits for bearing, packing, and export, recommends the following varieties:—

Orange: Navel, Jaffa, Valencia, and Mediterranean Sweet.

Mandarin: Beauty of Glen Retreat, Emperor, and Scarlet.

Lemons: Villa Franca, Lisbon, and Messina.

Any of the Brisbane nurserymen should be able to supply.

### **COLLAR ROT OF CITRUS TREES.**

F. GORE JONES, Mount Mee—

From your description, I believe your lemon trees are attacked by a disease called mal-de-goma, or collar rot. This may result from bad drainage, or a small borer may have set up the gumming. Clear away the soil and loose bark from the stem and upper roots. Carefully examine for borers, and probe any orifices with a wire, and stop with hard soap. Cut away decayed wood and gumming bark with a very sharp knife, and dab the wounds with coal tar or dilute carbolic acid. If the subsoil is clayey, it should be drained at once. Deep planting often causes the disease; also organic manures near the stem.

### **OATS IN THE TOLGA DISTRICT.**

In reply to a correspondent at Tolga, as to the advisability of planting oats at Tolga, Mr. Quodling, Agricultural Inspector, states that oats in that district are susceptible to rust, and if the season is at all favourable for raising a hay crop during the winter months, canary seed is to be preferred. The plant is unaffected by rust, and has proved invaluable as a hay crop in the Rockhampton district, at the Warren State Farm; 14 lb. of seed is sufficient for an acre of ground, if drilled. When broadcasted, use from 20 to 24 lb. of seed. Late April and May are seasonable periods to plant.

### **PRICE OF WHEAT PER QUARTER.**

"WHEAT-GROWER," Warwick—

The price of wheat in the home markets is generally given at per quarter. The same with oats and often with maize. Suppose oats (40 lb. per bushel) are quoted at 16s. per quarter. A quarter is 8 bushels. Divide by 8 and you have the price per bushel—2s. If you wish to reduce the price per quarter to price per ton, in the case of oats at 16s. per quarter, multiply the price by 7 and you have 112s. = £5 12s. per ton. Or, again, maize (60 lb. per bushel) at 17s. per quarter, multiply the price by 4.66 which gives £4 per ton. Or wheat at 62 lb. per bushel, multiply the price per quarter by 4.51—price per quarter, 60s.; per ton, 270s. = £13 10s.

### **FEEDING COWS WITH WASTE ORANGES.**

The utilisation of waste oranges for feeding milking cows has been proved, by experiments at the Roma State Farm, to be valueless. Waste citrus fruits were fed to some cows, and the effect was most pronounced, not only in the flavour of the milk, but in that of the cream and butter. The taint was so strong that all the products mentioned were almost unsuitable for human use. However, there is no reason why the oranges should not be used when feed is scarce. We have no analysis of oranges to show their value for food for stock in this way, but no doubt they will assist in maintaining the animals in a more satisfactory condition.

### PECAN NUTS AND GRAPES.

S. ROWE, Nagoorin, Gladstone—

“In reply to your inquiries,” writes Mr. C. Ross, Instructor in Fruit Culture, “seeds of Pecan nuts can be had from Mr. Pentecost, Helidon. The varieties of grapes recommended are—Syrian, Royal Ascot, Snow’s Muscat, Gros Colman, Black Hamburg, Wilder Goethe, Iona, and Chasselas; also a few Isabella, useful for jam.”

### STARTING AN ORCHARD.

W. RUSSELL, Cloncurry—

Mr. C. Ross, Instructor in Fruit Culture, advises beginning with worked trees. Seedlings are constitutionally hardier and grow to a larger size, but they do not become profitable for many years after named varieties. They are very serviceable, however, if planted as a breakwind on the outer rows of an orchard. For a large plantation it is advisable to plant such varieties as will succeed each other for marketing, rather than one variety to come in at once.

The following is a good selection:—Oranges: White Siletta, Babina, Jaffa, Joppa, and Late Valencia. Mandarins: Beauty of Glen Retreat, Emperor, and Scarlet.

### TREATING A FISTULA.

A correspondent writes that he has a horse with a fistula on the withers, giving off a matterly discharge from a deep hole on the top of it, and asks for a cure. Mr. McGowen, Government Veterinary Surgeon, advises as follows:—

“A case such as this requires an operation to be performed, which should only be done by a qualified veterinary surgeon; but, in the meantime, it would be advisable to inject into the sinuses from which the matter is discharging, morning and evening, the following solution by means of a glass syringe:—Bichloride of mercury, 1 dr.; water, 10 oz. A 1-oz. syringe, which contains one dose, should be used.”

