QUEENSLAND AGRICULTURAL JOURNAL

VOL. VIII. SEPTEMBER, 1917. PART 3.

Agriculture.

CULTIVATING THE COTTON CROP.

The cultivation of cotton after the crop has been properly planted and is up to a good stand is a very simple matter. The methods followed and the implements used in doing the work are unimportant, provided care is taken to keep the soil in best condition for the rapid growth of the plants. Some of the conditions that are important in the growing of cotton under boll-weevil conditions are the following:—

The highest temperature possible under existing weather conditions, good drainage, and keeping the cotton free from grass at every stage of its growth.

In order to maintain the best temperature and drainage it is necessary to plant the cotton on a bed and to keep this ridge up to a moderate height until as late as the middle or last of September. Late in the season flat cultivation can be given the crop. One very satisfactory method of cultivation to follow is to run a side-harrow around the cotton as soon as it is out of the ground. This will break any crust that may have formed on the soil, leave a good mulch of dirt around the little plants, and destroy all grass or weeds that may have come up. The side-harrow will have a tendency to flatten the beds and the middle should be ploughed out with a middle-breaker at once to guard against wet weather. This cultivation may be followed with a side-harrow and middle-breaker again, and it is not a bad plan to continue this until the middle of the growing season. Later a double-shovel or double cultivators may be substituted for the side-harrow and middle-breaker, using a small sweep next to the cotton

and a large one out in the middle. After the middle of September or October, or when the cotton is getting up to a fruiting stage, begin to practise flat cultivation with some form of diverse cultivator.

It is very important never to allow the soil to become hard or crusty. This may be accomplished by frequent cultivation and by always keeping two or three inches of loose dirt over the surface of the ground. Cotton should be ploughed every ten days. Once a week would be better. The width of the cotton rows should not be less than three feet on any land. A very good plan to follow in spacing rows is to give about the same width that the cotton will grow in height. The chopping or first hoeing of cotton should not be done until danger of cold weather has passed and there are four to eight leaves on the cotton. On ordinary land where cotton will grow from two to three feet high, ten or twelve inches is wide enough space to allow, and on the richest land two feet is ample space.

THE SPACING OF COTTON TO GET THE BIGGEST YIELD.

For years there has been controversy on the spacing of cotton in order to obtain the greatest yield. In the old days of cotton-growing in Queensland, cotton was often spaced to 6 feet by 3 feet, whether Sea Island or Uplands. To-day experience shows that generally cotton gives the greatest yield when planted in close spacing. The following article on this subject, taken from "Cotton and Cotton Oil News," Dallas, Texas, U.S.A., is well worthy of study by cotton growers in Queensland. The experiments and the results refer to Uplands, not Sea Island cotton, and it should also be noted that the boll-weevil does not occur in Queensland cotton fields.

Recently there has come to us a Mississippi Experiment Station Bulletin which gives in detail the results of cotton experiments at three Mississippi stations in 1916. The results obtained from spacing cotton different distances under boll-weevil conditions are of particular interest.

At the Central Station, latitude 33½ north, on valley land of moderate fertility that had been in cotton several years, the following results were obtained:—

WIDTH OF ROWS.

	Per Acre.
3-ft. rows	620 lb. of seed cotton
3½-ft. rows	540 lb. of seed cotton
4-ft. rows	490 lb. of seed cotton
4½-ft. rows	480 lb. of seed cotton
5-ft. rows	400 lb. of seed cotton

The plants in the above plat, thinned to 12 inches in the drill, grew approximately 4 feet high.

DISTANCES IN THE DRILL.

	Per Acre.
12 in.	576 lb. of seed cotton
24 in.	480 lb. of seed cotton
36 in.	450 lb. of seed cotton

Rainfall during the month of July amounted to 12·63 inches, or nearly two and one-half times the normal, and boll-weevils were very destructive.

At the Holly Springs Station, latitude 35 north, on rather highly fertilised land, the following were the results:—

Variety.	Width Row.	Distance in Drill.	Total Lb. Seed Cotton per Acre.
Triumph	3 ft.	9 in.	1,135
Cleveland Big Boll	3 ft.	9 in.	1,290
Sproull's Big Boll	3 ft.	9 in.	1,161
Triumph	3½ ft.	12 in.	1,304
Cleveland Big Boll	3½ ft.	12 in.	1,632
Sproull's Big Boll	3½ ft.	12 in.	1,323
Triumph	4 ft.	16 in.	1,274
Cleveland Big Boll	4 ft.	16 in.	1,467
Sproull's Big Boll	4 ft.	16 in.	1,158
Sproull's Big Boll	4 ft.	9 in.	1,255
Sproull's Big Boll	3½ ft.	12 in.	1,304
Sproull's Big Boll	3 ft.	16 in.	1,367

In regard to the above, Professor Ames, of the Holly Springs Station, says:—"As may be seen from the table, the best yields were secured from the drill. Spaced in this way there are 3½-foot rows with the plants spaced 12 inches in the approximately 12,000 plants on an acre. The varieties used in this test are all rather leafy and growthy. The land, too, was rather highly fertilised. On poorer land with less growthy plants the results would probably have been different."

At the Mississippi Delta Station, on rich loam land, the following results are reported, all rows being 3 feet and 9 inches wide:—

Variety.	Distance in Drill.	Seed Cotton per Acre.
Express-41	Unthinned	1,330
Express-41.	6 in.	1,470
Express-41	12 in.	1,400
Express-41	18 in.	1,470
Trice	Unthinned	1,715
Trice	6 in.	1,750
Trice	12 in.	1,680
Trice	18 in.	1,610
Lone Star	Unthinned	770
Lone Star	6 in.	805
Lone Star	12 in.	1,120
Lone Star	18 in.	1,050
Columbia	Unthinned	945
Columbia	6 in.	945
Columbia	12 in.	1,015
Columbia	18 in.	1,085

Commenting on these results, Director G. B. Walker says:—"Though the results from this experiment are not conclusive, it appears that with the early dwarf varieties, like Trice, close spacing will give the

highest yields, especially where only the early fruit can be counted on. The later, large-leaved varieties appear to yield better if given more space."

Turning now to Louisiana, where for twelve years farmers have had to fight the boll-weevil for the cotton crop, we find the following interesting results obtained by Newell, of the Louisiana Experiment Station:—

In 1907, on sandy loam upland at Mansfield, Louisiana, with Triumph cotton fertilised with a mixture of 200 lb. acid phosphate and 100 lb. cotton seed meal per acre, with cotton in rows 6 feet apart and plants 18 inches in the drill, the yield was 734 lb. seed cotton per acre; in 4-foot rows and plants 12 inches in the drill, 892 lb. per acre; and in 3-foot rows and plants 10 inches in the drill, 947 lb. per acre.

The next year the same land was planted to the same variety of seed and similarly fertilised, with the following results:—Six-foot rows, plants 20 inches in the drill, made 838 lb. of seed cotton per acre; 4½-foot rows, plants 15 inches in the drill, 993 lb. per acre; and 3-foot rows, plants 12 inches in the drill, 1,344 lb. per acre.

In 1908 a similar test with Triumph cotton was conducted on sandy chocolate land, fertilised with 300 lb. of acid phosphate per acre, at Mansura, Louisiana, with the following results:—Six-foot rows, plants 18 inches in the drill, yielded 474 lb. of seed cotton per acre; 4-foot rows, plants 10 inches in the drill, 621 lb. per acre.

The same year a similar test with Triumph cotton, unfertilised, was conducted on rich alluvial land at Bayou Pierre, Louisiana, with the following results:—Seven-foot rows, plants 24 inches in the drill, yielded 308 lb. of seed cotton per acre; 4½-foot rows, plants 15 inches in the drill, 553 lb. per acre; and 3½-foot rows, plants 12 inches in the drill, 636 lb. per acre.

These experiment station results, when we bear in mind that they are in line with similar results obtained by other stations both in and out of boll-weevil territory, indicate quite clearly that on average lands rather close spacing will give the largest yields. Certainly the old advice, "Space wide and let the hot sunshine kill the weevil," is bad.

[The moral for Queensland cotton growers, who have not the boll-weevil to contend with, is still "To space wide is bad."—ED. "Q.A.J."]

THE COTTON CROP, 1916-1917.

The Agricultural Department, in reply to advertisement, received early in August several tenders for the cotton which was being ginned by the Department, and the Minister accepted the highest tender of 11d. per lb. for the cotton, delivered in Brisbane. The successful tenderers were Messrs. Foy and Gibson, Brisbane. An accurate calculation was not possible until ginning operations were concluded, and considerable quantities of seed cotton were still coming in. It was estimated, however, that the return to the growers would be about 3½d. per lb. of seed cotton, as against a fraction over 2½d. last year. It was at first estimated that

the total of ginned cotton would be about 17,000 lb., but since cotton came in very freely it was estimated to reach about 30,000 lb. Last year the growers received a net return of 2·54d. per lb. of raw cotton, which at the low average of 1,000 to the acre is equal to £10 11s. 3d. per acre. The average cost of planting, cultivating, and harvesting a 1,000 crop is estimated at £2 16s. 11d. The net return to the growers of the 1916 crop was £7 14s. 9d. per acre. The planting season is now upon us, and those who require seed should apply to the Department, and it will be supplied free of cost. About 10 lb. of seed—a generous allowance—are needed for an acre, which under ordinary circumstances should return at least 1,000 of seed cotton. Much larger returns have been made in Queensland, especially during the 1907 season, when the following yields per acre were obtained:—At Wallumbilla, 2,240 lb.; Tallegalla, 4,250 lb. and 3,527 lb.; at Vernor, 3,006 lb., 1,473 lb., and 1,300 lb.; Mackay, 1,368 lb. Similar results were obtained in 1915, but only on a limited scale.

Intending growers who have the Department's pamphlet on cotton-growing should note particularly the remarks on "The New System of Cotton Cultivation" to ensure the production of an earlier crop and increased yield.

THE COTTON OUTLOOK FOR 1917-1918 IN THE UNITED STATES OF AMERICA.

Reports from the cotton belt are anything but encouraging. Low temperatures have been experienced in many sections, which have further accentuated the lateness of the crop. This is most disquieting when the need for a large yield is so essential.

Reports advise the steady migration from the South to the North of negroes, and it is estimated that 309,000 have left the cotton belt during the last eight months.

The successful prosecution of the war is receiving greater attention than trade, but this cannot continue indefinitely. The strong statistical position of cotton, which will be emphasised by the probability of the new crop being inadequate to provide a surplus over requirements, must command attention. Everything points to the cotton supply position during the next eighteen months occasioning the cotton trade of the world anxiety.

The stocks of manufactured goods throughout the world are acknowledged to be low. Consequently at some future date replenishment must take place.

The probability is that demand from countries other than Europe would be large, given reasonable facilities for trading. Therefore, in looking ahead, it would be unwise to place the world's requirements of American cotton under 14,500,000 to 15,000,000 bales.

The importance of augmenting the cotton supply has been repeatedly urged, but never before was the necessity so urgent as at present to avert a shortage.

LINTERS AND GUN COTTON.

The processes through which cotton passes in its preparation for use in the manufacture of guncotton are described in the following statement which was prepared by the United States War Department:—

"The cotton used in explosives manufacture consists of unspun short fibres, generally the linters and hull fibres which remain after the earlier ginning has removed the longer fibres more valuable for spinning and less suited to the manufacture of explosives. As an example of the treatment of this material, the United States Army specifications for smokeless powder require that the cotton be purified and bleached and thoroughly washed to remove the purifying and bleaching materials, salts, &c., and that, as the result, the cotton shall contain not more than 0·4 per cent. of extractive matter, not more than 0·8 per cent. of ash, and not more than 'traces' of lime, chlorides, sulphates, &c., also that it be of uniform character, clean, and free from such lumps as would prevent uniform nitration. It is delivered to the explosives factory in bales, sometimes compressed, sometimes not, but always covered with paper or other material for protection from dirt.

"In making smokeless powder or explosives, the cotton generally after being run through a picking machine to separate the fibres is dipped into nitric and sulphuric acids to nitrate it, producing nitro-cellulose, which is then washed, boiled, cut in a beater or pulping machine, further washed, and then wrung in a centrifugal. Up to this point the only important difference depending upon use is the degree of nitration, being more highly nitrated if for use as a high explosive. Such nitrocellulose, generally called military gun-cotton, is usually after the foregoing operations completed by pressing into blocks. If for smokeless powder the nitrocellulose must, however, be thoroughly dehydrated, mixed with a suitable solvent, and worked to a very stiff paste or colloid, either alone or mixed with other ingredients (nitroglycerine, &c.), and is then forced from a hydraulic press through dies and cut into grains of desired length, and dried."—"Cotton," official journal of the Manchester Cotton Association.

KUDZO.

To an exchange Mr. B. Harrison, F.R.H.S., contributes the following information concerning Kudzo, a plant which, because of its drought-resisting and soil-enriching properties, is claiming attention in various parts of Australia:—

The plant is a native of Japan, where it is a leading crop, and it is also highly commended by the United States authorities. This is a perennial vine, and its numerous merits, compared with lucerne, which is styled the "king of fodder plants," are many. It succeeds in any class of soil, if drained, does not require any fertiliser, it rapidly enriches poor soil, it does not require to be cut at a certain time to save it. It will

transform poor soil or barren hillsides into profitable use. it makes good permanent pasture, and it is not injurious to stock at any stage—either green or dry—and when fed to cows it will produce more and richer milk than any other single feed, as it is more nutritious than either lucerne or bran. It is said that in the United States it has produced four cuttings of 2½ tons each per acre annually. It is very drought-resistant, as it roots deeply, and the vines cover the ground with foliage which acts like mulch and conserves moisture. It is also said that land planted with kudso soon becomes like the rich soil that has recently been cleared from the virgin forest, and it becomes richer each year through the large quantity of nitrogen deposited therein. It should be cultivated in rows 8 ft. apart the first season, after which it will require but little attention.

IS A MECHANICAL COTTON-PICKER POSSIBLE?

Many attempts to invent a mechanical cotton-picker have been made, and several machines have been patented that will pick cotton, but none as yet has proven practical. The best of them either do too much damage to the stalks or they are too costly to operate.

Up to date the Southern negro has proven the best and cheapest cotton-picker.

No mechanical device has yet been found to take his place in gathering cotton. It might be rash to say that no mechanism can be invented that will pick cotton successfully and at a cost that will justify its use in the field.

