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Agriculture.

SOURCES OF PLANT FOOD.

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Amongst those whose occupation consists in the intensive cultivation of the land, the question is constantly being asked, "How can I retain the complete fertility of the soil?" To those living near town, stable manure was a source of supply; but, with the rapidly increasing motor traffic, stable manure is fast becoming difficult to obtain in sufficient quantities. To the market gardener and fruit-grower it is not in many cases practicable or convenient to keep sufficient stock as a source of manure for his land; but manure the grower must have, or the fertility of his soil will soon be reduced and its cropping ability diminish.

Artificial fertilisers can be used to supply deficient plant foods, but they cannot supply humus, which forms the basis of all successful

manuring. The value of stable and farmyard manures—although they contain all the elements of a plant's nutrition (viz., nitrogen, potash, and phosphoric acid), in more or less available form—consists in the amount of humus they supply to the soil which they help to build up. Humus is not exactly a direct plant food, but it supplies the ideal rooting medium for plant life. By its decay all the constituents of plant food are rendered available and the plant is enabled to make a perfect growth. Humus possesses other available properties which must not be overlooked, for by its decay vegetable acids are formed which are powerful in attacking dormant plant food in the soil, and so bring it into a condition suitable for the plant to absorb.

Generally, peaty soils and fen land contain sufficient humus; but it is of such an acid nature that a good system of drainage must be adopted, and the addition of lime is required to sweeten it.

The physical effects of humus upon the texture and water-holding capacity of the soil are most important, for it has been proved that a soil containing a stock of humus has during a dry spell produced better yields of crops than a soil rich in fertilisers, but deficient in humus. The water-retaining capacity of a soil rich in humus is from three to four times greater than that of a soil devoid of humus.

If we were to treat a sandy soil with plentiful dressings of farmyard manure or organic matter, in time, instead of the soil running through the fingers as through a sieve, it would be moist enough to hold together in a little ball. Just the opposite action takes place when a stock of humus is built up in a heavy clay soil, for, in a short time, the heavy soil becomes porous and friable; it is easier to work, and is also warmer in winter and cooler in summer, or, I should say, a more uniform soil temperature is maintained.

Another good and necessary purpose humus serves is, to encourage life in the soil. A sterile or dead soil will produce nothing; we must have a living soil, for, if a soil is to be fertile, it must contain millions of living workers called "bacteria." These microscopic organisms play a most important part in the nutrition of plants, and much scientific study has been given to their action in the soil.

The chief object sought after in manuring is to increase the supply of food in a form in which it can be used to make inert plant food available, so that plants may produce their maximum yield of crops. Farmyard manure can only be classed as a slow manure, and some of the undigested residues will remain in the soil for a considerable time before they become available as plant food, and, were it not for the valuable humus which it goes to build up in the soil, it is questionable whether it would pay to use it when we consider the extra expensive labour involved in cartage and spreading.

When such crops as cabbage and cauliflower and crops for green feed as oats, barley, maize are being grown, and potash and phosphoric acid not lacking in the soil, I know of no better fertiliser to use than nitrate of soda for quick returns. It is simply marvellous the rapid action it has if applied, at the rate of ½ lb. to 20 square yards, or 1 to

2 cwt. to the acre, to young cabbage just prior to hearting, in and during showery weather, or before the crop is watered by means of irrigation; the cabbage will be ready for market two or three weeks earlier. Care should be taken when sowing nitrate of soda to prevent it lodging on the foliage of the plants, as it is injurious to the leaf tissues.

Nitrate of soda should not be used excessively on heavy soils, as, if repeatedly used year after year, it has a very injurious effect on the tilth of the soil, causing it to become sticky and cloggy in wet weather, and on becoming dry the soil sets hard on the crust. This deleterious action is not so apparent in sandy soils, but in such soils it should be used in small applications, because it must be remembered that nitrate of soda is water soluble and is immediately available for food; therefore, what the growing plant is unable to absorb is washed into the subsoil or drainage water and lost, as it is not retained by the soil.

For vegetable-growing, the soil can hardly be too rich, as the foliage and roots form the edible portion. Flowers obtain their colours from minerals in the soil, and it is a mistake to give excessive dressings of fresh farmyard manure, because it produces a rank growth, superfluity of foliage, and a coarse, loose flower. In flower cultivation, the object of attainment is a flower of substance, size, colour, and keeping qualities. At experiments carried out at the New Hampshire Agricultural Station, U.S.A., it was found in carnation culture that bonemeal gave the best results as regards the vigour and keeping quality of the cut blooms. Fowl manure, which is a rich organic manure, when used in excess, gave poor results and was distinctly harmful. Nitrate of soda was most unsatisfactory, as it produced flowers of poor colour and keeping qualities.

In seed-growing, it is usual to limit supplies of food, as by so doing a better quality of seed is produced. Many farmers have no doubt noticed that when a tree is ring-barked it produces an immense crop of seed just prior to its death; also, orange trees, when roots are attacked by rot, produce fruit containing much seed instead of the juicy and luscious product. If an unproductive apple tree, which has been making a surplus of rank growth, owing to excessively rich manuring, be root-pruned, it produces good crops of fruit. It seems to be one of Nature's laws that, if the supply of plant food is checked, the plant expends its energy in producing seed to supply the next generation of plants.

On the seed farms in England and Holland, noted for their supplies of pure, bright, plump seed, it is the usual practice, after selection, to transplant cabbage, cauliflower, root crops, &c., on to land in a good state of cultivation, but not recently manured, and there remain to produce their crop of seed. The best double stocks are grown in flower pots, the restricted root area promoting a better quality of seed. From these observations and facts, we may deduce that dressings of rich nitrogenous manures produce abundance of growth, which is what is required when the foliage is consumed as food. Well-decomposed manures, potash, and phosphoric acid develop the fruit and seed and a well-balanced growth.

A valuable source of manure to those situated where stable manure cannot be obtained, and stock is not kept, is the growing of green crops and ploughing them in. It is surprising what can be done to enrich poor soil in this manner; providing there is depth and easy cultivation, with a good rainfall, it is only a matter of time, and the soil can be built up and humus supplied, for it naturally follows that, as the very essence of food was taken out of the soil to build up the bodies of the plants which form the humus, they are full of nourishment and will, when decomposed, supply the growing generation of crops with the very properties required.

Suitable crops for green manuring are buckwheat, rape, cowpeas, lupins, vetches; the leguminous crops are the most valuable, because the bacteria which develop nodules upon the roots are able to collect the nitrogen from the atmosphere and store it up in the root nodules. All that is necessary in green manuring is to roll the crop, use a plough with a rolling coulter, attach a chain to the beam of the plough just long enough to reach under the mouldboard; as the plough moves along, the chain guides the green stuff under the mouldboard, and it is nicely covered. It is essential to plough under in wet or moist weather and well bury the crop. After ploughing, it is advisable to roll, as this consolidates the soil and excludes air, which hastens the decay of the green crop.

Foul land is quickly cleaned in this manner, as weeds are smothered and have no chance to seed, also the water-retaining capacity of the soil is increased as the store of humus is added to, and the texture of the soil greatly improved. A disadvantage is that more land must be cultivated to permit the time required to grow a green crop. On the ridges and orchards it is the custom to allow weeds to grow to prevent erosion during heavy storms. How much better would it be to grow, say, a crop of cowpeas which could be left to rot on the ground?

COMPLETE FERTILISERS FOR FARM, ORCHARD, AND VEGETABLE GARDENS.

ONIONS.

A rich light sandy loam is most favourable, but even more clayey loams may be used if limed before cultivation. The soil should be friable and contain plenty of humus or decaying vegetable matter, and must be well drained.

Stable manure should not be used immediately before planting onions, but preferably the year before. An excess of nitrogenous manure may also be injurious to the crop.

Apply per acre, according to the class of soil—

4 to 7 cwt. superphosphate,

1½ to 2 cwt. sulphate of potash or muriate of potash,

1½ to 2½ cwt. nitrolim or sulphate of ammonia,

or the same amounts in lb. to every 43 square yards.

A mixed fertiliser, containing about 7 per cent. of soluble phosphoric acid, 8 per cent. of potash and 4 per cent. of nitrogen, may be used in quantities from 7 to 12 cwt. per acre, or from 7 to 12 lb. per 43 square yards.

PARSNIPS.

This vegetable requires a rich sandy loam, which must be trenched or ploughed very deeply. An artificial fertiliser similar to the one given for carrots may be used, although the quantity of superphosphate may, with advantage, be slightly increased.

Apply per acre—

4 to 7 cwt. superphosphate;
¾ to 1½ cwt. sulphate of potash;
1½ to 2 cwt. nitrolim, or sulphate of ammonia.

PASTURE.

Ordinary pasture can be very much improved by the application of artificial fertilisers. In the case of lawns the use of fertilisers becomes imperative, and they are best applied before lawns are top-dressed.

Use, per acre, from 3 to 7 cwt. of a fertiliser, containing 4 to 5 per cent. of nitrogen, 6 to 7 per cent. of available phosphoric acid, and 8 per cent. of potash.

A good mixture for lawns is the following:—

1 cwt. fine bonemeal
1 cwt. superphosphate
1 cwt. nitrate of lime
1 cwt. muriate of potash
} per acre.

or 4 lb. to 6 lb. of this mixture to every 43 square yards.

As a change the following mixture may be used alternately:—

3 cwt. Thomas phosphate
1 cwt. sulphate of potash
1 cwt. dried blood
} per acre.

PEANUTS.

Peanuts do best on a fairly rich sandy loam, containing plenty of lime.

They may be grown between the rows in young orchards, and the leaves and stalk will give a valuable mulch.

Use a fertiliser containing 8 to 10 per cent. phosphoric acid, 10 per cent. potash and from 1 to 2 per cent. of nitrogen, in quantities up to 6 cwt. per acre, or the following mixture:—

2 to 3 cwt. superphosphate
1 to 1½ cwt. sulphate of potash
1 cwt. meatworks manure (with blood)
} per acre.

PEAS.

Peas may be grown on almost any kind of soil, but do best on a fairly rich, sandy loam. The fertilisers already recommended for Cow-peas and also for beans may be used for peas.

POTATOES.

This crop has an extremely wide range, and can be grown almost all over Queensland. Deep, friable, sandy loams, with porous subsoils are most suitable. Heavy soils, and wet, sour, clay soils, must be avoided. The soil should contain a fair amount of humus, and for this reason, potatoes do particularly well in virgin soils. The land must be cultivated deeply.

Well-rotted farmyard manure is one of the best fertilisers for potatoes, and if the heavy amounts (10 to 20 tons per acre) are not available, even small amounts used in connection with artificial fertilisers will be found very beneficial. Potash is the principal constituent of all potato fertilisers.

A complete fertiliser for potatoes should contain 6 to 8 per cent. soluble phosphoric acid, 10 per cent. potash, and 3 per cent. of nitrogen, and should be used in accordance with the quality of the soil, in quantities from 5 to 10 cwt. per acre. It is often advisable to apply phosphoric acid and potash by itself, and the nitrogenous manure as a top-dressing later on.

The following mixed fertiliser can be recommended:—

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

and if large amount of stable manure has been applied the amount of nitrogenous manure is cut down to one-half of the above quantity, and applied as a top-dressing at the time of blossoming, and in this case the quick-acting nitrate of lime is to be preferred.

In some cases muriate of potassium, or potassium chloride, gives better results than the sulphate.

RADISHES.

Radishes require a light rich garden loam, and the crop may be forced with artificial fertilisers, containing 8 per cent. soluble phosphoric acid, 10 per cent. potash and 3 per cent. nitrogen, used at the rate of 6 to 10 cwt. per acre, or 6 to 10 lb. per 43 square yards, or from 2 to 4 oz. per square yard.

The same manure as recommended for lettuce may be used.

SORGHUM.

Use the fertiliser recommended for corn.

SPINACH.

The use of well-rotted farmyard manure at the rate of 10 to 12 tons per acre, or 2 to 2½ cwt. for every 43 square yards, is particularly recommended. Lighter dressings of stable manure must be supplemented by artificial fertilisers.

Use, per acre, from 6 to 10 cwt. of a fertiliser containing 6 to 8 per cent. soluble phosphoric acid, 5 to 6 per cent. potash, and 2 per cent. of nitrogen, or use—

4 to 6 cwt. superphosphate
1 to 1½ cwt. sulphate of potash
1 to 2 cwt. nitrolim or nitrate of lime
} per acre.

SUGAR-CANE.

Sugar-cane is grown on almost any kind of soil on our coastal country, but gives the best returns on our alluvial soils and scrub soils, rich in humus. The same crop is generally grown continuously for a great number of years, and requires therefore proper fertilising with large amounts of artificial manures, in order to maintain the fertility of the land.

Exhausted sugar lands may be worked up again, after lying idle for a few years and allowing lantana to grow, which acts as a very valuable green manure crop, accumulating more particularly large amounts of potash.

A complete fertiliser for sugar-cane should contain about 7 to 8 per cent. each of water soluble phosphoric acid, potash and nitrogen, and should be used at the rate of 4 to 6 cwt. per acre.

The following manuring mixtures can be used, instead of the ready-mixed fertiliser:—

(1.) 2 to 3 cwt. superphosphate
1 cwt. sulphate of potash
2 cwt. nitrolim or sulphate of ammonia
} per acre.

(2.) 3 to 4 cwt. meatworks manure
1 to 1½ cwt. sulphate of potash
1½ cwt. nitrolim or sulphate of ammonia
} per acre.

(3.) 2 to 3 cwt. superphosphate
1 to 1½ cwt. sulphate of potash
1 cwt. nitrolim
1 cwt. nitrate of lime
} per acre,

the nitrate of lime to be applied as a top-dressing.

SWEET POTATOES.

Sweet potatoes require, like the ordinary potato, a deep sandy loam, with a well-drained subsoil, and the same manurial treatment.

The same applies to other root crops, yams, arrowroot, &c.

LIST OF DEALERS LICENSED UNDER "THE FERTILISERS ACT OF 1914," AND REGISTERED FERTILISERS FOR THE YEAR 1915.

Name of Dealer.	Address.	Fertiliser.	Registered Fertiliser Certified to Contain Percentage of:										
			Nitrogen as:					Phosphoric Acid as:				Fineness.	
			Nitrate.	Ammonia.	Blood.	Flesh, Offal, Bone.	Unspecified.	Water Soluble.	Citrate Soluble.	Total.	Potash.	Fine.	Coarse.
Associated Farmers of Queensland, Ltd.	Brisbane ..	Various brands of Fertilisers ..	..	..	..	..	..	..	..	..	..	..	..
Australian Cooper Fertilisers, Ltd.	Toowoomba ..	Various brands of Fertilisers ..	..	..	..	..	..	..	..	..	..	..	..
Australian Meat Export Company, Ltd.	Brisbane	A.M.E. Fertiliser	..	..	7·0		..	..	..	11·0	..	..	..
Ditto	..	ditto Dried Blood	..	..	12·2	..	..	..	..	..	..	..	..
Ditto	..	ditto Bone Meal	..	..	..	4·05	..	..	..	24·8	..	26	74
Ditto	Townsville ..	ditto Dried Blood	..	..	12·0	..	..	..	..	..	..	..	..
Ditto	..	ditto Fertiliser	..	..	5·5		..	..	..	18·5	..	..	..
Australian Sugar Coy., Ltd. ..	Mourilyan ..	T.C. Fertiliser	..	..	..	..	3·8	..	..	20·0	..	..	..
Bateman, A. E.	Stanthorpe ..	Hassell's Potato Manure No. 1	2·5	2·0	..	..	..	12	..	12	..	..	..
Ditto	..	ditto Lucerne Manure ..	..	..	..	..	..	10·5	..	17·3	..	..	..
Ditto	..	ditto Pea and Bean Manure	3·2	..	..	..	..	12	..	15	..	..	..
Ditto	..	ditto Maize and Cabbage Manure	2·5	..	..	..	..	15·75	..	16·75	..	..	..
Ditto	..	ditto No. 1 Superphosphate	..	..	..	..	..	17	·5	18	..	..	..
Ditto	..	ditto Tomato Manure (orchard)	2·38	..	..	·75	..	11·25	..	13·95	..	..	..
Baxter, H.	Maryborough ..	Mover B (in diamond) Bonedust	..	..	..	3·5	..	..	..	25	..	..	..
Baynes Bros.	Brisbane	Baynes Brothers' Fertiliser ..	..	..	4·27		..	..	..	19·75	..	..	..
Beatty, T. S.	Mackay	Crown Brand Sulphate of Ammonia	..	20	..	..	..	..	..	..	..	..	..
Ditto	ditto	ditto Superphosphate	..	..	..	..	..	16	..	..	..	..	..

Ditto	ditto	ditto	Sulphate of Potash	..	..	..	..	..	..	..	..	50	..	..
Ditto	ditto	ditto	Cane Manure ..	..	4·3	..	..	..	7	..	..	15	..	..
Bergl Australia, Ltd... ..	Bowen	Dried Blood		..	..	12·05	..	..	..	..	..	..	..	..
Biboorah Meat Export Coy.	..	..		..	..	5·69	..	..	..	..	17·5	..	..	..
Birt and Co., Ltd.	Brisbane	Phœnix Fertiliser		..	..	4·5	..	..	..	18	..	..	..	
Ditto	ditto	ditto Dried Blood ..		..	..	12	..	..	..	..	..	..	..	
Borthwick and Sons, Ltd. ..	Brisbane	T. B. & S. (in diamond) Fertiliser		..	..	7·0	..	..	..	13	..	..	..	
Brisbane Gas Company ..	Brisbane	Sulphate of Ammonia ..		..	20·98	..	..	..	..	..	..	..	..	
Burdekin River Meat Preserving Company, Ltd.	Sellheim	Burdekin Fertiliser		..	..	3·3	..	..	..	17·44	..	..	..	
Burns, Philp, and Co., Ltd. ..	Cairns	T. B. & S. (in diamond) Fertiliser		..	..	6·0	..	..	..	12	..	..	..	
Campbell and Amos, Ltd. ..	Bundaberg ..	Runcorn Bonedust		..	..	..	4·25	..	..	..	21·85	..	50	50
Ditto	..	Shirley's 7-7-7		..	7	..	..	..	7	..	..	7	..	..
Ditto	..	ditto Superphosphate ..		..	..	..	..	..	17	..	..	..	..	..
Ditto	..	ditto No. 3		..	3·3	..	..	..	13	..	..	2	..	..
Ditto	..	ditto No. 5		..	3·3	..	..	..	12	..	..	7	..	..
Ditto	..	ditto No. 9		..	4·1	..	..	..	6·5	..	..	4	..	..
Ditto	..	ditto Sulphate of Ammonia		..	20	..	..	..	..	..	..	..	..	..
Ditto	..	ditto Nitrate of Soda ..		15·5	..	..	..	..	..	..	..	..	..	..
Ditto	..	G.M.W.Q. Meatworks Fertiliser		..	..	6·6	..	..	..	..	13·1	..	..	..
Central Q.M.E. Coy., Ltd. ..	Lake's Creek ..	Fitzroy Fertiliser		..	..	5·15	..	..	·13	8·88	16·94	·1	..	..
Chappel, J. H.	Charters Towers ..	Q.M.F. Fertiliser		..	..	5	..	..	..	..	15	..	..	..
John Cook and Co., Prop., Ltd.	Brisbane	Redbank Freez. W. Fertiliser		..	..	7·23	..	..	..	10·85	11·1	..	..	..
Corser and Co., Ltd.	Maryborough ..	Shirley's A Bone Phosphate ..		..	·5	..	..	..	..	..	29·8	..	..	..
Ditto	..	ditto Superphosphate ..		..	..	..	..	..	17	..	..	..	..	..
Ditto	..	ditto No. 3 Fertiliser ..		..	3·3	..	..	..	13	..	..	2	..	..
Ditto	..	ditto No. 5 Fertiliser ..		..	3·3	..	..	..	12	..	..	7	..	..
Ditto	..	ditto 7-7-7 Fertiliser ..		..	7	..	..	..	7	..	..	7	..	..
Ditto	..	ditto No. 9 Fertiliser ..		..	4·1	..	..	..	6·5	..	..	4	..	..
Ditto	..	ditto No. 11 Fertiliser ..		..	..	..	..	..	11·4	..	..	7	..	..
Croker, J.	Mackay	Hassell's No. 1 Cane Manure ..		..	7·7	..	..	..	7	..	..	7·7	..	..
Ditto	..	Q.M.E. Fertiliser		..	..	6·03	..	..	..	14·76	15·81	..	..	..
Ditto	..	Q.M.E. Dried Blood		..	..	12·08	..	..	..	..	..	..	..	..
Ditto	..	Sulphate of Potash		..	..	..	..	..	..	..	..	53	..	..
Ditto	..	Sulphate of Ammonia ..		..	21	..	..	..	..	..	..	..	..	..
Ditto	..	Nitrate of Soda		15·5	..	..	..	..	..	..	..	..	..	..
Ditto	..	Superphosphates		..	..	..	..	..	16·5	..	..	..	..	..