### COWS CHEWING BONES.

W. KIRK, Wetheron—

Mr. Kirk asks the cause of and remedy for his cattle dying, apparently owing to their going lame, after chewing bones, mostly in the shoulder. When examined after death, the bones appeared to be decayed in the joints. The matter was referred to a veterinary surgeon of the Stock Department, who says—

“The animals are suffering from a disease known as osteomalacia, or soft bone, caused by a deficiency of lime in the soil. I would advise Mr. Kirk to put his animals onto the lick recommended by this Department, which is as follows:—Bonemeal, 1 lb.; carbonate of iron, 4 oz.; gentian, 4 oz.; common salt, 8 oz.; fenugreek, 4 oz. Mix thoroughly, and give one tablespoonful to each animal three times daily in food. This mixture can be had from any wholesale chemist.”

### ANALYSIS OF PRICKLY-PEAR.

Mr. J. C. Brännich, Agricultural Chemist, gives the analysis of the prickly-pear as follows:—"100 lb. of prickly-pear (average quality) contains  $\frac{1}{2}$  of proteids,  $5\frac{1}{2}$  lb. of carbohydrates, 1 lb. of fibre, and  $\frac{1}{10}$  lb. of fat (all digestible constituents). A cow should consume from 40 to 80 lb. of the prepared sliced pear daily, and will require some roughage like bush hay, or wheat straw, and some food rich in proteids, like oilcake or cotton-seed meal, in addition."

### MIXING ARSENIC AND CAUSTIC SODA.

A correspondent asks whether it is necessary to boil arsenic and caustic soda in order to dissolve it. A mixture of these ingredients showed a deposit next day, and he asks if this deposit is an adulterant or really arsenic.

Mr. J. C. Brännich, Agricultural Chemist, to whom the question was referred, advises as follows:—"A mixture of arsenic and caustic soda does not require boiling. It is best to mix the dry arsenic and caustic soda intimately, and add water slowly. Any residue left is generally sand or other impurity. None of the commercial arsenic contains, as a rule, more than 90 to 94 per cent. of arsenious acid, which is a good purity for a commercial raw product."

### LE HUGUENOT AND CRETAN WHEATS.

These are both macaroni wheats, and, although the grain of each could be milled, the resulting flour would be dark and not suitable unless blended with a large percentage of flour made from bread wheats. Le Huguenot is a bald wheat which resembles "Bald Medeah." It is an excellent variety for growing in coastal situations for green feed, for silage crops, and for hay. If a satisfactory grain crop is obtained, such could be used for macaroni making, or as a feed for poultry and stock. This variety is a fair rust and smut resister.

Cretan is a bearded wheat, the grain of which can be used similarly to the above. It is also a good wheat for green feed and for silage purposes, but the presence of the "beard" makes it unsatisfactory as a hay crop. This variety possesses excellent rust-resisting qualities.

### SOLID GROUND WHEN EXCAVATED.

A correspondent asks: How many cubic yards of loose muck (placed in a bank) are produced from 1 cubic yard of solid ground, say, hard clay, picked or ploughed? The question was submitted to Mr. A. Morry, surveyor to this Department, who advises as follows:—

"Solid ground, such as hard clay, will increase in bulk when excavated, so that one cubic yard will then be equal to  $1\frac{3}{4}$  cubic yards. Rock, when excavated, will double itself—that is, 1 yard cube will then be equal to 2 yards."