Man has made other successful inventions that appear to be as intricate and as difficult as it is possible for machinery to be, yet a really practical, successful cotton-picker seems to defy the inventive genius of man.

Why should a cotton-picking machine be more difficult to make than the cotton gin, the sewing machine, the great self-binding reapers that harvest our grain for us, or the mighty printing presses that print and fold thousands of newspapers an hour? What is peculiar about the picking of cotton that renders a machine for the purpose any more difficult to construct than the inventions mentioned?

The answer to these questions may furnish the crux of the difficulty and yet leave the problem as far from solution as ever. In all the many useful machines that serve the purposes for which they were devised the material on which they operate is fed to them mechanically, but the machine that picks cotton must hunt the material on which it is to operate in a wilderness of foliage, branches, and bolls. Can a machine be made to do this successfully? *Quien sabe?*—"Cotton and Cotton Oil News."

MARKET GARDENING.

CROPPING A 10-PERCH ALLOTMENT.

Many people who have not previously had a garden are now endeavouring to grow vegetables on a small allotment, and some are, naturally enough, puzzled as to what quantities of the different kinds of vegetables it is possible to grow. The following article and plan of a garden which we take from the "Journal of the Board of Agriculture," London, are as applicable to Queensland as to England. They are based mainly on the assumption that most people will desire to grow several of the simple crops, in addition to potatoes. In the accompanying plan, the ground allotted to potatoes amounts to a little less than half the 10 perches, or just over 4½ perches. This area can easily be increased at the expense of the other crops, and, in particular in place of peas, for which the ground allotted adjoins the potato patch. Where manure is not too plentiful, legumes, *i.e.*, peas and beans, are of great value, since they collect nitrogen for other crops; hence the apparently large area devoted to these crops. After they are removed the ground may be dug and prepared for the small seeds of the following season, and for the second year the potatoes may be removed to the other end of the allotment, while the legumes should be removed to the patch now set out for potatoes. Many variations of the plan are possible. No ground has been set out for such crops as spinach, leeks, celery, &c., nor for salad crops, except as regards the vacant ground between peas and beans. The crops indicated are the staple crops of the garden, but others may be planted as the season for some of them is over, or space may be found on the border of some of the beds for salad crops and herbs, eschallots, as well as for a few bush marrow plants.

As regards manure, dung is the best all-round manure, and may be applied at the rate of 1 cwt. per perch. As a substitute there are many kinds of artificial manures which are normally used. Nitrates produce fine, luxuriant foliage, *e.g.*, they are useful for the cabbage and similar crops; phosphates induce earlier production of fruit and flowers, and will be found most useful with beans, peas, turnips, parsnips, &c.; while potash increases the substance and improves the quality of fruits, tubers, and roots, and it is excellent for potatoes. Guano is the best artificial fertiliser for the garden, as it contains all three of the plant foods mentioned. Pigeon and poultry dung are good substitutes. These may be applied at the rate of 4½ lb. to 7 lb. per perch. They should be mixed and pulverised with some fine, dry material, such as earth ashes or fine coal ashes. Wood ashes contain considerable potash, and for potatoes should be applied at the rate of about 4 lb. per perch. Heavy soils are benefited by lime. This may be applied at the rate of 2 to 5 bushels per 10 perches. It is best applied before the crop is planted, and thereafter it may be sprinkled on the top of the ground in small quantities. Fresh gas-lime is injurious to vegetable life.

As two crops of potatoes are anually raised in Queensland—the summer and the winter crops—a different rotation would be needed.—(Ed. "Q.A.J.")

Cropping—a 10 Perch Allotment.

No. of rows.	Crops.	Distance between rows.	33 ft. — Approximate number of plants	Space Allotted
3	Parsnips	15 ins.	150	3 ft 9 ins.
3	Carrots	12 ins.	230	3 ft. 3 ins.
4	Turnips	12 ins.	132	4 ft.
2	Beetroots	12 ins.	66	2 ft.
6	Onions	12 ins.	400 small to 600 medium size.	6 ft.
4	Broad Beans	18 ins	At 4 ins. 400 At 6 ins. 260	6 ft.
3	Dwarf Beans	18 ins	99 (or Early Brussels, 36)	4 ft. 6 ins.
2	Runner Beans	3 ft	At 6 ins. 132 At 9 ins 88	6 ft.
3	Early Mid Season Late Peas	3 ft	At 2 ins 600 At 4 ins 300	9 ft.
4	Early Potatoes	2 ft.	At 12 ins. 32 per row At 9 ins. 12 per row	8 ft.
4	Second Early Potatoes	2 ft. 6 ins	At 12 ins 132 (Brussels Sprouts, 16 per row.)	10 ft.
8	Main Crop Potatoes	2 ft 6 ins	At 12 ins 32 per row At 15 ins. 26 per row At 18 ins. 22 per row (Kale etc., 16 per row)	20 ft.
			Total	82 ft 6 ins

LAYING OUT THE GARDEN.

ECONOMY IN THE USE OF SEEDS.

It is important in the national interest that everyone who is sowing vegetable seeds should exercise economy in order that no more seed should be sown than is necessary. In ordinary times, when seed is both plentiful and cheap, it is often used with a free hand, but at the present time the seeds of many vegetables are neither plentiful nor cheap, and it is therefore not only a wise economy but also a duty to make seed go as far as possible.

The following hints will be of use in this connection:—

1. The seeds of many vegetables, especially if they are from a good harvest, retain their germinating power almost unimpaired for several years. This is true, for example, in the case of seeds of leguminous food plants—peas, beans, scarlet runners, French beans, &c. Therefore, before opening this year's seed packets, seeds of these kinds of vegetables left over from last year's seed order should be tested in order to ascertain whether they will germinate well or not. This is very easily done. All that is necessary is to line two saucers with pieces of flannel or with blotting-paper and to moisten, but not thoroughly to wet, the flannel or blotting-paper. A known number of seeds (20 or 30) should be placed, well separated from one another, in one of the saucers. The other saucer is then inverted on the one containing the seeds, and the saucers are stood in a moderately warm place, and to prevent drying up by evaporation may be covered with a bowl, jar, or newspapers. The germination will be quicker if before the seeds are placed in the saucer they are soaked in water until they have "plumped up"—for example, they may be soaked over night. After a day or two, the saucers being examined daily, the seeds which have begun to sprout are counted and removed. The rate of each seed's germinating varies very much according to the kind, so that the test must run on for a time, varying from two or three days to ten days or a fortnight. If a fair proportion of last year's seeds germinate they should be sown, and this year's seeds may be kept in their unopened packets for use next year.

2. Seeds should be sown as thinly as possible, but at the same time it must be remembered that if sown too thinly there may be gaps when the seedlings come up.

3. It should be remembered that many seedlings transplant quite well, so that carefully lifted thinnings can be used to increase the number of rows.

4. Care should be taken to ensure that there is no wasteful use of such seeds as those of cauliflower. At the same time, large gardeners should remember that a few dozen seedlings (good varieties) of cabbages and savoys are often a welcome gift to the smaller gardeners in their neighbourhood.

5. Anyone who has parsnips, beet, carrots, leeks, celeriac, or cabbages sown last year should leave some of each of these plants in the ground, let them run to seed, and if they do seed should be saved. Home-saved seed should, if possible, be protected from birds, and should be allowed to ripen thoroughly, should be harvested when ripe, and all the bad seed picked out and burnt, and the rest kept away from the air in a cool, dry place. The risk of disappointment in some cases owing to a wet autumn is well worth taking.

6. Another point which amateurs would do well to remember is that mice are very fond of certain kinds of seeds—certain peas, for instance. The seed should be slightly moistened and mixed with a little red lead so that the seed is avoided by vermin. Birds also are very apt to peck and destroy seedlings. Where netting is not available, three or four strands of black cotton stretched over the rows on sticks will often serve to keep birds away.—"Journal of the Board of Agriculture."

NEGLECTED INDUSTRIES.

THE PRODUCTION AND INDUSTRIAL EMPLOYMENT OF VEGETABLE OILS.

When we consider the large quantities of various vegetable oils annually imported into Queensland for use in a variety of industries, and that all the plants producing such oils find a congenial home in all parts of the State, according to the necessary climatic conditions, it is remarkable that no enterprising capitalists or companies have as yet not turned their attention to utilising these resources by manufacturing a product which is of first-class or of considerable industrial importance. The principal vegetable oils and their sources are discussed in the following article which appeared in "The Engineer" (16th February, 1917) :—

LINSEED.

Linseed is undoubtedly one of the most important, if not the most important oil known to man, and is derived from the seeds of the flax plant. This plant is cultivated in two distinct forms, one more richly flowered than the other, and therefore grown for the sake of the seeds. This variety is chiefly cultivated in Russia, India, Canada, the United States, and the Argentine. The Russian, particularly from the Baltic district, is perhaps the most highly esteemed source of linseed oil. The seed contains from 38 to 40 per cent. of oil. The oil is recovered from the seed very commonly by hot pressing. The hot press cake retains about 10 per cent. of the oil, and forms an extremely valuable and wholesome cattle food. Occasionally the seeds are pressed cold for the recovery of an edible oil. The hot pressed oil is of wide application in the arts, and is used extensively in the manufacture of soft soaps. Its high specific gravity and its fine drying qualities make it of first importance in the manufacture of paints and varnishes. The chemical changes which occur when linseed oil "dries" are not clear, but it is certain that the main feature is the oxidation of the oil. The oxygen is taken up rapidly, and transforms the oil into a flexible solid mass, known as "linoxyn," which is manufactured on a large scale, for it is the principal raw material of the linoleum and oil-cloth industry. In the natural state linseed oil dries to an elastic skin in about three days. If, however, it is prepared by heating it with various salts of lead or manganese, it will dry within six or eight hours. So treated, it is known as boiled oil, and is much used by painters and artists.

COTTON SEED OIL.

This oil has a claim to be ranked next in importance to linseed oil. It is obtained from the seeds of the cotton plant. The Egyptian and Sea Island cotton plants yield a black seed, while the American and Indian seeds leave the cotton gin with a considerable amount of the fibre still adhering to them. This is removed by a special machine. The husks also are removed before crushing the kernels. On an average, the amount of oil which the latter contains ranges from 18 to 24 per cent. according to the plant producing them. The residue left after milling the seed for

the oil retains all the fertilising properties, and is largely used as manure for sugar-cane, cotton, corn, tobacco, and so on, but it is found that the most economical manner of using it is to feed it to cattle, and to use the resulting manure, which contains 80 to 90 per cent. of fertilising value, on the land.

Cotton seed oil is a so-called semi-drying oil which absorbs oxygen slowly, but by blowing air through it at about 100 degrees cent., the absorption can be increased. Blown cotton seed and other semi-drying oils, similarly treated, become thickened and appear like castor oil. They are produced on a large scale, and when dissolved in light mineral oils are used as lubricants for machinery.

Refined cotton seed oil is in extensive use for edible purposes. It appears on the table as salad oil, it is used by the sardine tinning industry, and under the name of butter oil it forms one of the chief raw materials of the margarine manufacturer and of the manufacturer of lard substitute, or compound lard as it is called. Apart from the very great use of cotton seed oil for edible purposes, its chief industrial employment is in the soap-making industry. It is frequently used in this connection by itself. As an ingredient of toilet soap it is commonly mixed with tallow or coconut oil. It is also widely used in the manufacture of soap powder.

OLIVE OIL.

Olive oil is in several respects chemically and industrially closely similar to cotton seed oil. The latter being cheaper is frequently substituted for it, notably for edible purposes. The reputation of olive oil as an edible oil is, however, too great for it ever to be supplanted completely by any other. The olive tree is chiefly cultivated in the countries bordering the Mediterranean. The fruit of the olive consists of rind, flesh, stone, and seed kernel. All parts contain oil. The fleshy part, forming 80 per cent. of the whole, contains from 40 to 60 per cent. of oil, and yields the best oil for edible purposes. To produce this oil the fruit is gathered before it is quite ripe, and is peeled and stoned. The flesh is then pressed by itself. The kernels are crushed separately, and yield an inferior "olive kernel oil." The pulp left after the pressing of the flesh may contain as much as 20 per cent. of oil. It is ground up with hot water and allowed to stand until the broken-up cellular tissue rises to the surface. This is again pressed for a second-quality oil. The residue is finally extracted with solvents, commonly carbon disulphide. Such extracted oil acquires a deep green colour from the chlorophyll in the fruit, and is principally used for soap-making. In some mills the original fruit is not stoned before being pressed for the first time, but is crushed as a whole. The oil yielded is of a less perfect quality than that obtained by the other process, for it contains the poorer oil derived from the kernels.

The oil derived from the first pressing of the fruit is almost invariably used for edible purposes. A second or third pressing is commonly adopted. The oil so obtained is used for soap-making and for lubricating and burning purposes, for olive oil is a non-drying oil. The press cake is sometimes used locally as a cattle food. The value of the oil,

however, makes it pay to carry the recovery to the greatest possible extent. Hence the last drop of oil is usually recovered by the chemical solvent process.

CASTOR OIL.

The castor oil tree or shrub—it is found in both forms—grows in all tropical and subtropical countries. The seeds are enclosed in a rough outer shell, and consist of a husk containing a soft, white kernel, constituting 80 per cent. of the seed, and yields from 46 to 53 per cent. of its weight in oil. The husks are oilless. The oil is of the non-drying class, and is of great value as a lubricant. It is extensively used in the soap industry. Its medicinal use depends on the fact that it contains an alkaloid. This alkaloid in excess is poisonous, hence the residue left after crushing the seeds is unfit for cattle food. Hence the oil residue in it is extracted by solvents, such oil being suitable for soap-making and other technical purposes. The ultimate residue is used as manure.

Castor seeds are commonly pressed cold to obtain medicinal oil, and then pressed a second or third time in a hot condition to obtain technical quality oils.

AFRICAN OIL PALM OIL.

