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Agriculture.

COMPLETE FERTILISERS FOR FARM, ORCHARD, AND VEGETABLE GARDENS.

CUCUMBERS.

This vegetable may be grown on almost any soil, as long as it is fairly light and loamy, and plenty of manure is added. The pits or hills should be prepared by mixing a large amount of well-rotted stable manure, sheep or fowl dung, ashes, and bonedust with the soil.

Apply in addition the following artificial fertilisers:—

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

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

An excessive amount of nitrogenous manure, more particularly in

the form of quick-acting nitrates, may cause an excessive growth of vines and poor quality of cucumbers.

LEEKS and ESCHALOTS.

These vegetables require a deep, rich, sandy loam, a liberal manuring with stable manure, ashes, bonedust, &c., when preparing the bed, and a copious supply of liquid manure during their growth.

A complete fertiliser is made up as follows:—

4 to 6 cwt. superphosphate
1 to 1½ cwt. sulphate of potash
2 to 3 cwt. sulphate of ammonia or nitrolim
} per acre;

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

LETTUCE.

Lettuce requires a rich loam, in order to grow very quickly, and in good soil the addition of artificial fertilisers will produce large crisp plants.

Use per acre 8 to 12 cwt., or per square yard 3 to 4 oz., of a fertiliser containing 6 to 8 per cent. phosphoric acid, 4 to 6 per cent. nitrogen, and 8 to 10 per cent. potash; or the following mixture:—

4 to 6 cwt. superphosphate
1½ to 3 cwt. sulphate of potash
2 to 4 cwt. nitrolim or sulphate of ammonia
} per acre.

LUCERNE.

Lucerne, one of our most valuable fodder-plants, grows well on rich loams, and clayey soils, containing plenty of lime, and having a mellow, fairly open, or even gravelly subsoil. Clayey soil, deficient in lime, may be made to grow lucerne if the land is heavily limed with ground limestone, at the rate of one to three tons per acre. Some light sandy soil, with a clayey or gravelly subsoil, may also be made fit for lucerne by liming. Nitrogenous manure is, as a rule, not required, but a small dressing with nitrolim or nitrate of lime, at the rate of ½ to 1 cwt. per acre, at the time of sowing, may act as a stimulus and give the plants a chance to establish themselves in poorer soils. The plant requires an ample supply of potash and phosphoric acid, and an annual application of 3 to 6 cwt. of a fertiliser mixture, containing 6 to 8 per cent. phosphoric acid and 10 per cent. of potash, is to be recommended.

The following manures may be applied broadcast every year:—

2 to 3 cwt. superphosphate
1 to 1½ cwt. sulphate of potash or muriate of potash
} per acre;

or,

3 to 4 cwt. Thomas phosphate
1½ to 3 cwt. kainit
} per acre

MANGOLDS and SWEDES.

Mangolds, like Swedes and beets, are a very exhaustive crop and require a fairly rich loamy soil. Whenever possible from 10 to 20 tons of well-rotted farmyard manure should be applied, per acre, when

preparing the land for sowing. This crop is one of the few which prefers the potash in the form of chloride or muriate, and if the usual sulphate of potash is used, an equal amount of common salt may be added. The following mixture of artificial fertiliser will be found to give greatly increased crops:—

2 to 3 cwt. superphosphate
1 to 1½ cwt. muriate of potash
2 cwt. nitrolim or sulphate of ammonia
} per acre;

or,

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

MARROWS, PUMPKINS, and SQUASHES.

Marrows do best on a fairly rich loamy soil, with a stiff subsoil, and many of our scrub soils are particularly suitable for these vegetables. With the aid of artificial fertilisers they may be grown on lighter soil, in which case the amount of artificial fertiliser may be increased up to 8 and 10 cwt. per acre or 8 to 10 lb. to every 43 square yards.

The following mixed fertiliser will be found suitable:—

3 to 4 cwt. superphosphate
1½ cwt. sulphate of potash
1½ to 2 cwt. nitrolim or sulphate of ammonia
} per acre.

OATS.

This cereal may be grown on almost any class of soil, but requires a fairly cool and moist climate.

When grown on a soil of average quality apply per acre from 3 to 5 cwt. of a mixed fertiliser containing from 6 to 8 per cent. water-soluble phosphoric acid, 8 per cent. of potash, and 4 to 5 per cent. nitrogen, or the following mixture:—

1½ to 3 cwt. superphosphate
½ to 1 cwt. sulphate of potash
½ to 1 cwt. nitrolim or sulphate of ammonia
} per acre.

LAYING OF WHEAT.

BY BENJAMIN WILSON.

Some farmers, in their eagerness to obtain as big a wheat crop as possible, plant their seeds as close as they possibly can; with the result that light cannot pass between the plants and the stems become long and slender. The stems are thus no longer able to support the weight of the ears of corn and "laying" results. For the healthy growth of wheat a certain intensity of light is essential. The light acts directly on the protoplasm and gives to it some of the energy it utilises in constructive metabolism; thus it exerts a tonic influence on

the development of the cornstalk. Without entering into detailed botanical explanations, it may be said that while light is not absolutely essential for growth it is still necessary for healthy growth. Plants will grow faster in the dark than in the light, as may be seen in rhubarb, which when forced in the dark has small leaves and long slender stems. When grown in the light, the stem of rhubarb is short and thick. Speaking generally, it may be said that most plants grown in the dark have soft stems, which are very much elongated and sickly in colour.

Plants grow more rapidly during the night than during the day. During daylight food formation takes place, and the materials then stored are used up during darkness in producing the permanent change in the plant. From what has been said it will be seen that the remedy for laying of wheat is to widen the distance between each seed. The trouble will then be averted.

STOCK FOODS.

By J. C. BRÜNNICH, Agricultural Chemist.

The dairy farmers of this State have again passed, on account of scarcity and high cost of feed, through an exceedingly trying time, and in a very large number of cases hand feeding had to be resorted to. At such times it is of utmost importance to have some knowledge of the composition of various fodders, and more particularly of the more common commercial concentrated foodstuffs, which will have to be used in connection with poorer foods to keep the stock in good condition. The monetary value of such foods can only be judged by comparing their composition.

A very large number of various grasses, cereals, leguminous crops, grains and seeds, and root crops, have been analysed at our agricultural laboratory from time to time, and the results published in our annual reports. As these reports are not always to hand, I have had prepared a short table of the analysis and composition of the most common stock foods, which appeared in article under the same heading in the "Agricultural Journal" two years ago. Since that time a large number of various grasses, and of common pasture, at different periods of growth, have been analysed, and the variation in composition was found to be very striking,* so that it was considered of more value to average the results of all the analyses in the preparation of the new table.

In the table (Table II.) at the end of this paper the amounts of constituents most important for nutrition contained in every 100 lb.

* Annual Report of Agricultural Chemist, 1914.

of fodder are given under the headings: **Crude Protein, Carbohydrates, Crude Fibre, Crude Fat,** and **Crude Ash.** Only parts of these constituents become really **available** to the animal by being more or less digestible. Again, we must bear in mind that the various classes of farm stock, and even individual animals of each class, have a greatly varying power of digestion. All ruminants—animals like oxen, cows, sheep, and goats, which chew their cud—digest much larger proportion of the nutriment constituents of foods than non-ruminant animals, like horses, pigs, &c. This variation in digestibility applies more particularly to the coarse and bulky fodders, straws and hay, of which a horse digests much less than a cow or sheep.

Unfortunately, no actual feeding experiments on the digestibility of our stock foods have been carried out in Queensland, and all our calculations of the digestible portions of such foods have to be based on European and American experiments. The **values of digestible** constituents, contained in every 100 lb. of fodder, are calculated (in Table II.) on the average digestion of ruminants, and apply therefore chiefly to the feeding of cows, sheep, &c. The values would be lower when the fodders are used for the feeding of horses and pigs.

When calculating actual rations the values of digestible nutrients have again to be modified, as in all cases a certain amount of energy is required for mastication and digestion itself, and the "**availability**" of a food for actual productive purposes will in many cases be very considerably lowered. Of the digestible nutrients in the more easily digested fodders, like roots, grain, meals, &c., as much as 95 per cent. may be available, but in the case of rough fibrous foods, straw, poor coarse hay, &c., only 30 per cent., or about one-third, of the food is actually made use of, two-thirds of the energy being wasted for mastication and digestion. A liberal extra allowance has therefore to be made when using coarser fodders in the making up of rations. As a matter of fact, when feeding horses with coarse fodder like straw or poor quality of hay, so much energy is consumed in digestion that nothing is left to enable the animal to perform any work.

The nitrogenous compounds, included under the heading "**Crude Proteins,**" are called the **flesh-forming constituents** of food, as their chief function is the production of blood, muscle, and repair of waste tissue. The **nitrogen-free compounds** come under the headings: Carbohydrates (starch and sugars), crude fibre, and crude fat, which all are **heat** or **energy producers,** and may also form fat.

Every efficient food ration must contain a minimum amount of proteins and a certain amount of total heat or energy producing con-

stituents, and in order to avoid waste of one or the other, a certain ratio, called the **nutritive ratio,** between the amounts of digestible proteins and digestible non-nitrogenous (energy producing) nutrients has to exist in a properly balanced ration. This ratio must be changed in accordance with age and the amount of work to be performed by the animal.

When judging the value of fodder as food for stock we have to consider besides the practical points of succulence, flavour, and palatability, the chemical composition with regard to the amounts of: 1st, nitrogenous constituents; 2nd, heat or energy producing nutrients; 3rd, mineral matter; and, lastly, of water.

The amount of **water,** or rather the ratio between water and total dry food material, is of some importance, cattle requiring a ratio of about 4 to 1, sheep only 2.1, whilst horses, according if they are at rest or working, require ratios of 2.1 to 3.6 to 1. When feeding cattle with dry rations larger amounts of water are required; as soon as roots are fed, the quantity of water required is much less, and when feeding very succulent watery foods, as, for instance, prickly-pear leaves, no water at all need be supplied; in fact, giving water to cattle so fed may be even dangerous.

The **energy value** of a fodder may be measured by the amount of heat evolved on burning, and may also be called **fuel value.** For the calculation of this value, starch is taken as the unit, the other carbohydrates, sugars and fibre, are taken of the same heat value, fat produces 2.3 times the amount of heat, and protein only about $\frac{9}{10}$ the amount. The total amount of energy produced by all the digestible nutrients of a food is also expressed as its **starch value (equivalent),** and may be used for comparison of the feeding value of the various fodders.

The old feeding standards of *von Wolff* have been slightly modified on the results of more recent feeding experiments carried out by *Professor Kellner,* of the Möckern Experiment Station in Germany, and he applies in his feeding standard principally the starch equivalent of foods for the making up of suitable rations. Carefully conducted trials carried out in Denmark and Sweden, which were made more particularly to ascertain the milk production from certain rations, gave results closely approximating the values based on Kellner's starch equivalents.

In the following short table the actual net available amounts of energy produced by food is taken into account, and all compared with wheat taken as the unit.

Equivalent Quantities of Food.

—	Based on Kellner's Starch Equivalent.	Danish Scale.	Swedish Scale.	Lawe's and Gilbert's Scale.
Wheat	1	1	1	1
Bran	1·5	1	1·1	1·25
Oil Cake	·9 to 1·1	1	·85 to 1	·9 to 1·1
Clover Hay	2·2	2	2·5	2
Meadow Hay	2·3	2·5	2·6	2·1
Mangolds	11	10	10	13
Turnips	15	12	12·5	19
Straw	4·2	4	4	2·5
Green Fodder	7 to 9	10	7·5 to 11	..
Potatoes	3·8	4	5	8·5

In order to compare this table with the values given in my larger table at the end of this paper, in which the starch equivalent of wheat is taken as 16, meaning that it takes 16 lb. of wheat to supply a cow of 950 to 1,000 lb. live weight with sufficient amount of energy-yielding nutrients for the production of 25 lb. of milk daily, we find, for instance, straws to have a starch equivalent from 23 to 28 lb., thus requiring theoretically from $1\frac{1}{2}$ to 2 times the weight, as compared with weight of wheat, to supply the necessary amount of carbohydrates or fuel value.

As already stated, a large amount of energy is wasted in the mastication and digestion of straw, and therefore according to Kellner's and other practical tests, straw must be actually fed about 4 times the amount of wheat to produce the same energy. In the case of more digestible foods the difference between our theoretical starch values and Kellner's available starch equivalent will seem much smaller, and we find, for instance, that they practically agree in the case of bran, oilcakes, and potatoes.

For the actual calculation of rations for farm stock we must now take Table I. of "Kellner's Standard Rations," which we find gives values slightly lower than those given in von Wolff's table previously published. Again, in the case of two values being given we may safely assume that with our more favourable climatic conditions the lower value will suffice for the rations of our stock.

TABLE I.

Kellner's Standard Rations.

PER 1,000 LB. LIVE WEIGHT PER DAY.

Animal.	Dry Matter in Total Ration.	DIGESTIBLE.	
		Protein.	Starch Equivalent.
Horse (light work)	18-23	1·0	9·2
Horse (medium work)	21-26	1·4	11·6
Horse (heavy work)	23-28	2·0	15·0
Fattening Cattle—			
At 550 lb. live weight	26	2·8	14·4
At 770 lb. „ „	26	2·2	11·2
At 950 lb. „ „	26	1·5	10·0
Milch Cattle—			
Yielding 10 lb. milk	22-27	1-1·3	7·8-8·3
Yielding 20 lb. „	25-29	1·6-1·9	9·8-11·2
Yielding 30 lb. „	27-33	2·2-2·5	11·8-13·9
Yielding 40 lb. „	27-34	2·8-3·2	13·9-16·6
Fattening Lambs—			
65 lb. live weight	31	3·5	17
110 lb. „ „	28	2·5	15
Full grown	24-32	1·6	14·5
Fattening Pigs—			
44 lb. live weight	44	6·2	33·8
110 lb. „ „	36	4·5	32·0
200 lb. „ „	28	3·0	24·5

In this table all rations are calculated as required per day and per 1,000 lb. live weight. From the table we see that a horse heavily worked requires double the amount of proteins than a horse with light work. When fattening cattle or pigs, the amount of protein in the ration is reduced as the animals increase in weight. The quantities of digestible nutrients necessary for the calculation of rations may all be taken from Table II.

In order to make comparison easier the last two columns of Table II. give the **starch** and **protein equivalents** of each fodder expressed as the quantity of food in lb. required to be fed daily to a cow from 750 to 900 lb. live weight yielding about 25 lb. of milk and requiring about 26 lb. dry material, containing 1·9 lb. protein and 11 lb. starch value. Nearly the same amounts of food would be required by a horse fairly heavily worked. In all cases where the amounts of starch and protein equivalents are about the same, we know that the fodder is a well-balanced ration. We find that 16 lb. of wheat would supply the necessary amount of protein and starch, but the total weight of dry matter, of which a cow requires about 26 lb., would not be sufficient.

Of Couch grass and Prairie grass, some of the most ideal feeds for dairy cattle, about $\frac{3}{4}$ cwt. are required to supply the necessary protein and starch.

If we look at lucerne hay we find that about 24 lb. are required to supply the necessary amount of energy, but that only 17 lb. are required to supply the necessary protein, because lucerne hay has a nutritive ratio of 1 to 3·3, which indicates that it contains too much nitrogenous nutrient material as compared to carbohydrates, whereas a cow requires a ratio of about 1 part of digestible proteids to 5·4 parts of digestible carbohydrates, including fat.

When feeding, therefore, cows entirely on lucerne hay, we supply more nitrogenous material than necessary, which consequently goes to waste. It is therefore an advantage to feed a small quantity of lucerne hay and supplement the feed with fodders containing a comparatively higher amount of carbohydrates and fats, or of a wider nutritive ratio, like wheat straw, bush hay, potatoes, &c.

When using fodders like prickly-pear leaves, rather poor in nitrogenous nutrients, the fodder must be supplemented with concentrated foods rich in nitrogenous constituents like cotton-seed meal, linseed meal, or oilcake.

A cow could consume, say, 60 lb. of prepared prickly-pear leaves per day and gets therefore $\frac{6}{10}$ of .3, or about .2 lb., of digestible protein and $\frac{6}{10}$ of 6, or 3·6 lb., of starch. To supplement the ration we give in addition 25 lb. bush hay, and supply therefore $\frac{1}{4}$ of 3.2, or ·8 lb., protein, and $\frac{1}{4}$ of 56.6, or 14.2 lb., starch. The cow will get a total of 1 lb. of protein and 17·8 of starch, or only about half the amount of nitrogen required. In order, therefore, to make a complete ration we must add $2\frac{1}{2}$ lb. cotton-seed meal, or 3 lb. linseed meal, or 6 lb. of oilcake to supply the deficiency of ·9 lb. of protein.

Any other ration can be calculated in a similar manner.

Table II.

COMPOSITION OF FODDERS.