LIST OF DEALERS LICENSED UNDER "THE FERTILISERS ACT OF 1914," AND REGISTERED FERTILISERS FOR THE YEAR 1915—*continued.*

Name of Dealer.	Address.	Fertiliser.	REGISTERED FERTILISER CERTIFIED TO CONTAIN PERCENTAGE OF:										
			Nitrogen as:					Phosphoric Acid as:			Potash.	Fineness.	
			Nitrate.	Ammonia.	Blood.	Flesh, Offal, Bone.	Unspecified.	Water Soluble.	Citrate Soluble.	Total.		Fine.	Coarse.
Croker, J.	Mackay	Shirley's 7-7-7	..	7	..	..	..	7	..	..	7	..	..
Ditto		Fitzroy Fertiliser	..	..	5·15		..	·13	8·88	16·94	·1	..	..
Dalgety and Co., Ltd.	Brisbane	Shirley's Superphosphate	..	..	..	..	..	17	..	..	..	..	..
Ditto		Hassell's A1 Superphosphate	..	..	..	..	..	16·5	15	17·5	..	..	..
Ditto		M.R.C. Japanese Superphosphate	..	..	..	..	..	19·5	..	20·5	..	..	..
Ditto		M.L. (in diamond) Superphosphate	..	..	..	..	..	17	1	20	..	..	..
Ditto		Runcorn Bonedust	..	..	..	4	..	..	..	21·85	..	52	48
Darling Downs Co-operative Bacon Company, Ltd.	Willowburn	Bone and Blood	..	..	7·75		..	..	5·56	6·82	..	..	..
Decker and Co.	Eagle street, Brisbane	Hassell's Pineapple, Strawberry, and Banana Manure	3·5	3	..	..	..	10	..	10	..	..	..
Ditto		ditto Barley and Stone-fruit Manure	2·7	..	..	2·05	..	5·5	..	13·7	..	..	..
Ditto		ditto Orchardists' Manure	2·4	..	..	·73	..	11·25	..	13·95	..	..	..
Ditto		ditto Maize Manure	2·5	..	..	..	..	15·75	..	16·75	..	..	..
Ditto		ditto Lucerne Manure	..	..	..	..	..	10·5	..	17·30	..	..	..
Ditto		ditto No. 1 Superphosphate	..	..	..	..	..	16·5	·5	17·5	..	..	..
Ditto		ditto Pea and Bean Manure	3·2	..	..	..	..	12·0	..	15·0	..	..	..
Ditto		ditto Potato Manure	2·5	2·0	..	..	..	12·0	..	12·0	..	..	..
Early, Mrs. A. B.	Chermside	Q.M.E. Fertiliser	..	..	6·03		..	..	14·76	15·81	..	..	..
Ditto		Q.M.E. Dried Blood	..	..	12·08	..	..	..	..	..	..	..	..
Foggitt, Jones, and Co., Ltd.	Brisbane	"Oxley" Fertiliser	..	..	6·15	..	..	..	..	15·5	..	..	..
Francis, J. V.	Ipswich	*Bonemeal	..	..	..	2·72	..	..	..	25·8	..	30	70

Ditto	..	*Dried Blood	..	..	11·4	..	..	..	..	5·3	..	..	..
Gladstone Meatworks, Ltd. ..	Gladstone	G.M.W.Q. Fertiliser (cattle) ..	..	..	6·32		..	..	..	13·55	..	..	..
Ditto	..	ditto Fertiliser (sheep) ..	..	..	6·60		..	..	..	13·10	..	..	..
Gleeson, E.	Stanthorpe ..	Baynes Brothers' Fertiliser ..	..	..	4·27		..	..	17·3	19·75	..	..	..
Hacker, W.	Chermside ..	Redbank Fertiliser	..	..	7·23		..	..	10·85	11·10	..	..	..
Ditto	..	Q.M.E. Dried Blood	..	..	12·08	..	..	..	..	..	..	..	..
Ditto	..	Q.M.E. Fertiliser	..	..	6·03		..	..	14·76	15·81	..	..	..
Hamwood, W. E.	Toowoomba ..	Wattle Brand Bonemeal ..	..	..	..	2·8	..	..	..	19·0	..	35	65
Headrick, Ltd.	Cairns	Biboorah Fertiliser	..	..	4·88		..	..	..	13·57	..	..	..
Hutton, J. C., Prop., Ltd. ..	Brisbane	Hutton's Special Fertiliser ..	..	..	6·17		..	..	13·05	14·10	..	..	..
Jordan, C. F.	Aspley	Normanby Bonedust ..	..	..	..	3·8	..	..	..	24·2	..	59	41
Lawson, R. B., and Co. ..	Stanthorpe ..	Bonedust	..	..	..	3·7	..	..	..	21·9	..	..	..
Ditto	..	Shirley's No. 1 Superphosphate	..	..	..	..	..	..	..	16·5	..	..	..
Ditto	..	ditto No. 2 Fertiliser ..	..	1·6	..	..	..	15	..	..	1	..	..
Ditto	..	ditto No. 3 Fertiliser ..	..	3·3	..	..	..	13	..	..	2	..	..
Ditto	..	ditto No. 5 Fertiliser ..	..	3·3	..	..	..	12	..	..	7	..	..
Ditto	..	ditto No. 9 Fertiliser ..	..	4·1	..	..	..	6·5	..	..	4	..	..
Ditto	..	ditto No. 11 Fertiliser ..	..	..	..	..	..	11·4	..	..	7	..	..
Ditto	..	Sulphate of Potash	..	..	..	..	..	..	..	..	52	..	..
Ditto	..	Nitrate of Soda	15·5	..	..	..	..	..	..	..	..	..	..
Ditto	..	Sulphate of Ammonia ..	..	20	..	..	..	..	..	..	..	..	..
Ditto	..	Blood and Bone	..	..	5·5		..	..	..	12	..	..	..
Ditto	..	Bonedust	..	..	..	3·7	..	..	..	21·9	..	..	..
Mant, C. O.	Creek St., Brisbane	Alligator Creek Fertiliser ..	..	..	5·75		..	..	..	16·5	..	..	..
Ditto	..	Redbank Fertiliser	..	..	7·23		..	..	..	11·1	..	..	..
Nisbet, T. and Co.	Innisfail	Shirley's 7-7-7 Fertiliser ..	..	7	..	..	..	7	..	..	7	..	..
North Queensland Mortgage and Investment Co., Ltd.	Townsville ..	Q.M.E. Fertiliser	..	..	6·03		..	..	14·76	15·81	..	..	..
Ditto	..	Q.M.E. Dried Blood	..	..	12·08	..	..	..	..	..	..	..	..
Paul and Gray, Ltd. ..	Brisbane	Shirley's Superphosphate ..	..	..	..	..	..	17	..	..	..	..	..
Ditto	..	ditto No. 0 Fertiliser ..	..	2·5	..	..	..	..	9	13·7	6	..	..
Ditto	..	ditto No. 3 Fertiliser ..	..	3·3	..	..	..	13	..	..	2	..	..
Ditto	..	ditto No. 5 Fertiliser ..	..	3·3	..	..	..	12	..	..	7	..	..
Ditto	..	ditto No. 7 Fertiliser ..	..	1·6	..	..	..	11·4	..	..	1	..	..
Ditto	..	ditto No. 9 Fertiliser ..	..	4·1	..	..	..	6·5	..	..	4	..	..
Ditto	..	ditto No. 11 Fertiliser ..	..	..	..	..	..	11·4	..	..	7	..	..
Ditto	..	ditto No. 14 Fertiliser ..	..	2·5	..	..	..	5·5	..	14	6	..	..
Ditto	..	ditto No. 19 Fertiliser ..	..	4·1	..	..	..	4·1	..	11·4	2	..	..

LIST OF DEALERS LICENSED UNDER "THE FERTILISERS ACT OF 1914," AND REGISTERED FERTILISERS FOR THE YEAR 1915—*continued.*

Name of Dealer.	Address.	Fertilisers.	REGISTERED FERTILISER CERTIFIED TO CONTAIN PERCENTAGE OF:										
			Nitrogen as:					Phosphoric Acid as:			Potash.	Fineness.	
			Nitrate.	Ammonia.	Blood.	Flesh, Offal, Bone.	Unspecified.	Water Soluble.	Citrate Soluble.	Total.		Fine.	Coarse.
Paul and Gray, Ltd.	Brisbane	Sulphate of Potash	..	..	..	..	..	..	..	..	52	..	..
Paxton, W. H., and Co.	Mackay	Various	..	..	..	..	..	..	..	..	..	..	..
Pinder, A. W.	Rockhampton	"P.B. 8" Fertiliser	..	..	..	1	..	10	..	19·4	..	..	..
Ditto	..	"P.B. 3" Fertiliser	..	..	..	·7	..	8·5	..	12·9	..	..	..
Ditto	..	"P.B. 5" Fertiliser	..	4	..	·3	..	5	..	12·8	..	..	..
Pohlmann, J. W.	Doolbi	Bonedust	..	..	..	3·09	..	..	..	24·65	..	60	40
Pressler, G. L.; and Grotherr, E. C.	ditto	Bonedust	..	..	..	2·77	..	..	..	25·10	..	72	28
Pumpfrey and Kyle	Nundah	Q.M.E. Fertiliser	..	..	6·03		..	..	14·76	15·81	..	..	..
Queensland Fertiliser Coy., Ltd.	Runcorn	Runcorn Bonedust	..	..	..	4·25	..	..	..	21·85	..	50	50
Queensland Fruitgrowers' Industrial Trading Society	Brisbane	Webster's Superphosphates	..	..	..	..	..	16	..	..	..	..	..
Ditto	..	Shirley's Superphosphate	..	..	..	..	..	17	..	..	..	..	..
Ditto	..	ditto No. 3 Fertiliser	..	3·3	..	..	..	13	..	..	2	..	..
Ditto	..	ditto No. 5 Fertiliser	..	3·3	..	..	..	12	..	..	·7	..	..
Ditto	..	Sulphate of Potash	..	..	..	..	..	..	..	..	52	..	..
Ditto	..	Q.M.E. Dried Blood	..	..	12·08	..	..	..	..	..	..	..	..
Ditto	..	Q.M.E. Fertiliser	..	..	6·03		..	..	14·76	15·81	..	..	..
Ditto	..	Baynes Brothers' Fertiliser	..	..	4·27		..	..	..	19·75	..	..	..
Ditto	..	Runcorn Bonedust	..	..	4·25		..	..	..	21·85	..	52	48
Ditto	..	J. C. Hutton's Fertiliser	..	..	6·17		..	..	..	14·10	..	..	..
Ditto	..	Webster's Sulphate of Ammonia	..	20	..	..	..	..	..	..	..	..	..
Ditto	..	Webster's Sulphate of Potash	..	..	..	..	..	..	..	..	50	..	..
Queensland Meat Export and Agency Company, Ltd.	Brisbane	Q.M.E. Fertiliser	..	..	6·03		..	..	14·76	15·81	..	..	..

Ditto	..	Q.M.E. Dried Blood	..	..	12·08	..	..	..	..	..	..	..	..	
Rosewarne (Queensland), Ltd.	Brisbane	Excel Brand Fertiliser ..	..	..	3·88		..	..	..	16·80	..	..	..	
Searle, J., and Sons, Ltd. ..	Toowoomba ..	Wattle Brand Bonemeal ..	..	..	..	2·8	..	..	..	10	..	35	65	
Ditto	..	Baynes Bros. Fertiliser ..	..	..	4·33		..	..	..	19·33	..	..	..	
Taylor, C., and Co.	Brisbane	Shirley's Superphosphate ..	..	..	..	..	..	17	..	..	..	..	..	
Ditto	..	ditto No. 3 Fertiliser ..	..	3·3	..	..	..	13	..	..	2	..	..	
Ditto	..	ditto No. 5 Fertiliser ..	..	3·3	..	..	..	12	..	..	7	..	..	
Ditto	..	Sulphate of Potash	..	..	..	..	..	..	..	..	52	..	..	
Ditto	..	Mt. Lyall No. 1 Superphosphate	..	..	..	..	..	17	1	20	..	..	..	
Ditto	..	Redbank Fertiliser	..	..	6·46		..	..	..	13	..	..	..	
Torrens Creek Meat Export Company, Ltd.	Torrens Creek ..	T.C. Fertiliser	..	..	3·80		..	..	..	20	..	..	..	
Trackson Brothers	Brisbane	Nitrolim	..	..	..	..	18	..	..	..	..	..	..	
Ditto	..	Nitrate of Lime	13	..	..	..	..	..	..	..	..	..	..	
Tytherleigh, J.	Woombye ..	Nitrolim	..	..	..	..	18	..	..	..	..	..	..	
Ditto	..	Hutton's Fertiliser	..	..	6·17		..	..	13·05	14·10	..	..	..	
Ditto	..	Shirley's Superphosphate ..	..	..	..	..	..	17	..	..	..	..	..	
Ditto	..	Q.M.E. Fertiliser	..	..	6·03		..	..	14·76	15·81	..	..	..	
Ditto	..	Q.M.E. Dried Blood	..	..	12·08	..	..	..	..	..	..	..	..	
Walker, J. J., and Co. ..	Brisbane	Torrens Creek Fertiliser ..	..	..	4·40		..	..	..	16·47	..	..	..	
Walsh and Co.	Toowoomba ..	Downs Bac. Co. Gen. Fertiliser	..	..	2·84		..	..	..	14·54	..	..	..	
Ditto	..	Hutton's Fertiliser	..	..	6·17		..	..	13·05	14·10	..	..	..	
Ditto	..	Shirley's No. 3 Fertiliser ..	..	3·3	..	..	..	13	..	..	2	..	..	
Ditto	..	ditto No. 5 Fertiliser ..	..	3·3	..	..	..	12	..	..	7	..	..	
Ditto	..	ditto No. 1 Superphosphate	..	..	..	..	..	17	..	..	..	..	..	
Ditto	..	ditto No. 9	..	4.1	..	..	..	6·5	..	..	4	..	..	
Ditto	..	Wattle Brand Bonemeal ..	..	..	..	2·8	..	..	..	19·0	..	35	65	
Webster and Co., Ltd. ..	Brisbane	Crown Sulphate of Potash ..	..	..	..	..	..	..	..	..	50	..	..	
Ditto	..	do. Superphosphate ..	..	..	..	..	..	16	..	..	..	..	..	
Ditto	..	do. Sulphate of Ammonia	..	20	..	..	..	..	..	..	..	..	..	
Whiteley, D.	Emu Park ..	Sulphate of Potash	..	..	..	..	..	..	..	..	52	..	..	
Ditto	..	Sulphate of Ammonia ..	..	20	..	..	..	..	..	..	..	..	..	
Ditto	..	Nitrate of Soda	15·5	..	..	..	..	..	..	..	..	..	..	
Ditto	..	Shirley's No. 3 Fertiliser ..	..	3·3	..	..	..	13	..	..	2	..	..	
Ditto	..	ditto No. 5 Fertiliser ..	..	3·3	..	..	..	12	..	..	7	..	..	
Wood, T. H.	..	Bonemeal	..	..	..	4·07	..	..	..	24·2	..	50	50	

CORN-GROWING CONTEST, 1914-1915.

Following is an example of the Record Chart that was kept by one of the competitors in the corn-growing competition held under the direction of the Department of Agriculture and Stock, which commenced in 1914 and terminated in 1915. Another competition has been arranged for the season 1915-1916 under the same conditions. This chart was kept by an energetic young farmer in the Crow's Nest district, and, had the season been favourable, no doubt his energy would have been rewarded. He has now enlisted in the military forces, so will not be a competitor on this occasion:—

PARTICULARS ABOUT THE PLOT AND ITS PREPARATION.

Nature of Soil—Light, loamy forest soil, between a light black and chocolate colour.

Nature of Subsoil—Sub-soil in places consists of a heavy yellow clay, while other parts are gravelly.

Situation of Plot—Plot runs over the summit of a spur of the range, and slopes to east, south, and west.

Previous Cultivation or History of Plot—Plot has never been cultivated or worked in any way before, and up to this year (1914) has been heavily timbered with green iron-bark saplings, also a fair quantity of dead timber. As a rule, it carries a fair weight of grass, and up to September, 1913, was open to stock. It was then fenced, and from then on was not trodden in any way.

When Preparation of Plot commenced—Preparation commenced on 10th day of August, 1914.

Was Manure applied?—No manure was applied.

How was the Plot Prepared? (Competitors here to state fully how, and when, and why each operation was carried out; the condition of the soil as to moisture and fineness at each stage of working, the implements used, depth of working, difficulties experienced, &c.)—According to general ideas concerning farming, my plot does not stand a very good chance of bringing me in the first prize, as the soil is too new and sour from not having been worked. During the first week we commenced clearing operations in extremely dry and hot weather, but ideal conditions for the work. We stumped out the green saplings with axe and mattock, and burnt out all dry trees and stumps. Having filled up all holes remaining after burning, we intended to wait for rain to make the soil easier to work.

After waiting some little time and still no rain, we came to the conclusion that there was none to come, so decided to break the ground up dry. Accordingly, on Monday, 10th August, 1915, we started ploughing operations with three horses and a Newl-Saunder's improved single-furrow disc plough. The soil worked better than we anticipated, the only fault being that the sods in places would break away right down to the subsoil, making a very uneven furrow for the plough wheel to run in on the following round, and also leaving the ploughed land in a very rough condition.

Of course, we struck the usual collection of roots, stumps, &c., which was only natural; but, as two men followed the plough all the time, any obstruction was soon removed. The only real trouble we encountered was caused by the uneven bed of the furrow, which I have already mentioned. The disc stood the shaking splendidly until, happening to strike a specially rough patch, one of the main bolts broke in halves. Just as luck would have it, we had not another bolt in the place that would fit; so we were completely euchred. We were not beaten, however. So pulling the disc out of the way, we hooked on to a heavy English iron plough, made for the purpose, and finished the field with that.

The ground then lay in that condition for about four months, with scarcely a drop of rain, certainly not enough to soften the clods. A succession of storms early in December, however, had the desired effect, and I got on to the land with the harrows. After six or seven harrowings, the clods broke up sufficiently to allow of cross-ploughing—again with the disc plough. Of course, this was much easier than breaking up, and very little difficulty was experienced. The continued dry, hot spell had one good effect in that it completely killed the roots of the grass which were assisting to bind the soil together, so that after a thorough saturation the clods broke up rather easily.

After cross-ploughing it was harrowed again half-a-dozen times, till the soil was, in a certain measure, fit for planting as regards fineness and moisture. Of course, after breaking up, the soil was in the roughest possible condition and absolutely parched. The depth of ploughing was 5 in. On cross-ploughing, the depth was 6 in., while the sods were now broken up into squares as it were, and beginning to crumble. The ground was fairly moist, but, on account of the rough, open condition, moisture was not retained.

When we commenced planting, parts of the field were in very fair condition, the soil having crumbled up splendidly, while other parts were still very rough. Of course, I claimed the best corner for my plot, and was not refused.

Heavy rain fell during planting operations, so that the condition of the plot as regards moisture can easily be judged.

The only difficulty experienced was in the covering. I reversed the two outside hoes of the scuffler and raised the back one. In this way, by driving the horse in the drill and keeping one of the sides hoes on each side of the drill, both threw the soil inwards and so covered the seed effectively. But in the rough places the clods would jam up around the hoes, making them skid, so that I was continually stopping to clean them. However, I got all the drills covered; and on the 26th December I harrowed the field, and from then on I have been watching the crop grow, and dreaming of what I will do when I win the prize.

PLANTING.

Condition of Soil as to Moisture at Planting—Corn planted immediately after 1·20 in. of rain had fallen, so that the ground was thoroughly moist.

How was the Seed Sown?—The land was drilled out and the seed planted by hand and covered with a scuffler.

Was any Fertiliser applied?—No.

Was Seed Planted Singly, or in Groups or Hills?—The seed was planted singly.

Distance between Plants or Hills—The seed was planted roughly about 1 foot apart.

Distance between Rows—The distance was not accurately measured, about 4 feet.

Direction of Rows (north and south, or east and west)—Rows planted east and west.

Date of Commencing Planting—Commenced planting on 23rd December, 1914.

Date of Finishing Planting—Finished planting on 24th December, 1914.

Depth of Planting—The seed was planted about 4 in. deep.

PROGRESS OBSERVATIONS.

Date of First Appearance of Young Plants—First plants appeared on 27th December, 1914.

Time taken before all Plants are up in Rows—All plants up in rows on 30th December—seven days.

Number of Blanks re-seeded—No blanks re-seeded, as corn came up splendidly.

How Cultivated (Competitor to give in the form of a diary full particulars of the operations adopted to break soil crusts, cut out weeds, and keep in moisture)—27th December: First plants showing though. 30th December: All plants up in rows and looking very healthy. 14th January: Rain came and washed some of the plants out—a calamity, as every stalk may count. 18th January: In walking over the plot to-day, I noticed that weeds were coming in places. In this matter the new ground has the advantage as, speaking comparatively, there are scarcely any weeds. However, the few that are there must come out, as the weather is very hot and the moisture soon goes. 19th January: Commenced scuffling to-day with a very bad horse. At other times when scuffling, I do not take much notice if I destroy a few plants, but this time when the horse treads on one of my stalks I feel almost as bad as if he trod on me. However, the soil falls apart splendidly and I am having no trouble in killing the weeds. 20th January: Scuffling finished and the result is a very satisfactory job, in my opinion. Plants are now about 2 ft. high and growing exceptionally quickly. 27th January: Still growing, but beginning to look very bad during the heat of the day. My visions of the first prize are also becoming very dim. The worst part of it is that nothing can be done to improve matters, as there is not a weed to be seen anywhere and the soil is nice and loose. 4th February: In walking over the plot to-day, I noticed that the Early Leeming maize appears to be bad for suckers, as my

plot is thick with them, while 90-Day maize near at hand is entirely free. Otherwise the two varieties appear much the same so far. 8th February: First tassels noticed to-day, and the weather is horribly dry. In spite of this, corn is about 5 ft. high, but very withered. Pulled all the suckers from plot to-day to allow the main stalks all the moisture possible. 4 p.m.: Hopes reviving, as storm clouds appear in the west. A good downpour now will make a vast difference. 9th February: The first prize again appears before me. Smart storm yesterday evening, and good steady rain all to-day; in all about 3½ in. fell. This will do a world of good. 20th February: Several more light showers to-day. Corn is beginning to show cobs, but these light showers don't last long. We want another good soaking rain to produce proper growth. There appears no chance of this, however. 28th February: Getting very downhearted again. Dry, dry, dry—everything is dry—myself included. Corn withering again. 2nd March: Calamity altogether. Dreadfully hot day with scorching south-westerly winds and dust storms. Another day like this and I am ruined, or, rather, my chances of the prize are.

Weather Conditions during Early Growth—The weather conditions during early growth have been absolutely bad, no rain having fallen since plants were a fortnight old. They are now six weeks old, and are having extremely hot, dry weather, which causes the leaves to curl up completely during the heat of the day.