The fruit of the African Oil Palm consists of a fleshy outer layer or pericarp surrounding a hard woody shell within which is the seed kernel. Roughly, the shell forms 50 per cent. of the whole, the fleshy pericarp 35 per cent., and the kernel 15 per cent. Of the pericarp, 50 per cent. or so is oil, while the kernel yields about 45 per cent. In the case of the olive, the oils recovered from the fleshy part and from the kernels are practically the same. In the case of the palm-tree fruit, they are quite different. Palm oil, the product obtained from the pericarp, is used principally in the making of soap and candles. The pericarp, owing to its nature, has to be worked up as soon as the fruit is pulled. Consequently, the factory is placed near the plantation. The kernels, separated from the pericarp, are shipped to the United Kingdom, and (before the war) to Hamburg, &c., and are treated by crushing and extraction with solvents for the recovery of the oil. This oil, in a fresh condition, is largely used in the manufacture of margarine, and, to a considerable extent, when suitably treated, in the manufacture of chocolate. The poorer qualities and the extracted oil are suitable for soap, candle, and paint-making. Palm kernel oil-cake is somewhat deficient in nitrogen, so that its value as a cattle food is less than that of some other qualities of cake. This deficiency also renders the residue from the extraction process of low value as a manure.

COCONUT OIL.

Coconuts are obtained from a tree of the palm family, not, of course, from the cocoa (or cacao) tree. The fleshy layer inside the nut, dried, either in the sun or by artificial heat, is known as "copra." The undried flesh contains about half its weight of water, so that, by drying it—an operation carried on at the place where the nuts are gathered—a considerable saving of freight is effected. The copra shipped to the oil

mills is shredded and crushed hot. It yields round about 64 per cent. of its weight in oil, but this figure is subject to variation accordingly to the precise method adopted for drying the copra by the gatherers. Coconut oil is very closely similar to palm kernel oil, and is used for much the same purposes, that is to say, chiefly in the making of margarine and soap. These three oils, palm, palm-kernel, and coconut oils, are all of the non-drying type, and are to be regarded as vegetable fats rather than as oils.

It may be noted here, that although coconuts do not grow on cocoa trees, still, coconut oil—and also palm kernel oil—is of great value to the chocolate manufacturer. The cocoa bean, when roasted and ground, contains about 50 per cent. of fat, or "cocoa butter," as it is called. This fat renders the cocoa powder difficult of mixture with boiling water and indigestible. It is, besides, a valuable substance in itself, being used in medicine and soap-making. Hence it is frequently removed to the extent of about half its original amount by submitting the ground cocoa powder to hydraulic pressure. In working up the cocoa powder into chocolate of the best quality, a portion of the extracted cocoa butter is returned to it. In other chocolates the valuable cocoa butter is omitted, and coconut oil, suitably treated, or palm kernel oil, is used instead.

Soya Bean Oil.

The Soya Bean plant flourishes in Manchuria, China, and Japan. In Manchuria, the cultivation of the plant is stated to have been the main agricultural industry for centuries, while the production of soya bean oil and oil-cake formed the most important manufactures of the country. The bean cakes have for long formed one of the chief articles of food for the inhabitants. Nevertheless, the bean and the oil it yields were almost unknown in Europe until the Russo-Japanese war. Since then the production and use of soya bean oil and soya bean cake have developed phenomenally. The oil in Europe now rivals that obtained from the cotton seed, while the cake, on the Continent at least, is contesting the position as a food for milch cows held by linseed and cotton seed cake. The oil belongs to the semi-drying class, and is used for edible purposes, as an illuminant, in soap-making, and in the manufacture of linoleum. The bean contains about 18 per cent. of oil, and in the press yields from 10 to 13 per cent.

Rape or Colza Oil.

The rape plant is grown extensively in many European countries, notably in Russia. It is cultivated in British India to an extent which renders the annual crop second only in importance to the linseed crop. The bulk of the Indian seed is shipped to England, but Germany used

to have a preponderating hold on other sources of supply. Rape oil belongs to the semi-drying class, and is principally used for burning purposes and as a lubricant. In the latter case the oil is frequently "blown," as mentioned above under cotton seed oil. To a small extent rape oil when obtained by "cold drawing" is used for edible purposes, notably by bakers in the production of bread. It is commonly employed as a quenching medium for steel plates, &c., and on the Continent is used occasionally in the manufacture of soft soap. The seed contains anything from 33 to 43 per cent. of oil. It is frequently extracted by means of solvents. The oil apparently contains a poisonous element. Consequently rape seed cake is not greatly valued as a cattle food. It may, in fact, be said that the bulk of the residue left after either crushing or extraction with solvents is used as a manure.

MUSTARD OIL.

This oil is obtained from the black, white, or wild mustard plant, and is used in soap-making and as a substitute for or adulterant in rape oil, with which it is closely similar. The cake left after crushing is, however, a more important product than the oil. When ground, this cake gives the mustard of the domestic table.

SUNFLOWER OIL.

The sunflower is cultivated for the sake of its seeds on an immense scale in Russia, Italy, India, and China. The seeds, raw or roasted, are used in Russia as an article of diet. The oil recovered from them by crushing is, when refined, considered by some to equal olive oil for edible purposes. Its chief use, however, is in soap and candle-making. The seeds contain from 20 to 23 per cent. of oil. For cattle-feeding purposes the cake is not only very palatable, but being rich in nitrogenous matter is of great food value. Sunflower oil belongs to the drying class. The sunflower is very readily cultivated, and produces a high yield of seeds. It is believed that the Central Empires, cut off as they are at present from many important sources of oils and fats, are cultivating the sunflower on an extensive scale in an attempt to reduce the deficiency. They are probably growing flax—for linseed oil—also on a considerable scale; but flax, it is to be noted, rapidly exhausts the soil and is, therefore, in all likelihood being cultivated to an extent only slightly greater than in peace time. It may perhaps be added that the rumours recently in circulation as to Germany's shortage of glycerine and the horrible means she is adopting to make it good cannot be accepted as true by those qualified to judge. In the first place Germany uses

little or no glycerine in the production of her explosives, differing in this respect from this country which, of course, depends extensively upon nitro-glycerine. In the second place the yield of glycerine from the source suggested would be altogether too insignificant to justify the cost, trouble, and difficulty of recovering it.

POPPY SEED OIL.

The seed of the poppy contains from 45 to 50 per cent. of an oil which, when "cold drawn," is almost colourless, has little odour, and possesses a pleasant taste. It is in extensive use on the table as a salad oil, and is highly valued by artists and artists' colourmen. The seeds are usually expressed twice, the second pressing being carried out hot and yielding an inferior oil, which is extensively employed in making paints and soft soaps. The oil belongs to the drying class. Poppy seed cake is rich in nitrogen and is highly valued as a cattle food.

As showing the enormous value of the output of oil-seeds and vegetable oils in India, a report on the progress of agriculture in that country for 1915-1916 shows that the Indian export trade in oil-seeds and vegetable oils is worth, annually, over £16,500,000 sterling. Only about one-third of the output is exported, and the remainder is used in the country. After the outbreak of the war the exports of oil-seeds have naturally declined. The oil-seeds that have been mostly attended to are ground nuts (peanut), sesame, and coconut. The area under ground nuts has increased from 431,000 acres in 1901-1904 to 2,413,000 acres in 1914-1915. From a small beginning in Burma in 1902 the crop now occupies 262,000 acres. The net profit per acre from its cultivation has been estimated at 47 rupees (about £4 6s.).

With regard to sesame, the Indian (Burma) crop covers something like 1,000,000 acres annually.

The importance of the coconut palm tree in South India may be gauged from the fact that the value of exports of its various products during 1914-1915 amounted to over £1,500,000 sterling.

A NEW INDUSTRY IN PAPUA—MANGROVE BARK.

It looks (says "The Papuan Courier") as if there is every possibility of this becoming a great industry, and the pioneer of the trade, Mr. Butterworth, is now shipping large quantities of the bark to Australia, and various other small companies and syndicates have been formed.

The mangrove tree might be termed a land builder, as it collects and binds the soil in swamps and shallows, and in course of time large areas are in this way reclaimed.

The settlers employed in this industry should receive every assistance from the Government as regards concessions and reduced rates from the coastal and ocean shipping companies.

An industry which has for its object the extraction of chemicals from mangrove bark for the purposes of tanning is about to be started in Papua.

Mr. Ross, the representative of a Melbourne company, after three or four visits to Papua, has finally decided to recommend his company to commence operations.

Accompanied by Mr. G. Lincolne (of the firm of Messrs. Lincolne, MacDougall, and Demaine, civil and consulting engineers, of Melbourne), various sites have been inspected, and Kerema has been settled on as the place most suitable for the company's requirements. Other localities are in view to extend their operations once a start has been made. Permission has been granted by the Federal Treasurer to allow of the company to operate, and a sum of at least £20,000 is to be expended in the purchase and erection of a plant. Of course, some little time must elapse to enable the necessary machinery to be built and erected.

Both Mr. Ross and Mr. Lincolne stated, in an interview with our representative, that they were confident of the ultimate success of the enterprise, and that a great future exists for their operations. A chemist had been experimenting with the mangrove bark with the object of eliminating all dangerous chemicals therefrom.

We have no doubt all possible assistance will be granted by the Government towards facilitating matters for the new company.

Incidentally, Mr. Ross made inquiries in the direction of erecting a pulp mill for the manufacture of paper, but negotiations in that direction are at present in abeyance. In view of the present high cost of paper in Australia, and consequently in Papua, a movement in the direction of making paper here, with its huge timber resources, and the large amount of waste products inseparable from timber-getting, must recommend itself to all and sundry. A great deal of the business of the community is at any time likely to be hung up, owing to the insufficiency of paper supplies, and until the termination of the great European conflict no improvement in conditions can be looked for.

EXHIBITION NOTES, 1917.

THE EXHIBITS OF THE DEPARTMENT OF AGRICULTURE AND STOCK AT THE EXHIBITION OF THE QUEENSLAND NATIONAL ASSOCIATION, AUGUST, 1917.

Since the inception of the Queensland National Agricultural Association, forty odd years ago, there has been constant progress, despite initial difficulties, droughts, and eventually the destruction by fire of the first Exhibition Building at Bowen Park in June, 1888. It might have been and probably was anticipated that, owing to the increased exigencies of the war, necessitating special taxation, to the frequent disturbance of both rural and urban industries, consequent upon the many industrial strikes, and latterly to a long spell of dry weather, the prospects of a successful Exhibition in August, 1917, would not be very bright. Yet the very reverse has happened. That Exhibition was such a wonderful success, excelling all previous efforts in its results, that a casual visitor, unacquainted with the recuperative powers of the agricultural and pastoral industries of the State, might be excused for his belief that Queensland had been revelling in splendid seasons, and, consequently, in unreduced productions of nature and art, and it was, at the outset, generally conceded that the Exhibition of 1917 would prove a shining light in the history of the forty-two Exhibitions of the National Association. Nor were these anticipations destined to be erroneous. On the first day, before the official opening, the attendance numbered 6,000, the receipts being £72 7s. Only twice was this exceeded, and singularly enough, once, in point of numbers, during the great strike of 1912, when the record was 7,000 on the first day, representing receipts amounting to £87 13s., and the second time in 1914, in cash receipts from 4,800 visitors amounting to £88 2s. 6d.

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, animal, mineral, vegetable, and industrial, of this, the most resourceful of all the States of Australia. 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 sellers and agents.

The limits of this Journal will not admit of our giving an exhaustive description of the multifarious exhibits and awards in this connection. That we must perforce leave almost entirely to the enterprise of the metropolitan and rural journals, confining ourselves to special salient points.

A word may here be appropriately added as to the onerous duties of secretary of the Association, which has from its inception been fortunate in the choice of its "first lieutenants." On the decease of the

late Mr. Arvier, to whom the success attending many previous shows was due, the present secretary, Mr. J. Bain, has given ample evidence of his good organising ability, and he has carried on the good work since 1915 with an energy and enthusiasm which must be instrumental in building further success upon the solid foundation which he and his predecessors have laid. The position of secretary to an important Association such as this one, demands much tact and firmness, especially at Show time.

EXHIBITS OF THE DEPARTMENT OF AGRICULTURE AND STOCK.

Amongst the best arranged agricultural courts at the Exhibition this year, the display made by the Department of Agriculture and Stock undoubtedly takes a foremost place, and much is there to convince the stranger that Queensland is a most desirable State to select for a home. In this section, as also in those of 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 agricultural and pastoral land open to selectors. As far as rainfall is concerned, it must be confessed that occasionally severe droughts occur, and, as a matter of fact, for the four months preceding the Exhibition of 1917, very little rain fell in the Southern and Western districts, but to judge by the splendid exhibits of agricultural produce of all kinds, of cattle, horses, sheep, &c., this dry period had no generally bad effect on production.

Taken as a whole, the exhibits were so arranged as to bring before the public a number of individual sections, representing a part of the Department's activities, these being classed in such a way as to afford as much information as possible, and, at the same time, being of a highly educational character. The Court, this year, was arranged in a different manner to that of 1916, and afforded far more space for visitors to move about freely and inspect the exhibits at leisure.

In a general way, the various sections were grouped under four main heads: Temperate, Tropical, Agricultural, and Pastoral.

The several divisions were made up by—

Tropical and sub-tropical products: Exhibits of sugar-cane, tobacco, cotton, &c.

Wool.

Entomology and Plant Pathology, comprising—Diseases of fruits and vegetables; Queensland butterflies, moths, and beetles; insects injurious to fruits and fruit trees; insectivorous insects of the various districts of the State.

Botanical exhibit, embracing the chief natural grasses of Queensland, a large collection of the weeds of Queensland, prickly-pear of various kinds, &c.

Wheat and wheat-milling exhibits, the former being drawn from several of the chief wheatgrowing districts, and from the wheatbreeding State Farm at Bungeworgorai, near Roma.

PLATE 9.—GENERAL VIEW OF THE COURT OF THE AGRICULTURAL DEPARTMENT FROM MAIN ENTRANCE.