Giving pounds of food materials, and of water, and of digestible nutrients contained in every 100 lb. of fodder.
Pounds of each fodder required to supply a cow of 750 lb. to 900 live weight, yielding 25 lb. milk daily, with 11 lb. starch value, and 1·9 lb. protein,

—	Water.	Crude Protein.	Carbohydrates.	Crude Fibre.	Crude Fat.	Crude Ash.	DIGESTIBLE NUTRIENTS.						LBS. OF FODDER TO GIVE.	
							True Protein.	Carbohydrates.	Fibre.	Fat.	Nutritive Ratio (1 ÷)	Starch Value.	Starch Equivalent to 11 lb. Starch.	Protein Equivalent to 1·9 lb. Protein.
Green Fodders—														
Grasses and Cereals—														
Barley	79·0	2·7	8·0	7·9	·6	1·8	1·4	5·7	4·8	·4	8·1	12·8	86	136
Buffalo grass	78·0	2·1	12·3	4·6	·5	2·5	1·2	9·0	2·9	·4	10·7	13·9	79	158
Couch grass	74·1	4·1	10·0	8·4	·4	3·0	2·4	7·3	5·3	·3	5·5	15·5	71	79
Grass, mixed pasture	62·1	2·4	14·8	15·6	·6	4·5	1·3	10·8	9·8	·45	16·7	22·9	48	146
Maize	70·9	2·6	13·4	9·6	·5	3·0	1·2	9·8	6·4	·4	14·3	18·2	60	158
Indian cane	77·0	1·5	11·0	8·9	·2	1·4	1·7	7·9	6·0	·2	20·5	15·0	73	272
Oats (in green head)	79·0	1·8	11·9	5·1	·5	1·7	1·0	7·5	3·6	·4	12·0	12·9	85	190
Paspalum	74·7	2·3	9·9	10·2	·5	2·4	1·3	7·2	6·4	·4	11·3	15·7	70	146
Prairie grass	76·8	4·3	8·3	7·2	·8	2·6	2·1	6·1	4·5	·6	5·7	13·9	79	90
Rhodes grass	70·3	2·2	11·8	12·2	·5	3·0	1·0	8·6	7·7	·4	17·2	18·1	61	190
Sorghum	70·6	2·1	15·1	9·1	·6	2·5	·8	11·3	5·4	·5	22·3	18·6	59	238
Summer grass	72·0	1·4	13·1	10·0	·3	3·2	·6	9·6	6·3	·2	27·2	16·9	65	317
Sugar-cane tops	72·7	2·4	12·3	10·0	·8	1·8	1·1	8·9	6·7	·6	15·4	18·0	61	173
Legumes—														
Cowpea vines	79·1	3·3	8·3	5·5	·9	2·9	1·9	6·2	2·9	·5	5·4	12·0	92	100
Lucerne	76·0	5·4	8·3	6·8	·7	2·8	3·0	6·1	3·4	·3	3·4	12·9	85	63
Various—														
Prickly-pear (leaves)	89·7	·5	7·0	1·1	·1	1·6	·3	4·8	·7	·1	19·8	6·0	183	634
Saltbush	67·8	5·0	14·8	6·6	·7	5·1	2·6	10·1	4·1	·5	5·9	17·7	62	73
Sheeps Burnett	76·3	4·4	9·0	6·2	·7	3·4	2·5	6·1	3·8	·5	4·8	13·1	84	83
Sweet potato vine	85·6	2·0	6·3	2·8	·7	2·6	1·3	4·3	1·7	·5	5·5	8·3	133	146
Silage—														
Maize	69·1	1·9	11·6	9·2	·5	2·7	1·0	7·8	6·5	·4	15·2	16·1	68	190
Sorghum	74·3	1·8	14·4	8·9	·4	2·2	·9	9·6	6·3	·3	18·4	17·4	53	211
Wheat, thistles and mustard	65·0	4·6	13·5	11·9	1·2	3·8	1·9	9·0	8·4	·9	10·2	21·2	52	100

Roots, Tubers &c.—														
Beets	77·0	2·1	17·0	1·8	·1	2·0	·5	16·8	1·6	·1	37·2	19·1	58	380
Cabbages	90·5	2·4	3·8	1·5	·4	1·4	1·2	3·4	1·4	·4	4·8	6·8	162	158
Mangolds	87·5	1·6	7·1	1·4	·1	2·3	·6	6·5	·7	·1	12·4	8·0	138	317
Potatoes	75·5	2·1	20·2	·7	·2	1·3	·8	19·8	·4	·2	25·8	21·4	51	238
Ditto, sweet	71·1	1·5	24·7	1·3	·4	1·0	·6	24·2	·7	·3	42·6	26·1	42	317
Pumpkins	83·9	2·2	8·3	3·1	·9	1·6	1·1	7·0	2·6	·7	10·2	12·2	90	173
Swedes	86·0	2·0	9·4	1·3	·1	1·2	·4	8·9	1·2	·1	25·8	10·7	103	475
Turnips	89·5	2·7	5·2	1·4	·1	1·1	·6	4·9	1·3	·1	10·7	7·0	157	317
Dry Fodders—														
Hay and Straw—														
Barley	9·5	10·4	37·2	31·8	2·2	8·9	4·5	23·8	19·1	1·2	10·1	49·7	22	42
Bush hay, good	7·5	6·1	38·6	39·8	1·9	6·1	3·2	26·2	25·0	1·1	16·8	56·6	19	59
Ditto, poor	6·5	2·8	36·6	45·3	1·1	7·3	1·3	23·4	27·2	·6	40·0	53·2	21	146
Canary grass	9·0	15·2	40·2	26·0	2·1	7·5	6·1	25·7	15·6	1·1	7·2	49·3	22	31
Cowpea chaff	8·1	15·7	31·5	26·6	4·3	13·8	8·1	22·3	11·2	2·2	4·8	45·8	24	23
Lucerne	8·2	21·0	31·4	25·9	2·8	10·7	11·1	21·7	11·9	1·4	3·3	46·7	24	17
Prairie grass	9·0	16·9	32·6	28·2	3·0	10·3	6·9	20·8	16·9	1·7	6·0	47·8	23	28
Straw, barley	8·5	2·9	40·2	41·0	·8	6·6	·6	21·7	22·5	·3	74·8	45·4	24	317
Ditto, Oats	9·2	4·0	42·4	37·0	2·3	5·1	1·0	22·5	21·4	·9	46·0	46·9	23	190
Ditto, Wheat	7·6	2·5	42·2	39·3	·9	7·5	·5	16·4	21·6	·3	77·3	39·1	28	380
Wheat hay	8·3	10·7	33·6	37·6	2·0	7·8	4·2	21·5	22·6	1·1	11·1	50·4	22	45
Grains, Seeds, &c.—														
Barley	10·9	12·4	69·8	2·7	1·8	2·4	8·7	64·2	·7	1·2	7·8	75·5	15	22
Corn (maize)	12·0	13·1	65·8	2·0	5·5	1·6	10·0	61·2	1·2	4·7	7·3	82·2	13	19
Cowpeas	14·8	20·8	55·7	4·1	1·4	3·2	17·3	52·0	1·1	·8	3·2	70·5	16	11
Kaffir corn	9·3	9·9	74·9	1·4	3·0	1·5	7·5	69·6	·8	2·6	10·1	83·1	13	25
Linseed	9·2	22·6	23·1	7·1	33·7	4·3	17·0	12·7	4·3	29·0	4·9	99·0	11	11
Oats	11·0	11·8	59·7	9·5	5·0	3·0	9·2	46·0	2·5	4·1	6·3	66·2	17	21
Rice	12·4	7·4	79·2	·2	·4	·4	4·6	73·1	·1	·4	16·1	78·3	14	41
Sunflower seeds	8·6	16·3	21·4	29·9	21·2	2·6	14·3	16·5	17·0	18·7	5·3	89·4	12	13
Wheat, plump	11·1	14·8	67·4	3·2	2·2	1·3	11·8	54·0	1·1	1·5	5·0	69·2	16	16
Ditto, shrunk	8·3	17·1	65·8	3·5	3·0	2·3	13·7	52·6	1·2	2·0	4·3	70·7	16	14
By-Products—														
Barley and malt combings	15·1	11·2	64·0	5·3	·5	3·9	8·3	44·3	1·8	·5	5·6	54·7	20	23
Bran	11·9	15·4	53·9	9·0	4·0	5·8	11·0	34·5	1·6	1·8	3·6	50·1	22	17
Brewers' grain, wet	75·7	5·4	12·5	3·8	1·6	1·0	3·9	7·7	1·5	1·4	3·2	15·9	69	49
Corn cobs	8·4	2·5	54·7	32·0	·7	1·7	·5	26·3	18·3	·6	92·0	46·4	24	380
Cotton seed meal	9·9	47·3	22·5	3·2	12·2	4·9	39·0	13·5	1·8	11·3	1·0	76·4	14	5
Linseed meal	10·0	36·1	36·7	8·4	3·6	5·2	30·0	28·2	4·8	3·2	1·4	67·4	16	6
Oilcake, sunlight	9·5	19·2	47·4	7·0	11·2	5·7	15·6	38·6	4·0	10·4	4·3	80·6	14	12
Peanut meal	10·7	47·6	23·7	5·1	8·0	4·9	33·8	11·6	·6	7·2	·9	59·2	19	6
Pollard	10·0	17·4	58·0	5·2	5·6	3·8	13·9	47·0	1·7	4·8	4·3	72·2	15	14
Various Foods—														
Milk	87·2	3·6	4·8	..	3·7	·7	3·4	4·7	..	3·7	3·9	16·3	68	56
Ditto, skimmed	90·4	3·8	5·0	..	·1	·7	3·6	5·2	..	·1	1·5	8·7	126	53
Dried blood	8·5	84·4	..	..	2·5	4·6	52·4	..	..	2·5	·1	52·9	21	36
Molasses	24·0	2·2	63·8	..	..	10·0	..	57·5	..	..	..	58·5	19	..

DEPARTMENT OF AGRICULTURE AND STOCK.

CORN-GROWING COMPETITION, 1915-16.

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

2. Applications to be enrolled in the competition, containing the following particulars, must reach the Under Secretary, Department of Agriculture and Stock, Brisbane, not later than 12 noon on the 30th September, 1915:—

(*a*) Full name and address. (Give Christian names in full.)
(*b*) Date of birth. (Day, month, and year.)
(*c*) No. of Division in which applicant resides, and the name of the Dairy Inspector who supervises the locality.

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

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

The following table shows the length the rows must be to give the exact area according as four, five, six, or more rows are planted:—

No. of Rows 4 feet apart.	Length of Rows in Feet.	No. of Rows 4 ft. apart.	Length of Rows in Feet.
4	272 ft. 3 ins.	8	136 ft. 1½ ins.
5	217 ft. 10 ins.	12	90 ft. 9 ins.
6	181 ft. 6 ins.	16	68 ft.
7	155 ft. 7 ins.		

5. Each competitor will be required to keep a record chart showing the dates and particulars of the different stages of work, and these charts are to be delivered, at the time of harvesting, to the officer appointed for superintending and verifying the yield.

6. Within seven days from the verification of the yield from the crop, each competitor shall select, without aid from other persons, twelve cobs of the maize from his crop, and forward them to the Department of Agriculture and Stock, Brisbane. Labels for this purpose will be supplied.

7. Competitors must notify the Dairy Inspector for the district of the date when the crop shall have matured and be ready for inspection.

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

9. The competition will close on the 30th June, 1916, and the prizes will be allotted thus:—

The competitors will be grouped according to the following divisions:—

(1) The district supervised by—
Mr. S. A. Clayton, Dairy Inspector, Beenleigh.
Mr. H. C. Gordon, Dairy Inspector, Harrisville.
Mr. D. J. Binnie, Dairy Inspector, Rosewood.

(2) The district supervised by—
Mr. C. C. Pickering, Dairy Inspector, care of Mr. D. Macpherson, Montague road, South Brisbane.
Mr. R. G. Ridgway, Dairy Inspector, Ellerslie Crescent, Taringa, Brisbane.
Mr. R. Winks, Dairy Inspector, Gympie.
Mr. F. J. Watson, Dairy Inspector, Bundaberg.
Mr. W. S. Harding, Dairy Inspector, Esk.

(3) The district supervised by—
Mr. J. H. Barber, Dairy Inspector, Crow's Nest.
Mr. J. P. Carey, Dairy Inspector, Gatton.

(4) The district supervised by Mr. W. Hartley, Dairy Inspector, Nanango.

(5) The district supervised by—
Mr. J. J. Carew, Dairy Inspector, Russell street, Toowoomba.
Mr. L. Verney, Dairy Inspector, Newtown, Toowoomba.
Mr. J. R. D. Munro, Dairy Inspector, Warwick.

(6) The district supervised by Mr. C. Queale, Dairy Inspector, Gayndah.

(7) The district supervised by—
Mr. J. Cattanach, Dairy Inspector, Dalby.
Mr. R. S. Sigley, Dairy Inspector, Roma.
Mr. W. R. Holmes, Dairy Inspector, Goondiwindi.

(8) The Central district of Queensland, including that supervised by Mr. H. T. Deighton, Dairy Inspector, Rockhampton.

(9) The Northern district of Queensland, including that supervised by—

Mr. E. C. Lake, Dairy Inspector, Mackay.

Mr. H. C. Colledge, Dairy Inspector, Atherton.

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

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

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

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

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

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

No prize will be awarded unless the yield of corn equals 20 bushels per acre. This stipulation may be waived under very exceptional circumstances in the case of a lower yield.

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

(*a*) Quality of the maize produced.

(*b*) Yield of plot.

(*c*) Notes and records of plot.

12. The Director of Agriculture will be the sole judge of the competition, and his decision shall be final.

WILLIAM LENNON,
Secretary for Agriculture and Stock.

Brisbane, 30th July, 1915.

EXHIBITION NOTES, 1915.

DISTRICT EXHIBITS.

The Council of the National Association must be heartily congratulated on the gratifying results which have attended the Exhibition at Bowen Park in August, 1915, notwithstanding the great handicap of the breaking out of the European war, with its heavy calls, not only on the purses of the public throughout the State, but on some thousands of the flower of the young men of the towns and of the country districts, who in past years of peace have flocked every year to the metropolis to enjoy a week's holiday and, incidentally, to expend large sums in various ways during the national carnival. These patriotic men, as well as women, who have nobly gone to the front, will have doubtless been recalling memories of their enjoyment of the Exhibitions of previous years, whilst patriotically and cheerfully undergoing the dangers and privations to which they, to their eternal honour, have subjected themselves.

The severe drought conditions which prevailed for months prior to the Show date also contributed to the difficulties so ably overcome by the Association.

The value of the work of the Association consists not merely in the amount of money taken at the gates and otherwise, but in its effects in bringing together people from all parts of the Commonwealth, as well as many from oversea, thus advertising far and wide the great resources of this most resourceful of all the States of Australasia. The general public is naturally unaware of the great volume of business transacted during and after the Show, as a direct consequence of the advantages offered to business men, and to buyers and sellers generally, by personal inspection of the exhibits and personal communication with agents. Thus, as an advertising medium, irrespective of its value from an educative point of view, the National Association's Exhibition is of primary importance, and fulfils a purpose which it would be impossible to attain in any other way. Space will not admit of our giving a comprehensive description of the multifarious exhibits in this Journal. This we leave to the enterprise of the metropolitan and country journals, confining ourselves to special salient points in connection with them.

During the past year the Association had to deplore the demise of the late Secretary, Mr. Arvier, to whose energy and enthusiasm was due the success attending many previous Shows. His successor, Mr. J. Bain, has already given evidence of good organising ability, and his energy will doubtless be instrumental in building further success on the solid foundation laid by his predecessor. The position of Secretary to an important Association such as this one demands much tact and firmness, at Show time especially, when one has to remember the quotation

so very appropriate to the occasion—"*Tot homines, quot sententiæ,*" which, being interpreted, implies that where there are many gathered together, there will be as many different opinions.

In connection with the exhibits, those coming under the head of "District Exhibits" deserve special mention. Of late years they have formed a very distinctive feature of the annual Exhibition, and are especially valuable in educating the people in respect of the various products and industries of Northern, Southern, Central, and Western Queensland, of the tablelands and plains and coastal areas, which embrace tropical, sub-tropical, and temperate districts of a State covering an area of nearly 700,000 square miles. It is owing to the vast distances which separate these from each other, that little would be known of the products and possibilities of particular districts, were it not for the bringing together of these districts by means of the National Association's Exhibitions.

The very attractive District Exhibits, therefore, deserve special mention, forming, as they do, a distinctive feature of the Exhibition, as before stated. In times past, the Moreton District exhibit has been very successful in taking first place amongst these important exhibits. It was in 1906 that Moreton and Wide Bay and Burnett tied, and Moreton won the Chelmsford Shield in the following year. The latter district was also successful at the Bowen Park Shows of 1903, 1904, 1905, tying with Wide Bay and Burnett in 1906.