Date of First Appearance of Tasselling—First tassels noticed Monday, 8th February, 1915.

Weather Conditions during Tasselling and afterwards when Cobs are Forming—Just as the first tassels appeared—*i.e.*, on the 8th—we had good rain; but then it was dry and hot again, so that the cobs did not make proper growth. Rain fell again on the 5th March, however, which improved things considerably.

Was Plot Watered other than by Rain?—No; plot depended entirely on rain for moisture.

WOMEN IN AGRICULTURE.

The enrolment of a female student at the Dookie Agricultural College, with the report of the principal, Mr. Hugh Pye, to his council in regard to the innovation, raises an interesting and important question. A change is indicated in the relationship of women to agriculture, and, like every other change, it will be looked upon with both approval and condemnation by different observers. The development of modern conditions of life has greatly widened and changed the sphere of women's industrial and business activity, and, whether we approve of the change or not, it is important for us to recognise it and observe the direction of its tendency. When agriculture is compared with the other industries into which women are entering with increasing energy, little can be discerned in it that is calculated to preserve it as an exclusive sphere for men's occupation. As a matter of fact, there are many aspects of it

specially suitable for women, and there is nothing surprising in the fact that it should be invaded by the forces of the modern movement. In reality the invasion has been proceeding for a considerable time, and has already assumed considerable dimensions. Not much can be done to stop movements of this kind, even when it is desirable to do so. In this case there is little evidence that a larger participation in the agricultural industries would not be to the advantage of agriculture as well as of the general condition of society.

To understand what is new in this modern innovation it is necessary to remember that agriculture or farming consists of many widely varying branches. It not only embraces numerous differing branches connected with the cultivation of various crops and the keeping of different classes of live stock, but, like other industries, it must be considered in two aspects—viz., in regard to the work or labour involved, and in regard to the skill or knowledge employed in its management or direction. There are "farmers" and "farm labourers," and it is well to observe which of these two classes is meant when women are spoken of as engaging in agricultural occupations. Are they becoming occupiers and managers of farms, orchards, and vineyards, or are they serving as labourers on such places? There is surely nothing new in women engaging in farm work. They have in the past always taken an important part in the work of the field, of the farmyard, of the byre, and the dairy, as well as the orchard and the vineyard. As a matter of fact, modern progress has been in the direction of decreasing the proportion of female labour in agriculture, and in new countries like Australia, Canada, and the United States the almost entire absence of women from the fields is a marked feature of their newness. The new movement, therefore, cannot be a proposal for women to undertake farm labour. There are departments of farm work which are in their nature unsuitable for women. These have rarely been allotted to female labourers, and the new movement surely does not propose a backward step in this direction. This brings us back to the Dookie student, who has given rise to the discussion, "What is she doing?" She is certainly not preparing to be a farm labourer. It is not necessary to study the rudiments of the sciences upon which agriculture is founded in order to be a farm labourer. She is manifestly learning to be a "farmer"—to manage farm property and direct labour. If with the male students she works on the farm, it is not because she expects to have to do all branches of farm work herself when she becomes a farmer, but because, like the male students, she may know how to direct farm labourers. It is in aiming at being a "farmer," an "agriculturist," that this student is doing anything out of the common, and here we have the real nature of the innovation. What claims have women to be considered fit for assuming the position of farmers or managers of agricultural enterprises?

If we look at agriculture in its normal condition, as it has been conducted in the long past, and not in its changing modern phases, the part taken by women is found to have been by no means an unimportant one. The farmer has been assisted in his industry by his wife and his

daughters as well as by his sons. It has to be remembered that a farm is a home as well as an establishment for providing the means of living, and the home has always been an important department. Neither have modern developments decreased the essential value of the home department. There has certainly been evolved in the pioneering stages of agriculture in the new countries of America and Australia a crude type of producing centres, where wheat or live stock are raised under a rough and temporary system of exploitation. These, however, are not "farms," and the systems adopted are not farming. They are "camps," "ranches," or "stations," and they have to be followed in the course of progress by farms on which the homes must take their essential position of importance. When the relation of the home to the prosperity of farming is considered, it is realised that women have always been vitally associated with agriculture, and it is further manifest that farming, more than any other industry, is dependent upon woman's work and her special services. Modern changes have seen women invading many spheres in which the duties could be performed at least as well by men, but the case is different in relation to agriculture. A withdrawal of the part which woman has hitherto taken in farming would evidently be fatal to the industry, however well she could be spared from other spheres of business or occupation. It may, therefore, be in the interest of farming if women are now seeking to assume a larger share in the conduct of the industry.

But, before considering woman's fitness for a wider sphere of agricultural duties, it may be well to reflect upon the effect which is being produced upon the industry by other features of modern developments. Those tendencies which have produced the great cities and towns of the industrial age have, in all progressive countries, brought about a serious depletion of rural population. "Back to the land" is a cry which, for more than a generation, has voiced the suffering of agriculture by the loss of its producing population. Statesmen are agreed that one of the greatest needs for the accomplishment of permanent prosperity is an increase of primary production. This need is recognised in this country as clearly as in other parts of the world. While opinions differ as to the means by which primary production can be increased, no one disputes the vital importance of the object itself. In studying the causes and the remedies of rural depopulation, attention is too much confined to industrial or financial factors, and insufficient weight is attached to social influences. The effect upon this problem of the attitude which women have assumed towards agriculture and rural life has been more potent than has been recognised. What are the views of city girls in regard to marrying a farmer? The question is easily answered. It is not his income that is objected to, but the life such a marriage involves. If the city girl were willing to become a farmer's wife, what kind of a wife would she make? That question is also easily answered. It is evident that the young farmer would do well to marry his neighbour's daughter. But where is the neighbour's daughter? Perhaps whenever she left school she emigrated to the city. She, in fact, is probably one of those

city girls who decline to marry a farmer. As we have seen that the home is an essential part of the farm, with what difficulty farming and primary production are to be promoted until some important social changes are brought about. It may be that the movement suggested by the Dookie student under notice is the beginning of those necessary social changes.

If we inquire how far the part played by woman in agriculture hitherto suggests fitness for the leading rôle now being assumed, there is much to encourage expectation. Farmers' wives, as managers of the important home department, have been called upon to exercise many of those functions which have to be applied to the other branches of the farm—foresight, economy, industry, patience, skill, judgment in buying and selling. Have not farmers' wives displayed, as a rule, these qualities in the management of the house, the dairy, and the poultry yard as successfully as the farmer has done in the department under his direction? It may even be claimed that the farmer would have been more successful if his operations had been to a greater extent governed by the principles of "domestic economy." It has often happened that the head of a farming family has been prematurely removed, and the mother has had to assume the management in his place; but how seldom has she failed? It is difficult, indeed, to point out any feminine quality which is a disqualification for the management and direction of agricultural industries. Certainly there are departments of farm labour which are not suitable for women, but there are also departments of farming quite unsuitable for men—viz., those undertaken by farmers' wives. It is the directorship that women now proposes to assume, and it is difficult to deny her qualifications. It is likely, therefore, that women students at agricultural colleges will increase, and not improbable that the agricultural college in England for training girls will have its imitators. One result may be the elevation of agriculture and rural life in the estimation of young women, and than this nothing could do more to check the drift of agricultural population to the cities and bring about the necessary increase in primary production.—"Australian Farm and Home."

THE QUEENSLAND COTTON CROP OF 1914-15.

In connection with the cotton crop for this year, it is the intention of the Minister of Agriculture to take in hand the treatment of the crop in the same manner as was done last year, that is to say, that the Department will advance 1¾d. per lb. on the raw cotton, and afterwards sell the cotton and seed and distribute the profits amongst the suppliers. The Department will not make any charge for the work, but will deduct

any expense incurred in obtaining additional labour. Last season there was a small crop (9,445 lb. of seed cotton) which, when treated at the ginning house established at the Department of Agriculture, resulted in a yield of ginned cotton which, after all expenses were paid, enabled the Department to distribute an additional return over and above the 1½d. per lb. advanced to suppliers. It would be well if farmers would realise that cotton is a drought-resisting plant, that it requires little cultivation after it has made a good stand; that, beyond the boll worm, which can be overcome by alternative rows of cotton with a few rows of maize (which the insect prefers to cotton bolls), no disease troubles it. Had there been large areas of cotton planted in the districts which have, in the first half of the year, suffered so severely from drought, the growers would have realised very fair profits, the American quotations for ginned cotton being now 7d. per lb. and likely to go higher. When the present war is over, and many more settlers come to this State, we shall probably see cotton-growing established on a firm basis.

At the time of the Civil War in the United States of America, when American cotton could not be obtained except through successful blockade runners, Queensland had a splendid opportunity, and cotton was largely grown for several years, the farmers receiving 3d. per lb. for good seed cotton. Now 1,000 lb. of seed cotton (Uplands) is an ordinary return per acre, and as much as 1,500 and 2,000 lb. have been picked per acre in Queensland. How does a crop of 1,000 lb. of cotton compare with a 40-bushel crop of maize? In normal seasons, when good crops of maize are harvested, the average price per bushel may be put at 3s. 6d. to 4s., which is £8 per acre. The 1,000 lb. of cotton at 2d. per lb. amounts to £8 6s. 8d. per acre. But the cost of harvesting the crops has to be taken into consideration, when we come to reckon the profit. Maize has to be pulled, husked, threshed, winnowed, and bagged. Cotton has to be picked, sunned for a few hours, and bagged. In both cases white labour is employed. Cotton-growing in this State is a white man's job. If he has a family, he need employ no outside labour to pick it, which means ½d. per lb. saved to the farmer. Furthermore, in these days, the seed has a great value, which it had not in the sixties and seventies in Queensland. The seed which was then thrown out as useless, now brings from £4 to £6 per ton for oil and cake purposes. The 600 lb. of seed contained in a 1,000-lb. crop is worth from £1 to £1 10s. We have written so much about cotton-growing and its possibilities and certainties, that at the moment of writing we are wondering that many dairy farmers, who are to-day threatening to dry off their cows and give up dairying for the purpose of supplying the wants of cities, do not devote a few acres to a crop which will leave them a profit instead of what their present business shows, as they tell us, a dead loss. It is not

known how much will be sent in this season. It is believed that if the industry weathers the next year or two it may become more firmly established in Queensland, but, as is well known, the difficulty is the cost of labour for picking. A machine is now being tested which it is hoped will overcome this trouble. It is designed on the vacuum principle. The area planted last year was 134 acres, the yield being 20,336 lb. of seed cotton.

CHANGES IN THE DEPARTMENT OF AGRICULTURE AND STOCK.

Mr. H. C. Quodling to be Director of Agrictulture. Connected with Mr. Quodling will be the Instructors in Agriculture, Messrs. G. B. Brooks and A. E. Gibson; the Field Assistants, Messrs. E. R. Ashburn and H. Bechtel; also the travelling exhibit, which has been sent round to the various shows by the Department; and the State Farms at Hermitage, Bungeworgorai, Warren, Gindie, and Kairi.

Mr. A. H. Cory, M.R.C.V.S., has been appointed Chief Inspector of Stock, and will attend to stock and slaughtering matters in that portion of the State south of Mackay and of the 22nd parallel. He will also exercise veterinary supervision over the Stock Experiment Station at Yeerongpilly.

Mr. G. Tucker, M.R.C.V.S., will be Northern Deputy Chief Inspector of Stock, and will act as Director of the Stock Experiment Station at Townsville, besides attending to stock and slaughtering matters throughout the districts north of the 22nd parallel.

Mr. A. H. Benson, who has been appointed Director of Fruit Culture, took up his duties at the beginning of September. He will attend to all matters affecting the fruit industry, including the administration of the Diseases in Plants Act and the Fruit Cases Act. He will also exercise supervision over the State Nursery at Kamerunga, Cairns.

Mr. Cuthbert Potts, B.A., has been appointed Principal of the Queensland Agricultural College, Gatton, and took up his duties there at the end of September. Mr. Potts comes from the Hawkesbury Agricultural College.

Mr. R. P. M. Short has been appointed Registrar of Brands, while Mr. A. T. Jefferis, B.Sc., has been appointed Science and House Master at the Agricultural College, in succession to Mr. Ellard. Mr. Jefferis was formerly in the Department's Chemical Laboratory. Mr. A. R. Wilkin has been appointed Instructor in Cheesemaking, and his position as a Cream Inspector has been filled by Mr. W. S. Hartley, formerly Dairy Inspector at Nanango.

Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

MILKING RECORDS OF COWS FOR MONTH OF AUGUST, 1915.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Commercial Butter.	Remarks.
			Lb.	%	Lb.	
Lennie ...	Ayrshire	23 July, 1915	1,000	3·8	44·57	
Iron Plate ...	Jersey	2 Feb. ,,	539	5·5	35·05	
Lady Twylish	,, ...	5 June ,,	531	5·0	31·33	
Noble Dot ...	,, ...	2 May ,,	532	4·8	30·12	
Bluebelle ...	,, ...	20 June ,,	628	3·9	28·73	
Netherton Belle	Ayrshire	23 April ,,	549	4·3	27·82	
Miss Bell ...	Jersey	2 July ,,	529	4·4	27·39	
Lark ...	Ayrshire	17 June ,,	559	4·0	26·25	
Gretchen ...	Holstein	15 Aug. ,,	598	3·4	23·75	
Lady May ...	Ayrshire	7 Mar. ,,	518	3·8	23·07	
Black Bess ...	Jersey	4 June ,,	451	4·3	22·82	
Lady Athol	Shorthorn... ...	27 May ,,	506	3·7	21·94	
Thornton's Fairetta	Jersey	27 Mar. ,,	351	5·0	20·71	
Lady Lil ...	,, ...	27 June ,,	366	4·4	19·37	
Rosine ...	Ayrshire	7 Aug. ,,	435	3·8	19·37	
Cocoatina ...	Jersey	6 Mar. ,,	316	5·0	18·64	
Princess Kate	Ayrshire	9 July ,,	463	3·4	18·43	
Lady Melba	Holstein	6 Mar., 1914	399	3·9	18·25	

Grazed on natural pastures, supplemented by a ration of 30 lb. of maize ensilage daily.

GOAT'S MILK FOR TICKS.

Mr. J. F. Keane, Carbeen, writes:—Your article on milch goats in the June issue of the Journal tells me much I did not know, and encourages the idea that we may be on the brink of a very big thing. I have lately met farmers who have raised calves on goats' milk, and all are quite positive that the calves had no ticks on them while receiving the milk. To quote the words of one of them: "I thought everybody knew that, but it is really no good, since they get ticky again as soon as they are turned out." To my mind, the matter is set at rest. It is the goat's milk that kills the tick. Now, if the active principle, whatever it may be, that protects the goat, can slay a comparative monster like a cattle tick in the attenuated form in which it must reach it through the mamma of the goat and the digestion of the calf, what chance would a little thing like a tubercle baccillus stand if it met the full strength of it? If the histologist and bacteriologist ever isolate the goat's "good fairy," something makes me think it will turn out to be an inherent corpuscle rather than a virus.

TO PREVENT MILK FROM CREAMING.

The natural tendency for the minute fat globules is to rise to the surface of the milk, and this will happen to a greater or less degree irrespective as to whether the creams are stirred up by a rotary or semi-rotary movement of the stirring apparatus. The most effectual method of keeping the fat globules intermingled with the milk in anything approximating even proportion is to be attained by stirring the milk by means of a plunger. The adoption of this method is effectual in carrying the fat globules down amongst the lower milk strata.

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* NOTES ON THE NEED FOR AND THE VALUE OF ENSILAGE.

The silage method of preserving crops for future need does not take hold with the force that its undoubted merits would justify, and, despite the activity of Officers of the Department of Agriculture in their efforts to popularise the silo as a means for the conserving of fodder in a form highly suitable for sustaining the dairy herd, little addition has yet been made in the quantities of silage prepared from year to year, and the amount of ensilage annually prepared has never reached 5,000 tons —a poor record, indeed, for a State concerned in providing sustenance for 365,000 milch cows.

It is during a season like the past, when the failure of both grass and fodder crops occurred in many districts, that the true value of silage is to be readily recognised. By enabling the surplus crops of a favourable season to be held over in a succulent condition for use during a subsequent "dry spell," the silo provides the safest form of insurance against the depredations of a drought, and renders the farmer practically independent of the influences of adverse weather conditions.

The silo is a necessary adjunct to the dairy farm, and the value of ensilage as a fodder is fully appreciated by dairying communities the world over, except, possibly, in Queensland, where neither the silo nor any substituted method of conserving fodder seems to gain the favour of the dairy farmer.

It is only necessary to instance the disturbing influence exerted by the recent dry spell upon the volume of the production of dairy products, in order to gain an insight into the amount of wealth lost to the dairying community on account of improvidence and non-acceptance of the silo as an approved method of fodder conservation. The dairy farmers operating without a supply of fodder in reserve were forced to purchase food for their stock in the open market at a rate which prohibited the production of milk at a reasonable cost; and, instead of the dairymen being in a position to take advantage of the relatively high prices maintaining for dairy produce throughout Australia at the time, they were actually conducting their dairies at a loss.

Cases of dairy farmers being compelled to temporarily relinquish dairying, and place their dairy herds upon agistment in more favoured localities, were of common occurrence.

* Contributed by the Director of Agriculture and Mr. G. Graham (Dairy Expert).

An adequate supply of ensilage upon the farms would have eliminated or, at least, materially reduced the distress directly occasioned by the scantiness of the rainfall. Our methods of farm husbandry must remain incomplete until such time as silage is afforded greater attention by stockowners.

Ensilage exerts a decided tendency towards equalising the summer and winter production of dairy produce, for by its use silage assists in keeping the milk yields even and permanent throughout the year.

Ensilage is an attribute to success in dairy enterprise, and a bountiful supply of this fodder contributes largely to the profits derivable from the well-managed dairy farm.

The Stock-raisers resident within the closely settled areas can ill afford to be without the silo and its attendant advantages, particularly as a ration of ensilage is relished alike by oxen, sheep, and swine. These animals thrive when fed upon the succulent silage, which is equally efficacious for the purpose of producing flesh or milk when used in conjunction with a food rich in protein such as lucerne or cowpea.

It must be recognised at this period, when high prices for building material prevail and when people are anxious to husband their resources, that the time would be inopportune to advocate an outlay for silo and plant; consequently, immediate expansion in the way of conserving fodder must be on inexpensive lines, and in this connection the method of putting up green fodder in an approved manner in the form of a silage stack should readily appeal to all dairymen and stock-owners within closely settled areas.

For reasons stated, it is the aim of the Department of Agriculture and Stock to encourage fodder conservation throughout all Dairy districts.

The results accruing from previous work carried out under the direction of Officers of this Department have demonstrated the efficacy and practicability of the methods advocated.

This year it is purposed to send Officers out to give demonstrations in approved methods of silage-stack construction at a number of different dairying communities. These Officers will work in conjunction with the respective Dairy Inspectors, who are now making inquiries and organising with a view to the initiation of a widespread scheme of fodder conservation. The primary effort is to secure two farmers in each district willing to grow crops for the purpose of providing supplies of green maize to be used in connection with the demonstrations previously referred to. Naturally, it is anticipated that a considerable number of farmers in each locality will also plant up areas with fodder crops and actively engage in their preservation in a similar manner.

It is considered that a decided impetus would be given to the movement by various Farmers' Progress Associations encouraging discussion on this subject amongst their respective members. In this way it is possible that publicity may be given to the whole project, and the need of the Silo and the economic part it should play in farm husbandry thereby brought home to those immediately concerned.

TO ESTIMATE THE AMOUNT OF COMMERCIAL BUTTER CONTAINED IN MILK OF VARYING BUTTER-FAT TEST.

In connection with this matter the following noting has been made by Mr. E. Graham, Dairy Expert:—

"Usually the amount of commercial butter to be won from milk of a given test is to be most readily and accurately estimated by reference to a chart. In this State, O'Callaghan's Chart is in general use, and the chart is procurable from most booksellers of note. In the absence of the chart for determining the commercial butter content of a known quantity of milk of a given test, it is possible that the most accurate formula to be adopted for this purpose is as follows:—

First deduct ·22 from the butter-fat test; then multiply the remainder by the number of pounds of milk; next divide the product by 85. The quotient represents the estimated yield of commercial butter.

Example.—Find the commercial butter-fat content of 85 lb. of milk testing 3·8 per cent. of butter-fat—

$$3{\cdot}8 - {\cdot}22 = 3{\cdot}58 = \frac{358}{100}$$

We then have—

$$\frac{358}{100} \times \frac{85}{85} = \frac{358}{100} = 3{\cdot}58 \text{ lb. of commercial butter.}$$

MAINTENANCE OF YOUNG PIGS.

In laying down plans to maintain 100 pigs and carry them on to a fattening stage, either the initial work entailed in the rearing of the animals has been overcome, or else some natural supplementary food from the dairy farm or factory is available.

A supply of milk or by-products plays such an important part in the management and early life of young pigs that the change to their maintenance on "grazing" or "soiling" crops should preferably be a gradual one, and for obvious reasons the chief crops should be rich in flesh-forming constituents.

Lucerne is practically the main stand-by for pig-raising on this account. At certain periods of the year mature crops of cowpeas are invaluable also for the same purpose, and for fattening.

Apart from the consideration or the element of danger in using immature plants of the Sorghum family as food for animals, the crops mentioned by Mr. Evans—viz., Sorghum, Kafir Corn, Panicum, and Millets—if grazed as early as intended, will not supply the character of

food necessary for maintaining growing pigs, nor will these fodders be altogether satisfactory for assimilation in large quantities. From the investigations of the Agricultural Chemist it would appear that there is always danger in using plants of the Sorghum family when immature, and for this reason other crops are to be preferred if such a choice can be made. The seed heads of Kafir Corn and Sorghum make excellent food to supplement other classes of farm crops, and play an important part also in pig maintenance and for fattening.