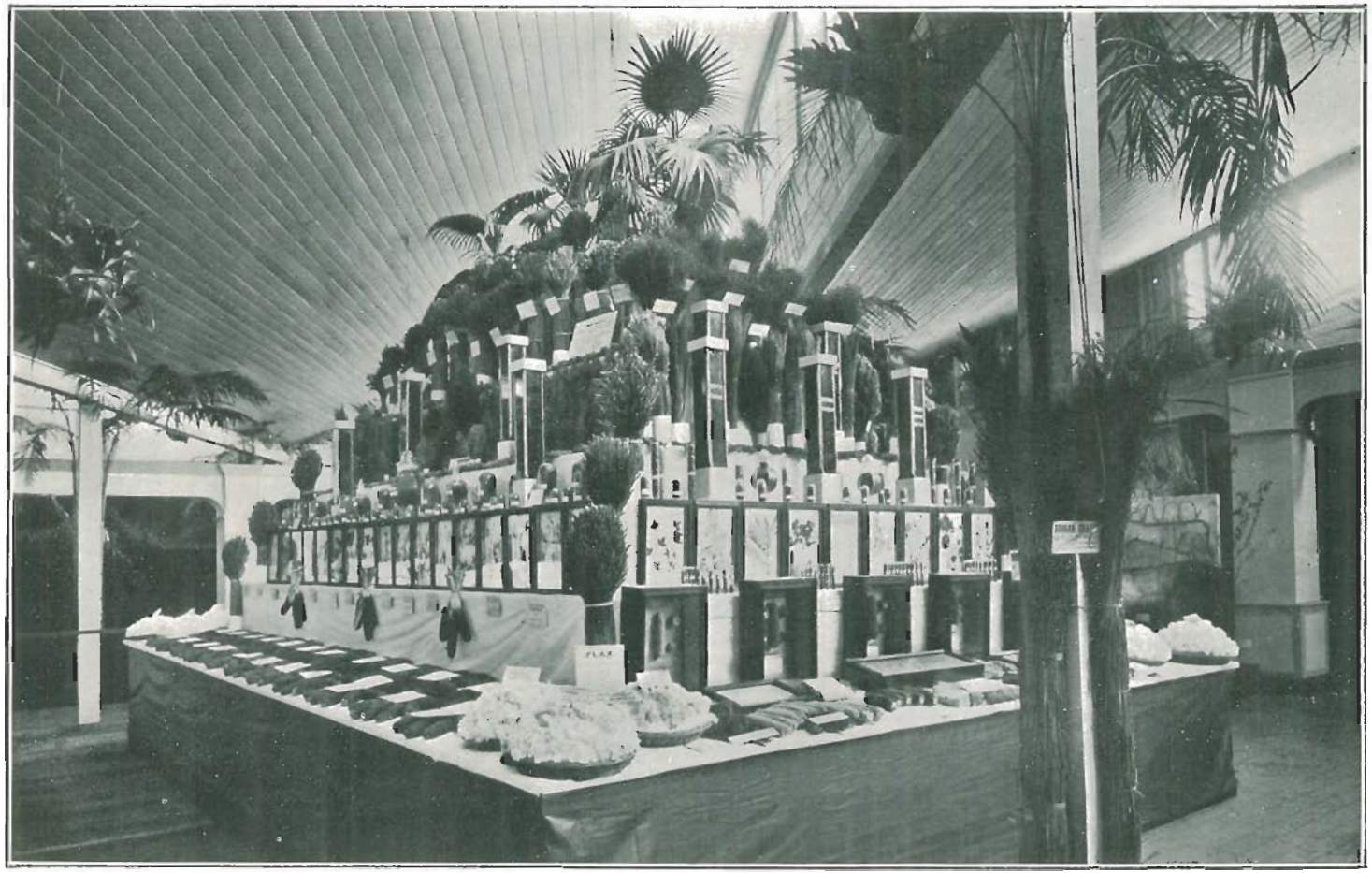

PLATE 10.—VIEW OF THE CENTRAL TROPHY, DEPARTMENT OF AGRICULTURE AND STOCK.

PLATE 11.—ENTOMOLOGICAL AND ORNITHOLOGICAL EXHIBITS, DEPARTMENT OF AGRICULTURE AND STOCK.

Maize exhibits, including sample cobs of maize grown by juvenile competitors in the 1916-17 maizegrowing competition, of which the results are given further on.

Bacteriological exhibit from the Stock Experiment Station at Yeerongpilly.

Division of dairying, fruit exhibits, broom and other millets, besides many other farm products, potatoes, hay, silage, vegetables, &c.

The Agricultural College at Gatton came well to the front with farm and dairy products, and such industrial work as saddlery, blacksmithing, and dairying was represented by excellent exhibits of cheese and butter, whilst many of the usual farm and garden products afforded evidence of the excellent work of the instructors.

WOOL.

The wool exhibits comprised—Merino ewes' wool, Dorset Horn, Rams (black), Romney Marsh, Romney Marsh × Merino, Rams', pure-bred British breeds, half-bred. Wool grown on coastal areas, Border Leicester × Merino, Dorset × Merino, Lincoln × Merino, Lincoln. Wool grown at Elimbah, in the coastal area, Romney Marsh × Merino and Merino ewes, and Corriedales. This exhibit was a very fine one, and was collected and got up for the show by Mr. W. G. Brown, sheep and wool instructor, Department of Agriculture, who has devoted himself to the establishment of sheep-raising on the coastal lands with gratifying results.

A model is shown of a sheep spray, such as is successfully employed at Alice Downs Station, Blackall.

SISAL FIBRE.

It may not be out of place to trace the history of sisal-planting back to its original source. Sisal "hemp," as the fibre is usually called, has to-day risen from about £24 per ton to £100 per ton for Java "A" quality, and from £90 to £95 per ton, ex store, according to quality. A few years ago, there was a considerable area planted with sisal in Queensland. The original plants were imported in 1890, and about a quarter-acre was planted at St. Helena Penal Establishment, where they throve remarkably well. Many thousands of young suckers were produced and were distributed gratis to intending growers in many coastal districts of the State. In time, scutching machinery was employed on the island, and splendid fibre was produced. A quantity was sent to the Panama Exposition in 1915, and it is gratifying to know that, in competition with many of the older sisal-growing countries of the world, the gold medal and the accompanying diploma were awarded to the Department of Agriculture and Stock for the best exhibit of sisal fibre at that great Show. These may be seen at the office of the Comptroller-General of Prisons. There are about 5 acres of the plants now in cultivation on the island. There are no longer any large sisal plantations in Queensland, mainly owing to, first, industrial troubles, and next, to the impossibility of shipping the fibre to Europe. What little fibre has been

PLATE 12.—WOOL EXHIBIT, DEPARTMENT OF AGRICULTURE AND STOCK.

PLATE 13.—EXHIBIT OF THE STOCK INSTITUTE, YEERONGPILLY.

PLATE 14.—EXHIBIT OF PRODUCTS OF THE QUEENSLAND AGRICULTURAL COLLEGE.

produced latterly came from St. Helena and from two small plantations on the Northern Railway Line, near Gladstone. Both of these have now stopped work.

PRUNING FRUIT TREES AND VINES.

Amongst the most valuable educationary exhibits was one, showing the various methods of pruning, by Mr. C. Ross, Instructor in Fruit Culture. Very frequently, fruitgrowers and viticulturists seek information on this important question of pruning from the Department. Here the whole system, as far as vine-pruning is concerned and the pruning of various fruit trees, was clearly demonstrated, and, in the matter of vines, the various methods adopted for different varieties of the grape vine are shown by growing vines only lately pruned.

SUGAR-CANE AND SORGHUMS

of splendid quality were largely in evidence in most of the courts and in the exhibits of the Department of Agriculture, where all the latest and best varieties from the Experiment Station were on view. In spite of the dry weather at the commencement of the growing season, the cane generally made wonderful progress, so much so that it is expected that, notwithstanding labour troubles, the 1917 crop will pan out at about 400,000 tons of sugar. Some of the sorghums shown were of marvellous growth. One exhibit of Honduras giant sorghum showed a total height growth of quite 15 feet, if not more. Various other sorghums and millets were also on view.

WEEDS AND NATIVE GRASSES.

In the Agricultural Department's section there was, as at last year's Show, a very instructive exhibit of the various pestiferous weeds which have spread from time to time throughout the State. These included several varieties of prickly-pear, which pest, if no means are found of controlling its activity, will cause even greater loss of our best pastoral and agricultural lands than the 1,000,000 acres per annum now stated to be a dead loss to the State. We have no space to give details of all the weeds illustrated and described by the Acting Government Botanist, Mr. C. T. White. One, however, demands the attention of all engaged in farming and dairying. This is the prostrate-growing khaki weed, which found its way to South America from South Africa, and eventually arrived in Australia.

As a set-off to these pests, most of our more valuable native fodder grasses continue to spread and provide excellent fodder for station stock.

COTTON.

Both in the Departmental Court and in the District exhibits cotton held a prominent position, and it speaks well for the suitability of the soils and climates of far-sundered portions of the State that there were no inferior exhibits of this class of product. This season the State ginnery has already ginned and disposed of over 30,000 lb. of cotton, which was sold by tender at 11d. per lb., and, at the time of writing, farmers' cotton is still coming in to be ginned. We sincerely hope that farmers will realise the great value of a drought-resisting plant, which returns to the grower more net cash per acre than any other field crop.

PLATE 15.—AN OBJECT LESSON IN PRUNING VINES AND FRUIT TREES.

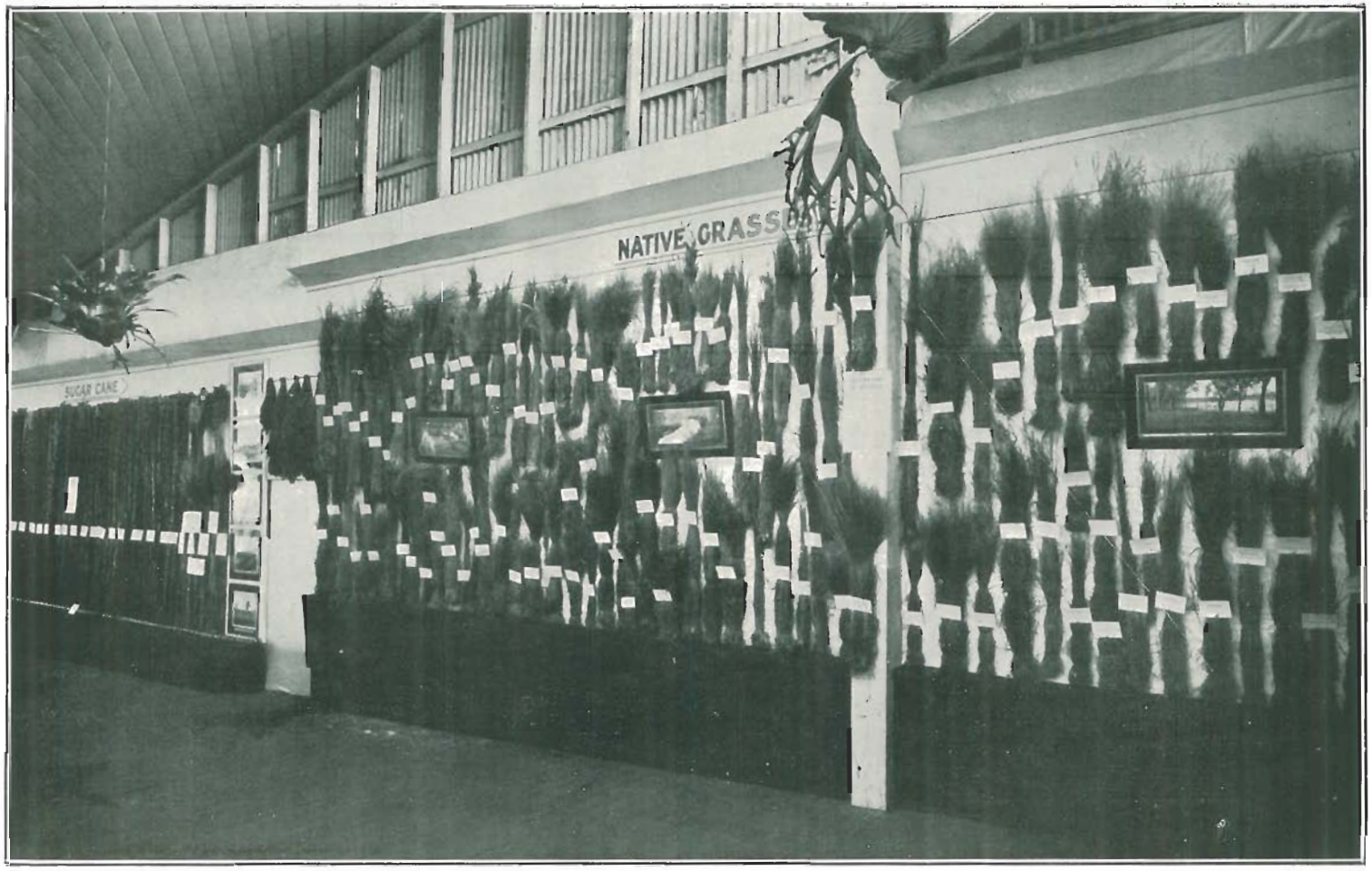

PLATE 16.—EXHIBIT OF SUGAR-CANE AND NATIVE GRASSES.

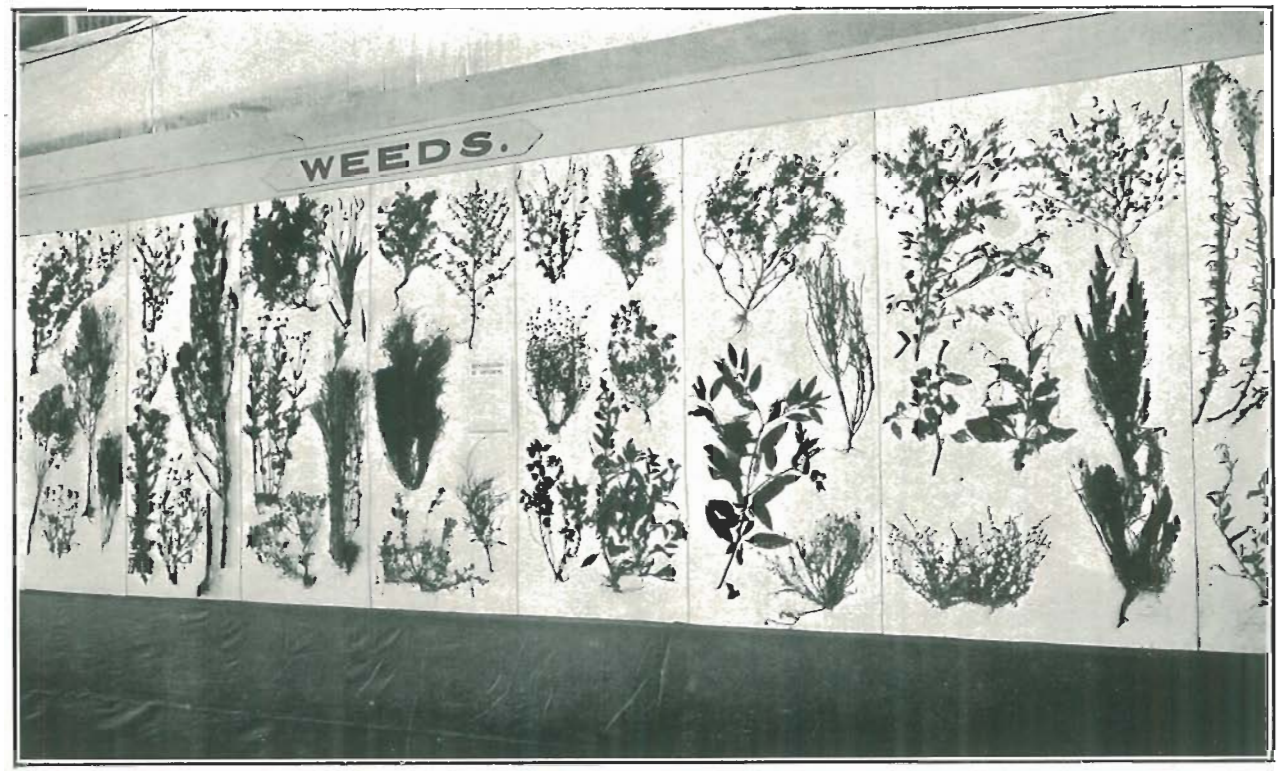

PLATE 17.—THE WEEDS OF QUEENSLAND. EXHIBIT OF THE BOTANICAL GARDENS, BRISBANE.