In 1907, Moreton decided to rest on its laurels and stand out in 1908. This was much to be deplored, although it was certainly magnanimous of the Moreton men. Still, it was considered that every district throughout the State should put forth its best endeavour to show what its resources are, and, win or lose, there will always be the satisfactory consciousness of having done something for the dissemination of a knowledge, or a dissipation of the crass ignorance existing in some quarters of the grand resources of this "Queenly State."

In 1908, other districts determined to wrest the laurels from the men of Moreton, and they gradually crept up, and the Central District was successful in that year.

In 1909 the honours went to Wide Bay and Burnett.

In 1910 a new departure was made by the Council of the Association, no general districts, as a whole, being represented, but their place was taken by what was termed "One Farm Exhibits." Probably more interest was taken in these than in the former classes. The object was to show what could be done by individual farmers. No district was ransacked to obtain every conceivable product, from a pincushion to a pumpkin, from a horseshoe to an engine, but everything shown was absolutely produced on the competing farms by the farmer and his family.

The result of this decision fully justified the new departure, and seven entries represented the first struggle. Under the caption "One Farm Exhibit," we have given all the information on these, as well as

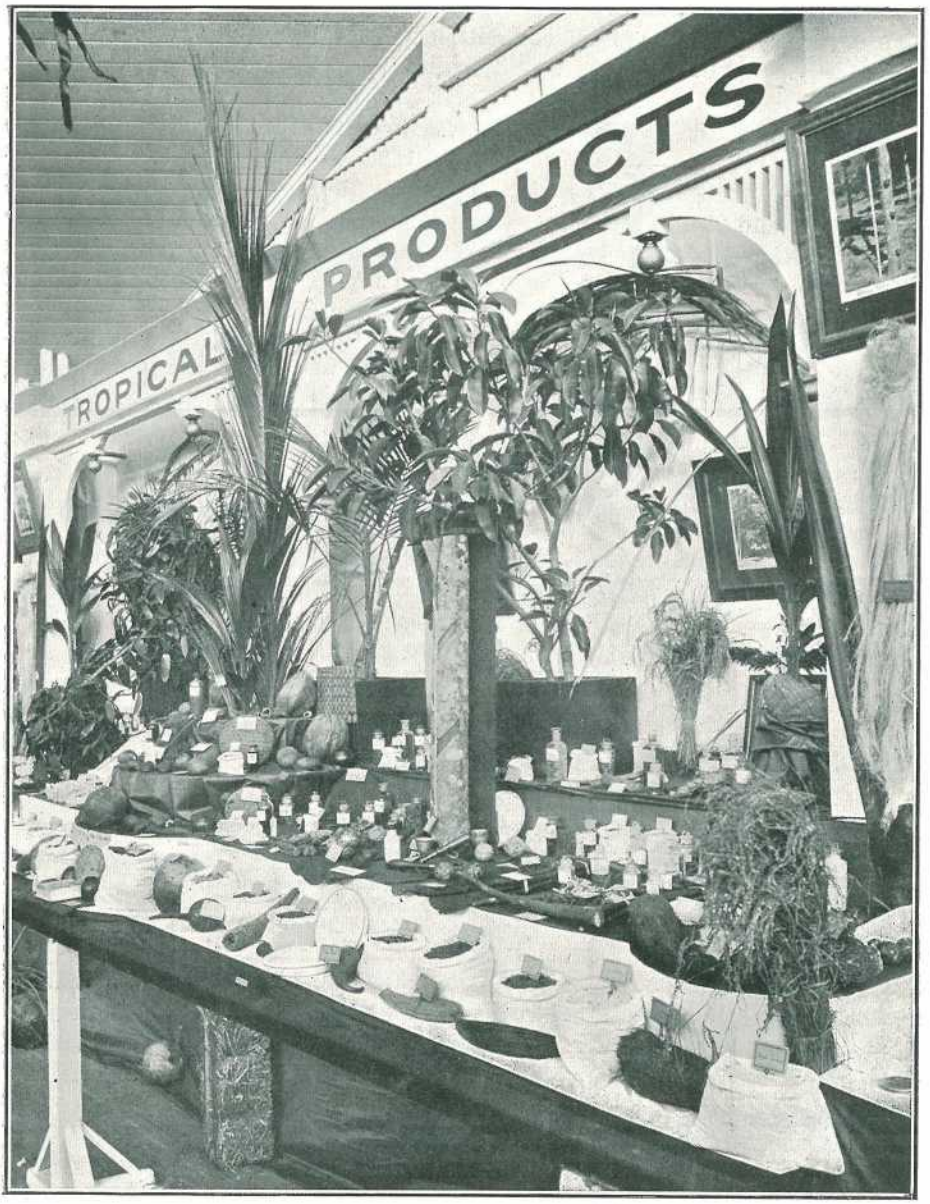

PLATE 6.—DISPLAY OF TROPICAL PRODUCTS, DEPARTMENTAL COURT (AGRICULTURE AND STOCK), NATIONAL ASSOCIATION SHOW, BRISBANE, 1915.

we know, up to the present date. It will be interesting to recall the words of the Hon. W. Kidston, then Premier of Queensland, on the subject of "District Exhibits," at the luncheon on the opening day of the Exhibition of 1906. He said, *inter alia*:—"The thing that struck him most about the annual Exhibition was its truly national character. The district exhibits were an admirable feature of the Show, and the competition was excellent from a national point of view. A personal patriotism was shown in the exhibit of articles for the sake of the district. It was an exceedingly healthy and profitable spirit to inculcate. . . . They needed to educate their own people in the possibilities of their own country, and if they could develop the district competition sufficiently, they might be able, not only to educate their own people, but to get together products from all parts of Queensland which would be worth sending to the old country. He was certain that, if the display was really worthy of the industries and production of Queensland, it would not only open the eyes of many Queenslanders, but would open the eyes of the people in the old country as to the value and possibilities of Queensland." This was putting all we have said and written in the past on the subject in a nutshell, tersely, and to the point, and verily the honourable gentleman unconsciously spoke prophetically, seeing that what he suggested as a possibility has become a reality, Queensland's products and industries having long since been exhibited in the old country, on the Continent of Europe, and now in San Francisco.

This year the Northern Rivers of New South Wales, the Western districts, and the Thera district of the same State were grouped under the title of

THE "A" GRADE.

WESTERN DISTRICTS (N.S.W.).

Last year the Western districts competed in this section, and the extent of the exhibits may be accounted for by the fact that the district comprises such centres as Bathurst, Dubbo, Mudgee, Orange, Lithgow, Wellington, and Blaney. The exhibits comprise 100 fleeces of wool both of the pure merino and its crossbreeds. As might be expected, wheat figures largely, as do hay and chaff, maize, grasses, tobacco, whilst it would seem impossible to present more magnificent apples, pears, peaches, and oranges than those grown at Dubbo. Marble from the Bathurst quarries (much used throughout the Commonwealth) attracted considerable attention. Dairy products were also in evidence, especially Cheddar cheese made at the Byalong Cheese Factory.

NORTHERN RIVERS (N.S.W.).

The Northern Rivers of New South Wales and their products are better known to Queenslanders than the Western districts of that State, owing to their proximity to the Southern districts of Queensland, and to the fact that it has long been acknowledged that Brisbane is the natural outlet for the products of those fertile districts and that only the construction of a short line of railway is needed to connect them with the Southern Queensland railway system. Most of the exhibits came from

the Tweed, Richmond, and Clarence Rivers, and the display was arranged by the North Coast Agricultural Shows' Association. Byron Bay and Ramornie were well to the front with dairy produce, swine products, and canned meats. Farm products, honey, jams, pickles, &c., were all largely represented and excellent of their kind. Sugar-cane, being grown to some considerable extent on the Tweed River, was well to the fore, and citrus and many tropical fruits were largely in evidence, proving that the climate and soil of the Rivers are much akin to those of Southern Queensland.

SOUTH COAST, QUEENSLAND.

It was gratifying, of course, to Queenslanders that the South Coast exhibit succeeded in carrying off the first prize in the "A" Grade. Six years have elapsed since the district, under the name of the Logan, appeared as a competitor at the Bowen Park Show. To-day the South Coast includes in its extensive area some of the finest agricultural, dairying, and fruit-growing soils in the State, nearly all of which had large areas under sugar-cane in the old days of sugar-growing in the State. These are Cleveland, Redland Bay, Ormiston, Beenleigh, Coomera, Nerang, Pimpama (Ormeau), and Yatala. Other non-sugar districts were Manly, Springbrook, Tabragalba, Beaudesert, &c. The exhibits comprised many varieties of sugar-cane, sugar raw and refined, cereals, potatoes, root crops, hay, grasses, fruits, and a vast variety of timber, besides multifarious products of the farm, women's industries, &c. Dairy products, hams, bacon, &c., were well to the fore. The exhibits were displayed to the greatest advantage.

"B" GRADE.

GYMPIE.

The Gympie exhibit was an "eye-opener" to many whose only idea of Gympie has hitherto been that the district is only devoted to gold-mining. Included therein is part of the celebrated Blackall Range, now so well-known for its magnificent scrub soils, hundreds of acres of which have long since been producing fortune-making crops of citrus fruits, pineapples, bananas, &c., beside ordinary farm and dairy products. Yandina, the Maroochy, Cooroy, &c., all districts producing splendid timbers, fruits, farm and dairy produce, &c., besides sugar-cane and sugar, of all of which there were splendid samples, especially of the magnificent kauri pine of Kin Kin, Lake Cootharaba. Gold specimens there were, of course, but the products of the soil were pre-eminent. Of the prize money allotted to "B" Grade exhibitors Gympie took the largest share.

MURGON, WONDAI, AND TINGOORA.

combined to make a very excellent display of the products of the Southern Burnett District. The above three districts are on the Maryborough-Nanango line. The exhibits, tastefully arranged, comprised a great variety of farm products, such as maize, potatoes, hay and chaff of various kinds, broom millet, sugar-cane, natural and artificial grasses. From the Murgon factory came the butter, from Goomeri the cheese,

from Wondai a fine sample of joinery work. The fruit section was well represented by citrus fruits, bananas, apples, &c. This was quite a typical display of the agricultural products of the Burnett. There was a wonderful exhibit of the industry of the ladies in the shape of those comestibles of which our ancestral mothers were so proud—namely, jams, jellies, preserved fruits, pickles, cakes, and confectionery. It was stated that some 400 varieties were tabled. Then there was a quantity of various kinds of needlework, embroidery, and other delicate confections, which added greatly to the attractions of the exhibit.

LOCKYER.

The Lockyer is essentially an agricultural district, and its varied products have always been conspicuous at our annual Exhibition at Bowen Park. How the varied excellent specimens of field produce shown have been produced in the face of the exceptionally dry season is not easily explainable, but there they were, and as fine as if there had been a plentiful rainfall, or grown under irrigation. The Laidley and Gatton districts have long been famous for their heavy lucerne and potato crops, and both grasses and potatoes, as well as sweet potatoes and maize, were in perfect condition. Vegetables, especially cabbages and cauliflowers, were in profusion, and a useful exhibit was that of varieties of farm seeds. Honey appears to be a specialty of the district, and the exhibitors were in hopes of repeating their success in obtaining a special prize for this product as in 1914. The numerous butter and bacon factories in the district were well represented by their butter, cheese, hams, and bacon. Farm-made butter of excellence was also to be found in this section. There were three exhibits of what may be called neglected industries of Queensland, although all grow to perfection in the district, and would produce heavy crops. These were sisal hemp, tan barks, and cotton, and fabrics from sisal and cotton fibre were shown. Neither is silk wanting, and this is another neglected industry which does not appeal to the Queensland farmer or his family. Stone from the Helidon quarries, ready dressed for the builder, and soft woolly fleeces represented two important industries. And then came the samples of woman's deft work, in the shape of comestibles and needlework, destined to vie with the same subjects in all the other district exhibits. The Lockyer was a display worth visiting.

KINGAROY.

This exhibit, which was organised by the Agricultural, Pastoral, and Industrial Society, properly represented the resources of the South Burnett, in the same direction as did Wondai, seeing that the two districts are conterminous. Amongst the agricultural exhibits were to be seen very fine onions of several distinct varieties, including tree and pickling onions, leeks, and eschalots. There was a very fine wool trophy, and an exhibit of hides and tanned pelts. A very useful lesson was afforded by a plot set out with various grasses and samples of the soils of the district. This is of more importance than most people are aware of, seeing that frequently, when an intending selector wishes to settle in any particular district, his first inquiry is as to the nature of

the soil; and the exhibition of the soils and subsoils of the locality might often decide the inquirer as to whether such or such country would be suitable for him.

CROW'S NEST.

Crow's Nest is a very fertile district only 34 miles from Toowoomba, and is very strong in the production of cereals, potatoes, pumpkins, chaff, grasses, vegetables, timbers. The samples of these were certainly very commendable, especially those of all the best-known and most profitable varieties of maize. The same may be said of the wheat exhibits, comprising Gluyas, Bunge, and others raised from seed from the wheat experiment State Farm, Bungeworgorai, Roma. It was at Geham, on the Crow's Nest branch railway line (15 miles from Crow's Nest), that the corn grown by H. W. Abel won a £2 prize, also a special prize of £3, and N. S. Smoothy, of Pinelands, Crow's Nest, won the district prize of £5, as well as a special prize of £5, in the corn-growing competition of 1914-15, held by the Department of Agriculture and Stock, when there were sixty-two entries by Darling Downs lads. His good work yielded at the rate of 82 bushels per acre, and F. Franke, of Cawdor, on the same line, raised 76 bushels per acre, also being a prize-taker. These examples go far to show the adaptability of the Crow's Nest soil and climate for maize-growing. It should be stated that the abovenamed young farmers were aged, respectively, fourteen and fifteen years.

Lucerne, Rhodes grass, and panicum appear to thrive well in the district, and the mangolds could scarcely be beaten anywhere for size and weight of crop per acre. The timbers were shown in the rough, and in the polished and unpolished state. The dairying industry, as elsewhere on the Darling Downs, was well represented, and the exhibits were interspersed with the many varieties of preserves, and other useful and delicate articles, the work of the ladies of the households.

Mr. John Macdonald (chairman of the National Association Council) presided at the annual informal meeting of those connected with the district and one-farm displays. Messrs. John Reid, A. W. Cameron (council stewards), and J. Bain (secretary) were also present, and there was a good attendance of the workers in connection with the different exhibits.

The chairman said he was glad to once again meet the district exhibitors. The National Association duly appreciated the work done in that section of the annual Exhibition, and in every way possible endeavoured to encourage them to come each year, for the council recognised that such displays were an object lesson as to the fertility of the soil and the high quality of the primary products of the State. The work of arranging these displays, he thought, was of considerable magnitude, but he was pleased to see that progress was being shown all round. Never had there been retrogression during the twenty years the district exhibits had been displayed in the Exhibition. He thanked all for their very hard work. During the previous year the Association spent no less a sum than £2,000 on these district displays, so that the

PLATE 7.—DEPARTMENTAL COURT (AGRICULTURE AND STOCK), CENTRAL DISPLAY FROM STATE FARMS AND EXPERIMENTAL PLOTS, NATIONAL ASSOCIATION SHOW, BRISBANE, 1915.

public understand that the Council was thoroughly alive to the fine advertisement Queensland secured through these collections of exhibits. Considering every aspect of the case, it was decided this year to give each of the "A" Grade districts a bonus of £20, and to increase the prize money in the "B" Grade by £50. The altered prize money was as follows:—"A" Grade: South Coast, £130; Western Districts, N.S.W., £105; Northern Rivers, N.S.W., £75. "B" Grade: Gympie, £73 18s.; Lockyer, £73; Kingaroy, £69 1s.; Wondai, Murgon, and Tingoora, £68; Crow's Nest, £66 1s. One-farm displays: O. C. Williams, £54 8s. 9d.; T. Nystrom, £45 11s. 3d. He sympathised with Mr. Trevitt, manager of the Western districts, in having met with an accident.

Mr. John Reid said the district exhibits had greatly improved during the last few years, and now they had been brought to the highest plane. He trusted that next year more "A" Grade districts would compete. The whole display had been astonishing, not only to the council but also to the public who visited the show.

Mr. A. W. Cameron said that arranging district displays had now become a science. Many small details required their consideration. They always endeavoured to secure the very best judges available for the work, but if there had been any errors of judgment it was no fault of the association. He trusted that all present would help at the next Exhibition, and encourage other districts to enter into the competition.

DEPARTMENT OF AGRICULTURE AND STOCK.