# The Markets.

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

Article.		JULY.
		Prices.
Bacon	lb.	8½d. to 10½d.
Bran	ton	£10 10s.
Butter	ewt.	215s.
Chaff, Mixed	ton	£10 10s. to £12
Chaff, Oaten	"	£13 10s.
Chaff, Lucerne	"	£13 5s.
Chaff, Wheaten	"	£8
Cheese	lb.	1s. to 1s. 0¾d.
Flour	ton	£16 10s.
Hams	lb.	1s. 1d.
Hay, Oaten (Victorian)	ton	£16
Hay, Lucerne	"	£10 to £16
Honey	lb.	3½d.
Maize	bush.	5s. 5d.
Oats	"	6s. 6d.
Onions	ton	£10 to £10 5s.
Peanuts	lb.	3½d.
Pollard	ton	£10 10s.
Potatoes	"	£13 to £13 5s.
Potatoes (Sweet)	ewt.	4s. 9d.
Pumpkins	ton	£4 to £5
Sugar-cane	"	36s.
Eggs	doz.	1s. 3d. to 1s. 6d.
Fowls	pair	2s. 9d. to 4s. 6d.
Ducks, English	"	3s. to 3s. 9d.
Ducks, Muscovy	"	3s. to 4s. 3d.
Turkeys (Hens)	"	7s. to 8s.
Turkeys (Gobblers)	"	10s. to 15s.
Wheat	bush.	8s.

### VEGETABLES.

Cabbages, per dozen	2s. 6d. to 5s. 6d.
Cauliflowers, per dozen	8s. to 12s.
Beans, per sugar bag	6s. to 9s.
Beetroot, per dozen bunches	9d. to 1s.
Carrots, per dozen bunches	1s. to 1s. 6d.
Chocos, per quarter-case	1s. 6d. to 2s. 9d.
Cucumbers, per dozen	...
Custard Marrows, per dozen	2s. 6d. to 3s.
Vegetable Marrows, per dozen	2s. to 5s.
Lettuce, per dozen	...
Peas, per sugar bag	4s. to 6s. 6d.
Celery, per dozen bunches	10d. to 1s. 9d.
Sweet Potatoes, per cwt.	4s. to 4s. 9d.
Table Pumpkins, per cwt.	5s. to 5s. 7d.
Tomatoes, per quarter-case	3s. 6d. to 7s.
Turnips, per dozen bunches	10d. to 1s. 3d.
Rhubarb, per bundle	1s. to 1s. 6d.

## SOUTHERN FRUIT MARKETS.

Article.	JULY.	
	Prices.	
Bananas (Queensland), per case ... ..	14s. to 18s.	
Bananas (Fiji), per case ... ..	20s. to 21s.	
Bananas (G.M.), per case ... ..	20s. to 21s.	
Mandarins, per case ... ..	3s. 6d. to 5s. 6d.	
Oranges (Navel), per case ... ..	5s. to 8s.	
Oranges (Other), per case ..	3s. to 5s. 6d.	
Passion Fruit, per quarter-case ... ..	2s. to 9s.	
Lemons, per bushel case ... ..	2s. 6d. to 6s.	
Papaw Apples, per half-case ... ..	...	
Pineapples (Queens), per case ... ..	6s. to 8s.	
Pineapples (Ripleys), per case ... ..	4s. 6d. to 7s.	
Pineapples (Common), per case ... ..	4s. 6d. to 7s.	
Tomatoes, per quarter-case ... ..	5s. to 8s.	
Cucumbers, per case ... ..	6s. to 8s.	

## PRICES OF FRUIT—TURBOT STREET MARKETS.

Article.	JULY.	
	Prices.	
Apples (Tasmanian), per case ... ..	8s. to 10s.	
Apples, Cooking, per case ... ..	6s. to 7s. 6d.	
Apricots, per quarter-case ... ..	...	
Bananas (Cavendish), per dozen ... ..	1½d. to 3½d.	
Bananas (Sugar), per dozen ... ..	1d. to 3d.	
Cape Gooseberries, per quarter-case ... ..	9s. to 10s. 9d.	
Cherries, per quarter-case ... ..	...	
Cocanuts, per sack ... ..	12s. to 15s.	
Cumquats, per quarter-case ... ..	2s. to 2s. 9d.	
Custard Apples, per quarter-case ... ..	4s. to 5s. 6d.	
Granadillas, per bushel case ... ..	3s. 6d. to 6s.	
Lemons (Lisbon), per case ... ..	3s. to 6s.	
Limes (Choice), per quarter-case ... ..	...	
Mandarins, per half-case ... ..	2s. 6d. to 7s.	
Mangoes, per quarter-case ... ..	...	
Nectarines, per quarter-case ... ..	...	
Oranges (Navel), per case ... ..	5s. 6d. to 6s. 6d.	
Oranges (Seville), per cwt. ... ..	9s. 6d.	
Oranges (other), per cwt. ... ..	2s. 6d. to 4s. 6d.	
Papaw Apples, per quarter case ... ..	9d. to 1s.	
Papaw Apples (Prime), per quarter-case ... ..	1s. to 3s.	
Passion Fruit, per quarter-case ... ..	3s. 6d. to 5s.	
Peaches, per quarter-case ... ..	...	
Peanuts, per pound ... ..	3d. to 3½d.	
Pears (Victorian), per case ... ..	...	
Rosellas, per sugar bag ... ..	...	
Persimmons, per quarter-case ... ..	...	
Pineapples (Ripley), per dozen ... ..	1s. 6d. to 1s. 9d.	
Pineapples (Rough), per dozen ... ..	9d. to 1s. 3d.	
Pineapples (Smooth), per dozen ... ..	1s. 6d. to 3s.	
Strawberries, per tray ... ..	2s. to 3s.	
Strawberries, per dozen pint boxes ... ..	8s. to 12s.	
Tomatoes, per quarter-case ... ..	2s. to 4s.	