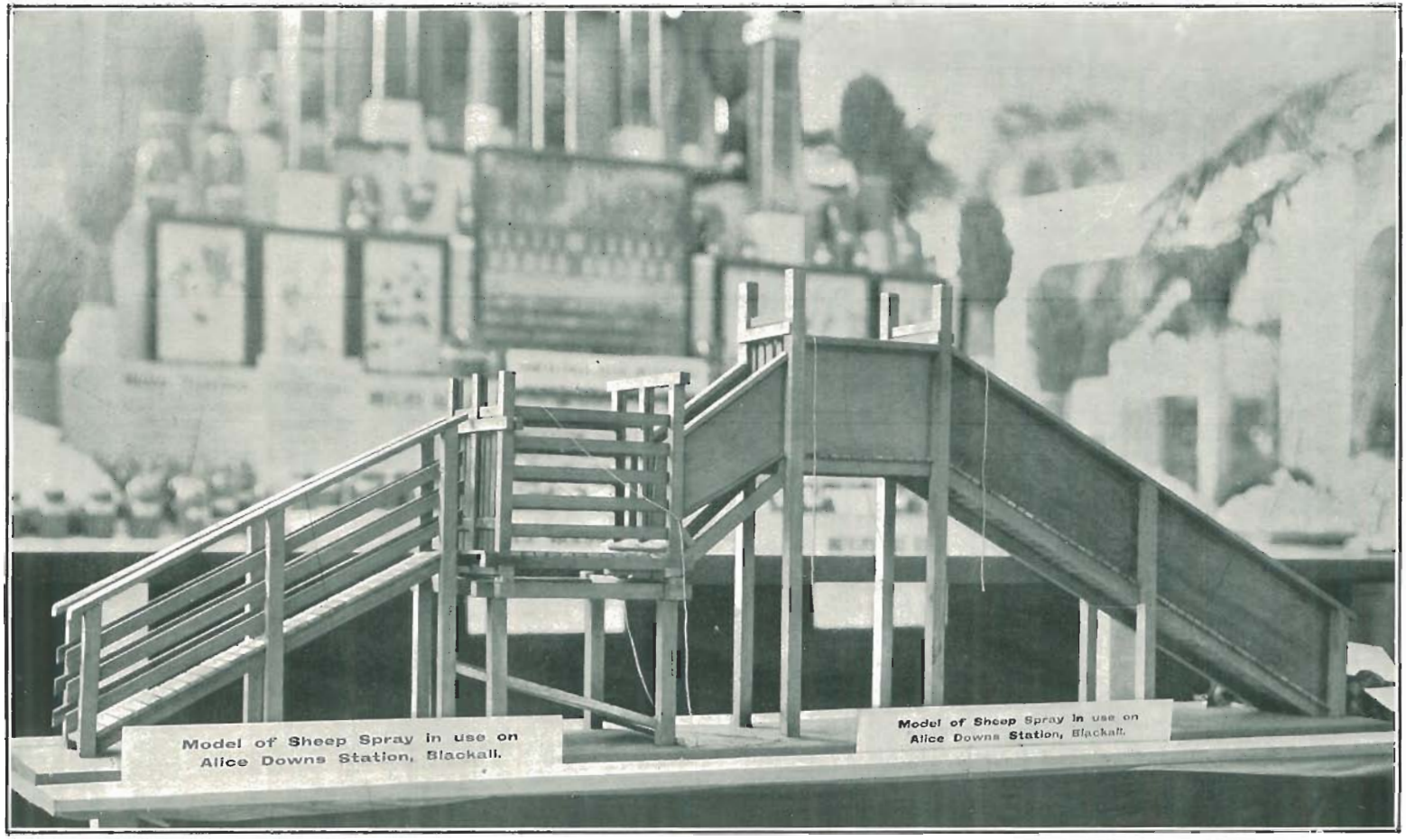

Plate 18.—Model of Sheep Spray.

JUVENILE CORN-GROWERS' COMPETITION, 1916-1917.

This annual competition is open to boys and girls under 18 years of age, who must be residents of Queensland, and must do all the work from preparing the land (one-tenth of an acre) to gathering the harvest. The Department of Agriculture and Stock supplies selected seed free of charge. The competition is much appreciated by the young farmers, and at National Association's Exhibition the results which are on view are examined with much interest by country visitors. The results of the 1916-1917 competition have now been made available. Eighty-seven young people entered for the contest. Some of the results were very good; one grower produced at the rate 107·8 bushels per acre, and five others reached or exceeded 100 bushels per acre, notwithstanding unfavourable weather conditions, first by excessive rain, later on by dry weather, and next by the depredations of mice, whose attacks reduced some of the averages by 30 to 40 per cent., and caused some of the competitors to withdraw from the competition.

Following is the list of awards:—

No. 1 DISTRICT.

Name and Address of Competitor.	Age.	Yield per Acre. (Standard, 125 bushels). Maximum Points, 75.		Quality of Grain and Uniformity of Ear. Maximum points, 15.	Records. Field Data, 10 points.	Totals. Maximum points, 100.	District Prize.
A. C. Marshall, Alberton, *via* Yatala	13½	76·1	45·6	9	6	60·6	1st, £5
R. G. Morrison, Purga, *via* Ipswich	14	75·1	45·0	9·5	4·5	59·0	2nd, £2
W. E. Patterson, Glamorgan Vale, *via* Walloon	13	66·5	39·9	12	4	55·9	3rd, £1
A. R. Pegg, Warril Bank, Harrisville	16	59·8	35·8	11	3·5	50·3	..
A. V. Rachow, Alberton, *via* Yatala	14½	58·5	35·1	9	5	49·1	..
W. O. Griffiths, Mount Forbes, *via* Rosewood	14	48·8	29·2	8·5	9	46·7	..
John Osborne, Mt. Alford, *via* Boonah	12	57·6	34·5	6	4·5	45·0	..
E. P. H. Prenzler, Kulgun, *via* Ipswich	15	45·1	27·0	8	4	39·0	..
Gordon Osborne, Mt. Alford, *via* Boonah	15	44·4	26·6	8	2·5	37·1	..
A. G. Marks, Alberton, *via* Yatala	14½	35·4	21·2	8·5	5·5	35·2	..
D. S. Loudon, Ebenezer, *via* Rosewood	11½	13·6	8·1	5	2	15·1	..

No. 2 DISTRICT.

N. H. McGinn, Oakey Creek, *via* Eumundi	17	105·7	63·4	10	9·5	82·9	1st, £5
E. A. Sims, Gheerulla, *via* Eumundi	11¾	101·0	60·6	11·5	6	78·1	2nd, £2
W. J. Guldbransen, Samford ..	15	104·1	62·4	10	4	76·4	3rd, £1
J. S. Bray, Lawnton, N.C. Line	14	90·3	54·1	11	5·5	70·6	..
A. F. G. Pedwell, Samford ..	18	78·3	46·9	12	5	63·9	..
W. P. Pedwell, Samford ..	13	75·7	45·4	9	5	59·4	..
V. R. Ellis, Tuchekoi, *via* Cooran	13¾	60·3	36·1	9	5	50·1	..
F. B. Leembruggen, Samford ..	17½	38·9	23·3	8	8	39·3	..

N. H. McGinn also secured a Special Prize (the second), value £5.

No. 3 DISTRICT.

Name and Address of Competitor.	Age.	Yield per Acre. (Standard, 125 bushels). Maximum Points, 75.		Quality of Grain and Uniformity of Ear. Maximum points, 15.	Records. Field Data, 10 points	Totals. Maximum points, 100.	District Prize.
T. A. Smoothy, Pinelands, Crow's Nest	13	107·8	64·6	11·5	9	85·1	1st, £5
V. Littleton, Pinelands, Crow's Nest	14¾	95·6	57·3	9	6	72·3	2nd, £2
G. Jannusch, Haden, *via* Toowoomba	16	84·8	50·8	9	3	62·8	3rd, £1

T. A. Smoothy also secured a Special Prize (the first), value £10.

No. 4 DISTRICT.

S. L. Marshall, Wooroolin ..	13¾	99·5	59·7	10	4	73·7	1st, £5
C. Maynard, Taabinga, *via* Kingaroy	13½	73·9	44·3	8	4	56·3	2nd, £2
L. J. Horne, Goomeri	15	61·3	36·7	11	5	52·7	3rd, £1
J. MacKenzie, Home Creek, *via* Tingoora	15	56·3	33·7	9	5·5	48·2	..
A. C. Ellwood, Memerambi ..	17	51·1	30·6	10	4	44·6	
W. C. Hansen, Wondai ..	13	49	29·4	9·5	4	42·9	..

No. 5 DISTRICT.

A. Wilkie, Killarney	14	96	57·6	9·5	3	70·1	1st, £5
H. Gow, Killarney	15	80·1	48·0	7·5	10	65·5	2nd, £2
Rachel Gow, Killarney ..	10	75·5	45·3	8	5	58·3	3rd, £1
C. Thies, Highfields, Toowoomba	13½	69·5	41·8	10	5	56·8	..
R. F. Watson, Summit, S. Line	15½	60·1	36·0	7	4·5	47·5	..
P. Madden, Killarney ..	13	48·7	29·2	8·5	6	43·7	..
A. T. Henderson, Summit, S. Line	17½	37·2	22·3	7	6	35·3	..

No. 6 DISTRICT.

F. H. C. Lieberam, Gurgeena, Gayndah	15	106·9	64·1	11	6	81·1	1st, £5

This Competitor also secured a Special Prize (the third), value £3; (no other competitors in district class).

No. 7 DISTRICT.

C. H. Kirstenfeldt, Rosalie Plns.	12¼	56·9	34·1	7	2·5	43·6	1st, £5
D. J. Allen, Pelican, *via* Chinchilla	15	17·7	10·6	8	2·5	21·1	2nd, £2

No third prize awarded owing to lack of competition.

No. 8 DISTRICT.

H. M. McCamley, Bajool ..	17	104·8	62·8	8·5	3	74·3	1st, £5
C. E. McCamley, Bajool ..	15	99·3	59·5	9	3	71·5	2nd, £2
B. Philp, Bracewell, Mt. Larcom	15¾	78·2	46·9	11	3·5	61·4	3rd, £1
Mary Wilson, Mt. Rae, Yeppoon	15½	66·5	39·9	9·5	5·5	54·9	..
A. E. Nitz, Barmoya Settlement	14	58·9	35·3	10	3	48·3	..

No. 9 DISTRICT.

Keith Downs, Tarzali, *via* Malanda	12¾	97·5	58·5	9	4·5	72	1st, £5

No second and third prizes awarded owing to lack of competition.

DYES AND PAPERS FROM NATIVE PLANTS.

A most interesting and, under present war conditions, important exhibit was one by Mr. J. Campbell, of Cairns, in which the manufacture of paper from various fibrous plants indigenous to Queensland was practically described by the exhibition of the plant, of its fibre, and of the several processes the material underwent to produce the fine samples of good, tough, brown packing-paper. Also there was shown how a highly important industry could easily be established in the manufacture of dyes of various hues, even black (a difficult dye to produce). These dyes have all the characteristics of the aniline dyes, so largely imported from Germany previous to the war. Mr. Campbell has clearly shown that we need not be dependent on importation of these products, since it is quite possible to produce them in our own State.

THE DISTRICT EXHIBITS.

Last year, much additional interest attached to the competition in this class, owing to the fact that the Queensland Districts were challenged in A Grade by the Western Districts of New South Wales, which included such centres of population as Lithgow, Paramatta, Orange, Mudgee, Bathurst, Dubbo, and Penrith, when the prize was awarded to New South Wales, whose score was 874 points out of a possible 1,390. The only Queensland competitor (Queensland South Coast District) made such a creditable display as to come in only 22 points behind the winner.

This year there were three exhibits in the "A" Grade, the competitors being the Darling Downs, Wide Bay and Burnett, and the South Coast. It is fifteen years since Darling Downs competed in this section, and seven years have elapsed since the reappearance of the Wide Bay and Burnett District. In "B" Grade, four districts—Crow's Nest, Fassifern, Wallumbilla, and Gympie—competed.

In the "A" Grade, Darling Downs was successful with 1,037 points, Wide Bay scoring 904, and South Coast 800.

In "B" Grade, Crow's Nest won with 884 points. Fassifern took second honours with 856; Gympie, 785. Wallumbilla scored 661 points.

DISTRICT EXHIBITS OF FRUITS.