As in former years, that portion of the Exhibition building devoted to the exhibits of the Department of Agriculture was nicely arranged, and set forth to the best advantage the multifarious products of the State, which include those of the torrid, sub-tropical, and temperate zones. Even a cursory inspection of the exhibits of the different branches of the Department must convince the stranger that Queensland is a most desirable State to select for a home. In this section, as also in the District sections, may be seen practical proofs of the extraordinary resources of the country, as well in climate, rainfall, and soil, as in the vast areas of land open to selectors. All the trophies and displays here have been arranged, not only with a view to spectacular effect, but rather with the the idea of making everything in the section serve an educational and instructive purpose. The different sections and trophies, illustrating the Department's activities, were, as described in the "Brisbane Courier":—

Sheep and wool, stock experiment station, botanical division (weeds and suspected poisonous plants, and native grasses), division of entomology and vegetable pathology, pure seeds display from the seed-testing branch, combined seed-corn and corn-growing display, exhibit of saccharine and non-saccharine drought-resistant sorghums, broom millet (educational display), tropical products, tobacco (pipe, cigar, cigarette), fibres (including cotton), hay, chaffs, and fodders, vegetables (including special display of imported potatoes, grown at the Agricultural College,

PLATE 8.—EXHIBIT OF SACCHARINE AND NON-SACCHARINE SORGHUMS (DEPARTMENTAL COURT, AGRICULTURE AND STOCK) NATIONAL ASSOCIATION SHOW, BRISBANE, 1915.

Gatton), Roma State Farm wheat and wheat-breeding display, various products from the Agricultural College, wheat, maize, sorghums, and fodders from field experiment plots, cereals and fodders from Warren and Hermitage State Farms, trophy of typical Queensland fruits (temperate and sub-tropical), Gordo Blanco raisins from Roma State Farm, farm and garden seeds, samples of seed wheat distributed to farmers under the 1915 wheat extension scheme, and photographs illustrating the State's primary industries.

The seed-testing branch exhibit includes a collection of seeds, comprising not only such well-known kinds as lucerne, prairie, oats, &c., but the samples as often sold to the seed trade, and the same after cleaning and grading preparatory to resale. All buyers of agricultural seeds are not as yet fully aware of the working of the Pure Seeds Act, and the seed-testing branch has been established so that they may guard against sowing seeds of low quality. Any purchaser may send samples to the branch to be tested for purity and germination. If a buyer insists on a low price he is practically insisting on low quality. One sample of Algerian seed oats, the sale of which was stopped by the Department, contained 46·48 per cent. of impurities (14·16 Star Thistle, 12·06 barley, 18·33 darnel or drake, 1·93 other impurities.) The cleanings from lucerne and prairie grass are object lessons as to the value of recleaned and graded samples. The samples of weed seeds—the dodder, darnel, star thistle, wild radish, and several others—were taken from the bulks of seed offered for sale. The system of testing adopted by the seed branch, after very carfeul investigation of the methods used in London, Paris, Copenhagen, Zurich, and Wageningen, may be briefly described as follows:—Purity tests: In testing for purity only foreign seeds, and foreign matter such as sand, stalks, &c., are treated as impurities. Germination tests: All seeds of the species to which the sample purports to belong are included without reference to their condition of maturity (immature seeds and seeds without kernel are retained as pure seeds). Check tests are made of every sample. The "Tissot" method, by germinating the seeds on damp flannel, and by the "Simplicitas method," germinating the seeds in sand, on porous blocks; both of these systems are demonstrated in the exhibit.

Soil Exhibit.—Soils from some of the most important and characteristic farming districts of the State were collected, the soil being taken to a depth of 2 ft., and are exhibited in specially made glass columns. The soils represent some of our fertile lands, many of which have been under cultivation for a great number of years. There are sugar-cane soils from Mulgrave, Mackay, and Bundaberg; wheat soils from Miles, Roma, and Westbrook; maize soils from Kingaroy, Beaudesert, and Tallegalla; lucerne soils from Murgon and Rosewood; potato soils from Beenleigh, Goombungee, and Lockyer. The collection also includes a soil from Buderim Mountains, well known for its excellent bananas; a soil from the Stanthorpe district, particularly suitable for stone fruit; particularly rich fertile soils from the Bowen district, suitable for citrus fruit and tobacco culture; a typical soil of good grazing

country from Westwood. A printed card gives for each soil a short description of the locality and the crops chiefly grown. The mechanical compositions with regard to the amount of sand, silt, and clay are given, followed by the chemical composition, showing how much of the important plant foods—nitrogen, potash, lime, and phosphoric acid—the soil contains in percentage, and also expressed in lb. per acre to a depth of 12 in.

Seed Corn and Corn-growing Display.—Three descriptive features are represented. Firstly, a collection of seed maize grown at the various departmental propagation plots, originating from grain imported from the United States of America. Systematic attention has been given to seed selection by field officers of the Department, and the produce from the plots is sold to farmers, who in this way have the opportunity of securing approved strains of seed. This season's orders have already absorbed all available stocks. The second feature comprises an educational exhibit, dealing in a comprehensive way with several types of maize. Typical ears of different stud varieties are shown in groups and in glass cases. Special attention has been given to the points governing seed selection in the field and barn, and concise information is furnished on descriptive cards and labels in such a way that anyone may become readily acquainted with the subject. The third section illustrates the final results of the recent corn-growing competition under eighteen years of age. Tabulated returns, prizes, and award cards are displayed in close proximity to the exhibits, which are arranged into groups representing nine different divisions of the State.

Sorghum Trophy.—The seed heads and seed of a number of saccharine and non-saccharine sorghums aggregating ten different kinds are displayed on a large trophy, to effectively present the different characteristics of each. The chief value of this exhibit lies in the fact that the non-saccharine kinds were imported from the United States, where they had established a reputation for drought-resistance. The Department has advertised seeds of respective kinds for sale, and already sufficient orders have been received to absorb all the stocks in hand. It is expected that during the coming season over 300 acres will be placed under crop from the seed so distributed.

Broom Millet Display.—The high price of well-graded and well-prepared fibre (from £37 to £40 per ton in Brisbane) indicates there is good money in this commodity. It is customary for growers to pay somewhat too limited attention to the grading, classing, and baling of the fibre for market. The different samples of fibre and articles in process of manufacture are arranged to serve as a guide for the grower when harvesting and preparing his crop for market, as so much depends on proper preparation and get-up.

Wheat.—In the general display of sheaves of wheat and grain the collection of new crossbred and named varieties of wheat from the Roma State farm are prominent. The bright attractive straws and prolific types of ear generally to be noted indicate that good progress is being made with the development of new varieties. A collection of over

PLATE 9.—A SECTION OF THE WALL DISPLAY IN THE COURT OF THE DEPARTMENT OF AGRICULTURE AND STOCK, NATIONAL ASSOCIATION SHOW, BRISBANE, 1915.

PLATE 10.—SECTION OF THE WHEAT EXHIBIT, DEPARTMENTAL COURT (AGRICULTURE AND STOCK), NATIONAL ASSOCIATION SHOW, BRISBANE, 1915.

PLATE 11.—DISPLAY OF WOOLS, DEPARTMENTAL COURT (AGRICULTURE AND STOCK), NATIONAL ASSOCIATION SHOW, BRISBANE, 1915.

fifty varieties raised at one of the field experimental plots in the Goondiwindi district shows conclusively what this tract of country is capable of producing. In this lot representative Canadian, Indian, Roma, and Southern wheats predominate, and it is interesting to note that a variety known as Pusa No. 12, which is reported to have given such excellent results in India, has also shown out prominently here in relation to its field characteristics.

Wool.—The wool exhibit this year takes a different form from that of other years, and has been arranged for instructional purposes in keeping with the character of this branch of departmental work, as well as to illustrate the perfection which the State has attained in the production of a wide range of notable wools and of different sheep breeds and their crosses. The success of Queensland in this particular section at the Panama Exposition shows that this State can hold its own with any other part of the Commonwealth in the matter of growing high-class wools of all kinds, including British breeds and crossbreds. In regard to the introduction of sheep on coastal areas, the show of British breeds, while not as complete as could be wished, contains good examples of such wools as are produced by the Border Leicester and Romney Marsh breeds. These breeds, so far, have done remarkably well under coastal conditions, and farmers may see the class of wool grown by each of these. The business of growing sheep on the coast is comparatively new, and other varieties may show up just as well as those named in the future, but at present it may be said that these two—Border Leicester and Romney Marsh—do very well. The examples shown are nearly all Queensland grown. One illustrative exhibit is that of a selection of Corriedale wools bred in the Longreach district by Mr. G. C. Greenwood, of Tocal. This example shows that long wools and crossbreds may be bred successfully in the hot West as well as on the coast and the Downs. Other examples show pure Lincoln, Leicester, Border Leicester, Dorset Horn, and Romney Marsh, with their various crosses. There is also a fairly representative selection of merino fleeces of much the same quality as those which gained the gold medal at the Panama Exposition recently. A small exhibit of mohair, Queensland bred, at Miles, by Mr. E. Scammell, is worth inspection.

ONE-FARM EXHIBITS.

There were three entries in this section, the competitors being Messrs. O. C. Williams (Plainby), J. A. Nystrom, Booie, Kingaroy, and Mr. G. Trevitt (Bathurst, New South Wales). On previous occasions—1911 and 1913—the winners were, respectively, Messrs. Allen Bros. of Gympie, who secured a £200 prize (1911), and Mr. H. Franke, of Cawdor (1913).

Of the three competitors at the Exhibition of August, 1915, one had the misfortune to drop out owing to an unfortunate injury to the hand sustained by Mr. G. Trevitt, of Bathurst, New South Wales, through a fall from a ladder. On these exhibits, one of the judges, Mr. C. Siemon, said a lot of time and labour had been expended by both exhibitors, and their displays were a credit to their respective districts, and more so to their own farms. The agricultural products were a

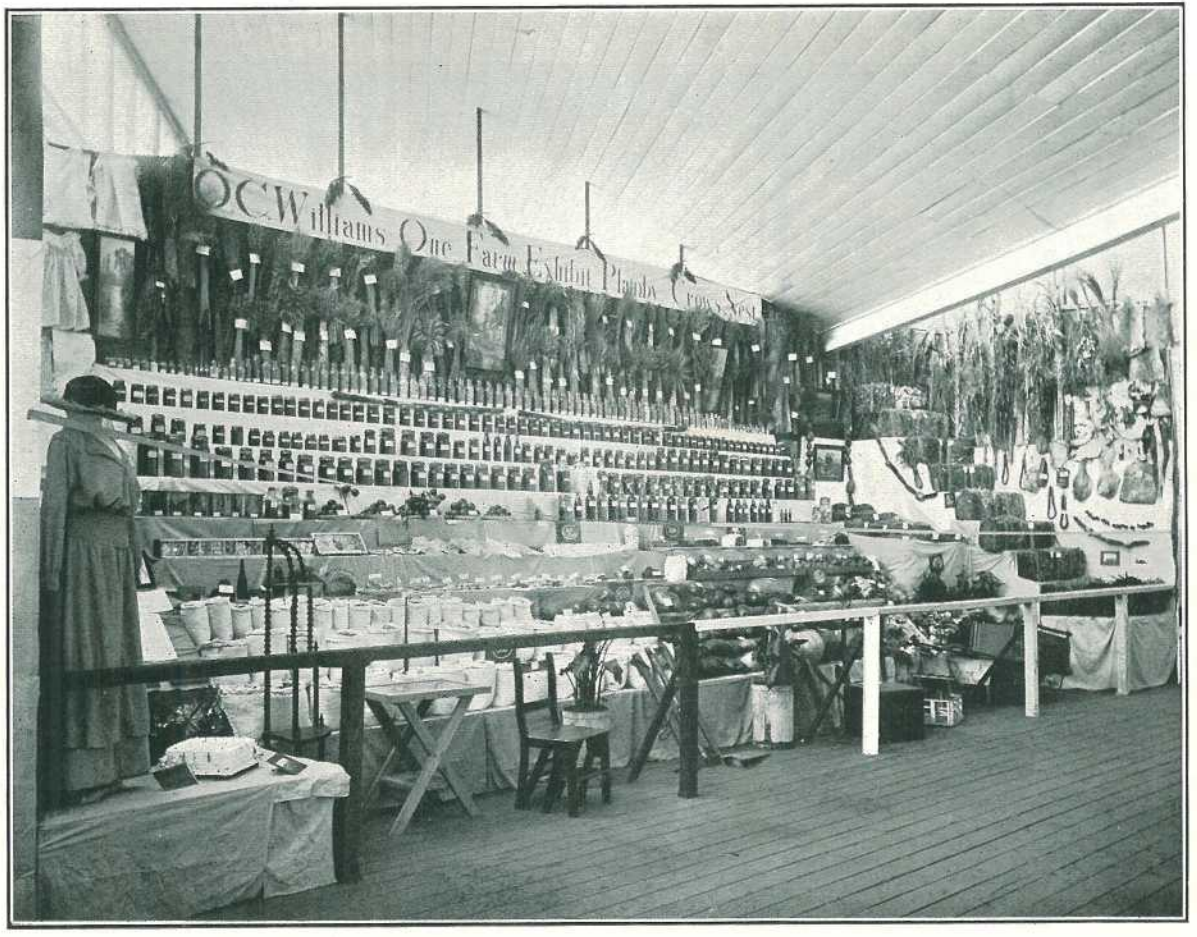

PLATE 12.—O. C. WILLIAMS'S ONE-FARM EXHIBIT AT THE NATIONAL ASSOCIATION SHOW, BOWEN PARK, AUGUST, 1915.

PLATE 13.—EXHIBIT FROM YEERONGPILLY STOCK EXPERIMENT STATION, DEPARTMENTAL COURT (AGRICULTURE AND STOCK), NATIONAL ASSOCIATION SHOW, BRISBANE, 1915.

Plate 14.—Departmental Court (Agriculture and Stock), Entomological and Vegetable Pathological Exhibits, National Association Show, Brisbane, 1915.

splendid feature of each competitor's exhibit. The hays, chaffs, and grains forming part of the exhibits were very fine. Another prominent feature in each man's display was the excellent collection of preserves, jams, &c. The vegetable section in each was very poorly represented. The home work by the lady members of Mr. Williams's household was a credit to them. Mr. Williams's labour and time-saving implements used in connection with the work on his farm showed much ingenuity. Mr. J. Fenton, another of the judges, acquiesced with his colleague's remarks. Mr. Williams beat Mr. Nystrom by 57 points.

The following were the points awarded:—

——	Possible.	Nystrom.	Williams.
1. Dairy Produce—			
Butter, 6 lb.	25	18	15
Cheese, one large or two small	20	18	19
Eggs, one dozen	5	3	4
	50	39	38
2. Foods—			
Hams, 15 lb.; bacon, 15 lb.	20	10	15
Corned, smoked, and spiced beef and mutton, 10 lb.	10	5	6
Honey, 12 lb.	10	7	7
Beeswax, 6 lb.	5	3	3
Bread, 2 loaves; scones, 1 dozen	5	3	4
Confectionery and sweets, 3 lb.	5	2	5
Lard, tallow, and oils	5	2	4
	60	32	44
3. Fruits, vegetables, and roots, fresh and preserved—			
Fresh fruit, all kinds	25	15	10
Dried fruits	10	6	4
Preserved fruits and jams	15	10	14
Fresh vegetables	15	7	10
Pickles, sauces, &c.	15	10	12
Potatoes (56 lb.), or a collection, and roots	25	18	15
Table pumpkins, squashes, and marrows, 56 lb.	10	6	6
Cocoanuts and nuts	3	2	2
Vegetable and garden seeds, 5 lb.	5	3	4
Arrowroot, 10 lb.	5	3	3
Cassava, 3 lb.	5	..	..
Ginger, 3 lb.	5	..	..
Sugar beet, 3 lb.	5	3	3
	143	83	83
4. Grain, &c.—			
Wheat	25	18	14
Maize	20	16	14
Barley	10	7	6
Oats, rye, and rice	15	10	10
	70	51	44
5. Tropical Products—			
Sugar-cane, 24 stalks or 1 stool	30	..	..
Cotton, in seed, 10 lb., long staple	10	8	1
Coffee, 10 lb.	15	..	..
	55	8	1
6. Tobacco—			
Tobacco, leaf, dried, 5 lb.	10	..	4
	10	..	4

—	Possible.	Nystrom.	Williams.
7. Hay, Chaff, &c.—			
Hay, oaten, wheaten, lucerne, and other varieties	20	8	17
Grasses and their seeds, including canary	10	4	8
Chaff, oaten, wheaten, lucerne, and other varieties	20	6	15
Ensilage, any form	15	..	6
Cattle fodder (pumpkins and green fodder)	15	8	10
Sorghum and millet	10	5	6
Hemp, 5 lb.	5	..	..
Flax, 5 lb.	5	..	2
Cowpea seed, 7 lb.	7	5	2
Broom millet, 10 lb.	10	8	5
	117	44	71
8. Wool—			
Greasy, 5 fleeces	20	10	10
Mohair	5	..	2
	25	10	12
9. Drinks, &c.—			
Temperance drinks, 6 bottles	10	5	4
	10	5	4
10. Women's and Children's Work—			
Needlework, knitting, fine arts	10	3	8
School work, maps, writing, &c.	10	..	8
Fancy work	10	6	8
	30	9	24
11. Miscellaneous Articles of Commercial Value ..	5	2	4
12. Plants and Flowers, in pots	5	1	3
13. Time and Labour Saving Useful Articles, made on the farm	10	..	7
14. Effective Arrangement of Exhibits	10	6	8
	600	290	347

CORN-GROWING COMPETITION.