Without a fuller knowledge of the conditions under which it is purposed to keep these pigs, generalities can only be touched upon—that is to say, the names of the most suitable crops for pig-feeding can be given, and the sowing of these crops to maintain a continuity of feed depends a great deal on the judgment of the person who is in charge of the animals and the conveniences at hand. A supply of green food in the way of Lucerne can only be kept up throughout the greater part of the year by means of irrigation. Other crops which can be grown under field conditions may be set down as follows:—Rape and Barley for sowing in March and April. Field Peas of various kinds in May and June. Maize, Kafir Corn, Sorghums, and Cowpeas in Spring and Summer. Cabbages, Swede and other turnips for planting in late February, March, and April; Mangels in April and August. Sweet Potatoes, Jerusalem Artichokes, Pumpkins, and Melons in Spring.

LICE ON PIGS.

To get rid of this trouble, cleanse the skin thoroughly with soap and water, and then rub in a decoction of Stavesacre—1 part to 40 parts water.

FEEDING MOLASSES TO SHEEP WITHOUT CHAFF.

In reply to a correspondent on this subject, Mr. W. G. Brown, Instructor in Sheep and Wool, advises as follows:—

"Without roughage such as chaff, or old grass, molasses would not be a valuable feed for stock. A sheep drinking molasses would allow the liquid to pass directly into the 3rd or 4th stomach and right through the system. It is doubtful if sheep or any other animals which chew the cud would get much benefit from molasses. It would act as a purgative.

"The usual proportions of molasses to water used in mixing with rough feed of any kind is half water, half molasses, with about 2 oz. of salt to the gallon of mixture; this is mixed up with the chaff. In my opinion a method of feeding to keep sheep alive, which was used at Thurulgoona in 1902, would be quite as good, and very little dearer.

"About 4 oz. of maize per head per day, thrown on the ground in the form of a circle 50 yards in diameter, will keep sheep alive easily, and will cost one-third of one penny per day with corn at 6s. per bushel. I know this saved the lives of 30,000 sheep fifteen years ago.

"Molasses is good with roughage. In pure liquid form, not nearly so good."

THE LATE P. R. GORDON.

Amongst the many old colonists who have lately passed away, and whose loss must be considered as almost a national one, is P. R. Gordon, who for many years held the position of Chief Inspector of Stock in the Department of Agriculture and Stock. In his youth he received his first training in the office of a solicitor or writer to the signet, in Aberdeen, and afterwards took great interest in matters dealing with stock of all kinds, which training was to stand him in good stead when, later on, he left the old country and settled in Victoria, where he became a station owner and manager. Subsequently he went to New South Wales, and was appointed metropolitan inspector of stock under the late Alexander Bruce. He assisted Mr. Bruce in stamping out the scab disease in sheep in New South Wales. In 1867 Mr. Gordon came to Brisbane, where he received the appointment of Chief Inspector of Stock. In that year he assisted to draft the Diseases in Sheep Act of 1867. and subsequent amendments. He was also the originator of the Brands Act of 1872, and, having had experience of the working of the Brands Act in New South Wales, he framed the Queensland '72 Act, which is, without doubt, the best system in Australasia, if not in the world. In Mr. Gordon's early days, there were no Parliamentary Draftsmen, and therefore, the framing of the Stock Acts, &c., devolved greatly on him, and his earlier experience in a lawyer's office greatly aided him in this, and similar work. He was, in conjunction with the late John Fenwick and Gresley Lukin, the originator of the present thriving institution, the Queensland National Agricultural and Industrial Association. Versatile in his accomplishments, he was one of the founders and chief supporters of the Brisbane Musical Union. He played several instruments, amongst them the drum tympani, and if the drums went astray, he took a score and sang in the chorus. In all expositions, such as the Indian and Colonial and others to which Queensland exhibits were sent, he was a leading factor in advancing the State's interests. He and Mr. Bruce were originators of the Annual Conference of Chief Inspectors of Stock of Australasia, conferences which were held alternately in the different States, with a view to establishing uniformity in all matters connected with the movements, diseases, &c., of stock. Mr. Gordon was always an advocate of a Stock Institute on the lines of the Pasteur Institute, to which all matters connected with stock should be submitted. In this, however, he was not supported by the other States, but he succeeded in founding the original Stock Institution, which was located in a temporary building in Turbot street, Brisbane, of which Mr. J. C. Pound (now Director of the Yeerongpilly Institute) was appointed director.

Those who were intimate with him will remember him as a good raconteur, reciter, and comic singer, his favourite comic song being "The Lively Flea." Mr. Gordon was always a strong advocate for introducing new blood into the flocks and herds, horses, and swine in the State. He compiled, and issued at one time, "The Drovers' Guide," which embodied the best parts of the various Acts he assisted in framing.

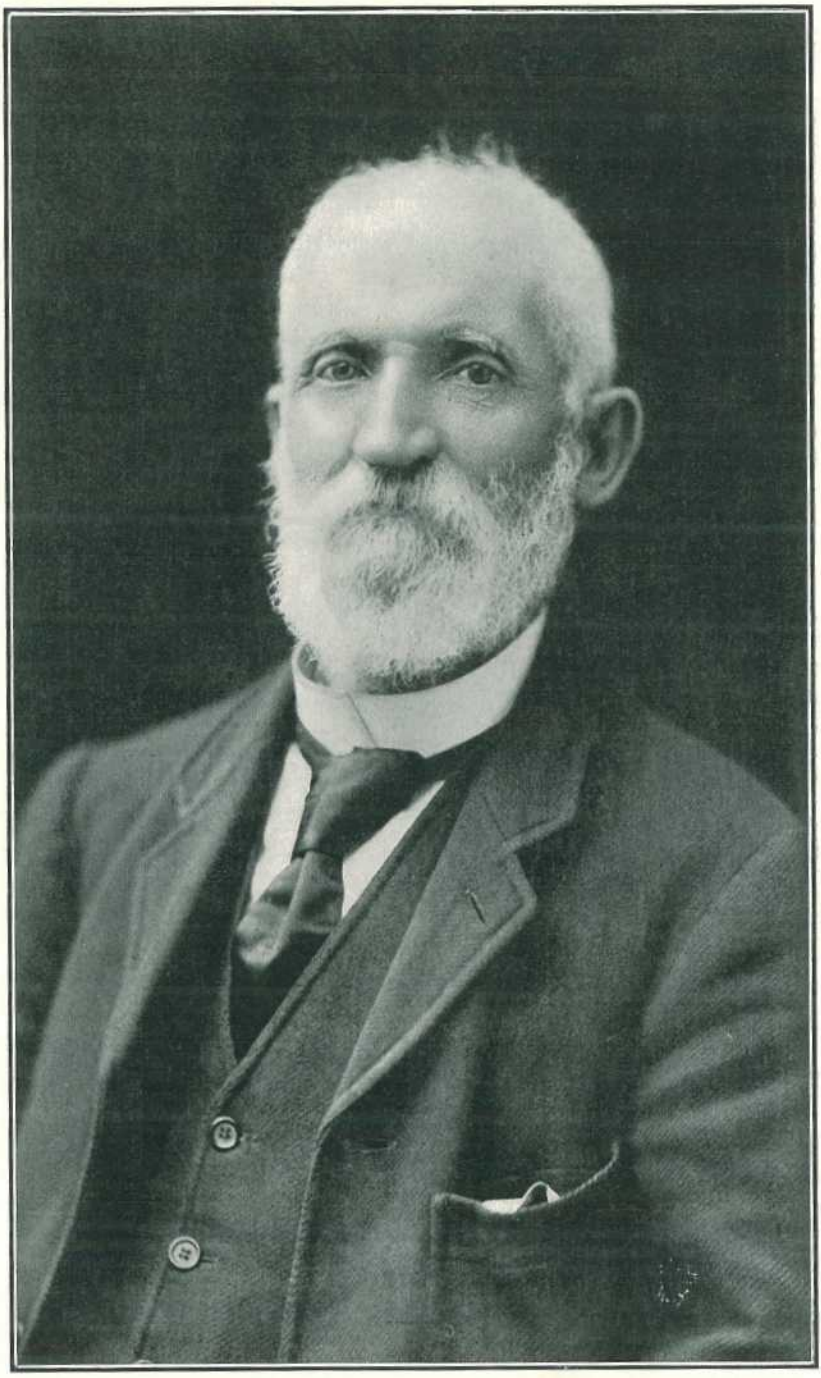

PLATE 16.—THE LATE P. R. GORDON, CHIEF INSPECTOR OF STOCK FOR QUEENSLAND FROM 1868 TO 1904.

Poultry.

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

Six thousand five hundred and sixty-three eggs were laid during the month, an average of 123·8 per pen. Most of the birds have now settled down to work and are doing well. E. A. Smith's Black Orpingtons win the wonthly prize with the splendid total of 150 eggs. The following are the individual records:—

Competitors.	Breed.	July.	Total.
Jas. McKay	White Leghorns	144	507
Mrs. J. Jobling, N.S.W.	Black Orpingtons	135	505
Mrs. Munro	White Leghorns	131	454
J. Gosley	Do.	146	454
J. D. Nicholson, N.S.W.	Do.	117	435
A. W. Bailey	Do.	133	429
C. E. Bertelsmeier, S.A.	Do.	118	428
S. E. Sharpe	Do.	131	426
J. R. Wilson	Do.	130	423
J. M. Manson	Black Orpingtons	144	416
King and Watson, N.S.W.	White Leghorns	129	416
Kelvin Poultry Farm	Do.	136	416
E. F. Dennis	Do.	126	403
A. H. Padman, S.A.	Do.	107	402
C. F. Clark	Do.	124	400
A. T. Coomber	Do.	113	386
T. Fanning	Do.	116	384
E. Le Breton	Do.	141	383
E. V. Bennett, S.A.	Do.	117	381
H. Harmill, N.S.W.	Do.	126	379
R. Jobling, N.S.W.	Do.	128	376
R. Jobling, N.S.W.	S. L. Wyandottes	111	371
J. M. Manson	White Leghorns	120	368
O.K Poultry Yards	Do.	116	368
T. Fanning	Black Orpingtons	140	367
C. Knoblauch	White Leghorns	108	366
F. Clayton, N.S.W.	Do.	122	361
Geo. Tomlinson	Do.	128	358
R. Burns	Black Orpingtons	126	357
W. Meneely	Do.	128	357
Cowan Bros., N.S.W.	White Leghorns	117	354
W. Purvis, S.A.	Do.	136	347
E. A. Smith	Do.	132	346
Derrylin Poultry Farm	Do.	132	343
W. Parker	Do.	132	343
Moritz Bros., S.A.	Do.	123	340
R. Burns	S. L. Wyandottes	132	336
Cowan Bros., N.S.W.	Black Orpingtons	139	333
W. Lyell	White Leghorns	111	330
J. Aitchison	Do.	96	327
W. Lindus, N.S.W.	Do.	140	314
G. H. Turner	Do.	122	308
J. Zahl	Do. (No. 2)	110	308
J. Zahl	Do. (No. 1)	136	302

Competitors.	Breed.	July.	Total.
J. G. Richter	White Leghorns ...	128	288
E. A. Smith	Black Orpingtons ...	150	282
Loloma Poultry Farm, N S.W. ...	Rhode Island Reds ...	107	260
J. G. Gill	White Leghorns ...	116	260
E. Pocock	Do.	100	247
S. Chapman	Brown Leghorns ...	101	211
F Clayton, N.S.W.	Rhode Island Reds ...	124	187
W. H. Forsyth, N.S.W.	White Leghorns ...	103	168
J. R. Johnson	Plymouth Rocks... ...	85	85
Totals	...	6,563	18,695

[The above report was inadvertently omitted from the September issue of the Journal—Ed.]

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

Seven thousand one hundred and seventy-six eggs were laid during the month, an average of over 135 per pen. T. Fanning's Black Orpingtons win the monthly prize with 154 eggs. The following are the individual records:—

Competitors.	Breed.	August.	Total.
Jas. McKay	White Leghorns ...	139	646
Mrs. J. Jobling, N.S.W.	Black Orpingtons ...	135	640
Mrs. Munro	White Leghorns ...	140	594
J. Gosley	Do.	140	594
C. E. Bertelsmeier, S.A....	Do.	147	575
J. D. Nicholson, N.S.W.	Do.	138	573
S. E. Sharpe	Do.	141	567
A. H. Bailey	Do.	138	567
J. M. Manson	Black Orpingtons ..	149	565
J. R. Wilson	White Leghorns ...	142	565
Kelvin Poultry Farm	Do.	143	559
King and Watson, N.S. W.	Do.	134	550
E. F. Dennis	Do.	140	543
A. H. Padman, S.A.	Do.	140	542
C. T. Clark	Do.	130	530
E. Le Breton	Do.	142	525
H. Hammill, N.S.W.	Do.	146	525
T. Fanning	Black Orpingtons ...	154	521
A. T. Coomber	White Leghorns ...	133	519
E. V. Bennett, S.A.	Do.	129	510
J. M. Manson	Do.	142	510
T. Fanning	Do.	126	510
R. Burns	Black Orpingtons ...	148	505
O.K. Poultry Yards	White Leghorns ...	135	503
W. Meneely	Black Orpingtons ...	145	502
C. Knoblauch	White Leghorns ...	133	499
E. A. Smith	Do.	151	497
R. Jobling, N.S.W.	Do.	120	496

Competitors.	Breed.	Augnst.	Total.
R. Jobling, N.S.W.	S. L. Wyandottes ...	124	495
Geo. Tomlinson	White Leghorns ...	134	492
F. Clayton, N.S.W.	Do.	127	488
W. Purvis, S.A.	Do.	138	485
Cowan Bros., N.S.W.	Do.	131	485
W. Parker...	Do.	139	482
R. Burns	S. L. Wyandottes ...	143	479
Cowan Bros., N.S.W.	Black Orpingtons ...	144	477
Derrylin Poultry Farm	White Leghorns ...	131	474
Moritz Bros., S.A.	Do.	132	472
W. Lyell	Do.	133	463
W. Lindus, N.S.W.	Do.	143	457
J. Aitchison	Do.	115	442
E. A. Smith	Black Orpingtons ...	151	433
G. H. Turner	White Leghorns ...	124	432
J. Zahl	Do. (No. 2)	123	431
J. Zahl	Do. (No. 1)	125	427
J. G. Richter	Do.	131	419
Loloma Poultry Farm, N.S.W. ...	Rhode Island Reds ...	134	394
J. H. Gill, Victoria	White Leghorns ...	134	394
E. Pocock	Do.	133	380
S. Chapman	Brown Leghorns ...	117	328
F. Clayton, N.S.W.	Rhode Island Reds ...	134	321
W. H. Forsyth, N.S.W.	White Leghorns ...	125	293
J. R. Johnston	Plymouth Rocks ...	111	196
Totals	...	7,176	25,871

INCUBATORS.

Mr. Hindes, the Poultry Instructor at the Gatton Agricultural College, advises as follows:—

1. He uses three makes, viz.:—Stewart's Nonpareil (water), Cyphers, and Prairie State (hot-air) machines. All of these do excellent work when properly handled, and may be recommended. There are other machines which are probably equally good, but the above are those with which we have had personal experience.

2. The only advantage of the hot-water machines is that, in the event of the lamp going out, the temperature does not fall to such an extent or so quickly as in the case of the hot-air machines. Water, of course, cools far less quickly than air, the result being that the temperature of the egg chamber will be longer maintained.

3. The idea that a small incubator does not give such good results as a large one is altogether wrong. Our Poultry Expert states that the only "100-chicken" hatch he ever had was from a 60-egg Cyphers machine.

BLACK ORPINGTONS.

According to the Rev. E. W. Sturges—probably the greatest authority in England on poultry-breeding, &c.—the Black Orpingtons are the most popular fowls in the world, owing to their strong basis of utility. They serve the dual purpose of providing large birds for the table, with flesh of first-rate quality; and they are good layers of large brown eggs. They are a docile breed, easily kept within bounds; and the hens make gentle mothers. The chickens are hardy, and easily reared. Mr. Sturges remarks that it is worthy of note that in the Australian laying competitions, which extend over a period of twelve months, the Black Orpington has more than once headed the list with an average of 250 eggs to its credit. In the April (1915) Competition at the Queensland Agricultural College, Mrs. Jobling's Black Orpingtons won the monthly prize with 123 eggs. In August, 1914, T. Fanning's Black Orpingtons laid 165 eggs, which won the top score; and up to June, 1915, in the 12th egg-laying competition at the College, which began on the 1st of April, Mrs. Jobling's birds topped the list with 370 eggs for the three months, Mr. J. McKay's White Leghorns coming next with 363 eggs.

UTILISATION OF PIE MELONS.

A lady correspondent at Goodna writes, on the subject of the value of pie melons, as follows:—

"I have found, in endeavouring to sell pie melons, that people have the idea that they can only make jam of them, and consequently do not buy, because they are too busy to use them in this way. The result was that I had a large number left on my hands; but I have not regretted it, for, although a 'new chum,' I thereby discovered various ways of cooking them.

"(1) *Jam:*—Cut up into dice, and sprinkle with half the sugar over night, adding lemons or rosellas, and boil next day an hour and a-half; then add remainder of sugar and boil twenty minutes. The sugar should be 1 lb. to 1 lb. of fruit. Ginger may be used for flavouring if desired; oranges as well as lemons may be used.

"(2) *Pies:*—Cut up the melon, and boil in water until soft; drain off the water, add sugar and lemon-juice or rosellas. Put a pastry crust over the fruit, and bake.

"(3) *Vegetable:*—Boil in water until soft, with salt, as for marrow.

"(4) *Pickle:*—Cut up some onions and, after they have boiled in salt and water a while, add the melon cut up. With some cold vinegar make a paste of mustard, flour, and sugar (equal quantities of each); add this to boiling vinegar and stir until it thickens; pour this over the melon and onions, well drained from the water in which they have boiled."

Our correspondent adds—

"We tried the method for drying rosellas given in the Journal, and found it answered splendidly. I have just made some melon and rosella jam from fruit kept all the winter."

State Farms.

STATE FARM, BUNGEWORGORAI.

MANAGER'S REPORT FOR THE MONTH ENDING 10TH SEPTEMBER, 1915.

Meteorological.—The droughty conditions were somewhat alleviated during the latter part of August by a fall of rain which resulted in 120 points being recorded. This was supplemented by a further fall of 30 points on the 6th instant; and on Friday, the 10th, rain again was experienced, 7 points being registered. The resulting benefits have been practically nullified by the exceptionally strong drying westerly winds since experienced: that is, so far as growing crops are concerned. More especially does this apply to those late sown.

Winter Cereals.—The best of these will give very light yields, which is not to be wondered at, seeing that no moisture has been present in the subsoil since the removal of the last crop, and that sufficient to meet the requiremeints of this has not fallen during the usual growing period.

On light sandy soils where the percolation is rapid, probably some of the summer rains were not lost wholly by evaporation, as the crops growing on such situations are slightly better.

In the beginning of last month the indications were that a whole season's work would be lost. Fortunately, at present, the outlook is more hopeful and, given fair conditions, a little more seed than that sown will be garnered. This applies to the sections embodying the new crossbreds.

Summer Crops.—The following have been sown to date, viz.:—10½ acres Teterita, 1½ acres Red Kafir, 7 acres Teff grass.

Vineyard.—The warm weather has wrought a change here, and, with only one or two exceptions, the varieties have started into growth. Where possible to make observations, the indications are that a heavy crop will result under fair conditions.

Citrus Orchard.—Those trees not seriously injured by the dry weather are covered with blossom, which requires more rain to make it set.

Deciduous Orchards.—The trees in this section, on the whole, are rather late this season, due, no doubt, to the late advent of moisture. Trellised peaches, in most instances, give promise of fair yields.

Grasses.—The dry weather in the sections put down under "Rhodes" grass killed out a great portion of the plants; but those remaining have demonstrated their marvellous recuperative powers, having shoots at the present time over 1 ft. long (runners). It should be mentioned that this is on light sandy country.

Stock.—Sufficient vegetation has not appeared in the paddocks to exercise any benefit on the animals depastured therein, but with another fall of rain within a reasonable period, good feed would be assured.

M. E. Soutter, Manager.

The Orchard.

CITRUS CANKER.

The Florida Agricultural Experiment Station has published in Bulletin 124 (issued October, 1914), three papers on the new citrus disease, which are summarised as below by the "Agricultural News" of Barbados:—

I.—HISTORY OF CITRUS CANKER: E. W. BERGER.

The realisation that a new citrus disease was present in Florida took place in July, 1913, when it was found in several blocks of grape fruit at a certain nursery. Specimens had been received from another locality a year earlier, but were supposed at that time to show merely an unusual form of citrus scab. The infections were traced partly to importations of *Citrus trifoliata* from Texas, partly to stock obtained direct from Japan. It transpired later that the disease was present in Alabama, Mississippi, and Louisiana.

An order was issued prohibiting importations of citrus plants into Florida; a fund was raised to which the Florida Growers and Shippers' Association contributed 2,000 dollars, and the Governor of Florida 1,000 dollars; and a campaign was started against the disease.

II.—STUDIES OF CITRUS CANKER: H. E. STEVENS.

Grape fruit is most severely attacked, the infection occurring on leaves, twigs, branches, and fruits; then in order of susceptibility follow *Citrus trifoliata*, and the navel and some of the sweet orange varieties, which are affected on leaves, twigs, and fruits. Scattered infections have been found on the leaves and twigs of Satsuma, tangerine, lime, and rough lemon.

The distinguishing feature of citrus canker, as observed in the field, is the characteristic spotting produced on the fruit and foliage. As usually seen, the infection appears as small light-brown spots, from less than $\frac{1}{16}$ to $\frac{1}{4}$ inch in diameter. The spots are usually round, and may occur singly, or several may run together, forming an irregular area. This last usually occurs on fruits. The spots project above the surrounding healthy tissue, and are composed of a spongy mass of dead cells covered by a thin white or greyish membrane. The membrane finally ruptures and turns outward, forming a lacerated or ragged margin around the spot.