The competition for the district exhibits of fruit created considerable interest. There were four competitors—Buderim Mountain District, Caboolture District (including Woodford, Glasshouse Mountain to Landsborough), Palmwoods, and the Gympie District (from Cooran-Tewantin road to Gundiah). The exhibits were very creditable, and a fine advertisement for the fertility of the soil of the districts mentioned. The judge was Mr. A. W. Carseldine. The first prize was awarded to Buderim Mountain District, with 111 points out of a possible 170. Landsborough North was placed second, with 109, and the Caboolture District, with 108, was a very close third. The Gympie District only did fairly well, but may do better in future with the experience gained in

the competition. In addition to the prize money, National certificates were awarded as follows:—Caboolture, for pineapples; Landsborough North and District, for citrus fruit; and Buderim Mountain District, for bananas. In grading and packing of fruits exhibited in cases and general display the honours were secured by Caboolture and Landsborough North, which each secured 22 points out of the possible 30. The details of the award are as follow, the possible points being shown in parenthesis:—

	Points.	Buderim.	Landsborough.	Caboolture.	Gympie.
Bananas	25	20	18	16	16
Pineapples	25	14	17	20	12
Citrus fruits	25	18	23	18	12
Custard apples	10	5	2	3	..
Papaws	10	7	5	5	7
Strawberries	10	7	8	2	8
All other fruits	15	12	5	8	6
Home-made preserved fruits, bottled, canned, or dried; or as home-made jam	20	10	9	14	8
Grading, packing, and general display	30	18	22	22	12
TOTALS	170	111	109	108	81

ONE-FARM EXHIBITS.

The competition in this section always evokes much interest amongst the farming community, and it is to be regretted that more farmers do not compete. Last year there were three entries—Mr. O. C. Williams, Plainby, Crow's Nest (who won the first prize in 1915); Mr. J. A. Nystrom, of Booie, Kingaroy; and Mr. W. Allan, of Gympie. Mr. O. C. Williams was again successful in winning the first prize in 1916, and this year he again comes out the winner, after a keen contest with Mr. Nystrom, who was only 62 points behind. The points scored were as follow:—

	Possible.	Nystrom.	Williams.
DAIRY PRODUCE—			
Butter	25	15	12
Cheese	20	20	14
Eggs	5	5	3
	50	40	29
FOODS—			
Hams and bacon	20	15	10
Corned, smoked, and spiced beef and mutton	10	5	8
Honey	10	5	8
Beeswax	5	2	3
Bread and scones	5	4	4
Confectionery and sweets	5	2	4
Lard, tallow, oils	5	3	4
	60	36	41

	Possible.	Nystrom.	Williams.
FRUITS, VEGETABLES, AND ROOTS (fresh and preserved)			
Fresh fruits, all kinds	25	16	10
Dried fruits	10	5	8
Preserved fruits and jams	15	7	12
Fresh vegetables	15	7	7
Pickles, sauces, &c.	15	8	12
Potatoes and roots	25	13	18
Table pumpkins, squashes, and marrows	10	5	7
Cocoanuts and nuts	3	2	1
Vegetable and garden seeds	5	2	4
Arrowroot	5	4	3
Cassava	5	12	12
Ginger	5	12	3
Sugar beet	5	3	3
	143	96	100
GRAIN, &c.—			
Wheat	25	10	18
Maize	20	12	18
Barley	10	6	8
Oats, rye, and rice	15	7	10
	70	35	54
TROPICAL PRODUCTS—			
Sugar-cane	30	15	10
Cotton, in seed	10	7	6
Coffee	15	12	5
	55	34	21
TOBACCO, &c.—			
Tobacco, leaf, dried	10	6	7
HAY, CHAFF, ETC.—			
Hay, oaten, wheaten, lucerne, &c.	20	8	18
Grasses and their seeds	10	6	6
Chaff, oaten, wheaten, lucerne, &c.	20	10	18
Ensilage, any form	15	8	8
Cattle fodder (pumpkins and green fodder)	15	8	8
Sorghum and millet	10	8	6
Hemp	5	3	3
Flax	5	3	3
Cowpea seed	7	6	4
Broom millet	10	6	6
	117	66	80
WOOL—			
Greasy	20	15	15
Mohair	5	4	4
	25	19	19
DRINKS, ETC.—			
Temperance drinks	10	4	5
WOMEN'S AND CHILDREN'S WORK—			
Needlework, knitting, fine arts	10	5	7
School work—Maps, writing, &c.	10	3	3
Fancy work	10	8	10
	30	16	20
Miscellaneous articles of commercial value	5	3	4
Plants and flowers in pots	5	2	4
Time and labour saving useful articles made on the farm	10	12	6
Effective arrangement of exhibits	10	7	9
	30	24	23
TOTALS	600	325	387

BUTTER AWARDS.

The judging of the butter was completed on Tuesday, 14th August. The competitions were keen, but it is understood that generally the butter was not equal to the best that has been produced in Queensland. No doubt the adverse season has had a detrimental effect. The outstanding feature of the competitions has been the pronounced success of the Downs Co-operative Dairy Company's Toowoomba factory. This factory won the two first prizes in the unsalted classes. In export classes the company won first prize for eight weeks' storage, second prize for thirty days' storage, first prize for greatest aggregate in all classes, and first prize for box salted with Australian salt. The first prize for thirty days' storage was won by Dungog Co-operative Butter Company, Limited, Dungog (N.S.W.), who were placed second to the Downs in eight weeks' storage. The awards are as follow:—

ONE BOX, UNSALTED, FACTORY MADE.

	Flavour.	Texture.	Colour.	Salting.	Packing.	Total.
Possible points	65	20	7	4	4	100
Downs Co-operative Dairy Company, Toowoomba	59½	19½	7	4	4	94
Maleny Co-operative Dairy Company ..	58	19½	7	4	4	92½
Stanley River Co-operative Company, Woodford	58½	19	7	4	3	91½
Queensland Farmers' Co-operative Co.—						
Booval	57½	19	7	4	3½	91
Boonah	56½	19½	7	4	4	91
Grantham	57	19	7	4	4	91
Laidley	56½	19	7	4	4	90½
Caboolture Co-operative Dairy Company	57	19	7	4	3½	90½
A. L. Frederich, Townshend	58	19	7	4	2½	90½
Silverwood, Gatton	57	19½	6½	4	3½	90½
Maryborough Co-operative Dairy Co.—						
Kingaroy	56½	19	7	4	3½	90
Biggenden	56½	19½	7	4	3	90
Mundubbera	56	18½	7	4	2½	88
Maryborough	53½	19½	7	4	3½	87½
Maclagan Valley Co-operative Dairy Co...	56	19	7	4	3½	89½
Kin Kin Co-operative Dairy Company ..	56½	19	7	4	3	89½
South Burnett Co-operative Dairy Co., Murgon	56½	19½	7	4	2½	89½
Wide Bay Co-operative Dairy Company, Cooroy	55	19	7	4	4	89
Logan and Albert Co-operative Dairy Co., Beaudesert	55	19	7	4	4	89
Singleton (N.S.W.) Central Co-operative Dairy Company	55	19	7	4	4	89
Queensland Agricultural College, Gatton	55	19½	6½	4	3	88
Terror's Creek and Samson Vale Co-operative Dairy Company	55	18½	7	4	3	87½
Goombungee Co-operative Dairy Company	53½	19	7	4	4	87½
Warwick Dairying Company—						
Allora	55	18½	6½	4	3½	87½
Texas	53	19	7	4	4	87
Millhill	55	18	7	4	3	87
Oakey Co-operative Dairy Company ..	52	19½	7	4	4	86½

ONE BOX FRESH, FACTORY MADE.

	Flavour.	Texture.	Colour.	Salting.	Packing.	Total.
Possible points	65	20	7	4	4	100
Downs Co-operative Dairy Company, Toowoomba	60	19½	7	4	4	94½
Wide Bay Co-operative Dairy Company, Cooroy	59	19	6½	4	4	92½
Queensland Farmers' Co-operative Co.—						
Booval	58	19	7	4	4	92
Laidley	57½	19	7	4	4	91½
Boonah	57	19½	7	3½	4	91
Grantham	55	19	7	4	4	89
Maleny Co-operative Dairy Company ..	57½	19	7	4	4	91½
Stanley River Co-operative Dairy Co., Woodford	57	19	7	4	3	90
A. L. Frederich, Townshend	57½	19	7	4	2½	90
Maclagan Valley Co-operative Dairy Co.	56½	19	7	3½	3	89
Silverwood, Gatton	54½	19½	7	4	3½	88½
Goombungee Co-operative Dairy Company	54	19½	7	4	4	88½
Caboolture Co-operative Dairy Company	55	19	7	4	3½	88½
Maryborough Co-operative Dairy Co.—						
Maryborough	55	19	7	4	3½	88½
Kingaroy	56	19	7	3	3½	88½
Mundubbera	56	19	6½	4	3	88½
Biggenden	53½	19	6	4	3½	86
Warwick Dairying Company—						
Texas	53½	19½	7	4	4	88
Millhill	56	18	7	4	3	88
Allora	55	18½	6½	4	3½	87½
Logan and Albert Co-operative Dairy Co., Beaudesert	54	19	7	4	4	88
Singleton (N.S.W.) Central Co-operative Dairy Company	54	19½	6½	4	4	88
Kin Kin Co-operative Dairy Company ..	55	19	7	3½	3	87½
Queensland Agricultural College, Gatton	54½	19½	6½	4	3	87½
Oakey Co-operative Dairy Company ..	53	19	7	4	4	87
South Burnett Co-operative Dairy Co., Murgon	55	19	6	4	2½	86½
Terror's Creek and Samson Vale Co-operative Dairy Company	54	18	7	3	2½	84½

EXPORT BUTTER—ONE BOX, THIRTY DAYS' STORAGE.

Dungog (N.S.W.) Co-operative Dairy Co.	61	20	7	4	4	96
Downs Co-operative Dairy Company, Toowoomba	61	19½	7	4	4	95½
Singleton (N.S.W.) Central Co-operative Dairy Company	60	19½	7	4	4	94½
Goombungee Co-operative Dairy Company	57	19½	7	4	4	91½
Queensland Farmers' Co-operative Co.—						
Grantham	57	19	7	4	4	91
Laidley	57	19	7	4	4	91
Booval	56	19	6½	4	4	89½
Boonah	55½	19	6½	4	4	89
Maleny Co-operative Dairy Company ..	66	19½	7	4	4	90½
Silverwood, Gatton	57	19	6½	4	4	90½
Logan and Albert Co-operative Dairy Company, Beaudesert	57	18½	6½	4	4	90
Warwick Dairying Company—						
Texas	56	19	6½	4	4	89½
Allora	56½	19½	6	4	3½	89½
Millhill	56½	19	6½	4	3½	89½
Gayndah Co-operative Dairy Company ..	54½	19½	7	4	4	89
Downs Co-operative Dairy Company, Clifton	55	19½	6½	4	3½	88½

EXPORT BUTTER—ONE BOX, THIRTY DAYS' STORAGE—*continued.*

	Flavour.	Texture.	Colour.	Salting.	Packing.	Total.
Possible points	65	20	7	4	4	100
Caboolture Co-operative Dairy Company	54½	19	7	4	3½	88
Queensland Agricultural College, Gatton	54½	19½	6½	4	3½	88
South Burnett Co-operative Dairy Company, Murgon	55	19	7	3½	3	87½
Maryborough Co-operative Dairy Co.—						
Kingaroy	55	18½	7	3½	3½	87½
Mundubbera	53½	18½	6½	3½	3½	85½
Biggenden	53½	18	6	3	3½	84
Maclagan Valley Co-operative Dairy Company	54	18½	7	4	3½	87
Oakey Co-operative Dairy Company ..	54	18½	6½	4	4	87
A. L. Frederich, Townshend	55	18½	6½	4	3	87
Wide Bay Co-operative Dairy Company, Cooroy	54½	18	6	4	4	86½
Terror's Creek and Samson Vale Co-operative Dairy Company	54	18½	5½	4	4	86
Stanley River Co-operative Dairy Company, Woodford	53½	18½	6½	4	3½	86
Kin Kin Co-operative Dairy Company ..	53	18	6	4	3½	84½
Roma Co-operative Dairy Company ..	55	19	6½	..	3½	84
ONE BOX, EIGHT WEEKS' STORAGE.						
Downs Co-operative Dairy Company, Toowoomba	60	20	7	4	4	95
Dungog (N.S.W.) Co-operative Dairy Company	59½	20	7	4	4	94½
A. L. Frederich, Townshend	58	19½	7	4	3½	92
Wide Bay Co-operative Dairy Company, Cooroy	56½	19½	7	4	4	91
Goombungee Co-operative Dairy Company	56½	19	7	4	4	90½
Warwick Dairying Company—						
Texas	56½	19½	7	4	3½	90½
Goondiwindi	56	19	7	3½	3½	89
Allora	54½	19½	7	4	3½	88½
Millhill	55	18½	6½	4	4	88
Queensland Farmers' Co-operative Co.—						
Grantham	56	19	6½	4	4	89½
Laidley	56	19	6½	4	4	89½
Boonah	54½	18½	6½	4	4	87½
Booval	53	18	6	4	3½	84½
Maclagan Valley Co-operative Dairy Company	55	19½	7	4	3½	89
Killarney Dairying Company	55	19	7	4	4	89
Caboolture Co-operative Dairy Company	54½	19½	7	4	3½	88½
Queensland Agricultural College, Gatton	55	19½	6½	4	3½	88½
Maleny Co-operative Dairy Company ..	54½	19	6½	4	4	88
Stanley River Co-operative Dairy Company, Woodford	55	18½	7	4	3½	88
Oakey Co-operative Dairy Company ..	54	18½	7	4	4	87½
Gayndah Co-operative Dairy Company ..	54	19	6½	4	4	87½
Silverwood, Gatton	54½	19	6½	4	3½	87½
Maryborough Co-operative Dairy Co.—						
Kingaroy	55	19	6½	4	3	87½
Mundubbera	54½	19	6½	4	3½	87½
Maryborough	53	18½	6	4	3	84½
Biggenden	53	18	6	3½	3½	84
Kin Kin Co-operative Dairy Company ..	54	19	7	4	3½	87½
Logan and Albert Co-operative Dairy Company, Beaudesert	54	19	6½	4	3½	87

ONE BOX, EIGHT WEEKS' STORAGE—*continued.*

	Flavour.	Texture.	Colour.	Salting.	Packing.	Total.
Possible points	65	20	7	4	4	100
Terror's Creek and Samson Vale Co-operative Dairy Company ..	53	19	6	4	3	85
Roma Co-operative Dairy Company ..	55	18½	6½	..	3½	83½
South Burnett Co-operative Dairy Company, Murgon	52	18½	6	3	3	82½

ONE BOX SALT BUTTER SALTED WITH AUSTRALIAN SALT.