This interesting and, from a rural educational point of view, most highly valuable competition, which was arranged by the Department of Agriculture and Stock last year, was concluded on 30th June, 1915, and adjudicated upon in July last. For several reasons, principally climatic, the competitiors were grouped according to nine districts, embracing the whole State from the border of New South Wales northwards to Cooktown, and westwards as far as Longreach, Cunnamulla, and Wallangarra, thus including every town and rural district throughout the State, the divisions being nine in number—viz., Logan, West Moreton, Darling Downs North, Darling Downs South, Maranoa, Moreton, Wide Bay and Burnett, Central Queensland, and North Queensland. Prizes of the following value were awarded:—First £5, second £2, third £1, and in addition three special prizes to the value of £10, £5, and £3 to be awarded to the competitors who stood first, second, and third in the whole competition. The conditions will be found on page 61 of the August issue of this Journal, 1915, and also on page 124 of this issue. It is notified

by the Department that a similar Corn-growing Competition to that of 1914-15 will be held for 1915-16, entries closing with the Under Secretary, Department of Agriculture and Stock, Brisbane, on the 30th September next.

DISTRICT PRIZE WINNERS.

	Points	£	Yield. Bushels per Acre.
West Moreton—			
J. R. C. Hart, Blackbutt	86.4	5	92
F. A. Bade, Rosewood	65·8	2	69
A. M. Bachmann, Marburg	60·7	1	56
Darling Downs North—			
N. S. Smoothy, Pinelands, Crow's Nest	77·1	5	83
H. W. Abel, Geham	74·9	2	82
F. Franke, Cawdor	72·2	1	76
Darling Downs South—			
Albert Gouchee, North Killarney	72·5	5	74·7
Archibald Gouchee, North Killarney	49·5	2	44·5
A. E. Ernst, Spring Creek, Clifton	44·1	1	42·8
Maranoa—			
F. R. Rowland Bell	29·7	5	22
(One competitor, only one prize.)			
Moreton—			
R. Rudd, Upper North Pine	56·4	5	52
F. Woodford, Samford	49·9	2	47
S. R. Hulse, Yandina	48·3	1	47·6
Logan—			
F. M. Birt, Nerang	46·8	5	41·2
E. L. Marshall, Gramzow	46·8	2	44
R. A. Tulloch, Veresdale	41·3	1	39
Burnett and Wide Bay—			
A. Fittell, Eel Creek, Gympie	63·9	5	67
F. H. J. Hayden, Kingaroy	59·5	2	55
E. Hayden, Kingaroy	51·1	1	48
Central Queensland—			
R. J. Philp, Mount Larcom	58·1	5	72·9
Isabella Wilson, Yeppoon	57·9	2	62·3
F. Williams, Barmoya	44·4	1	41·9
North Queensland—			
Mary R. Dougherty, Malanda	72·4	5	82
J. D. Gellweiler, Kulara, Cairns	58·7	2	61
R. Vance, Barrine	47·2	1	44·3

SPECIAL PRIZE WINNERS.

J. R. C. Hart, Blackbutt (West Moreton), £10.

N. S. Smoothy, Pinelands, Crow's Nest (Darling Downs North), £5.

H. W. Abel, Geham, Crow's Nest (Darling Downs North), £3.

Plate 15.—Stud-Seed Maize and Corn-Growing Competition Exhibit, Departmental Court (Agriculture and Stock), National Association Show, Brisbane, 1915.

EXHIBITION NOTES, 1915.

MILK TESTS.

National Champion Butter-fat test. £25 special prize, and a cash prize of £2 2s. yearly to the winner (presented by the Brisbane Newspaper Co., Ltd.). To be won three times by the same exhibitor, but not necessarily to be in succession or by the same exhibit. Cow, 4 years and over, averaging the greatest daily yield of butter-fat for 48 hours:—

—	—	Milk, Lb.	Test.	Commercial Butter.	Average, 24 Hours.	Lact. Points.	Total, 24 Hours.
C. Bloss's Canary, Jersey	M.	20·1	3·2	·70	..	..	
	E.	18·9	4·6	·95	..	..	
	M.	17·12	4·3	·84	..	0	
	E.	18·2	4·2	·84	26·64	12	38·64
Messrs. McIntyre Bros.' Handsome, Milking Shorthorn	M.	28·6	3·2	·98	..	0	
	E.	29·0	3·6	1·14	..	..	
	M.	31·11	3·7	1·28	..	..	
	E.	28·1	4·0	1·23	37·04	..	37·04
D. Dunn's Blossom III., Illawarra ..	M.	27·8	3·0	·89	..	..	
	E.	26·9	3·4	·98	..	..	
	M.	27·6	3·4	1·01	..	..	
	E.	25·8	4·0	1·12	32	7	32·7
J. and L. Paten's Jeanette of Wanora, Ayrshire	M.	23·9	4·5	1·18	..	0	
	E.	20·12	4·2	·96	..	..	
	M.	23·9	3·5	·89	..	..	
	E.	21·1	4·0	·93	31·68	..	31·68
D. Dunn's Jemima II. of Valley View, Illawarra	M.	27·1	2·6	·75	..	0	
	E.	25·14	4·1	1·17	..	..	
	M.	25·12	3·9	1·10	..	..	
	E.	22·22	3·7	·90	31·36	..	31·36
H. Marquardt's Roan, Milking Shorthorn	M.	18·12	3·8	·78	..	..	
	E.	18·4	4·1	·82	..	..	
	M.	17·10	3·6	·69	..	..	
	E.	18·5	4·1	·83	24·96	5	29·96
W. F. Hammell's Plum, Grade ..	M.	19·12	3·7	·80	..	..	
	E.	17·15	4·4	·87	..	..	
	M.	17·13	3·5	·65	..	..	
	E.	17·12	4·1	·80	24·96	3·1	28·06
V. Goodger's Pansy	M.	24·6	4·1	1·10	..	..	
	E.	14·2	4·5	·70	..	..	
	M.	19·15	2·9	·62	..	..	
	E.	17·6	4·2	·81	25·84	0	25·84
W. Middleton's Ruby of Devonport, Milking Shorthorn	M.	17·8	3·2	·61	..	..	
	E.	16·14	4·7	·88	..	..	
	M.	18·0	4·5	·90	..	..	
	E.	16·11	4·4	·81	25·60	0	25·60
V. Goodger's Roaney	M.	18·6	3·5	·70	..	..	
	E.	17·2	4·8	·91	..	..	
	M.	16·12	3·0	·54	..	..	
	E.	17·13	4·4	·87	24·16	0	24·16
E. Burton's King Lear's Buttercup, Jersey	M.	17·6	3·6	·68	..	..	
	E.	16·0	4·1	·72	..	..	
	M.	15·4	3·6	·66	..	..	
	E.	12·6	4·6	·63	21·04	·5	21·54
W. Middleton's Maggie, Milking Shorthorn	M.	23·9	2·3	·57	..	..	
	E.	24·10	2·9	·76	..	..	
	M.	27·0	2·3	·65	..	..	
	E.	24·15	2·5	·66	21·12	0	21·12

BUTTER AWARDS.

Following are the awards in the Butter Section:—

SALT BUTTER WITHOUT PRESERVATIVE, SUITABLE FOR EXPORT.

——	Flavour	Texture.	Col.	Salting.	Packing and Finish.	Totals.
Caboolture Co-operative Dairy Co., Ltd., Caboolture	55	19½	7	4	4	89½
Stanley River Co-operative Dairy Co., Ltd., Woodford	54	19½	7	4	4	88½
Killarney Dairy Co., Ltd., Killarney ..			Disqualified.			
Warwick Butter and Dairying Co., Ltd., Warwick	57	18	6	4	4	89
Warwick Butter and Dairying Co., Ltd., Allora	57	18½	7	4	4	90½
Warwick Butter and Dairying Co., Ltd., Texas	58½	19	6½	4	4	92
Marburg Butter Factory, Marburg ..	54	18½	6	4	4	86½
Mount Bismarck Co-operative Dairy Co., Mount Bismarck			Disqualified.			
Downs Co-operative Dairy Co., Ltd., Toowoomba	59½	19½	7	4	4	94
Logan and Albert Co-operative Dairy Co., Ltd., Beaudesert	52	18½	7	4	4	85½
Inverell Co-operative Butter Co., Ltd., Inverell, N.S.W.	56	19	6½	4	4	89½
Queensland Farmers' Co-operative Co., Ltd., Booval	55	19	6½	4	4	88½
Queensland Farmers' Co-operative Co., Ltd., Boonah	58	20	7	4	4	93
Queensland Farmers' Co-operative Co., Ltd., Grantham	55	20	7	4	4	90
Queensland Farmers' Co-operative Co., Ltd., Laidley			Disqualified.			
Atherton Tableland Co-operative Butter and Bacon Co., Ltd., Atherton			Disqualified.			
Oakey District Co-operative Dairy Co., Oakey	53	19½	7	4	4	87½
Goombungee Co-operative Dairy Co., Ltd., Goombungee	59	19½	7	4	4	93½
Kin Kin Co-operative Dairy Co., Ltd., Kin Kin	54	19	7	4	4	88
Silverwood Dairy Factory, Ltd., Terror's Creek	55	19	7	4	4	89
Silverwood Dairy Factory Co., Ltd., Gatton	53	19	7	4	4	87
Maryborough Co-operative Dairy Co., Ltd., Kingaroy			Disqualified.			
Maryborough Co-operative Dairy Co., Ltd., Biggenden			Disqualified.			

Taking into consideration the closeness of the complete results in the case of the Downs Co-operative Dairy Co., Ltd., Toowoomba, which was only half a point behind the Goombungee Co-operative Dairy Co., Ltd., the judge recommended that an additional prize be awarded.

AGGREGATE AWARD.

Special prize for the factory securing the highest aggregate number of points in all classes, and special prizes.

—	Unsalted, Factory Made.	Fresh, Factory Made.	Export, 30 Days' Storage.	Without Preservative.	Export, 8 Weeks' Storage.	Aggregate.
Goombungee Co-operative Dairy Co., Ltd., Goombungee	96	95	93	93½	93	470½
Downs Co-operative Dairy Co., Ltd., Toowoomba	95½	94½	94½	94	91½	470
Queensland Farmers' Co-operative Co., Ltd., Grantham	92½	93	95½	90	95	466
Queensland Farmers' Co-operative Co., Ltd., Boonah	91½	90½	91½	93	94½	461
Inverell Co-operative Butter Co., Ltd., Inverell, N.S.W.	92½	92	92	89½	91	457
Warwick Butter and Dairying Co., Ltd., Texas	91	90½	90	92	89½	453
Warwick Butter and Dairying Co., Ltd., Allora	91½	90½	88	90½	89½	450
Silverwood Dairy Factory Co., Ltd., Terror's Creek	91	89	90	89	90½	449½
Marburg Butter Factory, Marburg ..	93	90	90	86½	89½	449
Silverwood Dairy Factory Co., Ltd., Gatton	90½	91	91	87	89	448½
Queensland Farmers' Co-operative Co., Ltd., Booval	91	90½	90½	88½	88	448½
Oakey District Co-operative Dairy Co., Oakey	89½	88½	87½	87½	90	443
Stanley River Co-operative Dairy Co., Ltd., Woodford	90½	89½	89	88½	85	442½
Kin Kin Co-operative Dairy Co., Kin Kin	89½	89½	87	88	88	442
Warwick Butter and Dairying Co., Ltd., Warwick	91	87½	82	89	90½	440
Logan and Albert Co-operative Dairy Co., Ltd., Beaudesert	90½	88½	89	85½	86	439½
Maryborough Co-operative Dairy Co., Ltd., Kingaroy	90	92	92½	..	92½	367
Mount Bismarck Co-operative Dairy Co., Mount Bismarck	90½	91½	90	..	91	363
Queensland Farmers' Co-operative Co., Ltd., Laidley	91	91½	89	..	88	359½
Caboolture Co-operative Dairy Co., Ltd., Caboolture	91	89	87½	89½	..	357
Maryborough Co-operative Dairy Co., Ltd., Biggenden	89½	86½	87	..	85½	348½
Killarney Dairy Co., Ltd., Killarney ..	85½	85½	90	..	87	348
Maleny Co-operative, Maleny	88½	86	88½	..	84¼	347½

Subsequent to the awards being made known, the judge, Mr. G. S. Stening, stated to a representative of the "Brisbane Courier" that the sections judged by him (butter, cheese, bacon, hams, and lard) showed a great improvement on former exhibits of their kind, not so much from points of excellence, but rather from the aspect of general consistency of quality. The points for the winning butters, he said, might not be as high as those in former years, but there was a greater number of butters coming into first grade than hitherto. This in itself was a striking evidence of the educational bearing that exhibits of this nature had upon manufacturers showing in the several sections. The drought the dairying districts had passed through in this State was no doubt a factor in the want of excellence on account of the part played by the breed of cattle and the quality of the pastures at the time the

butter or cheese was manufactured for show purposes. In butter, outside the flavour, the manufacture showed a striking improvement, and with the exception of a few exhibits, compared more than favourably with that of New South Wales. However, there was one detail in manufacture requiring further attention, and that was the working of the butter, for unless the working was sufficiently carried on not only texture faults, but faults in colour, were sure to arise. With this defect overcome the manufacture of the butters would be all that could be desired.

CHEESE AWARDS.

The competition for the prizes in the cheese section was considerable, and of the successful competitors the Southwood Co-operative Dairy Company carried off three first prizes in the six classes. The Rosalie Cheese Factory at Leyburn annexed two firsts and the Leyburn Dairy Company, Limited, came first for matured cheeses. The awards were:—

—	Flavour.	Texture.	Colour.	Finish.	Total.
Two Exports, 70-80 lb., White, Suitable for English market.					
Possible points	50	25	15	10	100
J. Wilson, Worongary, S. C. line	40	24	15	9½	88½
Warwick Butter and Dairying Co., Elbow Valley	42½	24	15	9	90½
Westmore Cheese Factory, Westmore, *via* Killarney	42	24½	15	9½	91
Rosalie Cheese Factory, Glencoe	42	24	15	9	90
Southbrook Co-operative Dairying Co., Southbrook	45	25	15	9½	94½
Downs Co-operative Dairy Co. Cheese Factory, Hodgson's Vale	45	24½	15	9½	94
Mount Tyson Farmers' Co-operative Dairy Co., Ltd., Mount Tyson	44	24½	15	9	92
Two Exports, 70-80 lb., Coloured, Suitable for English market.					
J. Wilson, Worongary, ...	40	24	15	9½	88½
Warwick Butter and Dairying Co., Elbow Valley	42	24½	14½	9	90
Westmore Cheese Factory, Westmore, *via* Killarney	40½	24½	15	9	89
Rosalie Cheese Factory, Glencoe	43	24½	15	9½	92
Southbrook Co-operative Dairy Co., Southbrook	45	25	15	9	94
Downs Co-operative Dairy Co., Hodgson's Vale	44½	24½	15	9	93
Kooroongarra Co-operative Dairy Co.	43½	25	15	9	92½
Mount Tyson Farmers' Co-operative Dairy Co., Ltd.	43	24½	15	9	91½
Two Medium not exceeding 40 lb. matured.					
Warwick Butter and Dairying Co., Elbow Valley	40	25	15	9	89
Rosalie Cheese Factory, Glencoe	42	25	15	9½	91½
Southbrook Co-operative Dairy Co., Southbrook	38½	24½	15	9	87
Westmore Cheese Factory, Westmore, *via* Killarney	39	24½	15	8½	87
Rosalie Cheese Factory, Glencoe	44	24½	15	9½	93
Southbrook Co-operative Dairy Co., Southbrook	40	24	15	8½	87½
Downs Co-operative Dairy Co.'s Cheese Factory, Hodgson's Vale	42½	24½	15	9½	91½
Biddeston Co-operative Dairy Co., Ltd., Biddeston, *via* Oakey	41½	24½	15	9	90
D. Keir, Bellthorpe, *via* Woodford	40½	24	15	8½	88
Greenmount Dairy Co., Ltd., No. 3 Factory, Greenmount	40½	24	15	9	88½
Greenmount Dairy Co., Ltd., No. 3 Factory, Greenmount	41½	24½	15	9	90
Greenmount Dairy Co., Ltd., No. 2 Factory, Greenmount	40½	24	15	9	88½
Greenmount Dairy Co., Ltd., No. 6 Factory, Greenmount	41½	24	15	9	89½
Greenmount Dairy Co., Ltd., No. 6 Factory, Greenmount	43	24½	15	9½	92