On the leaves, infections first appear as small, watery dots, with raised convex surface. These dots are usually of a darker green than the surrounding tissue. Sometimes, however, the surface of the spots is broken as soon as they appear. Spots may appear on either surface of the leaf, but they do not at first penetrate through the leaf tissue. They gradually increase in size, change to a light brown, and become

visible on both sides of the leaf. In the older spots one or both surfaces may be bulged or raised, and such spots are commonly surrounded by a narrow yellowish band or zone. In the more advanced stages the surface of the spots becomes white or greyish, and finally ruptures, exposing a light brown spongy central mass. Old spots soon become overgrown by saprophytic fungi, and may appear pink or black on account of these fungus growths.

On the fruits, the spots are very similar to those formed on the leaves. They project and retain a circular outline. They do not penetrate far into the rind. They may be scattered over the surface, or several may occur together forming an irregular mass. Gumming is sometimes associated with the spots formed on the fruits. Canker, apparently, does not cause a rot of the fruits directly, but opens the way for other fungi to enter and cause infected fruits to rot. The spots on young twigs are like those on the leaves and fruit. On the older twigs they are more prominent, and more or less irregular in shape. This is especially true of old spots. They show the same spongy tissue as is found in the spots on the leaves, but assume a cankerous appearance, and the surface membrane completely disappears. These spots or cankers are formed in the outer layers of the bark tissue, and do not penetrate to or kill the wood. The spots once formed in the bark are persistent, and are not readily sloughed off. They may remain for a long time, and form centres from which infections may readily spread. This is confirmed by observations on infections produced on potted trees in the greenhouse, and in the grove by artificial infection. Some of these spots have been under observation for over a year, and show no tendency to slough off.

Other citrus diseases with which canker may be confused are Scab, Scaly Bark, and possibly Anthracnose. It can, however, readily be distinguished from any of these by noting the following points:—

"1. It differs from scab in the typical round spots produced; the size of the spots, and the fact that the spots penetrate through the leaf tissue. It does not distort the leaves. There are no wart-like projections. Canker occurs on older wood, Scab does not.

"2. Canker differs from Scaly Bark in the size of the spots, which are much smaller and more circular than those of Scaly Bark; and the spongy nature of the spots—Scaly Bark spots are hard and glazed. Canker is common on grape fruit, Scaly Bark is not. Canker forms spots on leaves, Scaly Bark does not.

"3. Canker differs materially from Anthracnose in the size of the spots, which are much smaller than those of Anthracnose. Canker spots are raised, Anthracnose spots are sunken. Canker has spots of spongy character, those of Anthracnose are hard. Canker occurs on young shoots and older twigs, Anthracnose does not."

Experiments in which dry infected material was pinned to young healthy foliage showed that the disease was infectious. Small watery spots appeared in one month, and these had developed in two months into the spots typical of the disease. A fungus was isolated from the young spots, and afterwards identified among those present on the older spots. Infection experiments from pure culture gave positive results in two out of many instances.

The fruiting bodies of the fungus are small globular pycnidia, which exude the colourless spores in thread-like tendrils. The pycnidia are somewhat difficult to distinguish from the tissues of the spots.

The disease spreads with great rapidity in rainy weather, infection proceeds from the old spots even after these have passed through a winter.

III.—ERADICATION OF CITRUS CANKER: FRANK STIRLING.

Mr. Stirling was employed by the Growers' League to try to clear up the disease first of all in Dade County, a district in which the grape fruit industry is developing very rapidly. He tells his story very dramatically.

At the outset some 200,000 nursery trees and over 500 acres of grove trees were cut back, defoliated, and the trunks painted with Bordeaux mixture or carbolineum. "At this juncture everyone began to breathe a little easier." As the inspection proceeded, more and more infection was found, and more and more was treated. The number of infected properties rose to nearly a hundred. Then with the new growth on the trees came the shock of finding that the work had been carried out in vain; that instead of checking the disease, the activity of the workers had actually contributed to its spread.

The next method adopted is even more heroic. A flaming spray produced by a machine "which resembles a plumber's blow-torch, only a hundred times larger," is used to scorch the trees, the grass, and the soil beneath, until the tree is completely charred. In one district 1,933

grove trees and 101,300 nursery trees have been burned. Some fifty men are employed on the work.

When leaving one grove for another, each man changes his suit, the discarded one being disinfected with corrosive sublimate solution. No one is permitted to touch a tree.

According to Stirling, "canker is without doubt the most infectious of any known disease." A certain 4-acre grove of grape fruit trees, inspected in the first week of June, was to all appearances free of canker. Three weeks later one tree began to show a slight infection upon one limb. Four days later canker was found on five trees; in another week the number infected was twenty-seven, and there would have been no difficulty in picking fifty boxes of diseased fruit. Canker is so deadly that a tree is rendered worthless in two or three months from the time of infection.

It will be seen that the citrus canker situation in Florida is affording us the spectacle of an attempt absolutely to eradicate a disease which has already become well established, and that in a district which must always be exposed to reinfection over the land frontier of the State. The odds against success are great, but the cost of failure would be very heavy. "It would be merely a matter of months before the canker would be entirely over the orange belt." The moral for the citrus-growing islands of the West Indies is obvious.

A BANANA BEARING TWO BUNCHES.

Such a *lusus naturæ* may have been observed in Queensland banana plantations, but if so we have never heard of it. The *Bulletin* of the Department of Agriculture of Jamaica (Vol. II., No. 8, August, 1915) publishes an interesting photograph (here reproduced), supplied by the General Manager of the United Fruit Company of Jamaica, Captain S. D. List, recording this very rare occurrence.

"It would be interesting," says the editor of the *Bulletin*, "to see whether the suckers from this plant are capable of reproducing this habit as a double-fruiting type of banana might prove of economic value in increasing the output of bunches from a cultivated area. The expectation is, however, that this is an accidental production and not a confirmed character of the Banana plant."

Plate 17.—Banana Plant Bearing two Bunches of Fruit.

Tropical Industries.

PROFITABLE MANURING OF SUGAR-CANE.

From an article in the "Fiji Planters' Journal" (August, 1915), we take the following:—

A great deal of valuable work has been done in Fiji as well as in other parts of the world during recent years with the object of improving varieties of cane plant-breeding and selection; and new varieties have been evolved or discovered which promise to yield a higher percentage of sugar than various common kinds which have been hitherto widely grown.

It is really an unbusiness-like and old-fashioned policy to grow varieties of cane which yield a large tonnage per acre, but with an actual low sugar content. In the cultivation of sugar-cane, quality stands for quite as much if not more than in other business undertakings.

It is sugar that is wanted, and it is sugar really that is only paid for, for example:—

> 30 tons of a cane containing about 14 per cent. sugar yield 3½ tons of sugar; 25 tons of cane containing about 10 per cent. sugar yield 3 tons of sugar.

And that is not all, for the 5 extra tons entail extra cost for cutting, additional haulage, and milling charges, besides depriving the soil of elements of fertility to no good purpose, necessitating an additional use of fertilisers to make up the deficiency.

Occasionally a heavy crop of a quick-growing variety of cane may yield more sugar on the whole than might be possible to get in the same time from a variety having usually a higher p.o.c.s., but "still" the expenses incurred in harvesting and milking it will be proportionally greater, and should not be overlooked in balancing up the account.

Howbeit, although a planter may make profit from growing a cane with a comparatively low percentage of sugar, he should never cease to aim at producing as heavy if not a heavier crop of cane with the "highest possible p.o.c.s."; and to achieve this desirable end the use of liberal supplies of manures or fertilisers will do much, particularly when suitable combinations are judiciously applied.

The water supply is an obvious controlling factor in the production of good cane fields.

No water supply can surpass the natural rain when it falls in reasonable quantities and at favourable times throughout the growing period of the cane crop. In tropical latitudes, unfortunately, the rainfall is not always exactly as is desired. Sometimes torrential downpours scour the land and beat down the cane. Sometimes the rain is too continuous,

and otherwise excellent cane soil is rendered swampy and sour, which is not beneficial to a good cane development.

In the Hawaiian Islands where the cultivation of sugar-cane has been subject to the most thorough scientific and practical investigations, and where, as the outcome of which, the average production of sugar per acre is higher than in any other cane-growing country in the world, manures costing the cane planters more than 2,000,000 dollars per annum are used, and nitrogen (mostly in the form of nitrate of soda) is the principal ingredient which constitutes by far the greatest portion in this enormous sum of money expended in a group of islands, the total area of which is 1,000 square miles smaller than the Fiji Group.

Nitrates, though of first importance in producing greater yields of sugar-cane, do not supply the probable need also of potash and phosphates. Potash has a marked influence on the carbohydrate (sugar and starch) contents of plants; and consequently, when a soil is deficient in this ingredient, it is expedient to use some sulphate of potash—say 1 cwt. to 1½ cwt. per acre—which should be incorporated in a mixture to apply at time of planting or before ratooning.

Phosphates of themselves do not seem to increase the cane yields to anything like the extent that nitrate and potash do; still, to omit using some phosphatic manure in any manurial treatment would be most inadvisable, as these manures are comparatively inexpensive, and constitute an important factor in maintaining a soil in a necessary state of general fertility.

It is confidently believed that sugar planters in Fiji will find that it is most profitable to always employ a combination of manures containing a suitable proportion of phosphates, potash, and nitrates at the time of planting or when the ratoon crops are starting their new growth. These manure mixtures should be worked or ploughed into the soil along the rows just prior to the time when the cane begins to make its main growth.

The top-dressings of nitrate of soda should be given 1 cwt. per acre (or not more than 1½ cwt.) at a time at intervals of a few weeks during the chief growing period. Two or three such top-dressings will probably be found sufficient and highly satisfactory.

THE MOUNT MORGAN MUNITIONS COTTON LEAGUE.

COTTON-GROWING IN AUSTRALIA: NO COTTON, NO SHELLS.

By G. STEPHEN HART, Mount Morgan.

Many attempts have been made to grow cotton in Queensland, but the trouble of picking it has repeatedly thrown it into disfavour. That it will grow successfully is well known, but it is less generally known that in 1871 Queensland exported 602,100 lb. of cotton—over 1,300 tons

weight, valued at £79,317. That was just after the American civil war. When American cotton-growing recovered, America grew much cotton, and was anxious to sell quickly, even at a low price, and this price was too small to make cotton-growing in Australia as profitable as other crops. The return was all the smaller on account of the cotton-seed being thrown away instead of forming a by-product. From time to time the Government of the day made different efforts to re-start the industry without much success. To-day, the Government guarantees to advance 1¾d. per lb. on raw cotton, to gin it, export it, and sell it, and give any further profit obtained to the producer. On their estimated yield this should give growers more than wages. The Government do not guarantee what would be a safe minimum yield per acre, and farmers not knowing this will not venture to grow it.*

The individual farmer is not yet convinced that he could grow cotton at a profit, but now there is a national reason why he should try. Now, it is no exaggeration to say that the existence of the Empire is largely dependent on the available supply of cotton, for "no cotton, no shells" has become an accepted axiom. If ever Australia could be invaded or cut off from other lands by ocean raids we might realise to our cost, "No cotton in Australia, no shells in Australia." We have been told that a British submarine has already sunk a German super-dreadnought in the Gulf of Riga. Will it take long before submarines improve sufficiently for German submarines to sink British super-dreadnoughts? We hope it will. We hope they will never do it. But what have we to go on?

Australian cycle races were fought out on the old high "bone-shakers" until 1888, when the safety bicycle was used. In the same year Dunlop invented pneumatic tyres, but the bicycle boom did not come until 1896. This boom produced the motor cycle, and, with the powerful engines of light weight used for motor cycles, came the motor-car. Until 1896 no one could drive a motor vehicle along an English road unless preceded by a pedestrian with a red flag, and it was not until 1903 (twelve years ago) that it was thought necessary to legislate specially for motor-cars. The first motor-driven aeroplane was built in 1903, and in 1906 Santon Dumont achieved world-wide fame by flying 200 yards, for, although the Wrights had flown 24 miles the year before, their performance was not generally believed. Now, nine years later, it has been officially announced that Great Britain has 2,500 aeroplanes and Germany 2,000. Probably France has more than either. Each year they become better, and have still lighter and more powerful petrol motors. The submarine also depends upon light and powerful motors. They have

* Minimum yield in a fair season is 1,000 lb. of seed cotton per acre. In 1907 the yield ranged from 1,368 lb. to 4,250 lb. per acre.—ED. "Q. A. J."

only been tested under war conditions for twelve months, and it is quite certain they will be much improved. Whether they will be more quickly improved by Germans than by British, French, and Americans is less certain. Still, it seems more than possible that they may seriously affect the safety of our ocean communication, and we may become, temporarily at least, more thrown on our own resources to protect ourselves from outside raids. We should remember that our AE 2 travelled 30,000 miles before her end came. What will they do next year? Nine years ago Santos Dumont flew 200 yards! And no Australian cotton means no Australian shells.

In 1909 the United Kingdom imported close upon 1,000,000 tons of raw cotton, of which 732,359 tons, valued at £41,174,869, came from the United States, and 38,399, valued at £1,724,923, from British possessions. For 10,000,000 soldiers 1 lb. of cotton per man would mean about 4,500 tons. I do not know how many pounds of high explosives made from cotton each soldier, on the average, uses in one year, but as a guide it may be taken that 1 lb. of cordite is required for about 250 rifle cartridges, and 500 lb. of cotton makes one charge for one 15-in. shell for the "Queen Elizabeth." That illustrious chemical savant, Sir William Ramsay, has, with others, been asserting, again and again, that no cotton means no shells, and has at last prevailed upon the allies to declare cotton contraband of war, and that unless we have cotton in Australia we are defenceless. Shall we grow it or import it? Or shall we sit down without it till we see if anybody comes our way?

The ultimate fate of Australia is now being decided in Europe, and patriotic Australians who are fit and free to do so are hurrying there to help; but cannot those who stay behind do something? A number of fitters are to be used in Queensland to make shells. A single lathe capable of making 20 shells a day is gladly accepted. So would a contribution of 1,000 tons—or even 100 tons—of cotton. From world statistics it may be taken that 5 acres of cotton-plants yield 1 ton of ginned cotton. The yield from perennial cotton, where unaffected by frost, is as high as 5 lb. of bolls or 2½ lb. of lint per plant. As the picking necessitates considerable labour it would seem better for many to grow small areas of up to (say) 5 acres each, rather than for individuals to attempt large plantations.

We have all over Australia, women working industriously at Red Cross work for our soldiers. Individually, each one's work may seem but a drop in the ocean, but they are showing that sufficient drops make an ocean. Why should not each of the 20,000 residents of Rockhampton and each of the 12,000 residents of Mount Morgan grow one cotton-plant? Why should not each of the 600,000 residents of Queensland grow one plant? Their little contributions could be taken to the local municipal

authorities to forward to Brisbane. The Government's advance of 1¾d. per lb. could be a good addition to our patriotic funds. But the farming community could help more largely. Many feel they cannot leave their land to become a wilderness whilst they fight a year, or two years, or three years in Europe, and many know they cannot leave their families unaided in the bush. But if they cannot give their lives they can give some of their time and energy. They can often give more time than ready cash to help the Empire. Even if there was no cash return from their cotton-growing they could do this, and cotton-growing is not unprofitable. If a man has land, let him grow some cotton, even if only a little. Let him grow what he can harvest himself or with paid labour, and then, if volunteer pickers are available, let him plant another piece to be picked by these volunteers and sent to the patriotic fund suggested above.

In these ways we should at least get sufficient cotton to help the Empire, or to help Australia if she was put to a sudden test of her internal strength, and we should all get more familiar with the cotton-growing industry, which yields its hundreds of millions worth of produce year after year. Then we should know if we could add it to our list of exports or, better still, to our list of internal manufactures.

These suggestions are put forward with the hope that they will be improved upon, and carried to a successful issue, under the guidance of those amongst us who have had many years' successful experience in cotton-growing; but we should move quickly, as seed planted in September and October or even November should produce a harvest about the close of the next European winter.

PRACTICAL SYMPATHY FOR AN ORCHARDIST AT THE FRONT.

A splendid example of appreciation of the patriotism of a vigneron at Renmark, who enlisted in the Commonwealth Military Reserve Forces, was afforded by his fellow orchardists in September last. No less than sixty volunteers answered the call of the Renmark Agricultural Bureau to prune Reservist Starke's vineyard on Saturday afternoon, 12th September. Some had been at work the previous Saturday, and a few that morning, and the crowd in the afternoon very soon had the 5 acres of currants, malagas, and sultanas pruned clean, rods tied up, and cuttings raked off the ground. The erection of a row of trellis was also included in the afternoon's work. Arrangements were made for ploughing the land by volunteer teams and labour on the following Saturday, and Mr. Barge, who is looking after his brother-in-law's property during his absence, reckons to manage all right now till harvest. Private Starke was the first man to leave Renmark at the call to arms, and he is so far the only married man from this settlement with the troops in Europe. His grape crop was harvested by voluntary labour in the summer, and the house which he left half built has been pretty well finished off by unpaid labour and a donation from the Renmark Patriotic Fund.

Entomology.

CONTROL OF THE CANE BEETLE.

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

Studies relating to the control of our common Cane Beetle (*Lepidiota albohirta*) during its grub stage are being continued, experimentation having for the most part been confined to the trial of various poison-baits.

This interesting branch of research will be carried on as long as possible, but may have to be abandoned shortly, as the majority of larvæ will soon be pupating, and in some districts have already gone down out of reach of the plough.

Prevailing dry conditions have forced cane grubs to penetrate into the ground more deeply than usual to obtain a sufficiency of moisture, and at present in localities where the soil is of a light nature it appears likely that the beetles may make an exceptionally early emergence this season.

Perfectly developed adult forms of *albohirta* are often found below ground in their pupal chambers patiently awaiting the occurrence of certain conditions of temperature and moisture conducive to a general emergence of the pest.

Odd specimens may be dormant in this way for two or even three weeks, and in abnormally wet seasons when grubs pupate near the surface have been ploughed up as early as the middle of October. It may be of interest to note that an adult specimen of *albohirta* was found in dark volcanic soil at "Green Hills" on the 28th of July, the earliest previous record of the kind at the Laboratory being 14th October, 1913.

Towards the end of July I was instructed to proceed to Mossman to attend a conference of the Australian Sugar Producers' Association, and prepare a paper reviewing the work instituted at Gordonvale Experiment Station during the past ten months.

The reading of this paper was followed by a discussion having reference mainly to the complex question of Natural Control and the possibilities of our being able to artificially enlarge its sphere of usefulness.

Speaking of predacious insects, it was pointed out that action in this direction was not always advisable in the case of indigenous species, owing to the repressive influence exercised by their hyperparasitic and other foes.

I have already stated in a previous report that knowledge of this fact need not necessarily cause us to wholly neglect such methods, or regard them as being invariably beyond our control. It is not unreasonable to assume that in a vast territory like Queensland supporting a

great variety of useful insects inhabiting widely separated districts, we might be able in some cases to derive assistance from the introduction of useful native species of local occurrence, provided they were transferred from considerable distances and without their hyperparasites and other natural enemies.

As an instance in point it may be mentioned that a chalcid parasite of our formidable sheep-maggot flies, discovered by the writer in Central Queensland on 10th October, 1913, is at present extensively bred at the Brewarrina Laboratory, and has already been distributed to sheep stations in many parts of New South Wales, where it is considered to be a very important factor in reducing the numbers of these destructive blow-flies.

Allusion was also made at Mossman to the matter of proposed importation from other countries of such useful insects as the "digger-wasp" (*Tiphia parallela*), a well-known enemy of various Scarabacidæ closely related to our cane beetles. With further reference to this parasite it may be well to mention that before introducing it into Queensland it would be necessary to take steps to ascertain if our soils and other important conditions resemble those obtaining in localities where the insect occurs naturally or has been successfully established. These investigations would have to be conducted by a capable entomologist, who, in the event of finding normal conditions practically alike in essential particulars, would then collect a large quantity of Tiphia cocoons, pack them suitably, and forward same to Australia in cold storage.

Other matters were discussed, one of which referred to the apparent scarcity of grubs in certain districts owing to causes unknown. We hope to find time to investigate cases of this kind which may afford some clue of considerable value.

In many instances, however, such immunity may reasonably be attributed to unsuitability of the soil, or the absence of food plants of the beetle in the vicinity of plantations, or possibly to a natural non-occurrence of the pest due to the presence of adverse climatic or other influences.

CANE BEETLES AND ARTIFICIAL LIGHT.

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

As a result of certain field experiments conducted during November and December last, acetylene light was proved to be very attractive to both sexes of our principal cane beetles throughout their aerial existence, such reaction, however, being considerably influenced by various meteorological and other conditions.

The movements of the beetles whilst flying near artificial light were studied, particularly their manner of approaching the trap and behaviour when within a foot or so of the flame; and certain conclusions were arrived at regarding the kind of design most likely to produce a serviceable light trap, and the conditions under which the latter might be expected to yield payable results. As an outcome of these observations it is proposed to construct an entirely new form of trap for trial during the coming season. Such contrivances usually aim at

capturing the insects by means of a shallow tray or pan containing water and kerosene placed under a strong lamp. This principle, however, is not to be commended in the present instance for the following reasons:—In the first place, it entails needless labour and expense, which, although small, would nevertheless be appreciable when dealing with a number of traps; secondly, it would destroy a certain proportion of useful insects, both parasitic and predaceous, which help to control not only the cane beetle in question, but a number of other insect pests of sugar-cane.

In this connection I may mention that a well-known enemy of cane grubs (*Dielis formosus*), the common "Digger Wasp," and probably beneficial Cockroach (*Ellipsidion pellucidus*, Brunn.), which frequents the foliage of sugar-cane are susceptible to the influence of artificial light. An arboreal species of earwig also, which I believe to be predaceous on small Lepidopterous larvæ of at least one of our cane pests, is attracted in great numbers.