Downs Co-operative Dairy Company, Toowoomba	60	19½	7	4	4	94½
Wide Bay Co-operative Dairy Company, Cooroy	59	19	6½	4	4	92½
Queensland Farmers' Co-operative Co.—						
Booval	58	19	7	4	4	92
Boonah	56½	19½	6½	4	4	90½
Grantham	55	19½	7	4	4	89½
Laidley	56	19½	7	4	4	90½
Terror's Creek and Samson Vale Co-operative Dairy Company	54½	18½	6½	4	3	86½
Goombungee Co-operative Dairy Company	57	19½	7	4	4	91½
Warwick Dairy Company—						
Texas	54½	19½	7	4	4	89
Allora	56	19	6½	4	3	88½
Millhill	56	19	7	4	3½	89½
Maclagan Valley Co-operative Dairy Company	54½	19	7	4	3½	87½
Oakey Co-operative Dairy Company ..	53	19½	7	4	4	87½
Maleny Co-operative Dairy Company ..	57½	19	7	4	4	91½
Kin Kin Co-operative Dairy Company ..	53½	19	6	4	3	85½
Logan and Albert Co-operative Dairy Company, Beaudesert	54	19	7	3½	4	87½
A. L. Frederich, Townshend	57	18	7	4	2½	88½
Queensland Agricultural College, Gatton	54½	19½	6½	4	3½	88
South Burnett Co-operative Dairy Company, Murgon	55	19	6	4	3	87
Singleton (N.S.W.) Central Co-operative Dairy Company	54	19½	6½	4	4	88
Maryborough Co-operative Dairy Co.—						
Maryborough	56	19	6½	4	3½	89
Kingaroy	57½	19	7	4	3½	91
Biggenden	54½	19	6	4	3½	87
Mundubbera	56	18½	6½	4	3½	88½

GREATEST AGGREGATE, ALL CLASSES AND SPECIALS.

Downs Co-operative Dairy Company, Limited, Toowoomba, 473½ points.

MILKING TESTS.

THE RESULTS.

The prizes were awarded according to the following scale:—One point for every ounce of commercial butter in twenty-four hours, taking the average of forty-eight hours' yield; one point for every completed ten days since calving, deducting the first forty days. Maximum allowance of lactation, ten points. Fractions of ounces of commercial butter

and incomplete periods of less than ten days to be worked out in decimals and added to the total points. In addition a declaration may be required to the effect that the cow has not broken her service during the lactation period.

COW, 4 YEARS AND OVER, AVERAGING GREATEST DAILY YIELD OF BUTEER FAT IN FORTY-EIGHT HOURS.

	—	Milk. Lb.	Test.	Butter.	Total, 48 Hours.
Marquardt Bros.' Champion (Illawarra), 47·52 points (1)	M.	19·13	14·7	1·08	
	E.	19·6	5·7	1·30	
	M.	19·5	5·2	1·22	
	E.	18·1	5·1	1·09	
Nestle's Maggie 2nd of Numba (Holstein), 44·8 points (2)	M.	34·5	3·2	1·27	
	E.	31·2	4·3	1·57	
	M.	33·6	3·2	1·24	
	E.	30·02	4·3	1·52	
H. Benbow's Joyce, 41·58 points (3) ..	M.	27·0	3·1	·97	
	E.	28·10	4·0	1·32	
	M.	30·10	3·5	1·25	
	E.	27·14	3·9	1·27	

COW, 4 YEARS AND OVER, AVERAGING QUALITY AND DAILY YIELD OF BUTTER FAT FOR FORTY-EIGHT HOURS, NO LACTATION TEST.

Nestle's Maggie 2nd of Numba, 44·8 points (1)	M.	34·5	3·2	1·27
	E.	31·2	4·3	1·57
	M.	33·6	3·2	1·24
	E.	30·2	4·3	1·52
H. Benbow's Joyce, 38·48 points (2) ..	M.	27·0	3·1	·97
	E.	28·10	4·0	1·38
	M.	30·10	3·5	1·25
	E.	27·14	3·9	1·27
Marquardt Bros.' Dairymaid, 32·64 points (3)	M.	21·8	3·7	·93
	E.	21·7	4·2	1·05
	M.	19·9	3·3	·75
	E.	21·6	5·4	1·35

COW OR HEIFER, UNDER 4 YEARS, NO LACTATION TEST.

B. O'Connor's Stella 2nd of Hillview, 37·21 points (1)	M.	23·12	3·8	1·06
	E.	22·7	4·4	1·15
	M.	23·6	4·3	1·17
	E.	21·10	5·0	1·27
Marquardt Bros.' Canary, 30·96 points (2)	M.	19·6	4·3	·97
	E.	18·10	4·5	·98
	M.	20·7	3·9	·93
	E.	18·9	4·6	·97
A. T. Waters's Favourite of Railway View, 30·32 points (3)	M.	23·2	3·8	1·04
	E.	22·3	3·9	1·01
	M.	21·5	2·9	·71
	E.	23·4	4·0	1·03

COW OR HEIFER, UNDER 4 YEARS, AVERAGING GREATEST DAILY YIELD OF BUTTER FAT FOR FORTY-EIGHT HOURS.

Marquardt Bros.' Canary, 34·06 points (1)	M.	19·6	4·3	·97
	E.	18·10	4·5	·98
	M.	20·7	3·9	·93
	E.	18·9	4·6	·99

COW OR HEIFER, UNDER 4 YEARS, ETC.—*continued.*

—	—	Milk. Lb.	Test.	Butter.	Total, 48 Hours.
E. Burton's Oxford Golden Girl, 33·2 points (2)	M.	18·6	4·0	·86	
	E.	16·5	4·6	·88	
	M.	17·13	4·3	·90	
	E.	16·6	4·2	·81	
A. T. Waters' Favourite of Railway View, 30·32 points (3)	M.	23·2	3·8	1·04	
	E.	22·3	3·9	1·01	
	M.	21·5	2·9	·71	
	E.	22·4	4·0	1·03	

COW, YIELDING LARGEST SUPPLY OF MILK IN FORTY-EIGHT HOURS.

Nestle's Maggie 2nd of Numba, 128·15 points (1)	M.	31·5	..	..	
	E.	31·2	..	..	
	M.	33·6	..	..	
	E.	30·2	..	..	
H. Benbow's Joyce, 114·2 points (2) ..	M.	27·0	..	..	
	E.	28·10	..	..	
	M.	30·10	..	..	
	E.	27·14	..	..	
M. Lawrence's Model of City View, 65·13 points (3)	M.	15·11	..	..	
	E.	16·9	..	..	
	M.	16·6	..	..	
	E.	17·3	..	..	

Special prize under similar conditions, Maggie 2nd of Numba.

NATIONAL CHAMPION BUTTER FAT TEST.

(Brisbane Newspaper Co.'s special prize of £25, to be won thrice, and cash prize of £2 2s. to each year's winner), for cow averaging greatest daily yield of butter fat for forty-eight hours, under Babcock test.

Marquardt Bros.' Champion, 47·52 points (1)	M.	19·13	4·7	1·08	
	E.	19·6	5·7	1·30	
	M.	19·15	5·2	5·2	
	E.	18·1	5·1	5·1	
Nestle's Maggie 2nd of Numba, 44·8 points (2)	M.	34·5	3·2	1·27	
	E.	31·2	4·3	1·57	
	M.	33·6	3·2	1·24	
	E.	30·2	4·3	1·52	
H. Benbow's Joyce, 41·58 points (3) ..	M.	27·0	3·1	·97	
	E.	28·10	4·0	1·32	
	M.	30·10	3·5	1·25	
	E.	27·14	3·9	1·27	

HOME MILKING TEST.

Various Breeds.

M'Intyre Bros.' Handsome (1)	M.	28½	3·6	1·29	
	E.	29¼	4·6	1·57	
	M.	27½	4·0	1·28	
	E.	27¾	4·2	1·36	5·50

Holsteins.

Maggie 2nd of Numba (1)	M.	26¼	3·55	1·10	
	E.	23½	4·9	1·35	
	M.	27	3·5	1·10	
	E.	22	4·7	1·21	4·76

HOME MILKING TEST—*continued.*

—	—	Milk. Lb.	Test.	Butter.	Total, 48 Hours.
Nolly 1st of Kabbinokka (2)	M.	30	2·6	·90	
	E.	26½	4·0	1·23	
	M.	29½	3·0	1·02	
	E.	25	3·9	1·14	4·29
Jerseys.					
W. J. Affleck's Golden Lily II. of Grasmere (1)	M.	23·5	5·3	1·46	
	E.	24·0	4·4	1·25	
	M.	23·0	5·9	1·60	
	E.	23·5	4·6	1·26	5·56
W. J. Affleck's Floss 6th of Grasmere (2)..	M.	15·5	6·3	1·14	
	E.	14·5	5·4	·92	
	M.	13·75	5·4	·87	
	E.	16·0	4·8	·90	3·83
Ayrshires.					
F. A. Stimpson's Pretty Maid of Harelmar (1)	M.	35	4·55	1·89	
	E.	34	5·60	2·25	
	M.	36	4·50	1·90	
	E.	37	5·45	2·40	8·44
F. A. Stimpson's Tina of Coolangatta (2)	M.	31	4·15	1·50	
	E.	28	4·45	1·46	
	M.	31	4·35	1·58	
	E.	34	4·25	1·69	6·23
F. A. Stimpson's Model of Harelmar (3) ..	M.	33	4·25	1·67	
	E.	31	3·87	1·40	
	M.	33	4·0	1·54	
	E.	30	3·3	1·15	5·76
J. W. Paten's Jean (4)	M.	25½	3·9	1·16	
	E.	22	4·4	1·13	
	M.	26	3·8	1·16	
	E.	22	4·5	1·17	4·62
Illawarras.					
*M. Marquardt's Champion (1)	M.	23¾	4·0	1·10	
	E.	23½	5·1	1·41	
	E.	23	5·9	1·04	
	M.	20½	5·2	1·25	
	M.	22½	4·6	1·215	
	E.	23¾	5·0	1·397	7·412
B. O'Connor's Charm of Glenthorne (2) ..	M.	35	4·3	1·76	
	E.	29	4·8	1·64	
	M.	34	3·8	1·57	
	E.	30	4·5	1·59	6·49
B. O'Connor's Blue Belle (3)	M.	24	4·05	1·15	
	E.	23	8·2	1·60	
	M.	25	5·1	1·50	
	E.	21·5	4·9	1·235	5·470
B. O'Connor's Fairy Queen II. (4) ..	M.	30·5	4·35	1·55	
	E.	24	4·7	1·32	
	M.	26	3·8	1·16	
	E.	25	3·9	1·14	5·17

* Early and late milkings shown.

PIG AWARDS.

Boars (Judge, H. M. Warburton, Mittagong, N.S.W.).—Improved Berkshires: boar, 2 years and over, Macfarlane Brothers' Onward 1, Goodna Hospital for Insane's Goodna Serang 2. Year and under 2, W. J. Warburton's Northgate Model Count 1, Queensland Agricultural College's Red Knight 2. Six months and under 1 year, Macfarlane Brothers' Conargo Invincible 1, Goodna Hospital for Insane's Barney 2. Under six months, W. J. Warburton's Northgate Romper 1, Dunwich Benevolent Asylum 2. Family group, boar and two of progeny: Goodna Hospital for Insane's Goodna Serang 1, Macfarlane Brothers' Onward 2. Champion: Macfarlane Brothers' Onward.

Sows.—Improved Berkshires, 2 years and over: Goodna Hospital for Insane's Goodna Lavina 1, Macfarlane Brothers' Miss Request 2. Year and under 2: W. J. Warburton's Northgate Queen 1, Queensland Agricultural College's Conceit 2. Six months and under year: W. J. Warburton's Northgate Empress 1, Goodna Asylum's Lady Bell 2. Under 6 months: Goodna Asylum's Goodna Polly 1, W. J. Warburton's Northgate Blossom 2. Any age, litter not over 6 weeks old: W. J. Warburton's Northgate Happy Emperor 1, Gatton College's Vanity Fair 2. Champion: W. J. Warburton's Northgate Queen.

Yorkshires.—Boar, over 2 years: W. J. Warburton's Rupert's Pride. Six months and under year: Gatton College's Gatton Snow King. Under 6 months: W. J. Warburton's Northgate Roger. Champion: W. J. Warburton's Rupert's Pride. Sow, over 2 years: W. J. Warburton's Northgate Snowflake and Rupert's Fancy 1 and 2. Year and under 2: W. J. Warburton's Northgate Duchess. Six months and under year: W. J. Warburton's Northgate Laura and Northgate Ruby 1 and 2. Under 6 months: W. J. Warburton's Northgate Pearl. Champion: W. J. Warburton's Northgate Duchess.

Tamworth.—Boar, 2 years and over: D. W. Evans's Royal King. Six months and under 1 year: D. W. Evans's Indian Prince 1, Dunwich Benevolent Asylum 2. Under 6 months: D. W. Evans's Sunbeam. Champion: Dunwich Benevolent Asylum. Sow, over 2 years: D. W. Evans's Indian Queen. Year and under 2: D. W. Evans's Knowles Queen. Six months and under year: Dunwich Benevolent Asylum 1 and 2. Under 6 months: D. W. Evans's Princess Knowle. Champion: D. W. Evans's Knowles Queen.

Miscellaneous.—Three bacon pigs, 100 lb. to 150 lb.: J. J. Fitzgerald 1, C. Bright 2. Any breed or cross, from 120 lb. to 150 lb.: H. B. Baldwin 1, W. J. Warburton 2. Three porker pigs, 60 lb. to 80 lb.: W. J. Warburton 1, Queensland Agricultural College 2. Sow, with litter, not over 6 weeks: Wm. Geo. Osborne.

FARM AND DAIRY PRODUCE.

(Judge, R. E. Soutter, Roma.)

Cereals.—Milling wheat: E. J. Anderson. Any other variety: E. J. Anderson 1, J. Brosnan 2. Milling barley: F. Franke. 90-day maize, any variety: C. Behrendorff. White: A. Loweke 1, Jas. Barbour, junr., 2. Early Leaming: John Stenzel. Yellow, horsetooth: John Stenzel 1, C. Behrendorff 2. Yellow, Dent: C. S. Huxley 1, A. Loweke 2. Any other yellow variety: Day and Bridge 1, C. S. Huxley 2. White: C. Behrendorff 1, John Fielding 2. Oats, Algerian: John Fielding 1, J. E. Stanton 2. Rye, millet (giant and white): John Fielding. Millet, imphee: C. Behrendorff. Cow peas, brown: C. S. Huxley. Black: C. Behrendorff 1, John Fielding 2. Any other variety: John Fielding. Canary, 50 lb.: Thos. W. Glasheen.