—	Flavour.	Texture.	Colour.	Finish.	Total.
Two Loaf Cheeses, not exceeding 12 lb., under two months old.					
Greenmount Dairy Co., Ltd., No. 3 Factory, Greenmount	43	24½	15	9	91½
J. Wilson, Worongary, S.C. line	41½	24½	15	9½	90½
Warwick Butter and Dairying Co., Elbow Valley	41½	24½	15	9	90
Westmore Cheese Factory, Westmore	39	24	15	9	87
Westmore Cheese Factory, Westmore	39½	24	15	9	87½
Rosalie Cheese Factory, Glencoe	42	24½	15	9½	91
Southbrook Co-operative Dairy Co., Southbrook	43½	24½	15	9	92
Kooroongarra Co-operative Dairy Co., Kooroongarra	41	24½	15	9	89½
Downs Co-operative Dairy Co., Ltd., Toowoomba	42	24½	15	9½	91
Biddeston Co-operative Dairy Co., Ltd., Biddeston	41	24	15	9	89
Leyburn Dairy Co., Ltd., Roma street, Brisbane	41½	25	15	9	90½
Pittsworth Dairy Co., Ltd., Pittsworth	42	24½	15	9	90½
Moola Cheese Factory, Braeside, *via* Dalby ..	41	24½	15	9	89½
Downs Co-operative Dairy Co., Ltd., Toowoomba	41½	24	15	9	89½
Biddeston Co-operative Dairy Co., Ltd., Biddeston, *via* Oakey	41	24½	15	9	89½
Leyburn Dairy Co., Ltd., Roma street, Brisbane	44	24½	15	9½	93
Mount Tyson Farmers' Co-operative Dairy Co., Ltd.	44	24½	15	8½	92
Greenmount Dairy Co., Ltd., No. 3 Factory, Greenmount	41	25	15	9	90
Greenmount Dairy Co., Ltd., No. 2 Factory, Greenmount	41	25	15	9	90
Two Medium, not exceeding 40 lb., under two months old.					
J. Wilson, Worongary, S.C. line	40	24½	15	9½	89
Warwick Butter and Dairying Co., Ltd., Elbow Valley	42	24	15	8½	89½
Westmore Cheese Factory, Westmore, *via* Killarney	41	24	15	9	89
Rosalie Cheese Factory, Glencoe	44	25	15	9½	93½
Southbrook Co-operative Dairy Co., Southbrook	42	25	15	9	91
Kooroongarra Co-operative Dairy Co.	43½	25	15	9	92½
Downs Co-operative Dairy Co., Ltd., Toowoomba	43	24½	15	9	91½
Leyburn Dairy Co., Ltd., Roma street, Brisbane	42	24½	15	9	90½
Pittsworth Dairy Co., Ltd., Pittsworth	42	25	15	9	91
Moola Cheese Factory, Braeside, *via* Dalby ..	41	24½	15	9	89½
Moola Cheese Factory, Braeside, *via* Dalby ..	42	24½	15	9	90½
Burnside Cheese Factory, Tannymorel	42	25	15	8½	90½
Cambooya Dairying Co., Ltd., Cambooya (No. 1)	40	24	15	9	88
Cambooya Dairying Co., Ltd., Cambooya (No. 2)	39	24	15	9	87
Greenmount Dairy Co., Ltd., No. 3 Factory, Greenmount	42	24½	15	9½	91
Two Loaf Cheeses not exceeding 12 lb. matured.					
Warwick Butter and Dairying Co., Elbow Valley	38	24	15	8½	85½
Moola Cheese Factory, Braeside	40½	24½	15	9	89
Burnside Cheese Factory, Tannymorel	42	24½	15	9	90½
D. Keir, Bellthorpe, *via* Woodford	40½	24½	15	9	89
Wm. Smith, Yangan	41	24½	15	8½	89
Cambooya Dairy Co., Ltd., Cambooya (No. 1)	40½	24	15	9	88½
Cambooya Dairy Co., Ltd., Cambooya (No. 2)	42	24	15	9	90

COTTAGE GARDEN COMPETITION.

It is many years since the National Association first offered a prize for the best cottage garden in and in the suburbs of Brisbane, and it is highly satisfactory to find that the Council of the Queensland National Association have this year offered substantial prizes for the laudable purpose of encouraging a taste for flower and vegetable gardening in Brisbane and its suburbs, and the satisfactory response to the Association's invitation to compete in this section affords good evidence that the movement has been greatly appreciated. In the year 1881 we ourselves obtained the Society's medal and certificate in the only competition of this description which had been held up to that date. There were, if our memory serves us, seventeen entries, and the conditions were much the same as those laid down for competitors in the Cottage Garden Section in August, 1915.

The revival of the garden competitions cannot but have a beneficial effect in the direction of beautifying the surroundings of suburban dwellings, and incidentally will possibly lead to the establishment of a very lucrative business in the cut-flower trade. This year, 36 gardens competed, and were judged by Messrs. J. Soutter and Mr. J. F. Bailey, Colonial Botanist, who remarked on the area, soils, plants, &c., that there was a great sameness in the laying out of the gardens, and that in some districts, notably Paddington, there was a want of the first essential for successful gardening—*i.e.*, water, and much patience and industry had been shown by competitors in that district to overcome the difficulty.

The following are given as the results obtained by the first twelve of the competitors:—

The numbers represent—1, general effect in laying out gardens, &c.; 2, variety and condition of plants; 3, quality of flowers and foliage plants; 4, quality and quantity of vegetables; 5, condition of garden generally:—

—	1	2	3	4	5	Total.
W. F. Greenslade, Clayfield	12	6	9	12½	9	48½
J. Smith, Church street, Red Hill ..	12½	7	9	11	8	47½
W. Brewster, Byrne Estate	12	7	12	8	8	47
Mrs. Grenning, Zillmere	10	7	10	11	8	46
J. H. Buxton, Bowen Hills	12	7	9	10	7	45
H. Hacker, off Bowen Bridge road ..	12	7	9	9	6	45
C. Short, Toowong	10	7	13	10	6	45
Jas. Hamilton, Kennedy terrace	10	7	9	12	6	44
R. Fulcher, Kennedy terrace	11	8	11	7	7	41
R. Littleford, View street, Paddington ..	9	7	9	12	7	44
W. Bell-Booth, Duke street, Thompson Estate	10	7	8	10	7	42
R. J. Street, Duke street, Thompson Estate	10	7	9	9	7	42

The judges in their report state that the first and second prizes were won by elderly gentlemen, who seemingly devote the whole of their time to tending their gardens, and, therefore, may be considered to have an advantage over those who, having occupations which take them daily from home, can only spare odd times for the work, but this is not a point to be taken into consideration by the judges. Several of the competitors were handicapped by having paid little or no attention to the vegetable portion of their gardens. In one of these gardens—namely, that of Mr. P. Dowd, of Bell street, Kangaroo Point, was an illustration of what good effect may be obtained from grass and shrubs, with a touch of the old-fashioned carpet-bedding. The whole area is laid down in grass with roses and other shrubs dotted here and there, and is kept in beautiful order. Another, at Clayfield, was tended solely by Mr. Scott, a young man employed by the Tramways Company. This garden is most tastefully laid out, and the massing of plants of one kind will be sure to prove effective later on in the spring. Mr. Thomas's garden at Indooroopilly could only be judged so far as flowers and vegetables were concerned, as the large area at the disposal of the owner placed it at an advantage far beyond that of one eligible for competition as a "cottage garden." Here are to be seen some fine palms and other trees bordering the drive, and placed on the lawns. A feature of this garden is a hedge composed of pink and red Bougainvilleas, the gorgeousness of which is almost beyond description. The pink variety is also used with beautiful effect trained along the veranda. It would be worth while for anyone interested to take a trip along Hart's road to see the effect produced by using these plants in this manner. Mr. Greenslade's garden is an ideal "cottage garden," sufficient plants being grown to beautify the home on the one hand, and to supply the household requirements on the other hand. Mr. Smith's effort has been made under most unfavourable conditions so far as position is concerned, as it stands on the side of a steep hill, with a low depth of soil to work upon. The leading feature of Mr. Brewster's garden is the excellent display of sweet peas and Shasta daisies. In each garden every inch of space has been used to advantage.

We are indebted to the courtesy of the Secretary of the National Association for the following correct list of prize-takers in the District and One-Farm Exhibits for the past thirteen years.

DISTRICT EXHIBITS.

First Award.

1903—5 Competitors	Moreton Districts, Nundah, and Zillmere.
1904—7 Competitors	Moreton—Combined Moreton Association.
1905—8 Competitors	Moreton.
1906—5 Competitors	Wide Bay and Burnett and Moreton—equal.

1907—3 Competitors	Moreton.
1908—3 Competitors	Central Queensland.
1909—5 Competitors	Wide Bay and Burnett.
1910—No entries.	
1911—"A" Grade, 1 Competitor ...	Central Queensland.
"B" Grade, 3 Competitors ...	Lowood and Tarampa District.
1912—"A" Grade, 3 Competitors ...	Central Queensland.
"B" Grade, 2 Competitors ...	Kingaroy.
1913—"A" Grade, no entries.	
"B" Grade, 5 Competitors ...	Fassifern.
1914—"A" Grade, 2 Competitors ...	North Coast Agricultural Societies' Union, Lismore, N.S.W.
"B" Grade, 8 Competitors ...	Fassifern.
1915—"A" Grade, 3 Competitors ...	South Coast District Display Association.
"B" Grade, 5 Competitors ...	Gympie.

ONE-FARM EXHIBITS.

First Award.

1910—6 Competitors (and 1 non-competitive)	Prevost Brothers, Moss Vale, N.S.W.
1911—1 Competitor	Allen, D. H. A. and W., Chatsworth, Gympie.
1912—2 Competitors (and 1 non-competitive exhibit)	Muller, T. P., Tirroan, Gin Gin.
1913—2 Competitors	Franke, H., Cawdor.
1914—5 Competitors	Todd, A. P., Rockhampton.
1915—3 Competitors (one retired)	Williams, O. C.

HOUSEHOLD HINTS.

THE VALUE OF VINEGAR.

All housewives would seldom be without vinegar on the kitchen shelf if its value were more widely known.

Its usefulness in the household can hardly be over-estimated, as there are a surprisingly large number of duties that can be rendered comparatively easy by its application.

The boiling of eggs when the shells are cracked sometimes proves a little difficult. When this happens, add a small quantity of vinegar to the water, and the egg will be cooked as satisfactorily as if the shell had been undamaged.

Where it is desired to keep meat, and the more costly methods are impossible, the use of vinegar will again overcome the difficulty. Simply wrap the meat in a cloth wet with vinegar and it will be kept nice and fresh. Wash off the vinegar before cooking operations.

Vinegar heated to boiling-point will also be found a most effective softener of hard brushes which have become dry and otherwise too hard to use.

Then, a little vinegar rubbed over the hands when they have become red and discoloured through rough work or too frequent dabbling in soapy water will greatly improve and whiten them.

Pastoral.

SETTLERS' FLOCKS ON COASTAL LANDS.

Mr. J. R. Chisholm writes us as follows from The Plains, Prairie, N.Q.:—

Since writing my paper on settlers' flocks, I have been through from Gladstone to Tamworth, in New South Wales, by rail, and I think now, by what I saw of some lands, and what I heard from those I travelled with and met, that I may have treated the matter of worms in coast-kept sheep too lightly. Will you therefore please give me space for a few lines more on this subject.

Although in my paper I referred to coast flocks in the North being successfully kept, and with little attention, yet these I know are on sweet country, and I saw much land—between Bundaberg and Maryborough, for instance—that, I should say, was not sweet, and I would say there may be areas about Gatton, Helidon, and thereabouts also wormy country; and I spoke with a New England man in the train, and he tells me of much of his district where the sheep have to be drenched continually to keep them healthy. Throughout New Zealand they grow good sheep and superfine wools, and those seen from the train look healthy enough; hence stockowners there must deal with worm troubles successfully.

My object in writing is to encourage the small settler to keep sheep, and just now is his opportunity, for breeding sheep from the Longreach district could be bought cheaply, and they would be merinos; but a settler buying a little lot, of 25 to 50, could get a Lincoln, Corriedale, or Border Leicester ram, or a good Shropshire or Romney, when he would soon have big lambs, and could pot the ewes for his pigs. However, I was going to refer to worms in sheep, and wished to emphasise the ease with which a small flock is handled. Some years ago we got some Lincoln rams from South Australia, and, unknown to me, they were transhipped in Sydney, and kept in a wormy paddock out by Rooty Hill for a few days. When they came here I let them go with sheep in a paddock, and some time afterwards I saw they were doing no good; so I got Mr. Collins, the stock inspector, then at Hughenden, to come down. He had been about the Burnett country as a lad, when it was all sheep-stocked, and he said at once that the rams were wormy. I said they had come off a sound country in South Australia and this could not be. However, we killed one, and found both tape and stomach worms (the little red fellows). We at once drenched the rams with an arsenic drench, but it was a good while before they did any good; and, by the way, the Lincolns were never very much of a success here. However, some time afterwards, we found worms in the sheep where these rams had been, and we drenched 1,500 of them in half a day—quite effectively, too, because we never

had any more worm trouble; but, as I said in my paper, ours is a dry country. Think, then, how quickly a home flock could be handled.

At that time, however, we read up a good deal of literature on worms in sheep, and to me, anyone who could talk worms in sheep was congenial company. Much of my reading goes to show that most sheep worms find their resting places by the medium of dirty water. Little waterholes and small excavations would be the home of worm eggs in dry weather. The man who waters his sheep out of troughs supplied from a well will have less trouble than his neighbour with a small dam or tank excavation.

In many of the American States sheepowners have worm troubles. They give common salt in plenty, and sulphate of iron, about 2 oz. of the latter to 1 lb. of salt. The sulphate of iron must be added to the salt a little at a time, otherwise you may put the sheep off it. A popular worm remedy in American sheep husbandry is gasoline. They add this to the lick, only a drop or two at first, to get the sheep used to the smell of it, then add little by little. Turpentine and coal tar mixed would be about equal to the gasoline. I believe in turpentine as a worm remedy for all stock, and for sheep it is popular and effective in many countries. The dose is one cup of turpentine to two cups of milk, giving the grown sheep half of a small-sized sauce bottle to each dose, after starving them for twenty-four hours. Keep them in for a few hours, and then let them out for a feed, and shut them in again, watching the droppings for results. In all dosing and medicinal matters, one must be guided by results and see what good is done by the dosing, so that the treatment may be known to be effective or, if otherwise, that some other may be substituted. Home flocks of sheep should be quiet, ready feeders and, where this is so, they can easily be given any medicine mixed with food, provided judgment is exercised in mixing a very little at a time so that they may not be put off it.

The treatment I have suggested may deal with stomach worms and tapeworms successfully. Where the more malignant varieties of worms affecting the head, liver, and lungs of sheep are found, it is matter for consideration if the land cannot be put to better profit than may accrue from sheep.

WHEAT AND GRASS CULTIVATION.

By P. R. GORDON.

If the present disastrous European war has the effect of greatly extending the cultivation of wheat in Queensland, it will also, incidentally, greatly benefit the meat export trade and the pastoral industry generally. Many thoughtful men among the pastoralists hold the opinion that the time is not far distant when the cultivation of exotic grasses on much of the available waste lands on the coast watershed, and for many miles inland, west of the coast range, will be resorted to by many of our more enterprising graziers, and the extension of wheat growing will provide the very best conditions for inaugurating such a system.