The grey-backed Cockchafer (*Lepidota albohirta*) responds to the stimulus induced by acetylene light from a considerable distance, the phototropic influence being wellnigh irresistible, and compelling this insect to advance towards the trap. It rarely flies directly into the flame, but when within a few yards approaches in an erratic manner by a series of short flights, settling at brief intervals on the ground or on cane plants, and, finally, as though struggling against the attractive force, plunging headlong downwards at a distance of about 1 ft. or 18 in. from the light. Our new trap will be fitted with a landing stage designed to take advantage of the above habit, and immediately capture all beetles that may settle or fall upon it, and deposit them in a large chamber from which return will be impossible. Suitable exits will, of course, be provided for useful insects such as Carabidæ (predaceous ground beetles) and the various hymenopterous parasites.

The light will be protected in such manner as to throw beetles that may attempt to dash into it on to the stage below to their certain doom, but at the same time prevent the destruction of beneficial species.

By making use of a discovery relating to a peculiar habit connected with the flight of this insect when taking to wing, it will be a simple matter to prevent cane beetles from flying out of the trap.

Recent experiments with regard to the control of *Lepidiota albohirta* whilst in its larval form have for the most part given negative results, but, although apparently inconclusive, such work in reality serves a useful purpose by directing investigations into more and still more promising channels, which, owing to this gradual process of contraction, must eventually come to a focus somewhere, and in all probability reveal a pathway to discoveries of decided economic value.

Whilst stationed at Gordonvale, I have sought to embrace present opportunities for studying the life history and economy of many insect pests of sugar cane, the majority of which, although of minor importance, include a few decidedly injurious species and several hitherto undescribed forms. Such knowledge is essential to a comprehensive survey of the cane-grub problem, it being, of course, quite possible to advocate control methods that, whilst successful against one kind of pest, may destroy certain natural enemies of another, and so tend to favour an abnormal increase of the latter species.

Botany.

ILLUSTRATED NOTES ON THE WEEDS OF QUEENSLAND.

BY J. F. BAILEY AND C. T. WHITE.

No. 1.

ON THREE CLOSELY ALLIED WEEDS—ASTER SUBULATUS, *Michx.*; ERIGERON CANADENSIS, *Linn.*; AND ERIGERON LINIFOLIUS, *Willd.*

As there has been confusion for some time past in Queensland between the two weeds *Aster subulatus* and *Erigeron canadensis* (Canada Fleabane), it has been deemed advisable to prepare this series; ray florets 20-30 scarcely exceeding the pappus, more numerous A description and figure of the closely allied *Erigeron linifolius* (Rag Weed) is given for comparison.

ASTER SUBULATUS, Michx.

Annual, glabrous; stems paniculately branched, flexuous above, 1-6 ft. high, slightly angular. Stem leaves linear-lanceolate, acute, entire, sessile by a broad or slightly clasping base, 2-10 in. long, 1-8 lines wide, those of the branches very small and subulate. Flower heads numerous, 3-5 lines broad; involucre campanulate or at length hemispherical, the bracts linear-subulate, green, imbricated in 3 or 4 series; ray florets 20-30 scarcely exceedingly the pappus, more numerous than the disk florets. Achenes compressed, minutely pubescent.

This North American plant has for some time passed in Queensland as a glabrous form of *Erigeron canadensis;* but on going fully into the matter we have determined it as above. It is very abundant in cultivation paddocks and waste places about towns in Queensland. In New South Wales and Victoria it has been recorded as *Aster dumosus,* Linn, but J. H. Maiden and E. Betche, in a note in Proc. Linn. Soc. N.S.W., vol. 24 (1909), p. 363, record it as *Aster subulatus* Michx., after referring specimens to H. L. Fernald, a well-known authority on North American plants.

Although the plant is a very common weed here, we know of no local name applied to it.

CANADA FLEABANE.

ERIGERON CANADENSIS, Linn.

Annual, hispid-pubescent or glabrate; stems usually much branched; 3-10 ft. high. Lower leaves elongate-spathulate, entire or toothed, 1-4 in. long, stem leaves linear and mainly entire. Flower-heads small and very numerous, peduncles slender; involucre campanulate, the bracts narrow, acute, about 2 lines long; ray florets numerous,

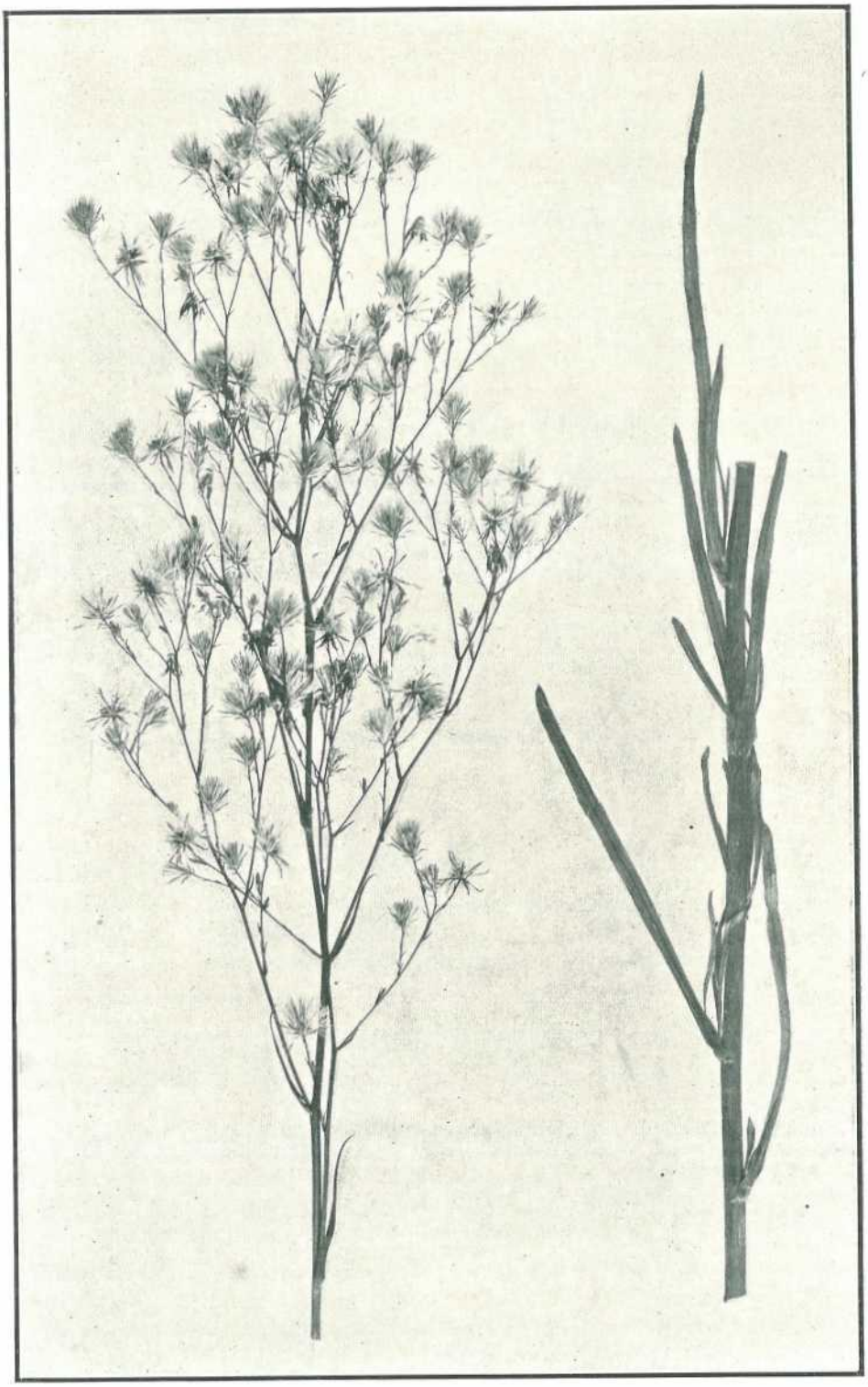

Plate 18.—Aster subulatus, *Michx.*

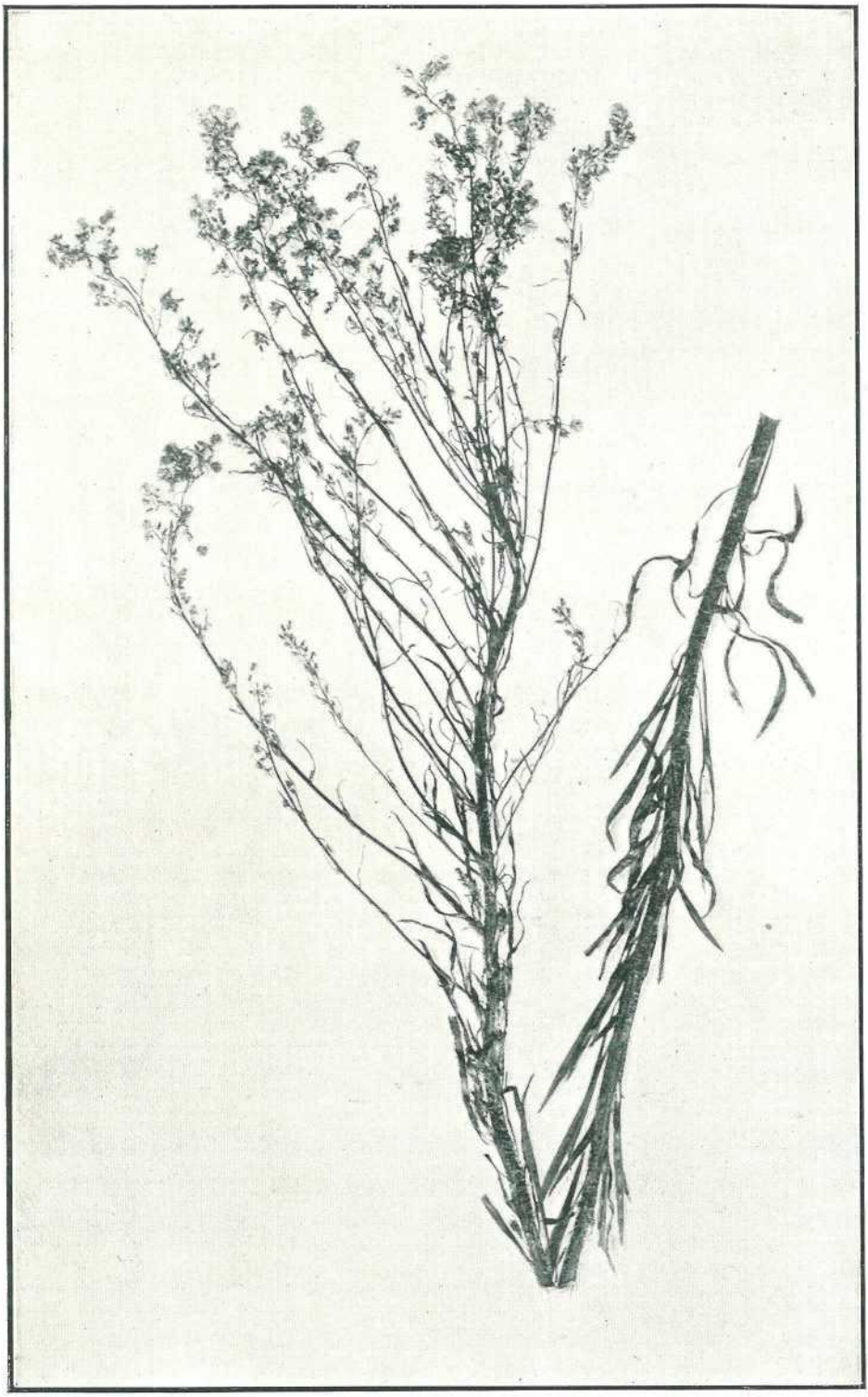

PLATE 19.—ERIGERON CANADENSIS, *Linn.*

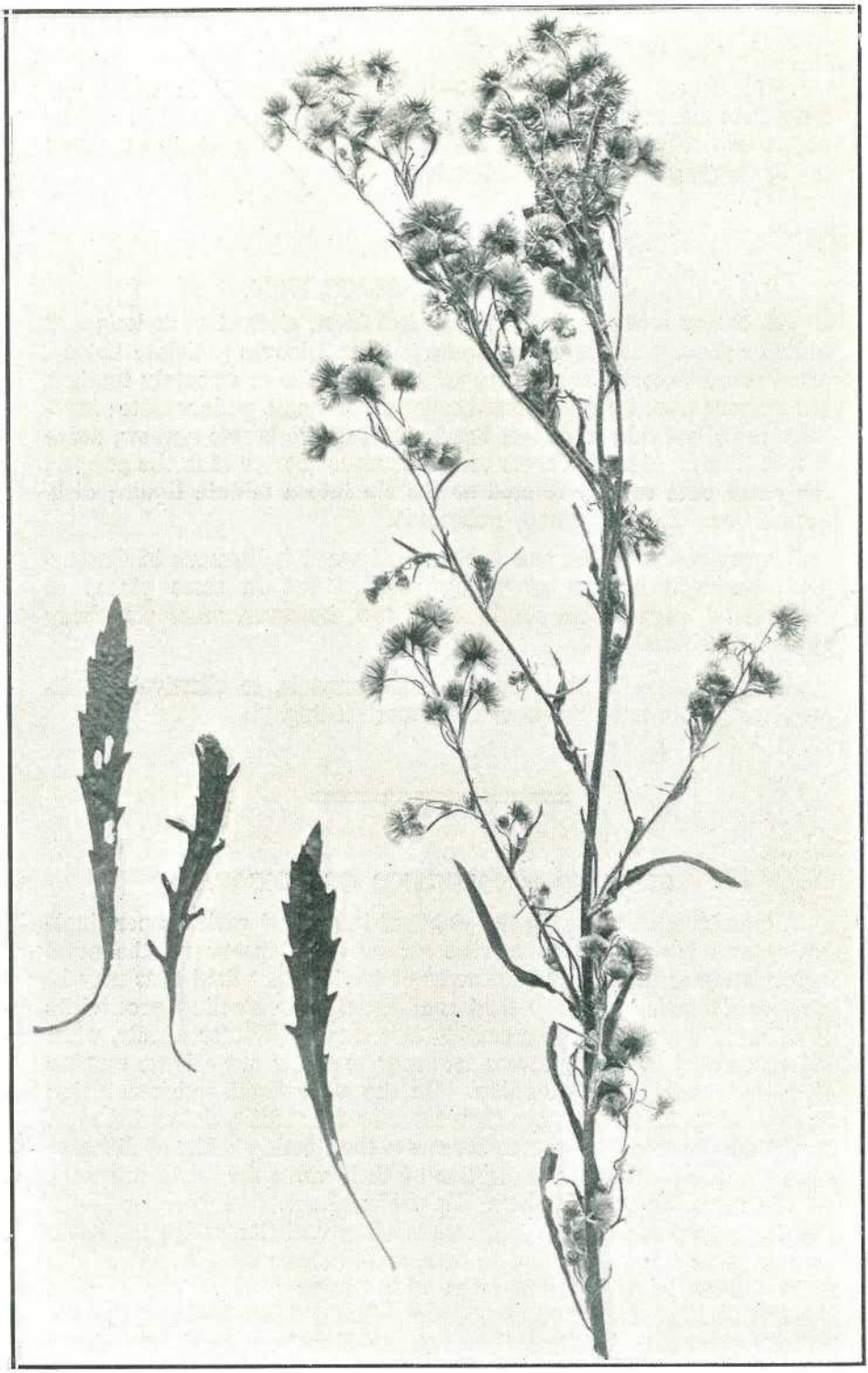

Plate 20.—Erigeron linifolius, *Willd.*

scarcely exceeding the involucre, more numerous than the disk florets. Achenes very small.

This North American plant—now widely spread in warm and temperate countries—has lately established itself as a weed in several places in Southern Queensland, and has become especially abundant in the Nerang and Coomera districts.

RAG WEED.

ERIGERON LINIFOLIUS, Willd.

A coarse erect annual, several feet high, clothed with long soft hairs or shortly scabrous-pubescent. Radical leaves petiolate oblong, often coarsely toothed, stem leaves sessile, entire or remotely toothed, often above 2 in. long. Flower-heads rather small, pedunculate; involucre broadly ovoid or almost hemispherical, the bracts narrow, acute in 2 or 3 series; female florets very numerous shorter than the pappus, the outer ones usually dilated at the tip into a minute ligula; disk-florets few. Achenes small, pubescent.

A common tropical and sub-tropical weed indigenous in Queensland, generally known as "Rag Weed," but in some places as "Cobblers' Pegs"; this sobriquet is now, however, more commonly applied to *Bidens pilosa*.

Eradication—All these species being annuals, to effectively eradicate, the plants must be prevented from seeding.

STOOLING PROCLIVITIES OF WHEAT.

Experiments comparing the yields of individual varieties per single grain sown have not been carried out by the Department, the usual course being to plant up larger areas of land so that field tests may be carried out under ordinary field conditions. The stooling proclivities of different wheats vary to a considerable extent. Winter wheats, when fed off or kept in check, have a tendency to throw out a large number of stems, possibly 50 in number. On the other hand, quick-maturing wheats rarely throw out more than three or four stems, unless fed over. It will thus be seen that comparisons as to the stooling habits of different wheats are not always an indication of their value for grain purposes. Of the three varieties—Golden King, Hermitage, and Cleveland—the two former are mid-season, moderate stooling varieties, whilst the latter usually takes a longer period to mature and stools more heavily. The name Golden King is synonymous with Gluyas Early. The heaviest stooling wheats referred to above—*e.g.*, Winter Wheats—belong to the Manitoba and Fife families. Other wheats with the same characteristics are commonly grown in cold countries.

Vegetable Pathology.

EXPERIMENTS WITH POISONOUS SPRAYS FOR THE DESTRUCTION OF WEEDS AT THE SUGAR EXPERIMENT STATION, MACKAY.

Some time ago it was promised that the Sugar Bureau would undertake experiments with arsenical sprays for the purpose of determining whether weeds could be successfully and economically destroyed. In the composition of the sprays used it was determined to follow the experience of other countries, and accordingly two mixtures were made up.

The first solution was made up as follows:—

8 lb. arsenic and 2 lb. caustic soda were mixed together in the dry state, and water slowly added until dissolved. Sufficient heat was generated to bring the mixture to almost boiling point. This was then made up to 5 gallons, and for use was diluted to 300 gallons.

The second solution was made in the same way as the first, but about 40 oz. of washing soda was added.

The Chemist in Charge of the Experiment Station at Mackay (Mr. L. C. McCready) states:—

The experiments were divided into two series, as follows:—

SERIES No. 1.

Sprays used on growing cane with a view to testing their effects on the destruction of weeds, and also to determine whether their use had an injurious effect on the growing cane.

SERIES No. 2.

Sprays used on open headlands solely with a view to the destruction of weeds and grasses.

No. 1. Series.

1. All ground between cane drills on inside and half the space on the outside received a fortnightly spraying at the rate of approximately 75 gallons to the acre. Great care was exercised in this case that the cane itself received none of the spray.

2. This section received the same treatment as the first section, with the exception that the No. 2 Spray formula was used.

3. This section received a spraying with No. 2 Spray formula at the same rate as Nos. 1 and 2; but in this case the cane was also sprayed around the bottoms.

No. 2 Series.

In this series two portions of headland were sprayed as under, using the same quantity per acre as in the first series:—

1. Sprayed with No. 1 Spray formula solution.

2. Sprayed with No. 2 Spray formula solution.

The spraying was at first carried out every fortnight; but, as this made little or no impression on the grass, the application was increased to a weekly spraying.

RESULTS.

The results in No. 1 Series cannot be taken as conclusive, for the reason that when the experiment was first started the cane was well advanced in growth, and as a consequence soon reached a stage where it was impossible to walk between the rows with a spray outfit. The cane having closed-in rows, many of the softer grasses perished naturally by the exclusion of sunlight. It is, therefore, a debatable point whether the dying of some of the weeds should be attributed to the above factor or to the effects of the sprays. No positive conclusion can, therefore, be drawn from this series until the experiment is again tried on cane of younger growth.

The following notes have been made, although from the reasons stated above they must not be taken as positive:—

SECTION 1.

Weeds such as pig weed, billy-goat weed, and red asthma were destroyed almost on the first spraying, whilst grasses such as couch and crowsfoot, beyond a slight yellowing during the first few days after spraying, soon recovered and grew as robustly as ever. Summer grass and mystery grass in some cases were killed, and in others survived.

SECTION NO. 2.

The results in this section were identical with those found in the first section.

SECTION NO. 3.

The effects of the spraying on this section with reference to weeds and grasses were identical with the former two sections. With regard to its effect on the cane, no real damage has been done, the cane having at the present time survived and thrown off any apparent injury.

A day or two after spraying, the leaves and bottom of the stool present a very withered and burnt looking appearance. In one or two individual cases where the spray reached into the heart of the cane sucker or shoot, the leader has been burnt out and the cane killed. According to the writer's mind, the wilting and burning of the leaves cannot fail to have anything but a prejudicial effect on the growth and vitality of the crop—first by limiting transpiration on account of the wilting of its foliage; and, secondly, by the set-back to growth, and the subsequent struggle rendered necessary to throw off the ill effects and re-establish growth.

SERIES 2.

In this case both sprays have given equal results, and have been successful in destroying all weeds, with the exception of couch grass and crowsfoot grass. The couch at first appears wilted, but soon overcomes the effects, and three or four days after spraying has again established itself. With reference to star grass, the effects of the poison to date has failed to kill it. The individual plants are, however, very small and stunted in appearance, and there is no doubt that eventually the grass would succumb to the poisons.

The cost of material and labour amounted to £1 17s. 7d. per acre for work amongst cane rows, and £1 0s. 7d. per acre for headlands, for one spraying only.

Commenting on the above, the General Superintendent considers the growth of weeds to be too great at certain seasons of the year on our Northern canefields to be economically dealt with by means of arsenical spraying. In the red soils of Childers and Isis, where weeds do not grow to any extent, the work might be done at a considerably lower cost, and this land is similar to the Hawaiian lands where spraying was cheaply carried out.