**TOP PRICES, ENOGGERA YARDS, JUNE, 1915.**

animal.	JUNE.
	Prices.
Bullocks ... ..	£13 5s. to £17 2s. 6d.
Bullocks (single) ... ..	£20 2s. 6d.
Cows ... ..	£12 2s. 6d. to £15 2s. 6d.
Merino Wethers ... ..	34s.
Crossbred Wethers ... ..	38s. 3d.
Merino Ewes ... ..	30s. 6d.
Crossbred Ewes ... ..	45s. 6d.
Lambs ... ..	32s.
Pigs (Porkers) ... ..	52s.

**LONDON QUOTATIONS.**

LONDON, 24th July.

Danish butter is quoted at 162s. to 166s. per cwt.

The market for frozen rabbits is firm. New South Wales blues, ex store, are quoted at 20s. to 21s. per crate.

Jute, August shipment from Calcutta, £24 to £24 15s. per ton.

Hemp, July-September shipment, £31 10s. per ton.

Rubber, fine hard Para, 2s. 6d. per lb.; plantation first latex crepe, 2s. 6d.; smoked sheet, 2s. 5½d.

The Liverpool quotation for middling American cotton, July-August shipment, is 5-08d. per lb.

Copra, South Sea, August-September shipment, £21 10s. per ton.

Raw linseed oil, spot pipes, £26 5s. per ton.

**NOTICE.**

All communications in connection with the Journal, inquiries, &c., should be addressed to "The Editor" only. Letters addressed personally are liable to delay in reply.

No replies can be given to Anonymous letters. The writers are requested to sign their communications, not necessarily for publication.

## TIMES OF SUNRISE AND SUNSET AT BRISBANE—1915.

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

Date.	MAY.		JUNE.		JULY.		AUGUST.	
	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.
1	6:14	5:17	6:31	5:0	6:39	5:3	6:30	5:18
2	6:14	5:16	6:31	5:0	6:39	5:3	6:30	5:18
3	6:15	5:15	6:32	5:0	6:39	5:3	6:29	5:19
4	6:15	5:14	6:32	5:0	6:40	5:4	6:28	5:20
5	6:16	5:13	6:33	4:59	6:40	5:4	6:27	5:21
6	6:17	5:12	6:33	4:59	6:40	5:4	6:27	5:21
7	6:17	5:12	6:34	4:59	6:40	5:5	6:26	5:21
8	6:18	5:11	6:34	4:59	6:40	5:5	6:25	5:22
9	6:18	5:11	6:34	4:59	6:40	5:5	6:24	5:22
10	6:19	5:10	6:35	4:59	6:40	5:6	6:24	5:22
11	6:19	5:10	6:35	4:59	6:39	5:6	6:23	5:23
12	6:20	5:9	6:35	4:59	6:39	5:6	6:23	5:23
13	6:20	5:9	6:35	4:59	6:39	5:7	6:22	5:24
14	6:20	5:8	6:36	4:59	6:39	5:7	6:21	5:25
15	6:21	5:8	6:36	5:0	6:38	5:8	6:20	5:26
16	6:21	5:7	6:36	5:0	6:38	5:8	6:19	5:26
17	6:22	5:6	6:37	5:0	6:38	5:9	6:18	5:26
18	6:22	5:5	6:37	5:0	6:37	5:10	6:17	5:27
19	6:23	5:5	6:37	5:0	6:37	5:11	6:16	5:27
20	6:23	5:4	6:38	5:0	6:36	5:12	6:15	5:27
21	6:24	5:4	6:38	5:0	6:36	5:12	6:14	5:28
22	6:24	5:4	6:38	5:0	6:36	5:12	6:13	5:28
23	6:25	5:3	6:38	5:0	6:35	5:13	6:12	5:29
24	6:25	5:3	6:38	5:1	6:35	5:13	6:11	5:29
25	6:26	5:3	6:39	5:1	6:35	5:13	6:10	5:30
26	6:26	5:2	6:39	5:1	6:34	5:14	6:9	5:30
27	6:27	5:2	6:39	5:2	6:34	5:14	6:8	5:31
28	6:28	5:2	6:39	5:2	6:33	5:15	6:7	5:31
29	6:29	5:1	6:39	5:2	6:32	5:16	6:6	5:32
30	6:30	5:1	6:39	5:3	6:31	5:17	6:5	5:32
31	6:30	5:1	...	...	6:31	5:17	6:5	5:33