It will, of course, be known to many of our wheatgrowers that the first great impetus to wheatgrowing in New South Wales was by the inauguration of what is known as the share-system of cultivation. This system was initiated about twenty-five or thirty years ago by the late Hon. George H. Greene, of Iandra Station, Grenfel district, New South Wales. He contracted with farmers and others without capital, men possessing a practical knowledge in the growth of crops, to plough the land, plant the seed, and harvest the crops; he, on his part, giving the use of the land free of rent, providing the seed wheat, and in some if not in all cases advancing the money to provide the necessary farming implements. It is also known to the writer that he was willing to lend the free use of young horses to those of the cultivators who cared to break them into harness. When harvested, the crop was shared in equal parts between the owner of the land and the cultivators. The system soon became general and rendered New South Wales the only State of the Commonwealth in a position to export a large surplus of wheat. Two crops of wheat in succession were thus taken off the same land, when the cultivators were moved on to another portion of virgin soil. The land from which the wheat crop had been taken was either allowed to return to indigenous grasses or planted with exotic grasses. If the former, it is well known to men of experience that the native pasture is greatly improved by the breaking up of the surface soil, and cattle and sheep always prefer it to pasture on undisturbed soil. It is not the object of the present writing to trace the effect that the share-system has had on the production of wheat in New South Wales, but to show the splendid opportunity the system offers for laying down in cultivated grasses large areas of land, thus greatly increasing its grazing capabilities, both for dairying purposes and for the fattening of stock, thus coming into line with other countries, such as New Zealand and Argentine, in fattening off cattle at early ages, and thus bringing the quality of our breef more in accordance with the requirements of our butchers and tastes of foreign meat consumers. In normal times there are always available plentiful supplies of store cattle from the larger inland grazing holdings, and farms of improved pasture could be very profitably used in the fattening of store stock. There are many excellent exotic fodder grasses that have taken kindly to the Queensland climate, among others, lucerne, Rhodes grass, Paspalum dilatatum, sheep Burnett, fescue, &c.; and the late Mr. F. M. Bailey, the veteran Government Botanist, pointed out many of our indigenous grasses which not only were of great value as fodder plants but which were greatly improved in their habits of growth and in quality by cultivation. The practice in Great Britain and other countries in the Northern Hemisphere, when laying down fields in pasture, is to sow the grass seeds with the wheat or oat crops, as the case may be; the cereal crop affording the necessary protection from the sun during their earlier growth. This could easily be carried out when sowing the second crop of wheat. This has the double advantage, in countries where straw forms an important item in cattle food, in rendering it more digestible and palatable for the stock. The experience of Queensland farmers who have experimented with Rhodes and other

grasses of rank growth will suggest to them whether they would be apt to overshadow the wheat crop before the latter arrives at maturity. That the cultivation of pastures would immensely increase our annual "cast" of fat cattle and sheep, in addition to improving the quality of the meat, will be regarded as a matter of course, and that it would largely increase the flow of milk in dairy herds is equally self-evident.

FEEDING AND MANAGEMENT OF MILCH GOATS.

Feeding is an important question, and naturally one is desirous of obtaining the best results combined with economy. Whether goats are kept tethered or running at large, the best fodder for hand feeding is prime lucerne chaff, and bran together with linseed meal and sweet potatoes, as a valuable addition to the diet, and to give variety.

If kept tied up, the ration should consist of the following proportions, to be given twice a day, morning and night, preferably at milking time, viz.:—Prime lucerne chaff, 2¼ lb.; bran, 3 single handfuls; linseed meal, half handful; sweet potatoes, cut up, 1 lb.

Note.—If the potatoes are given lessen the bran to half. The items mentioned should be mixed well, excepting the cut-up potatoes, which should be placed on top. A little green lucerne is good, but let it wilt for a day or two before feeding, as it might produce hoven otherwise.

It should be borne in mind that it will take nanny at least a fortnight to learn to feed properly, and until she does the yield will not increase.

Bran when made wet acts as an aperient, but when given dry it is a valuable food, so do not wet the bran, as it sours quickly.

Grain of any kind is too heating, and has the effect of putting them back with the milk yield, and if persisted in will dry them off, corn in particular. If a grass plot is available it is an excellent plan to tether them so that they can get a pick. If the available grass is small in area, it is better to cut or pull it, and put it in their manger. They are very fond of milk thistles.

If able to allow the goats their freedom, it is astonishing the variety and amount of food they will collect. Such being the case, the quantities of feed to be given when kept in captivity can be reduced to half or less, depending on the value of what they can find. The milk yield will help to determine this point. A good goat will keep in milk profitably for twelve months, or even longer, but it is not desirable to keep them in more than a year. If this end is to be attained they must be kept away from the buck.

The diet can always be supplemented by bits of bread, potato peelings, and waste from the kitchen, but all such waste must be

clean, else nanny will not eat it, nothwithstanding the assertion that they will thrive on jam tins and old boots. Certainly, they are very hardy, but most particular about what they eat.

It is necessary to have a shelter of some kind for them, as they do not like rain or damp places. Always have fresh drinking water on hand, and see that it is not soiled.

In selecting milkers it is best to see them milked before purchasing if possible. It is well to keep the following in mind, viz.—"It takes no more to feed a good animal than a bad one."

The Angora goat is of no value as a milker; the common goat is by far the best. A nanny that will give two quarts a day when just in must be considered an excellent milker.

Goats' milk will stand one-third its own volume of added water, and will then be richer than ordinary cows' milk, and will be found quite the thing for all ordinary purposes.

THE STOMACH-WORM IN SHEEP.

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

[CONTINUED FROM AUGUST NUMBER.]

Another set of experiments conducted by Dr. Theiler will have interest to most sheep farmers in Australia who are grazing sheep on infected country, the subject being—"What is the effect of dosing pregnant ewes?"

The sheep experimented upon were 4, 6, and 8 tooth sheep. The table showed some interesting results, but is too long for insertion here.

Thirty ewes in an advanced stage of pregnancy were dosed with various amounts of Cooper's dip and bluestone, and in only four cases were the lambs born dead. Three of these four cases showed twin lambs which died; the singleton died a few days after birth. Dr. Theiler's conclusions on the experiment are:—

"The dosing of pregnant ewes with the maximal safe dose of Cooper's dip and bluestone was followed, in two instances, by the death of the twins. This may be due to the actual dose, since in one other instance where the twins survived, the ewe had only been dosed with half the safe dose."

In regard to the use of arsenic in this matter, I met with a curious experience two years ago, at Emerald, in the Central district. A sheep farmer who had some 2,000 ewes about to lamb, informed me that he would like advice about them. Several days later I visited his farm, and, sure enough, found his sheep wormy, and also heavy in lamb. Knowing that ewes with lambs at foot may safely be drenched without injury to the lambs, I advised him to wait, and drench his ewes after

they lambed. He then said triumphantly, "I thought you would say that. I drenched them all two days ago." He used Pottier's dip and got good results. For several weeks I visited these sheep at regular intervals, and found in the end that the lambing was very successful. There is no doubt, however, that he took a big risk, and, in my opinion, an unnecessary one, for reasons stated above.

THE DOSING OF EWES WITH LAMBS AT FOOT.

This question also has interest for us, and another set of tables shows that the dosing of ewes with the maximal safe dose of Cooper's dip and bluestone had no ill effect on the lambs suckled by the dosed sheep.

This is in accordance with facts I have noticed in drenching ewes with the arsenical drench. Absolutely no ill effect on the lambs was to be observed after drenching the ewes with the full dose (2½ grains).

THE LICK.

"The second method of dosing sheep is by allowing them free access to a lick containing vermifuge ingredients. The danger of this method is, obviously, that sheep may get too much of the lick." Thus Dr. Theiler. My experience is that sheep, after the first day of two, only help themselves sparingly to the salt lick, whatever other ingredients are included.

Dr. Theiler's conclusions after the experiments are—"The free access of sheep to a lick containing Cooper's dip and bluestone for a period of three months, during which time one sheep consumed on an average daily 2·3 grains of Cooper's dip and 2·3 of bluestone, had no decisive effect on the worms. The sheep kept in good condition, but the controls which were not dosed showed exactly the same condition, so that no effect, whether good or bad, could be noticed in the sheep. This experiment should indicate that the method of allowing sheep to partake of vermifuge through the medium of a lick is by no means a method which can be considered to be preferable to the dosing of the sheep with the optimal doses."

Other drenches than Cooper's dip and bluestone were tried by Dr. Theiler, and from time to time I shall make extracts from his published conclusions on these. It is a matter of such importance to this country that all information should be searched for and spread broadcast. The pest is making headway fast in almost every district in Queensland, excepting the very far West. It is only reasonable to conclude that even there it is possible that once these parasites get a footing, as much loss and trouble will be caused by the parasite as in the closer settled areas nearer the coast. I know that they are in as dry areas as are to be found in Queensland, as at Alpha, Jericho, Augathella, Surat, Yeulba, &c., which are surely dry enough areas, yet worms are to be found a pest in these districts.

Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

MILKING RECORDS OF COWS FOR MONTH OF JULY, 1915.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Commercial Butter.	Remarks.
			Lb.	%	Lb.	
Noble Dot ...	Jersey	2 May, 1915	612	4·6	33·17	
Lady Twylish	,, ...	5 June ,,	562	4·7	31·14	
Netherton Belle	Ayrshire	23 April ,,	630	4·2	31·10	
Bluebelle ...	Jersey	20 June ,,	724	3·6	30·53	
Iron Plate ...	,, ...	21 Feb. ,,	466	5·4	29·75	
Miss Bell ...	,, ...	2 July ,,	514	4·2	25·38	
Lark ...	Ayrshire	17 June ,,	618	3·4	24·55	
Black Bess ...	Jersey	4 June ,,	471	4·2	23·23	
Lady Athol	Shorthorn... ...	29 May ,,	545	3·6	22·99	
Lady May ...	Ayrshire	7 Mar. ,,	513	3·6	21·64	
Lady Lil ...	Jersey	27 June ,,	410	4·2	20·23	
Cocoatina ...	,, ...	6 Mar. ,,	332	4·9	19·18	
Thornton's Fairetta	,, ...	27 Mar. ,,	325	4·7	18·0	
Lady Melba	Holstein	6 Mar., 1914	413	3·7	17·90	
Nellie II. ...	Shorthorn... ...	20 July ,,	428	3·5	17·52	
Miss Melba	Holstein	22 Nov. ,,	459	3·2	17·12	

The following cows were stall fed, in preparation for Brisbane Exhibition :—Noble Dot, Netherton Belle, Iron Plate, and Black Bess. The remainder of the herd grazed on natural pastures, supplemented by a ration of ensilage.

DRIED YEAST AS FOODSTUFF.

With the increased prices of imported concentrated foodstuffs, it is desirable that farmers should keep their eyes open for any new sources of suitable foods which may be available.

Such a food, according to an article appearing in the Journal of the Board of Agriculture, appears to be dried yeast.

In Germany it is estimated that the output of brewers' yeast is about 69,000 tons a year, a large proportion of which is subjected to the drying process and sold for stock feeding. The small quantity of dried yeast prepared in this country has been mainly exported to Germany, where the product has grown in favour so rapidly that the demand is said to have exceeded the supply. The high percentage of albuminoid in dried yeast is a feature to be noted. From various

analyses it appears to contain from 45 to 50 per cent. of this valuable constituent, and in this respect is only equalled amongst ordinary farm foods by decorticated seed meal or cake and soy bean meal and cake.

Feeding experiments with dried yeast have been carried out at Garforth, and the report on the results is of a distinctly favourable character.

It is, therefore, considered opportune by the Board of Agriculture that apart from the exceptional circumstances of the moment, the attention of the British farmer should be directed to this new feeding material, and especially that, if the claims as to its merits can be substantiated, every effort should be made to develop the home demand to such an extent as to render exportation in the future as unnecessary as it is undesirable.

According to the experience gained during the trials, the results were summarised as follows:—

1. Dried yeast has proved a safe food for cows, pigs, and calves.

2. For cows, dried yeast is not to be strongly recommended, since they show a special aversion to its bitter taste.

3. It has proved a good food for pigs, having given results markedly better than those obtained with an equal weight of wheat "sharps." Despite the increased cost of the ration on introducing dried yeast in the place of an equal weight of "sharps," the margin of profit on the feeding has been undoubtedly increased.

4. Dried yeast has proved a safe food for calves, but no evidence has been obtained as to its merits in comparison with other foodstuffs commonly used for calf-rearing.

5. Dried yeast keeps well, and on mixing with other meals and water may be kept for some time without objectionable fermentation taking place.

6. In arriving at these conclusions no account has been taken of the value imparted to the manurial excreta of the animals by the consumption of dried yeast. From its composition, this may be expected to be as high as that of any other foodstuff commonly used on the farm.

7. Although the experience with dried yeast at Garforth, as outlined above, has been favourable, there is no reason to believe, either from the results of experiments or from careful observation of the general health of the animals throughout the tests, that the dried yeast possesses special medicinal or dietic virtues which any other highly digestible food rich in albuminoids might not be expected to possess.

The Board of Agriculture would, no doubt, be ready and willing to supply information as to the best way of utilising the substance for stock-feeding purposes.—"Mark Lane Express."

The Orchard.

PINEAPPLE MEMOS.

C. F. BARKER, Barmundoo—

Following are replies to your questions:—

Q. 1. What is the average yield of pineapples per acre on fair to good pine land?

Q. 2. What is the average (about) gross profit per acre of pines under safe conditions?

A. 1 and 2. Returns fluctuate. £35 and £80 per acre. 10,000 to 12,000 pines not uncommon, say 10 to 15 tons per acre.

Q. 3. What labour is required? About how many acres can a man keep cleared, manured, and generally attended to?

Q. 4. Does this labour require to be kept at work regularly? In other words, does the planter employ the majority of his hands permanently or only at particular periods, say, when the cultivation requires cleaning or the fruit picking?

A. 3 and 4. Five to 10 acres or more. It depends on the man, nature of the soil, horse or hand labour. Labour may or may not be continuous if it is required to keep the plantation clean and for harvesting the crop.

Q. 5. What is the usual class of labour employed, and at what wages?

A. 5. Ordinary farm or garden hands at the ruling rate of wages for the district.

Q. 6. Is it your opinion that much experience is required to be successful at pinegrowing? What chance has a man without previous experience at fruit-growing of making a success at pine cultivation?

A. 6. No. A good cultivation has a splendid chance.

Q. 7. Is it customary or beneficial to grow other fruits with pines?

A. 7. Ground crops, such as peas, beans, tomatoes, &c., may be grown between the rows for the first year or two, but fertilisers must be used to prevent the pines being robbed of any sustenance.

Q. 8. Does disease frequently destroy a whole crop of pines?

A. 8. No.

Q. 9. Is it your opinion that we are likely to over-produce pines?

A. 9. No.

Q. 10. Could you recommend me any books on pineapple culture?

A. 10. We have no other literature in this connection.

Botany.

LIST OF FRUIT TREES SUITABLE FOR NORTHERN QUEENSLAND.

(Does not include those already commonly grown for the market.)

Alligator Pear
Breadfruit
Jack Fruit
Chinese Raisin
Litchi
Mangosteen
Sapodilla Plum
Star Apple
Vi Apple
Wampee
Rambutan
Butter Fruit or Mabola
Pulassan
Rose Apple
Brazilian Cherry

Most of the above could be obtained from Singapore.

J. F. BAILEY,
Colonial Botanist.

LIST OF ORNAMENTAL TREES SUITABLE FOR NORTHERN QUEENSLAND.

Exotics.

Albizzio fastigiata, A. Forbesi, A. stipulata.

Bauhinia Candida, B. purpurea, B. splendens, B. variegata.

Cassia fistula (Indian Laburnum), C. nodosa (Golden Chain), C. siamea.

Caesalpinia ferrea

Cinnamomum Camphora (Camphor).

Erythrina caffra, E. indica, E. speciosa (Coral trees).

Ficus benjamina (Weeping Fig).

Harpephyllum caffrum (Natal Plum).

Jacaranda mimosæfolia.

Kigelia pinnata (Sacred Bean of Nubia).

Myrospermum pereirae (Balsam of Peru).

Poinciana regia (Flamboyant Tree).

Natives.

Acacias (a number of species).

Bauhinia Hookeri (Queensland Ebony).

Buckinghamia celsissima.

Castanospermum australe (Moreton Bay Chestnut).

Cupania pseudorhus.

Cypress Pine.

Grevillea robusta (Silky Oak) and other species.

Harpullia pendula (Tulip wood).

Stenocarpus sinuayus (Wheel of Fire).

Sterculia acerifolia (Flame Tree) and other species.

The above list includes those which can be purchased at nurseries within the State, otherwise there are numerous other trees which could be recommended.

Science.

AIR IN THE SOIL AND EARTHWORMS.

BY BENJAMIN WILSON.

Loose soil is a mixture of (1) solid constituents, (2) water, (3) air. It is the last named that we will deal with. Air in the soil is a most important point not considered by many people, though it is absolutely necessary to the successful growth of the crops. All living subterranean parts, like all other living parts, require air (oxygen) for breathing. Only such plants as have large air spaces, connected by passages, can thrive in soil deficient in air—for instance, in very wet soil where the ground water is at the surface. All other plants would die through suffocation. The reason for this is that alcoholic fermentation and the evolution of carbon dioxide is set up, with the inevitable result of death and putrefaction. In soils poor in oxygen, decomposition takes place in a totally different manner from that in aerated soils; humic acids are formed in great quantities, so that the soil becomes sour. Air in the soil differs slightly in composition from that in the atmosphere; it contains more carbon dioxide and less oxygen, particularly so in the subsoil, because of the respiration of subterranean organs, bacteria and animals, and the decomposition of organic bodies. The amount of carbon dioxide varies with the quantity of organic matter in the soil, the crop, the method of cultivation, the contour and humidity of the land, the size of the soil particles, the depth of soil, and the temperature (season).