Statistics.

RAINFALL IN THE AGRICULTURAL DISTRICTS.

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

Divisions and Stations.	Average Rainfall.		Total Rainfall.		Divisions and Stations.	Average Rainfall.		Total Rainfall.	
	July.	No. of Years' Records.	July, 1915.	July, 1914.		July.	No. of Years' Records.	July, 1915.	July, 1914.
North Coast.	In.		In.	In.	*South Coast*—continued:	In.		In.	In.
Atherton	0·89	13	0·40	0·39					
Cairns	1·14	27	3·18	0·35	Nanango	1·76	27	1·20	1·29
Cardwell	1·39	27	0·88	0·25	Rockhampton ..	1·58	27	0·02	0·08
Cooktown	0·83	27	1·91	1·47	Woodford	2·73	27	1·19	2·46
Herberton	0·57	27	0·22	0·37	Yandina	2·77	21	2·02	2·41
Ingham	1·50	22	0·71	0·90					
Innisfail	4·13	27	5·79	1·27	*Darling Downs.*				
Mossman	1·54	5	3·07	0·81					
Townsville	0·50	30	0·14	0·08	Dalby	1·84	27	1·48	1·24
					Emu Vale... ...	1·50	17	2·38	1·12
Central Coast.					Jimbour	1·86	24	1·54	1·23
					Miles	1·69	27	1·99	1·94
Ayr	0·49	27	0·45	Nil	Stanthorpe ...	2·04	27	1·12	1·02
Bowen	0·67	27	Nil	Nil	Toowoomba ...	2·06	27	2·38	1·76
Charters Towers ...	0·47	27	0·61	0·48	Warwick	1·83	27	2·97	0·97
Mackay	1·34	27	1·72	Nil					
Proserpine	0·94	11	1·14	Nil					
St. Lawrence ...	1·26	27	0·10	0·03	*Maranoa.*				
					Roma	1·40	25	0·82	1·04
South Coast.									
					State Farms, &c.				
Biggenden	1·39	14	1·09	0·41					
Bundaberg	2·20	27	1·03	0·62					
Brisbane	2·31	64	1·74	2·03	Gatton College ...	1·54	14	1·25	1·00
Childers	1·76	19	1·64	0·99	Gindie	1·23	13	0·38	0·35
Crohamhurst ...	2·85	20	2·16	2·61	Kamerunga Nurs'y	1·35	23	2·71	0·55
Esk	2·11	27	1·12	0·88	Kairi	0·49	3	0·50	0·58
Gayndah	1·65	6	0·58	0·55	Sugar Experiment				
Gympie	1·97	27	1·66	1·36	Station, Mackay	1·36	16	0·94	Nil
Glasshouse M'tains	2·65	6	1·54	2·52	Bungeworgorai ...	0·73	3	0·66	1·18
Kilkivan	1·87	27	0·95	1·58	Warren	...	...	Nil	0·13
Maryborough ...	2·13	27	1·60	0·68	Hermitage ...	1·49	7	3·17	0·78

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

This return was inadvertently omitted from the September issue of the Journal.

RAINFALL IN THE AGRICULTURAL DISTRICTS.

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

Divisions and Stations.	Average Rainfall.		Total Rainfall.		Divisions and Stations.	Average Rainfall.		Total Rainfall.	
	Aug.	No. of Years' Records.	Aug., 1915.	Aug., 1914.		Aug.	No. of Years' Records.	Aug., 1915.	Aug., 1914.
North Coast.	In.		In.	In.	*South Coast*—continued:	In.		In.	In.
Atherton	0·91	13	Nil	1·18					
Cairns	1·48	27	0·06	4·93	Nanango	1·55	27	1·42	0·18
Cardwell	1·16	27	Nil	1·19	Rockhampton ...	0·97	27	0·41	Nil
Cooktown	1·28	27	0·23	7·22	Woodford	2·05	27	1·22	0·89
Herberton	0·65	27	Nil	1·10	Yandina	2·18	21	0.90	1·73
Ingham	1·44	22	0·04	0·54					
Innisfail	5·30	27	0·43	10·53					
Mossman	1·58	3	0·34	2·36	*Darling Downs.*				
Townsville	0·40	30	0·53	0·03					
					Dalby	1·26	27	1·18	0·39
					Emu Vale	1·36	17	1·72	0·17
Central Coast.					Jimbour	1·41	24	2·25	0·37
					Miles	1·23	27	1·51	Nil
Ayr	0·40	27	0·38	Nil	Stanthorpe ...	1·72	27	1·60	0·31
Bowen	0·68	27	0·51	0·09	Toowoomba ...	1·89	27	1·54	0·44
Charters Towers ...	0·44	27	Nil	Nil	Warwick	1·59	27	1·66	0·15
Mackay	1·19	27	0·88	0·32					
Proserpine	0·77	11	0·99	2·13					
St. Lawrence ...	1·15	27	0·40	0·28	*Maranoa.*				
					Roma	1·04	25	1·45	Nil
South Coast.									
Biggenden	1·27	14	1·82	0·44	*State Farms, &c.*				
Bundaberg	1·56	27	1·31	0·36					
Brisbane	2·27	64	1·60	0·29	Gatton College ...	1·49	14	1·62	0·25
Childers	1·33	19	0·48	0·84	Gindie	0·74	13	1·29	Nil
Crohamhurst ...	2·37	20	1·86	2·07	Kamerunga Nurs'y	1·54	23	0·05	3·49
Esk	1·75	27	1·99	0·24	Kairi	0·81	3	Nil	2·24
Gayndah	1·22	27	1·32	0·16	Sugar Experiment				
Gympie	1·65	27	1·47	1·31	Station, Mackay	0·84	16	1·05	0·21
Glasshouse M'tains	1·72	6	1·45	1·13	Bungeworgorai ...	0·40	3	1·20	Nil
Kilkivan	1·42	27	1·23	Nil	Warren	0·12	3	0·18	Nil
Maryborough ...	1·59	27	1·21	1·62	Hermitage ...	1·90	7	1·98	Nil

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

RATION FOR A BULL.

Mr. J. C. Brünnich, Agricultural Chemist, in reply to a correspondent, gives the following complete ration for fattening a bull for show purposes:—

Sugar-cane tops require to be fed at the rate of 50 to 60 lb. daily per 1,000 lb. live weight, if the ration is balanced by the addition of 2 lb. of bran and ¾ lb. of linseed meal for every 20 lb. of chop-chop. Should the ration be found to be too laxative, the bran can be replaced by an equal amount of crushed corn for a time.

If possible, the above ration should be supplemented by a little bush hay.

General Notes.

QUEENSLAND AGRICULTURAL COLLEGE.

BURSARIES.

An Examination will be held on the 14th December next in Brisbane and elsewhere, according to where the candidates reside, for Four (4) Bursaries at the Queensland Agricultural College, tenable for three years. Candidates must not be less than 15 or more than 18 years of age on the 1st January, 1916. Nominations close on the 16th November, 1915. Further particulars can be obtained upon application to the Under Secretary, Department of Agriculture and Stock, Brisbane.

THE NORIT PROCESS OF MANUFACTURING WHITE SUGAR.

The "International Sugar Journal" contains an account of a lecture by Dr. A. Wijnberg on "The Norit Process of Manufacturing White Sugar." In this process it is claimed that the colouring matter of the juice is removed by means of so-called 'decolourising carbon' (manufactured under the name of Norit) in the same manner that this is effected by animal charcoal in the sugar refinery. This substance has already been successfully employed for bleaching purposes in various industries, but hitherto has not been used in sugar works, partly on account of its cost and partly because a method of regenerating was not known.

It is now found that the decolourising colour of Norit can be very largely restored by boiling for fifteen minutes with a 3 per cent. solution of caustic soda.

Norit is stated to exert its decolourising action on slightly acid sugar solutions, the colour being only slightly or not at all removed when the solution is alkaline. The author explains this action by reference to the properties of colloids of the nature of pectin which are transformed into larger molecular groupings in feebly acid solutions, but into smaller ones in alkaline. The larger molecular groups are held by the decolourising carbon, while the smaller ones are not.

It is claimed that the decolourising power of Norit is about twenty-five times greater than granular animal charcoal. Its decolourising power is relatively greater in dilute sugar solutions as compared with concentrated ones; hence it is recommended to use Norit to bleach the juice rather than syrup. Norit is stated to possess the advantage of removing pectins and gums from sugar solutions, so that juice decolourised by this means is more easily filtered.

A continuation of the article is promised, in which the practical results obtained in certain factories and refineries will be considered.

TANNING SKINS.

The Sydney "Town and Country" gives the following as a "lightning tanning process":—

The lightning or sulphuric acid process is the quickest method of tanning wallaby, rabbit, and other skins, and is a very simple one. Pour five or six quarts of boiling water over two quarts of bran, and then strain the infusion. Make an equal quantity of salt water, by adding to blood-warm water as much salt as will dissolve. Mix the bran and salt water, and to each gallon of the mixture (when no more than lukewarm) add an ounce of sulphuric acid (H_2SO_4). Immerse the skins in the liquor, stirring them occasionally till tanned, which will be in about twenty minutes. When tanned, rinse in clean water, and hang out in shady place to dry. Pull and stretch them well while drying. By sufficient pulling they can be made quite white. Dry skins should be soaked in warm water before tanning till they are quite soft, and all flesh and grease should be well cleansed from them.

DESTROYING BOX AND SANDAL WOOD SUCKERS.

Mr. H. C. Quodling, Director of Agriculture, advises:—

"Round leaf box is always a difficult class of timber to kill owing to its predisposition to throw up suckers from surface roots, or after ring-barking, and more so when the operation is carried on at the wrong time of the year. The sap must be active. April and May are the months during which ring-barking will be generally satisfactory. Grubbing or cutting down suckers represents a good deal of work, but many persons are prone to grub effectively as the surest course, rather than risk cutting down the suckers, and the splitting of the butt simultaneously, to be followed by the application of arsenical solution.

"Strong plant poison is made up by boiling 2 lb. of arsenic and 1 lb. of caustic soda for an hour in 2 gallons of water—make up to 2 gallons with boiling water. Use a watering can after removing the rose. The spout should be plugged to allow the liquid to ooze out and be absorbed into the split butt."

THE QUEENSLAND COTTON CROP.

Arrangements have again been made by the Department of Agriculture to handle the cotton crop throughout Queensland. The farmers will receive an advance of 1¾d. per lb. on all cotton in seed delivered in Brisbane. The Officers of the Department will gin the cotton and dispose of the clean lint, and if there should be any net profit, after paying all expenses, the amount will be handed over to the grower. It is further announced that the Department will supply suitable seed to any intending grower of cotton, free of cost, and will pay railway freight to the station nearest to the applicant's farm. Seed will be available early in October.

PRICKLY-PEAR IN EGYPT.

The accompanying photograph of a prickly-pear plantation at Heluan, in Egypt, is interesting as indicating that the Egyptians use the plant as food for stock, where, possibly, there is a scarcity of other fodder. The photograph was taken by an officer of the British forces

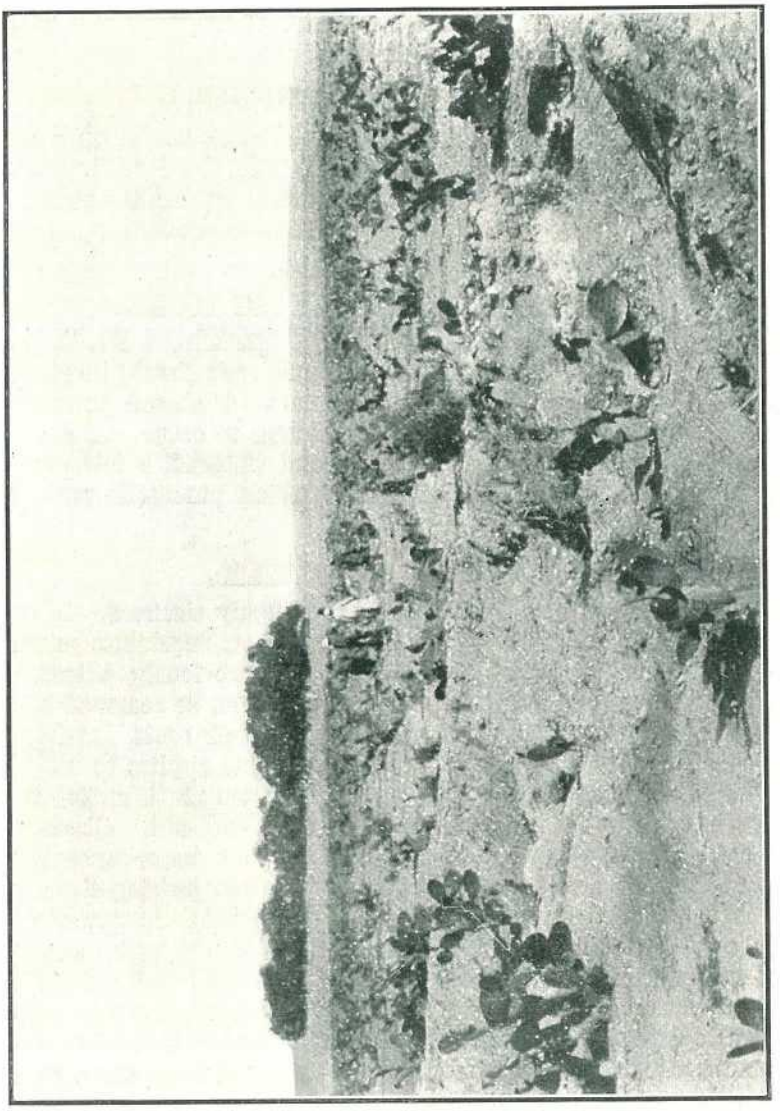

Plate 21.—Prickly-pear Plantation in Egypt.

in Egypt. He did not know, or did not state, what use was made of the plant; but it could only be used as fodder, or for the fruit. We have seen, at Cairo, baskets of prickly-pear fruit for sale in the market. Heluan is a place on the Nile, about 16 miles south of Cairo.

TO KEEP FLIES FROM HORSES' EYES.

The skin around the eyes should be painted daily with the following dressing:—

Spirits of tar, 1 oz.; olive oil, 5 oz.

TO DESTROY ZAMIA PLANTS.

Mr. J. F. Bailey, Government Botanist, says that the usual mode adopted for killing the plant is to chop a notch in the trunk and then bore a large hole from the notch to the centre of the pith. The hole is filled with arsenic, and the plant soon dies.

USEFUL MEDICINES ON THE FARM.

As regards medicines for horses, &c., the most useful on a farm are—Raw linseed oil, turpentine, and baking soda, the dose for a horse being 2 oz. turpentine, 1 pint linseed oil, and 2 oz. baking soda. In severe or doubtful cases the services of a qualified veterinary surgeon, if available, should be requisitioned.

NON-GERMINATION OF PINEAPPLE SEEDS.

With regard to pineapple seeds failing to germinate, Mr. C. Ross, Instructor in Agriculture, states that pineapple seed should be planted immediately after being taken from the fruit. The seed germinates very irregularly, and it is usual for many misses to occur. If sown in light, well-drained loam, properly shaded and watered, a fair proportion should result. There is no secret in raising pineapple seed, and Mr. Ross is at a loss to account for failures.

HOW TO COOK VEGETABLES.

First of all, the vegetables should be thoroughly cleansed. If fresh gathered and perfectly free from insects and dirt, vegetables preserve their colour in boiling much better when not previously wetted. If blighted, or in any respect dirty, remove all that can be removed before wetting—that is, trim away the outside leaves and roots, leaving no more than is to be actually boiled and eaten. This applies to cabbage, broccoli, and cauliflowers. Having carefully trimmed them, let them lie an hour or more in a pan of spring water and salt. Observe to plunge them into the water, not to pump or pour water upon them, which would make them flabby. Immediately before putting them into the saucepan, take them out of the water and shake them well in a colander or thin straining cloth that every drop of cold water may run off. In trimming vegetables do not be too saving; one tough outside leaf will spoil a whole dish; strip till you come to tender quick-grown leaves; and in cabbages shave the stem and also the stalks of the outer leaves. Salad and radishes should be washed in water without salt. Celery requires half an hour or more to soak. A brush, somewhat resembling a plate brush, is very useful in cleaning the root end of the celery.

Green peas, French beans, and broad beans require no washing. They should be cut or shelled just before boiling. It sometimes, however, happens to suit to shell peas an hour or two earlier; if so, they should be covered with the shells, and placed on the stones or bricks in a shady room.

Asparagus, if quite fresh, need not be washed; tie them with bass or tape, in bundles of twenty-five or thirty each, making all the heads lie level, and cut the stalks to an equal length.

Turnip greens, if cleanly gathered and carefully trimmed, need no washing. Only the hearts and stems are to be used. The latter should be skinned. But turnip greens grown on sandy land, especially after heavy rains, require to be washed in several waters.

Spinach should be picked leaf by leaf, and washed in several waters, and afterwards thoroughly drained.

The stalks of white beet for boiling, as well as those of rhubarb for pies or puddings, should be skinned.

Red beetroots should be well washed and scrubbed, but not scraped with a knife, as that would discharge the rich juice and the bright colour. Potatoes and Jerusalem artichokes should be scrubbed with a birch broom or scrubbing-brush and washed very clean, just before boiling. They should not be wetted at all till they are about to be used. Carrots and parsnips should be well scrubbed and washed. After boiling, rub off the skins with a coarse cloth. New potatoes are done in the same manner. In spring, when potatoes become old and specky, it is better to peel them raw, carefully removing the specks. This must be done with a knife. Afterwards rinse the potatoes, and either steam them or boil for mashing or for browning under meat.

Onions, Leeks, and Shalots.—Take off as many coats of the skin as are at all slimy or tough. For roasting onions should not be skinned or washed, but merely wiped from dust. Young spring onions are served with the green tops, merely the roots and one thin skin being removed. Artichokes should be soaked an hour or more before boiling.

Now, with regard to dressing vegetables, one general set of rules may serve for all green vegetables. 1. A tin saucepan that shuts close, large enough to allow plenty of water. 2. The water fast boiling the moment of putting in the vegetables, but not having boiled before nor been allowed to stand on the hob. The quicker the water comes to boil at first, and again when the vegetables are put in, the sooner they become tender, and the better they preserve their colour. 3. A brisk fire that will cause the water to boil up again quickly. 4. A small quantity of common salt to be put in with the vegetables—not before. A tablespoonful of salt is sufficient for a large dressing of greens; half that quantity for peas. 5. The instant the vegetables are put in shut the lid close, and do not lift it up again until it is forced up by rapid boiling; when this is the case, remove it, and do not return it again. 6. When the vegetables are nearly done, have quite ready a colander and slice or wire ladle with which to take them up; do not pour the water through them, but carefully lift them out with the ladle into the colander. 7. Shake them carefully in the colander to drain before putting them into the vegetable dish. Spinach should be pressed between two trenchers.

N.B.—The boiling of green vegetables may be expedited, the colour preserved, and if they are old and tough they may be made tender by putting in with them a small quantity of soda, half a teaspoonful of carbonate of soda, or a bit of washing soda the size of a small hazel-nut, is enough for a moderate dressing. This is not suitable for potatoes or roots in general; it spoils their colour, though it improves that of greens.

Answers to Correspondents.

TO SMOTHER COUCH GRASS.

In reply to a correspondent making inquiries on the subject of a suitable crop to smother couch grass, Mr. H. C. Quodling, Director of Agriculture, advised in August, as follows:—

"Panicum is probably the quickest growing crop for the purpose. Some trials carried out at the Agricultural College when there was a plentiful supply of moisture and warmth, a crop of panicum matured in seven weeks from the date the seed was sown, and gave a return equal to 8 tons of green fodder per acre. It may be pointed out that everything was in favour of this crop, particularly in the matter of preparation of the land, which had been lying fallow for some time previously. Siberian millet is not as quick a grower as panicum, but it spreads and stools to a greater extent. Japanese millet can also be recommended as a smothering crop, but it must be understood that all of these varieties revel in heat and moisture, and at this time of the year it is unlikely that you will get the same growth and progress as in the rainy season. Cowpeas (black for preference) are favoured as a smothering crop for couch, but it is not to be expected that they will get ahead of the grass unless the latter is kept well in check before planting time. Couch destruction is brought about effectually by shallow cultivation during the warm weather, keeping the grass on the surface, and knocking it about with implements to expose the roots to the drying action of the sun."

SEED OF A GRAFTED ORANGE.

"Orchardist," Wolvi, Gympie—

Your question as to whether the seed of a grafted orange will produce fruit, or go back to the original stock on which the scion was grafted, was submitted to the Director of Fruit Culture, Mr. A. H. Benson, who states that the seed from a grafted orange tree, if sown, will produce an orange, not necessarily, however, of the same type as its parent, as there is always the danger of inoculation by bees or other insects. It is not possible for the seed of an orange mated, say, on a lemon or citron stock to produce a lemon or citron. Copies of Mr. Benson's Bulletin on Citrus Culture and Pineapple Growing have been forwarded to you, and in them you will find answers to the questions on which you desire information. It would certainly be advisable to have the soil analysed. Directions for the collection of samples and scale of fees payable have been also sent to you. Send the samples of soil to the Agricultural Chemist, Department of Agriculture and Stock.

The planting seasons for Citrus fruits in the Southern coast districts are from May to August, and again in February. It is not too late to plant during this month (September) if the weather should prove favourable.

DESTRUCTION OF ANTS.

We frequently receive letters asking for a remedy against ants of all kinds. With a view to satisfying inquiries we published in the issue of this Journal for November, 1913, several remedies more or less effective in dealing with the most common varieties of ants. These were:—

DESTRUCTION OF ANT HILLS.

As the hot weather approaches, those pests of the State, ants of all sorts and descriptions, become lively, and begin to infest house and field. Then, on all sides, the question is heard: "How can we get rid of the ants?"

In the case of the extensive "antdoms" of the blue meat ant, a good way to exterminate them is to cover the gravelly nests with weed chippings from the garden. This proceeding appears greatly to trouble the insects, probably because the dry weeds prevent them from safely depositing the quantities of small stones and gravel they carry up from below the surface of the soil.