## PHASES OF THE MOON, 1915.

On or about the 150th Meridian, East Long.

		H.	M.
6 May	☾ Last Quarter	3	22 p.m.
14 "	☾ New Moon	1	31 "
22 "	☽ First Quarter	2	50 "
29 "	☽ Full Moon	7	33 a.m.

The moon will be at its brightest not only when full, but because it will this month be at its least distance from the earth at that time.

5 June	☾ Last Quarter	2	32 a.m.
13 "	☾ New Moon	4	57 "
21 "	☽ First Quarter	12	24 "
27 "	☽ Full Moon	2	27 p.m.

The moon will be at its greatest distance from the earth on 11th June at 10 a.m., and nearest on the 26th at midday.

4 July	☾ Last Quarter	3	54 p.m.
12 "	☾ New Moon	7	30 "
20 "	☽ First Quarter	7	9 a.m.
26 "	☽ Full Moon	10	11 p.m.

The moon will be at its greatest distance from the earth on 8th July, about 9 p.m., and at its nearest on the 24th at 3:24 p.m.

3 Aug.	☾ Last Quarter	7	27 a.m.
11 "	☾ New Moon	8	52 "
18 "	☽ First Quarter	12	17 p.m.
25 "	☽ Full Moon	7	40 a.m.

The moon will be at its greatest distance from the earth on 5th August at 36 minutes after 12, midday, and at its nearest on the 20th about midnight.

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 will rise and set about 4 minutes later than at Brisbane, and at Oontoo (longitude 141 degrees E.) about 48 minutes later.

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

At Roma the times of sunrise and sunset during May, June, July, and to the middle of August may be roughly arrived at by adding 20 minutes to those given for Brisbane.

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

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

[All the particulars given on this page were computed by D. Eglinton, F.R.A.S., and should not be reproduced in local newspapers without acknowledgment.]

## Farm and Garden Notes for September.

FIELD.—Spring has now arrived, and with it there will be the usual trouble with weeds, especially on carelessly prepared ground. Therefore, the cultivator and the horse and hand hoe must be kept vigorously at work to check the weed pests and save the growing crops as well as much future labour. Attend to earthing up any crop which may require it. There may possibly occur drying winds, dry weather, and even very late frosts, which have not been unknown in parts of this State even as late as September. Still, good showers may be looked for in October, and much useful work may be done during the present month which will go far to afford a fair prospect of a good return for labour. Plant out *Agave rigida*, var. *Sisalana* (sisal hemp plant), in rows 6 to 8 ft. apart, according to the richness of the soil. All dry places on the farm, too rocky or too poor for any ordinary crops, should be planted with this valuable aloe. Especially should limestone country be selected for the purpose. If the soil is very poor, and the plants very small, it is better to put the latter out into a nursery of good soil, about 1 ft. apart. Next year they will be good-sized plants. Keep down tall weeds in the plantation, and do not allow couch or buffalo grass to grow about the roots. Sisal will do no good if planted on low-lying wet land, or on a pure sandy soil. It thrives best where there is plenty of lime, potash, and phosphoric acid, all of which (except potash, unobtainable under present war conditions) can be cheaply supplied if wanting in the soil. Sisal requires so little labour from planting to maturity that it can be grown to good profit despite the high cost of white labour. Sow cotton—Sea Island near the coast, and Uplands generally. Caravonica succeeds best in North Queensland. Sow maize, sorghum, imphee, mazzagua, Indian cane, prairie grass, Rhodes grass and paspalum, panicum, tobacco, pumpkins, and melons. Sugar-cane planting should be vigorously carried on. Plant sweet potatoes, yams, peanuts, arrowroot, turmeric, chicory, ginger, and canaigre, the latter a tuber yielding a valuable tanning substance. Plant out coffee.