The aeration of soil depends essentially upon the structure; the more porous and loose the soil is the more complete is the aeration. Natural factors and artificial factors (cultivation) that assist this aeration are many and varied. As these factors are almost universally known, we need not mention them. One natural factor, however, that has a great connection with aeration, and to which the average person is not inclined to place much credit, is the earthworm. Earthworms play special roles in ordinary soil. The role that concerns us here is: By the tunnelling carried out, and the passages made, due to their activity, they render the soil more porous and better aerated. In other words, the soil becomes mellow, thus promoting breathing in the roots and, consequently, growth in the crops. The excrement deposited likewise serves to render the soil more pliable and porous. They also facilitate drainage. The effect of these animals will be patent to anyone if he can realise that it has been calculated that there may be as many as 400,000 in 2½ acres of land. By admitting air to the soil, more plant food is made available, the soil is made warmer, drainage assisted, the soil broken up, breathing promoted, and in fact a large number of definite advantages arising from admitting air, and which will be seen by anyone who pays a little attention to the matter.

Entomology.

EXPERIMENTS IN THE DESTRUCTION 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:—

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 insects 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 (*Lepidiota alborhirta*) responds to the stimulus induced by acetylene light from a considerable distance, the phototropic influence being well-nigh 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 a foot or eighteen inches 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 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.

OIL OF GERANIUM.

Essential oil of geranium is the product of the steam distillation of the leaves and flower of species of pelargonium (*n. o.* Geraniaceæ).

French oil of geranium is obtained from *P. radula*, Algerian oil from *P. roseum* and *P. odoratissimum*.

Various forms of still are used, and inquirers are referred for particulars of these to works dealing specially with the subject of essential oil distillation. Brant's "Practical Treatise on Animal and Vegetable Fats and Oils" may be consulted.

Essential oil of geranium prior to the present war was quoted at from 15s. to 30 per lb. for various grades, the value being based, probably, on geraniol content.

It is pointed out that no operation of essential oil extraction upon a small scale can be expected to compete successfully in the production of an oil which forms the product of a specialised industry in other parts of the world.

General Notes.

A NEW USE FOR PRICKLY-PEAR.

The American Consul in Uruguay says that, when travelling through certain parts, one's attention is attracted to the fine white colour of the farm buildings, even during the wet season. To obtain this neat effect a whitewash is used which is made from the sliced "leaves" of the prickly-pear, macerated in water for twenty-four hours, producing a solution of creamy consistence. To this lime is added and well mixed. When applied to any surface, be it wood, brick, iron, or other material, a beautiful pearly white appearance is produced, which will endure through storms and frosts for many years.

SPLIT PEAS.

"Woodford Marrow" and "Prizetaker" are used for split peas. They should be planted in drills like other peas, and should be sown as a winter crop, say from May to July, and reaped in Spring, before the heat is too great.

CUBIC CONTENTS OF A TANK.

A correspondent at Yelarbon sends the following dimensions of a tank—Top, 107 ft. by 61 ft.; bottom, 68 ft. by 36 ft.; depth, 8 ft.—and asks for the cubic content. Mr. A. Morry, surveyor to the Department, advises as follows:—

"The Prismoidal formula is—Add together the area of the top and bottom, and four times the middle area. Then divide the whole by six, which gives the mean area. Then divide by 27, which gives cubic yards. In this case the following is the result:—

Area of top = 107 × 61 = 6,527·0
Area of bottom = 68 × 36 = 2,488·0
4 times area of middle = 876 × 48·6 = 16,878·0
6)25,853·0
4308·10 = mean area in superficial feet.

Then 4308·10 sup. feet × 8 (the depth) and divided by 27 gives 1276⅔ cubic yards.

Note.—The middle area is obtained by adding together the length at top and bottom and dividing by 2, and the width at top and bottom, also divided by two. Then multiply the two results together—

107 61
65 36
2)175 2)97

87·6 × 48·6 = the middle area.

The Markets.

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

Article.		AUGUST.
		Prices.
Bacon	lb.	11d. to 1s. 0½d.
Bran	ton	£9 10s.
Broom Millet	,,	£37 to £40
Butter	cwt.	156s.
Chaff, Mixed	ton	£11 5s. to £13
Chaff, Oaten	,,	£13 3s.
Chaff, Lucerne	,,	£17 to £17 10s.
Chaff, Wheaten	,,	£4 10s. to £5 5s.
Cheese	lb.	11d. to 11½d.
Flour	ton	£20 5s.
Hams	lb.	1s. to 1s. 1½d.
Hay, Oaten	ton	£12 10s.
Hay, Lucerne	,,	£6 to £7
Honey	lb.	3½d. to 4d.
Maize	bush.	4s. 10d to 5s. 3d.
Oats	,,	6s. 6d.
Onions	ton	£10 10s.
Peanuts	lb.	3d. to 4d,
Pollard	ton	£9 10s.
Potatoes	,,	£5 to £11
Potatoes (Sweet)	cwt.	1s. 9d. to 5s. 10d.
Pumpkins	ton	£4 15s. to £5 15s.
Eggs	doz.	11d. to 1s. 1d.
Fowls	pair	3s. 6d. to 5s. 6d.
Ducks, English	,,	2s.6d. to 4s.
Ducks, Muscovy	,,	4s. to 5s.
Geese	,,	6s. to 7s.
Turkeys (Hens)	,,	6s. 10d. to 7s. 6d.
Turkeys (Gobblers)	,,	12s. to 15s.
Wheat	bush.	8s. 2d,
VEGETABLES.		
Cabbages, per dozen		1s. to 3s. 6d.
Cauliflowers, per dozen		2s. to 7s. 6d.
Beans, per sugar bag		1s. 6d. to 3s. 6d.
Beetroot, per dozen bunches		6d. to 9d.
Carrots, per dozen bunches		9d. to 1s.
Chocos, per quarter-case		1s. 9d. to 2s. 6d.
Cucumbers, per dozen		...
Custard Marrows, per dozen		1s. 6d. to 4s. 6d.
Vegetable Marrows, per dozen		1s. 6d. to 4s. 6d.
Lettuce, per dozen		...
Peas, per sugar bag		1s. 9d. to 3s. 6d.
Celery, per dozen bunches		1s. 3d. to 1s. 6d.
Sweet Potatoes, per cwt.		4s.
Table Pumpkins, per cwt.		5s.
Tomatoes, per quarter-case		3s. to 6s. 9d.
Turnips, per dozen bunches		6d. to 9d.
Rhubarb, per bundle		1s. to 1s. 6d.

SOUTHERN FRUIT MARKETS.

Article.	AUGUST. Prices.
Bananas (Queensland), per case	14s. to 18s.
Bananas (Fiji), per case	23s.
Bananas (G.M.), per case	22s. 6d. to 23s.
Mandarins, per case	3s. to 7s.
Oranges (Navel), per case	4s. 6d. to 6s.
Oranges (other), per case	3s. to 5s.
Passion Fruit, per quarter-case	2s. to 9s. 6d.
Lemons, per bushel case	3s. to 5s. 6d.
Papaw Apples, per half-case	...
Pineapples (Queens), per case	5s. to 8s.
Pineapples (Ripleys), per case	4s. to 4s. 6d.
Pineapples (Common), per case	4s. to 4s. 6d.
Strawberries (Queensland) per tray	3s. to 4s. 6d.
Tomatoes, per quarter-case	3s. to 8s.
Cucumbers, per case	6s. to 8s. 6d.

PRICES OF FRUIT—TURBOT STREET MARKETS.

Article.	AUGUST. Prices.
Apples (Tasmanian), per case	9s. to 10s. 6d.
Apples, Cooking, per case	6s. to 7s. 6d.
Bananas (Cavendish), per dozen	3d. to 4d.
Bananas (Sugar), per dozen	3½d. to 4d.
Cocoanuts, per sack	12s. to 15s.
Custard Apples, per quarter-case	4s. to 5s.
Granadillas, per quarter-case	...
Lemons (Lisbon), per case	4s. to 6s.
Limes (Choice), per quarter-case	2s. to 3s. 6d.
Mandarins, per half-case	2s. to 7s. 6d.
Oranges (Navel), per case	5s. 6d. to 6s. 6d.
Oranges (other), per case	3s. to 3s. 6d.
Papaw Apples, per quarter case	9d. to 2s. 6d.
Passion Fruit, per case	6s. to 9s.
Peanuts, per pound	3d. to 4d.
Rosellas, per sugar bag	...
Pineapples (Ripley), per dozen	1s. 3d. to 3s.
Pineapples (Rough), per dozen	6d. to 1s. 3d.
Pineapples (Smooth), per dozen	2s. 9d. to 3s.
Strawberries, per dozen pint boxes	3s. 6d. to 9s. 3d.
Strawberries, per tray	1s. 6d. to 2s.
Tomatoes, per quarter-case	2s. to 5s. 6d.

TOP PRICES, ENOGGERA YARDS, JULY, 1915.

Animal.	JULY. Prices.
Bullocks	£19 10s. to £21 12s. 6d.
Bullocks (single)	£31 10s.
Cows	£14 5s. to £17 5s.
Merino Wethers	40s.
Crossbred Wethers	51s. 3d.
Merino Ewes	36s.
Crossbred Ewes	46s. 6d.
Lambs	40s. 6d.
Pigs (Porkers)	45s.

LONDON QUOTATIONS.

London, 1st August.

Danish butter is quoted at 170/ to 174/ per cwt.

The market for frozen rabbits is steady and prices unchanged.

The Liverpool quotation for middling American cotton, August-September shipment, is 5·38d. per lb.

Jute, August shipment, from Calcutta, £23/10/ per ton.

Hemp, August-October shipment, £32.

Copra, South Sea, August-September shipment, £22/5/.

Raw linseed oil, spot pipes, £25 per ton.

Rubber, fine, hard Para, 2/4⅛ per lb.; plantation, first latex crepe, 2/5⅛; smoked sheet, 2/4⅞.

Hemp, sisal. No quotation owing to stoppage of shipments from Mexico. Probable from £38-£40 per ton.

Answers to Correspondents.

THE NUBIAN GOAT.

"ENQUIRER"—

We are informed that the Nubian goat is not at present obtainable in Queensland. You would have to import from Nubia, *viâ* Suakin, on the Red Sea, or Suez.

R. B. PORTER, Calbra.—

See reply to "Enquirer."

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	4·18	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.

Farm and Garden Notes for October.

FIELD.—With the advent of warmer weather and the consequent increase in the soil temperature, weeds will make great headway if not checked; therefore our advice for last month holds good with even greater force for the coming month. Earth up any crops which may require it, and keep the soil loose among them. Sow maize, sorghum, setaria, imphee, prairie grass, panicum, pumpkins, melons, cucumbers, marrows. Plant sweet potatoes, yams, peanuts, arrowroot, turmeric, chicory, and ginger. Coffee plants may be planted out. There are voluminous articles in previous journals giving full instructions how to manage coffee plants, from preparing the ground to harvesting the crop, to which our readers are referred. The planting of the sisal agave and the fourcroya may be proceeded with at any time of the year, but the best time is in spring and beginning of summer, when warm weather and good showers will enable the young plants to root quickly and become firmly established before the winter. The demand for the fibre is constantly increasing, and the supply does not nearly overtake the demand; hence prices keep high, and the outlook for the future is very promising. See our instructions in "The Sisal Industry in Queensland," obtainable free by intending planters on application to the Under Secretary, Department of Agriculture and Stock. Plant only on dry or well-drained soil. Cotton may still be sown.

KITCHEN GARDEN.—Our notes for this month will not vary much from those for September. Sowings may be made of all kinds of vegetables. We would not, however, advise the sowing of cauliflowers, as the hot season fast approaching will have a bad effect on their flowering. French beans, including butter beans, may be sown in all parts of the State. Lima and Madagascar beans should also be sown. Sow the dwarf Lima beans in rows 3 ft. apart with 18 in. between the plants. The kitchen garden should be deeply dug, and the soil reduced to a fine tilth. Give the plants plenty of room, both in sowing and transplanting, otherwise the plants will be drawn and worthless. Thin out melon and cucumber plants. Give plenty of water and mulch tomato plants planted out last month. Asparagus beds will require plentiful watering and a good top-dressing of short manure. See our instructions in "Market Gardening," obtainable on application to the Under Secretary, Department of Agriculture and Stock. Rosella seeds may be sown this month. No farm should be without rosellas. They are easily grown, they bear heavily, they make an excellent preserve, and are infinitely preferable to the mulberry for puddings. The bark supplies a splendid tough fibre for tying up plants. The fruit also makes a delicious wine.

FLOWER GARDEN.—The flower garden will now be showing the result of the care bestowed upon it during the past two months. The principal

work to be done this month is the raking and stirring of the beds, staking, shading, and watering. Annuals may be sown as directed for last month. Plant chrysanthemums, gladiolus and other bulbs, such as tuberose, crinum, ismene, amaryllis, pancratium, hermocallis, hippeastrum, dahlias, &c. Water seedlings well after planting, and shade for a few days. Roses should now be in full bloom. Keep free from aphis, and cut off all spent flowers. Get the lawn-mower out and keep the grass down. Hoe the borders well, and trim the grass edges.

Orchard Notes for October.

THE SOUTHERN COAST DISTRICTS.

As October is often a dry month throughout the greater part of the State, one of the most important duties of the fruit-grower is to keep his orchard or vineyard in a thorough state of cultivation, thus retaining the moisture in the soil that is essential to the setting and development of the fruit crop. As long as the land is level one cannot over-cultivate, as there is no danger of the soil washing, but when the orchard is on a hillside heavy thunderstorms, which may occur during the month, are very apt to cause heavy washaways of soil if the land is kept in the high state of tilth necessary to retain moisture. In this case the cultivation should always be across and not up and down the face of the hill, and where the soil is of such a nature that it will wash badly thin blocks, consisting of a row or two of a growing crop or of light timber, brushwood, or even a body of weeds or heavy mulching, should be provided, such blocks to follow the contour of the orchard. If dry, and water for irrigation is available, citrus trees will be the better for a thorough watering during the month. Give the trees a good soaking, and follow the irrigation by systematic cultivation, as this is much better than constant surface watering, as practised by the Chinese. Examine the orchard and vineyard carefully for pests of all kinds. When young trees are showing signs of scale insects, cyanide same; when leaf-eating insects of any kind are present, spray the plants that are being attacked with arsenate of lead. Look out carefully for black spot and oidium in grape vines, using Bordeaux mixture for the former and sulphur for the latter. When using sulphur, see that you get a fine sample—viz., one in which the particles of sulphur are in a very fine state, as the finer the sulphur the better the results. Do not apply the sulphur in the early morning, but during the heat of the day, as it is the sulphur fumes, not the sulphur, which do the good. A knapsack sulphurer is the best machine for applying sulphur to grape vines, trees, or plants.

Examine any late citrus fruits or early summer fruits for fruit-fly, and take every precaution to keep this great pest in check now, as, if

fought systematically now, it will not do anything like the same amount of damage later on as if neglected and allowed to increase unchecked. October is a good month for planting pineapples and bananas. Be sure and have the land properly prepared prior to planting, especially in the case of pineapples, as the deeper the land is worked and the better the state of tilth to which the surface soil is reduced the better the results, as I am satisfied that few crops will pay better for the extra work involved than pines.

TROPICAL COAST DISTRICTS.

As the fruit-fly usually becomes more numerous at this time of year, especial care must be taken to examine the fruit thoroughly prior to shipment, and to cull out all fruit that has been attacked by the fly. Banana and pineapple plants may be set out, and the orchards should be kept well tilled, so as to have the land clean and in good order before the heavy summer growth takes place.

All the spring crops of citrus fruits should be now marketed, and the trees, where necessary, should be pruned and sprayed, and the land be well ploughed. The ploughing should be followed by harrowing and cultivating, so as to get the surface of the land in good order. Granadillas and papaws should be shipped to the Southern markets, as, if care is taken in packing and they are sent in the cool chamber, they will carry in good order. These fruits should not be gathered in an immature condition, as, if so, they will never ripen up properly. They should be fully developed but not soft, and if gathered in this condition, carefully handled, and packed and shipped in cool storage, they will reach the Southern markets in good condition, and, once they become commonly known, will meet with a ready sale.

SOUTHERN AND CENTRAL TABLELANDS.

In the Stanthorpe district the spraying of apple, pear, and quince trees for codling moth will have to be carefully carried out, the best spray being arsenate of lead, of which there are several reliable brands on the market.

When fungus diseases, such as powdery mildew, &c., are also present, Bordeaux mixture should be combined with the arsenical spray.

The vineyard will require considerable attention, as the vines must be carefully disbudded, and any signs of oidium or black spot should be checked at once. Look out for late spring frosts, and, if possible, try the effect of smudge fires producing dense smoke for preventing any damage.

Keep the orchards and vineyards well cultivated, as it is of the utmost importance to keep the moisture in the soil at this time of the year if a good fruit crop is to be secured.

In the warmer districts cultivation is all-important, and when irrigation is available it should be used for both fruit trees and vines, a thorough soaking followed by systematic cultivation being given.