Failing this remedy, the best method of dealing with these ants in a large nest is to make several holes with a bar or broom handle to the depth of a few inches in different parts of their habitation. Pour into each hole about a tablespoonful of carbon bi-sulphide, and then cover the whole nest with a blanket. The heavy fumes of the insecticide will permeate the ant hill, killing all insect life. The operation may be made more effective by exploding the vapour under the blanket by the aid of a light on the end of a pole. This drives the poisonous fumes throughout the nest, rendering them more fatal to the inmates. The best time for this treatment is towards the evening, when most of the ants will be at home.

SOLDIER AND JUMPER ANTS

can be effectually destroyed by this process.

Another good remedy is to pour half a pint of gasoline into the hill or nest, and set it afire. The gasoline will instantly spread through all the galleries of the nest, and, as the heat on the surface increases, the gas will generate in the utmost recesses and the fire will cook the ants. Half a pint of gasoline will burn from three to eight hours, and every ant in the nest, or attempting to enter, will be destroyed.

TO CLEANSE A CUPBOARD

infested with red or black ants, all the shelves should be washed with carbolic acid and water, or carbolic soap. If the scent of the carbolic is offensive, as it is to some persons, use the following:—A large lump of ammonia dissolved in hot water, and more cold water added. The proportion is—ammonia the size of a hen's egg to a quart of water. Brush the shelves well over with it. The ants will quickly leave, as they dislike the scent of ammonia.

TO KEEP ANTS AWAY FROM TREES.

Take White Lime (slaked)	6 quarts.
Kerosene oil	½ pint.
Turpentine	1 wineglass.
Soft soap	5 lb.
Cow manure	3 quarts.
Water	16 quarts.

Mix the whole thoroughly together, and apply freely with a paint brush to the trunks of trees or shrubs.

It is said that trees can be protected against ants by saturating woollen strings with castor oil, and tying them tightly round the trunk. The ants go up as far as the strings, but none will cross them. Cotton strings will not do. Woollen yarn must be used.

TO GET RID OF BLACK ANTS.

Mix 10 parts of sugar with 100 parts of water, and boil. Cool, and then add 1 part of tartar emetic, and stir. Set this about in tins covered with muslin or wire netting. A very similar method is to use in exactly the same way a mixture of 1 oz. of jam or syrup and 10 grains of finely powdered corrosive sublimate.

Another remedy, involving no poison, is to soak a piece of sponge in sweetened water. When it is full of ants, drop it into boiling water, and sweeten afresh for a second lot of ants. Ants are curiously intelligent when once they have grasped the idea; so they keep away.

A third remedy: Mix flour, sugar, and arsenic to the consistency of putty with water, and place pieces of the mixture about the nests of the ants. If an examination is made in a few days after using this remedy, hundreds of dead ants will be found in the vicinity of the poison; and it is very unlikely that the ants will reappear on a spot where the mixture has been used.

TO PREVENT ANTS CLIMBING FRUIT TREES.

If chalk is rubbed on the bark of a tree, it will absolutely prevent ants from climbing. If they are above it, they fall the instant they set foot on the chalk when descending. They appear to lose their foothold. The correspondent who supplies this information mentions his experiment with a nectarine tree which was covered with black aphis. Observing that there was a continuous stream of black ants ascending and descending, he smoothed the bark of the steam to a width of about 6 or 7 in., and rubbed this space with chalk. The chalk was renewed from time to time as it fell or was washed off. That year there was not an aphis or black leaf on the tree, nor had there been any since. The ants, cut off from their food supply, were exterminated. "A chalk ring," he says, "drawn round a sugar ants' nest is equally effective." This is worth a trial, as, if successful, chalking the legs of tables and meat safes would preserve the contents from the ants.

Another way of preventing ants from climbing is said to be cheap and effective. Tie a rabbit skin (upside down, tail up the tree), fur

outwards, tightly round the stem. The ants start to climb up the fur, and as they reach the end of each single hair, the hair drops and lets them down. The ants always give it us as a bad job.

REMEDIES FOR WHITE ANTS ATTACKING LIVING TREES.

There are two ways in which the pests may be got rid of—one by arsenical poisoning; the other by the use of bisulphide of carbon, as already described. For the first plan, get 3d. worth of arsenic, and pound it as fine as flour. Next, collect as many ants as possible, mix the ants with the arsenic, some molasses, and a little soil. Make this into a ball, and place it near the ants' nest. The living ants will devour the dead ones, and their followers will devour them. Thus there will be an end of them.

A good remedy is apterite, which is destructive to most insect life when chipped into the ground, and is not harmful to plants.

Sugar and arsenic spread between slips of pine wood, and covered with an inch of soil, is a good trap for white ants.

GREEN HEAD ANTS.

These are most difficult to deal with, as they make their nests in inaccessible places and run long galleries out to some distance. Unless the nests can be located and bisulphide poured into them, there is little hope of getting rid of them.

ANT EXTERMINATION GENERALLY.

For the extirpation of ants the following remedies are good. To be effective, they require attention and perseverance. It is well to find their main burrow or nest, if possible. Arsenic is sure destruction to them, but it is dangerous to handle:—

Air-slaked lime plentifully dusted in warm dry weather over and around the hills, or in the house or other places infested, will cause the ants to vacate them in a short time.

Snuff: Dust a little snuff upon the floor of the rooms or pantry.

Draw a thick chalk line around a smooth tree or across an upright board or post, and they will not pass over it.

Camphor: Put a piece of camphor, the size of a filbert nut, into 2 quarts of hot water. When cold, apply to pot and other plants, and the insects will be driven off without injury to the plants.

Mix together 1 part of calomel and 10 parts of finely powdered white sugar, and lay it in little heaps about their nests and runs. The ants will eat it and die.

Coal oil, mixed with six times its bulk of water, sprinkled over the nests every few days, will kill and drive them away.

Pans or saucers, nearly filled with honey or sweet oil, attract ants, and they are drowned in it.

Flowers of sulphur, ½ lb.; potash, 4 oz. Set in an earthen vessel over the fire until dissolved and united. Afterwards beat to a powder.

Infuse a little of the powder in water and sprinkle in places infested with ants.

To Destroy Black Ants: A few leaves of green wormwood scattered among the haunts of black ants will drive them away.

Red Ants: Powdered borax sprinkled around will exterminate both red and black ants.

Make holes in the ant hills, 6 in. deep and 1 ft. apart, with an iron or zinc tube fitted with a wooden stake. Withdraw the stake. Pour 1 tablespoonful of bisulphide of carbon down the tube. Withdraw the tube and stop the hole immediately. Bisulphide of carbon is very inflammable.

RECORD PRICE FOR A PIG.

A correspondent writes from Tinana, Maryborough, that, at the monthly sales held on the 7th September, high prices ruled throughout for pigs, the reason being probably, the very great demand by the bacon factories. Very brisk bidding took place for a fine "backfatter," sold on behalf of Mr. Chas. Fortey, of Newtown. The bids ran up to £7 17s. 6d., which is easily a record for a pig in Queensland sold for commercial purposes. It would be interesting to know how this pig panned out in the way of bacon, hams, and sundries in the factory.

A SYMPTOM OF WORMS IN SHEEP.

A correspondent at Cloncurry, who last year lost 20 per cent. of his lambs, noticed that, at about from three to six months old, they developed a lump under the throat, and wrote to the Department for advice on the matter. Mr. W. G. Brown, Instructor in Sheep and Wool, advised as follows:—

One of the most decisive symptoms of worms in sheep is the lump under the jaw. The fact that lambs from four to six months old die from this complaint is a very strong corroboration of intestinal or stomach worms. If these lambs be drenched with a suitable drench, they should not die. If the fourth stomach were opened, twisted wire-worms in thousands would be found. Mr. Brown sent directions for making the drench, which, he said, would be found so effective that it was a certainty that no drenched lambs would die of stomach worms.

TIMES OF SUNRISE AND SUNSET AT BRISBANE—1915.

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

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

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

PHASES OF THE MOON, 1915.

On or about the 150th Meridian, East Long.

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

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

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

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

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

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

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

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

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

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

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

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

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

The Markets.

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

Article.		SEPTEMBER. Prices.
Bacon	lb.	1s. 1d. to 1s. 2½d.
Bran	ton	£6 15s.
Broom Millet	,,	...
Butter	cwt.	140s.
Chaff, Mixed	ton	£11 to £12
Chaff, Oaten	,,	£12 to £14 10s.
Chaff, Lucerne	,,	£15 to £20
Chaff, Wheaten	,,	£5 10s. to £10
Cheese	lb.	10d. to 10½d.
Flour	ton	£17 5s.
Hams	lb.	1s. 1d. to 1s. 2d.
Hay, Oaten	ton	£16
Hay, Lucerne	,,	£9 to £15
Honey	lb.	3½d. to 4d.
Maize	bush.	5s. 7d.
Oats	,,	6s. 3d to 7s. 6d.
Onions	ton	£10 10s.
Peanuts	lb.	3d. to 3½d.
Pollard	ton	£7 10s.
Potatoes	,,	£11 to £13 10s.
Potatoes (Sweet)	cwt.	6s. 9d. to 7s. 9d.
Pumpkins	ton	£6 to £8
Eggs	doz.	11½d. to 1s.
Fowls	pair	4s. 9d. to 6s.
Ducks, English	,,	4s. to 4s. 3d.
Ducks, Muscovy	,,	5s. to 6s.
Geese	,,	...
Turkeys (Hens)	,,	8s. 6d.
Turkeys (Gobblers)	,,	16s. to 18s.
Wheat	bush.	9s.
VEGETABLES.		
Cabbages, per dozen		6d. to 2s.
Cauliflowers, per dozen		1s. to 5s. 6d.
Beans, per sugar bag		3s. to 4s.
Beetroot, per dozen bunches		6d. to 9d.
Carrots, per dozen bunches		9d. to 1s. 3d.
Chocos, per quarter-case		1s. 9d. to 2s. 6d.
Cucumbers, per dozen		...
Custard Marrows, per dozen		2s. 6d. to 4s.
Vegetable Marrows, per dozen		2s. 6d. to 4s.
Lettuce, per dozen		...
Peas, per sugar bag		1s. to 2s. 6d.
Parsnips, per dozen bunches		1s. to 1s. 3d.
Celery, per dozen bunches		10d. to 1s. 6d.
Sweet Potatoes, per cwt.		6s. 9d. to 7s. 6d.
Table Pumpkins, per cwt.		7s. 6d. to 8s.
Tomatoes, per quarter-case		2s. to 7s.
Turnips, per dozen bunches		6d. to 9d.
Rhubarb, per bundle		1s. to 1s. 6d.

SOUTHERN FRUIT MARKETS.

Article.	SEPTEMBER. Prices.
Bananas (Queensland), per case	10s. to 12s.
Bananas (Fiji), per case	17s. to 18s. 6d.
Bananas (G.M.), per case	20s. to 23s.
Mandarins, per case	5s. to 7s.
Oranges (Navel), per case	6s. to 8s.
Oranges (other), per case	5s. to 7s.
Passion Fruit (Local), per half-case	2s. to 10s.
Lemons, per bushel case	3s. to 5s. 6d.
Papaw Apples, per half-case	...
Pineapples (Queens), per case	5s. to 7s. 6d.
Pineapples (Ripleys), per case	4s. to 6s.
Pineapples (Common), per case	4s. to 6s.
Strawberries (Queensland) per tray	3s. to 5s.
Tomatoes, per quarter-case	5s. to 9s.
Cucumbers, per case	6s. to 8s.

PRICES OF FRUIT—TURBOT STREET MARKETS.

Article.	SEPTEMBER. Prices.
Apples (Tasmanian), per case	7s. to 10s.
Apples (Croftons), per case	14s.
Apples, Cooking, per case	6s. to 10s.
Bananas (Cavendish), per dozen	2d. to 5d.
Bananas (Sugar), per dozen	1¾d. to 3d.
Cape Gooseberries, per quarter-case	5s. to 7s. 6d.
Cocoanuts, per sack	12s. to 15s.
Custard Apples, per quarter-case	5s. to 8s.
Granadillas, per quarter-case	...
Lemons (Lisbon), per case	5s. to 7s. 6d.
Limes (Choice), per quarter-case	2s. to 3s. 6d.
Mandarins, per half-case	6s. to 8s.
Oranges(Navel), per case	6s. to 8s.
Oranges (other), per case	3s. 6d. to 5s.
Papaw Apples, per quarter case	1s. to 2s. 6d.
Papaw Apples (Prime), per quarter-case	3s.
Passion Fruit, per case	6s. 6d. to 7s. 6d.
Peanuts, per pound	3d. to 4d.
Rosellas, per sugar bag	...
Pineapples (Ripley), per dozen	1s. 9d. to 3s. 6d.
Pineapples (Rough), per dozen	9d. to 1s. 6d.
Pineapples (Smooth), per dozen	1s. 9d. to 3s. 6d.
Strawberries, per dozen pint boxes	3s. 6d. to 7s.
Strawberries, per tray	...
Tomatoes, per quarter-case	2s. to 5s. 6d.

TOP PRICES, ENOGGERA YARDS, AUGUST, 1915.

Animal.	AUGUST. Prices.
Bullocks	£31 to £41 5s.
Cows	£14 to £16 17s. 6d.
Merino Wethers	54s. 9d.
Crossbred Wethers	63s.
Merino Ewes	46s. 9d.
Crossbred Ewes	50s.
Lambs	44s. 6d.
Pigs (Porkers)	44s. 6d.

EXHIBITION PRICES.

Animal.	AUGUST. Prices.
Bullock (Champion)	£46
Bullock (Guessing)	£37
Bullock	£39
Cows (Champion)	£20 5s.
Cows	£22 5s.
Crossbred Wethers	81s.
Merino Wethers	55s. 6d.
Crossbred Ewes	54s.
Lambs (Crossbreds)	51s.

LONDON QUOTATIONS.

London, 11th September.—Danish butter is quoted at 174s. to 176s. per cwt.

The Liverpool quotation for middling American cotton, September-October shipment, is 5·94½d. per lb.

Jute, September-October shipment from Calcutta, £26 per ton.

Hemp is dull. October-December shipment, £33 per ton.

Mexican Sisal: It is stated in Messrs. Landauer and Co.'s report for 11th August (London) that, owing to a sharp fall in exchange and freight, prices have moved in favour of buyers. Offers have been received for forward shipment at £34 per ton for fair average quality. No business had apparently been concluded, but a small parcel of good quality in store was offering at £36 per ton. From statistics to hand it was to be noted that the shipments of sisal hemp from the Port of Progreso (Mexico) during the month of June reached the record figure of 132,356 bales against 89,208 bales during June, 1914.

Stocks on hand in Progreso, 30th June, 1915 .. .. 81,912 bales.

Stocks on hand in Progreso, 30th June, 1914 .. .. 28,567 bales.

Shipments of sisal this year presumably only reach the United States. The market was quiet for Mauritius hemp, spot values remaining at £33 to £33 10s. for prime, £31 to £31 10s. for good fair, and £30 to £30 10s. for ordinary grades.

Rubber, fine hard Para, 2s. 4⅞d. per lb.; plantation, first latex crepe, 2s. 4d.; smoked sheet, 2s. 4d.

Copra, South Sea, September-October shipment, £22 15s. per ton.

Orchard Notes for November.

THE SOUTHERN COAST DISTRICTS.

November is somewhat of an off month for fruit, as the crop of strawberries is about over; pineapples, with the exception of a few off season fruit, are not ready for marketing; and citrus fruits of all sorts, with the exception of those grown in the latest districts, are now over. Bananas should, however, be improving, particularly if the season is favourable.

The most important work of the month is the cultivation of the orchard, as, in order to retain moisture in the soil, it is essential that the soil be kept in a fine state of tilth. Where land is liable to wash, breaks should be left between the fine-worked land, or, even better, a good break of cowpea or other leguminous crop, valuable for producing nitrogen and humus, should be grown. All fruit pests should be attended to; cyaniding can be carried out where necessary, and is especially useful now in the case of the Red, Purple Mussel, Circular Black, and Glover Scales. Fruit-fly should be systematically fought; all infested plums, peaches, guavas, or other fruits should be gathered and destroyed, so as to prevent the spread of the pest. Sucking bugs of all sorts should be gathered and destroyed, the egg-clusters, as well as the immature and mature insects, being destroyed. Hand-gathering is as good a plan as any. Fig beetles should be destroyed by spraying with Kedzie's mixture; and the egg-clusters should be destroyed whenever found.

Bananas and pineapples can be planted during the month, taking care, in the case of the pineapples, not to set out suckers that will immediately throw out a fruit, but those that will become firmly established before they fruit. Examine the vineyard carefully, and keep it well worked. Look out for Oïdium and Black Spot, and treat for same as recommended in the Orchard Notes of the two previous months.

Early ripening grapes will be reaching maturity towards the end of the month; but few, if any, will be ripe. In any case do not market too immature fruit; rather wait a few days longer, till it is fit to eat.

THE TROPICAL COAST DISTRICTS.

The main crop of pineapples will ripen during the month; and if gathered at the right time—viz., when fully developed, but not turned colour—they will carry all right South, if carefully handled and well packed. Papaws and granadillas are still in season, and will meet with a good Southern demand; they must be packed in cases containing only a single layer of fruit, and should be sent in the cool chamber. I am certain that a good market can be got for these fruits in both Melbourne and Sydney, particularly at this time of the year, when their winter fruits are off and their summer fruits are not yet on.

Watch bananas carefully for fly. Keep the orchards well cultivated.

Only ship good mangoes South; far too much rubbish is sent to Brisbane. Good mangoes will pay to pack properly, but the common sorts, which predominate to an enormous extent, will barely pay freight, if there is a good crop. The canning of good types of fibreless mangoes of good flavour is well worth taking up commercially in the North, as a ready sale for the canned fruits can be obtained.

As in the Southern Coast districts, all fruit pests should be systematically fought, and the orchard should be kept in a good state of tilth, as, once the wet season starts, there is little chance of cleaning up weeds and rubbish of all kinds, or of cultivating and sweetening the soil.

THE SOUTHERN AND CENTRAL TABLELANDS.

The earlier kinds of summer fruits, such as cherries, will ripen during the month. See that, if fruit-fly makes its appearance, it is systematically fought.

Look out for Codling Moth, and continue the sprayings with Kedzie's mixture.

Look out carefully for any San José scale that may have escaped the winter spraying, as, if the trees are sprayed whilst the young are hatching out, the bulk of the insects are killed and little damage is done either to tree or fruit.

The sulphide of soda spray is one of the best to use now. Keep Woolly Aphis in check, should it make its appearance, using the resin washes; or, if it and San José scale are both present, use the sulphide of soda spray.

Watch the vineyards carefully for Black Spot and Oïdium. Keep the orchard and vineyard well cultivated, so as to retain all the moisture in the soil required for the growth of the tree and development of the fruit. In the warmer parts, irrigate when necessary, following the irrigation by deep and systematic cultivation.

See that grape vines have plenty of foliage to protect the ripening fruit from sun scald, but yet not so dense a foliage as to induce Oïdium or Black Spot. Look out for Red Scale on citrus trees, and cyanide to check same. Look out for fruit-fly in the early ripening fruits, and gather and destroy all that may be so affected.

Farm and Garden Notes for November.

FIELD.—Under ordinarily favourable conditions, harvesting the wheat and barley crops may now begin. Those who have oats for hay should cut it when the grain has formed, but before it is ripe, for then the plant is in its most nourishing condition. Destroy caterpillars on tobacco plants, and top the latter so as to throw all the strength into the leaves. Keep down the weeds, which will now try to make headway;

earth up any growing crops requiring the operation; sow maize, imphee, setaria, kafir corn, teosinte, sorghum, &c. Plant sweet potatoes, sisal hemp, yams, peanuts, and ginger.

KITCHEN GARDEN.—Why do so few gardeners and farmers grow their own vegetables? This is a question frequently asked by visitors to the farming districts. The reason probably is, that vegetables require a good deal of care and attention, which means also a good deal of time taken from the ordinary farm work. In many cases it pays the farmer better to buy many kinds of vegetables than to grow them himself. The only vegetables grown on many fine farms are cabbages and pumpkins, not to class potatoes under the head. Many people have an idea that European vegetables cannot be grown during the hot summer months, but this is a great fallacy; the Chinese gardeners supply the town with all kinds of vegetables, except, perhaps, cauliflowers, during the whole of the summer. It is, therefore, clear that, by constant work, plenty of manure, water, and some shade for seedlings, most vegetables can be produced during the hot months from November to March. If your ground has been trenched or deeply dug and well worked, the advantages will be seen during the coming months. It does not pay to work shallow-dug ground. When sowing and planting during this month, give plenty of room between the rows and the plants, otherwise they will be drawn up and worthless, and keep the ground open by constant forking and hoeing. Thin out melon and cucumber plants. It is a good plan to peg down the vines; they will then not be blown about by the wind; they will take root at intervals, and thus help the main stalk. Give plenty of water to tomatoes planted out last month. They should also be mulched. Sow cabbage, French beans, melons, lettuce, radishes, pumpkins, cucumbers, marrows, rosellas, &c.; and transplant for succession in calm cloudy weather.

FLOWER GARDEN.—Stake any dahlias which may be now above ground, and plant out the bulbs which were stored in a moist place. If the weaker bulbs are reserved, they will come in for autumn planting. Take up all bulbs which have done flowering, and store them in a dry place. Winter-flowering plants will have gone off almost; still, the garden should be in full bloom, and will well repay the trouble bestowed on it, and a little fertiliser given as a top-dressing will assist the plants to bloom and look well for a longer time than if they were neglected. Give weak liquid manure to chrysanthemums, and allow no suckers to grow till the plants have done flowering. Take up narcissi. Do not store them, but plant them at once in new situations. Sow anthirrhinum, balsam, zinnia, summer chrysanthemum, calliopsis, and nemophila.