KITCHEN GARDEN.—Now is the time when the kitchen garden will richly repay all the labour bestowed upon it, for it is the month for sowing many kinds of vegetables. If the soil is not naturally rich, make it so by a liberal application of stable manure and compost. Failing a sufficient supply of these, artificials may be used with good results. Dig or plough the ground deeply, and afterwards keep the surface in good tilth about the crops. Water early in the morning or late in the evening, and in the latter case, stir the soil early next day to prevent caking. Mulching with straw, leaves, or litter will be of great benefit as the season becomes hotter. It is a good thing to apply a little salt to newly dug beds. What the action of salt is, is not exactly known, but when it is applied as a top dressing it tends to check rank growth. A little is excellent for cabbages, and especially for asparagus, but too much renders the soil sterile, and causes hardpan to form. French or

kidney beans may now be sown in all parts of the State. The Lima bean delights in the hottest weather. Sow the dwarf kinds in drills 3 ft. apart and 18 in. between the plants, and the climbing sorts 6 ft. each way. Sow Guada bean, providing a trellis for it to climb on later. Sow cucumbers, melons, marrows, and squash at once. If they are troubled by the red beetle, spray with Paris green or London purple. In cool districts, peas and even some beetroot may be sown. Set out egg plants in rows 4 ft. apart. Plant out tomatoes 3½ ft. each way, and train them to a single stem, either on stakes, trellis, or wire netting. Plant out rosellas. Sow mustard and cress, spinach, lettuce, vegetable marrows, custard marrows, parsnips, carrots, chicory, eschalots, cabbage, radishes, kohlrabi, &c. These will all prove satisfactory, provided the ground is well worked, kept clean, and that water, manure, and, where required, shade are provided.

FLOWER GARDEN.—Continue to plant bulbs as directed last month. Protect the plants as much as possible from cold westerly winds, which may still occur, notwithstanding the increasing temperature. Be careful that the bulbs do not come in contact with fresh manure. Keep a good lookout for slugs. Plant out chrysanthemums, palms, and all kinds of tropical and semi-tropical plants. If hot weather should ensue after planting, water and shade must be given. Sow dianthus, snapdragon, and coleus, seed or cuttings of the latter. Roses will now be in full bloom. Keep them free from aphid, and cut off all spent blooms. This latter work should be done in the case of all flowers. If you wish to save seeds, do not wait for the very last blooms, but allow some of the very best to go to seed. If you have any toads in the garden or bush-house, encourage them to take up their abode there. They are perfectly harmless, in spite of their ugliness, and they destroy an astonishing number of insects injurious to plants. Fill up all vacancies with herbaceous plants. Sow zinnia, gaillardia, amaranthus, cockscomb, balsam, sunflower, marigold, cosmos, summer chrysanthemum, coreopsis, portulaca, mesembryanthemum, calendula, &c.

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## Orchard Notes for September.

### THE SOUTHERN COAST DISTRICTS.

The marketing of citrus fruits, in the later districts, of the late winter or early spring crop of pines and bananas, also of strawberries and Cape gooseberries, will continue to occupy the attention of fruit-growers. We can only repeat the advice we have so often given in these Notes respecting the marketing of all kinds of fruit—viz., to grade the fruit evenly, pack honestly, and display it to the best advantage if you want to get good returns.

September is a very important month to the fruit-grower, owing to the fact that it is usually a dry month, and that it is essential in all cases

to keep the land in a high state of tilth, so as to retain the moisture that is required by the various trees that are in blossom, thus securing a good set of fruit. Where irrigation is available, it is advisable to give the trees a good watering should the ground be dry, as this will induce a good growth and cause the fruit to set well. If an irrigation is given, it should be a thorough one, not a mere surface watering, and once the land is saturated the moisture must be retained in the soil by constant and systematic cultivation. If this is done, one good watering will usually be enough to carry the trees through in good condition to the thunderstorms that come later or even to the summer rains, if the soil is of a deep sandy loamy nature.

No weeds must be allowed in the orchard or vineyard at this time of the year, as they are robbing the trees and plants of both the water and plant food that are so essential to them at this period of their growth.

There is not much to be done in the way of fighting scale insects during the month, as they are more effectually dealt with later on; but where young trees are showing signs of distress, owing to the presence of scale insects, they should be treated, the gas method being the most efficacious.

Beetles and other leaf-eating insects often make their appearance during the month. The best remedy is to spray the trees or plants with one or other of the arsenical washes that are recommended by me in this journal. The vineyard will require considerable attention. Not only must it be kept well worked, but any vines that are subject to the attack of black spot must be sprayed from time to time with Bordeaux mixture. Disbudding must be carefully carried out, as this work is equally as important as the winter pruning, as it is the best means of controlling the future shape of the vine. A very common fault with vines grown in the coast districts is that the buds often remain dormant, only the terminal bud and possibly one other starting into growth, thus leaving a long bare space on the main rods, which is undesirable. When this takes place, pinch back those shoots that have started, and which are taking the whole of the sap, and force the sap into the dormant buds, thus starting them into growth. This will result in an even growth of wood all over the vine—not a huge cane in one part and either a stunted growth or dormant buds on the rest.

Every care should be taken during the month to prevent the fruit-fly from getting an early start. All infested oranges, loquats, kumquats, or other fruits should be gathered and destroyed, as the keeping in check of the early spring crop of flies, when there are only comparatively few to deal with, will materially lessen the subsequent crops. Land that is to be planted to pines or bananas should be got ready now, though the planting need not be done till October, November, or even later. Prepare the land thoroughly; don't scratch the surface to the depth of a few inches, but plough as deeply as you have good surface soil, and break up the subsoil as deeply as you can possibly get power to do it. You will find that the extra money expended will be a profitable investment, as it will pay every time.

### TROPICAL COAST DISTRICTS.

September is usually a very dry month, and fruit trees of all kinds suffer in consequence. The spring crop of citrus fruits should be harvested by the end of the month, as, if allowed to hang later, there is a great risk of loss by fly. The fruit should be well sweated; and, if carefully selected, well-graded, and well packed, it should carry well to, and fetch high prices in, the Southern States, as there are no oranges or mandarins grown in Australia that can excel the flavour of the best of the Bowen, Cardwell, Cairns, Port Douglas, or Cooktown fruit.

As soon as the fruit is gathered, the trees should be pruned and sprayed with the lime and sulphur wash, as this wash is not only a good insecticide, but it will keep down the growth of all lichens, mosses, &c., to which the trees are very subject.

Every care should be taken to keep down the crop of fruit-fly during the month. All infested fruit should be gathered and destroyed, particularly that in or adjacent to banana plantations. Watch the banana gardens carefully, and keep well cultivated. New land should be got ready for planting, and where land is ready planting can take place.

Papaws and granadillas are in good condition now, and, if carefully gathered and well packed in cases only holding one layer of fruit, they should carry well to the Southern markets if sent in the cool chamber.

### SOUTHERN AND CENTRAL TABLELANDS.

Prune grape vines at Stanthorpe in the early part of the month, leaving the pruning as late as possible, as the object is to keep the vines back in order to escape damage from late spring frosts. All vines subject to the attack of black spot should be treated with the winter dressing when the buds are swelling; this treatment to be followed by spraying with Bordeaux mixture later on.

Where fruit trees have not received their winter spraying, they should be treated at once before they come out into flower or young growth. Where the orchard or vineyard has not been ploughed, do so, taking care to work the land down fine as soon as it is ploughed, so as to keep the moisture in the soil, as the spring is always the trying time for fruit trees.

Look out for fruit-fly in the late oranges and loquats in the Toowoomba district. Keep the orchards and vineyards well cultivated; disbud the vines when sufficiently advanced. Spray for codlin moth.

In the Central tablelands irrigate vines and fruit trees, and follow the irrigation with deep, constant, and systematic cultivation. Keep down all weed growth, and fight the red scale on citrus trees with cyanide. The objective of the fruit-growers throughout Queensland during September and the following months is, "How best to keep the moisture in the soil that is required by the trees, vines, plants, and vegetables"; and this objective can only be obtained by irrigation where same is available, or by deep, systematic, and constant cultivation where there is no water available for irrigation.