Potatoes (blue varieties).—Circular Heads: John Young. Guyra, Coronations, or Commonwealths: A. J. Moon 1 and champion, A. Loweke 2. Manhattans: A. Loweke. Brownell varieties—true to name: H. Franke. Peach bloom: H. Franke. Satisfaction: A. J. Moon 1 and champion, H. Franke 2. Queen of Valley: A. Loweke. White varieties —Carmens: Joseph Sinnamon 1 and 2. Scottish Triumphs: George Spiller 2, no first. Up to Date: H. Franke. Collection: H. Franke 1, A. Loweke 2. Sweets, white table: James Barbour, junr., 1, J. C. Butler 2. Cattle: James Barbour, junr. Red, table: J. C. Butler. Crown pumpkins: J. E. Stanton 1, John Fielding 2. Ironbark: J. C. Butler. Bugle: John Fielding.

Hay, Chaff, and Ensilage.—Lucerne hay: Charles Baulch 1, H. Franke 2. Oaten and panicum: H. Franke. Lucerne chaff: Charles Baulch 1, J. E. Stanton 2. Oaten: W. T. Beverley 1, John Williamson 2. Panicum, giant and white: John Fielding. Panicum, Japanese: H. Franke. Wheaten hay: George Hands 1, John Fielding 2. Rhoades: John Fielding 1, H. Franke 2. Rye: John Fielding. Canary: H. Franke. Mixed, lucerne and oaten: Charles Baulch 1, J. E. Stanton 2. Mixed lucerne and wheaten: John Fielding 1, C. S. Huxley 2. Lucerne and panicum: John Fielding 1, H. Franke 2.

Grasses.—Any other variety: H. Edser.

Bacon, Etc.—Six sides (factory cured), hams (factory cured), sausage, and lard: J. C. Hutton Proprietary, Ltd., won all the prizes. Hen eggs: Mrs. R. Loff 1, Mrs. A. Wyllie 2.

YOUNG JUDGES' COMPETITION.

Open to young farmers or farmers' sons and others, 25 years of age and under.

Swine (Judge, A. Moles, Bald Hills).—Leslie Arthur Warburton, Northgate, 1; David A. Logan, Bundamba, 2. The judge remarked as follows:—"In reference to this section I expected to see a greater number of young men competing. Those that came before me had a fair knowledge of their work. I would suggest that the Association encourage this section."

QUEENSLAND CHAMBER OF AGRICULTURAL SOCIETIES.

Minutes of the Annual Meeting of the Queensland Chamber of Agricultural Societies, held in the National Association's Council Room, Show Grounds, Brisbane, on Wednesday, 15th August, 1917, at 7.30 p.m.

Mr. John Macdonald (President) occupied the chair. His Excellency, Sir Hamilton J. Goold-Adams, was present, also the Minister for Lands, Hon. J. M. Hunter, and Mr. E. G. E. Scriven (Under Secretary, Department of Agriculture and Stock). Others present included Messrs. W. J. Affleck (Hon. Treasurer), G. H. Pritchard (Vice-President, representing Charters Towers), R. S. Archer, F. W. De Little, and H. Hill (Rockhampton), Ernest Baynes (Blackall), C. J. Booker, M.L.A. (Maryborough and Kilkivan), A. C. Thompson (Dalby), J. A. Pardy (Rosewood), J. P. Bottomley (Ipswich), A. J. M. Chapman (Noosa), Thos. Chappell (Charters Towers), J. N. Parkes (Townsville), R. P. Watson (Ipswich), M. Gleeson and E. Thorne (Clifton), D. Wildermuth (Toombul), W. J. Johnston (Pine Rivers), F. Shaw (Caboolture), S. Holmes (Pittsworth), A. B. Marquis (Zillmere), W. J. Lacey and A. W. Kirkley (Gayndah), W. A. A. Bates (Biggenden), W. M. Charles (Maryborough), J. Dean (Allora), Donald Gunn, M.L.A. (Goondiwindi), Gerard Noble (Toowoomba), B. J. Stark (Southern Queensland—Beenleigh), T. B. Murray-Prior (Fassifern), S. P. Fraser (Barcaldine), J. Hiron (Lowood), D. McIntyre (Goombungee), Chas. Baulch (Laidley), and J. Bain (Hon. Secretary).

An apology for non-attendance was received from Hon. W. Lennon, Minister for Agriculture.

President's Address.—The President, in opening the meeting, expressed pleasure at seeing such a large and representative gathering. He had pleasure in announcing that since their last meeting six more societies had affiliated, the membership of the Chamber now totalling 61 societies. He considered that this was good evidence that the work done by the executive was appreciated by agricultural societies. He briefly reviewed the annual report, and stated that they were very pleased to have His Excellency the Governor with them. It showed that His Excellency took a keen interest in the work of the Chamber when he came to spend the evening with them after having had such a strenuous day. They also had with them the Minister for Lands, Mr. Hunter, who had hardly missed a meeting since they had started, and they were always pleased to see him.

Minutes of the previous meeting having been previously circulated amongst members were taken as read and confirmed.

ANNUAL REPORT AND HON. TREASURER'S FINANCIAL STATEMENT.

The report and balance-sheet, which had been circulated amongst members and delegates, was taken as read and adopted. The financial report showed that receipts since last meeting had amounted to £78 5s. 8d., and expenditure £55 8s. 1d., leaving a credit balance in the

Government Savings Bank of £113 17s. 1d. Mention was made in the report of the arrangement made on behalf of affiliated societies with the Commissioner for Insurance by which, instead of every exhibitor being compelled to insure his riders and drivers in ring events at a cost of 5s. per day, the societies relieved exhibitors of all such bother by arranging that a flat rate should be charged the societies, such rate ruling according to the size of the society, from £3 per annum down to £1 per annum. The report notified that quite a number of societies had already availed themselves of this concession. Reference was also made to the good work which had been done on behalf of the societies with the Railway Department, the principal item being with regard to the continuance during the present year of the concession made to exhibitors of live stock at shows.

GOVERNOR'S ADDRESS.

His Excellency the Governor, who was received with applause, thanked the delegates for the kind invitation which had been extended to him to be present. He made explanation regarding remarks which he had made at Barcaldine on the subject of wool, explaining that at many of the centres he had visited he had noticed the absence of sheep, and had expressed regret that there were not more sheep shown. At the Barcaldine Show he had noted a fair display of sheep, and stated that they were the best he had seen at any show, not —as the report stated—that he had seen in Queensland. He trusted that his explanation would remove any feeling which might have been caused due to this incorrect report. He was very pleased to be present at the meeting, and was glad to find that six additional societies had come into the circle during the past year. It was most desirable that every society should join, for their interests were in common. One of the very grave problems was what classes of stock they considered the best for the country, and he congratulated the societies upon the good work which they were doing towards assisting the solving of this problem.

HORSE BREEDING.

Mr. Ernest Baynes gave a brief address on the subject of the improvement of horse breeding. He pointed out that it was a most important matter, and one to which they could not pay too much attention, for horses of the proper sort would undoubtedly prove to be one of the finest assets imaginable to the State. Last October the Federal Government had called a conference of representatives of agricultural societies, and there certain facts relating to the horse-breeding business had been disclosed. After the outbreak of the war the Federal authorities went into the question of ascertaining what horses were available for military purposes, and to their surprise found that only 2½ per cent. of the horses in Australia were fit for military purposes. When it was explained that the horses embraced in these figures included even those under four and over twelve years, and also brood mares and foals, it could easily be understood how fatal had been the system of horse-breeding in the past. It was imperative, if horse-breeding was to be

improved, that better stallions should be used. He urged that agricultural societies should make it a condition that all stock should be entered in stud books. Nothing would improve live stock more than stud-book registration. He hoped that breeders would take particular notice of the fine lot of military horses which were being paraded daily on the Show Grounds, so that they could ascertain the type required for military purposes.

A discussion followed the reading of this paper, the general tenor being in favour of the certification and taxation of stallions with a view to eliminating undesirable nondescripts which were too prevalent in our State. His Excellency's suggestion that a sub-committee should be appointed to give advice to those trying to find good stallions was received with unanimous approval, and it was decided that the suggestion should be considered by the executive, who would take the necessary steps to make it effective.

A motion was carried to the effect that the Government should be asked to introduce a Bill providing for the registration of stallions, also for a stallion tax, and, further, to prevent the importation of horses of undesirable type.

INOCULATION FOR TICK FEVER.

A motion was submitted by the Rockhampton Agricultural Society—

> "That the Chamber urge the Government to take immediate steps to secure more effective means for improving and perfecting the process of inoculation for tick fever, and to this end the services of a leading scientist with reliable assistance be secured."

Mr. R. S. Archer and Mr. Booker spoke on this subject, submitting very emphatic arguments in its favour. It was unanimously agreed to adopt the motion, and to urge that the Government, if possible, get the loan from South Africa of Dr. Tyler, who was stated to be the most eminent living authority known on the tick question.

EDUCATIONAL PAPERS.

It had been intended that papers should be read by Mr. Cuthbert Potts and Mr. F. W. De Little, the former on "Agricultural Education in connection with the future development of the State," and the latter on the subject of "Cotton Growing," but as the lateness of the hour prevented justice being done to the importance of both papers, it was decided to publish them in conjunction with the minutes, so that they could be read and discussed at next meeting of the executive.

ELECTION OF OFFICERS.

The following officers were elected for the ensuing year:—

President—Mr. John Macdonald.

Vice-Presidents—Messrs. G. H. Pritchard and Ernest Baynes.

Hon. Treasurer—Mr. W. J. Affleck.

Hon. Secretary—Mr. J. Bain.

Hon. Auditor—Mr. C. J. Booker, M.L.A.

Pastoral.

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—BEEF AND DAIRY CATTLE.

The following revised list of breeders of purebred cattle is published for the purpose of informing those who desire to improve their stock where the best cattle can be obtained in the State. The Department of Agriculture and Stock takes no responsibility in relation to the entries in the list; but, when inquiries were first made, the condition was imposed that the entries were to be only of stock that had been duly registered, or that were eligible for registration in the different herd books. The entries received were, in some cases, somewhat too confusing for proper discrimination, it has, therefore, now been decided that only such cattle as have been registered will be included. The lists previously published in the *Queensland Agricultural Journal* have now been withdrawn for revision.

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
P. Young	Talgai West, Ellinthorp	2	42	Milking Shorthorn Herd Book of Queensland
L. H. Paten	"Jeyendel," Calvert, S. & W. Line	8	21	Ayrshire Herd Book of Queensland
F. C. G. Gratton ..	"Towleston," Kingsthorpe	2	14	Holstein Cattle Club Herd Book
T. Mullen	"Norwood," Chelmer	3	20	Queensland Jersey Herd Book
J. H. Paten	Yandina	6	21	Ayrshire Herd Book of Queensland
Queensland Agricultural College	Gatton	2	6	Ayrshire Herd Book of Queensland
		2	3	Holstein-Friesian Herd Book of Australia
		3	13	Jersey Herd Book of Queensland
J. W. Paten	Wanora, Ipswich ..	10	42	Ayrshire Herd Book of Queensland
M. W. Doyle	Moggill	4	12	Queensland Jersey Herd Book
G. A. Buss	Bundaberg	1	15	Herd Book of the Jersey Cattle Society of Queensland
W. Rudd	Christmas Creek, Beaudesert	2	10	Milking Shorthorn Herd Book of Queensland
M. F. and R. C. Ramsay	Talgai, Clifton ..	5	27	Herd Book of the Jersey Cattle Society of Queensland
George Newman ..	Wyreema	9	37	Holstein-Friesian Herd Book of Australia

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—*continued.*

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
R. Conochie	Brooklands, Tingoora	9	21	Queensland Jersey Herd Book
W. J. Barnes	Cedar Grove ..	10	37	Queensland Jersey Herd Book
T. B. Murray-Prior ..	Maroon, Boonah ..	2	37	Queensland Shorthorn and Australian Herd Books
W. J. Affleck	Grasmere, N. Pine ..	6	31	Queensland Jersey Herd Book
A. J. McConnel ..	Dugandan, Boonah	19	36	Australian Hereford Herd Book
A. Pickels	Blackland's Stud Farm, Wondai	4	62	Illawarra Dairy Cattle Herd Book of Queensland
G. C. Clark	East Talgai, Ellinthorp	3	7	New Zealand Herd Book
H. D. B. Cox	Sydney (entered brother's name)	3	16	Commonwealth Standard Jersey Herd Book
J. T. Perrett and Son	Coolabunia	2	36	Illawarra Herd Book of Queensland
State Farm	Kairi	4	8	Ayrshire Herd Book of Queensland
		1	2	Holstein-Frisian Herd Book of Australia
E. M. Lumley Hill ..	Bellevue House, Bellevue	45	127	Australian Hereford Herd Book
W. F. Savage	Ramsay	1	12	Illawarra Herd Book of Queensland
Tindal and Son ..	Gunyan, Inglewood	50	400	Australian Hereford Herd Book
J. N. Waugh and Son	Prairie Lawn, Nobby	3	28	Queensland Jersey Herd Book
J. H. Fairfax	Marinya, Cambooya (2)	9	55	Ayrshire Herd Book of Queensland
C. E. McDougall ..	Lyndhurst Stud, Warwick (2)	25	100	Queensland Shorthorn Herd Bock
J. Holmes	"Longlands," Pittsworth	6	20	Ayrshire Herd Book of Queensland
P. Biddles	Home Park, Netherby	1	20	Illawarra Dairy Cattle Association
A. Rodgers	Torran's Vale, Lanefield	1	9	Milking Shorthorn Herd Book
R. S. Alexander ..	Glenlomond Farm, Coolumboola	1	..	Holstein-Frisian Herd Book of Queensland
State Farm	Warren	3	83	Ayrshire Herd Book of Queensland
S. H. Hosking.. ..	Toogooloowah ..	2	15	Holstein Cattle Club Herd Book
W. J. H. Austin ..	Hadleigh Jersey Herd, Boonah	1	2	Queensland Jersey Herd Book
Ditto	ditto	..	6	Commonwealth Standard Herd Book
H. M. Hart	Glen Heath Stud, Yalangur	7	21	Ayrshire Herd Book of Queensland

Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

MILKING RETURNS OF COWS FROM 27TH JUNE TO 28TH JULY, 1917.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Commercial Butter.	Remarks.
			Lb.	%	Lb.	
Lady Melba	Holstein	14 Feb., 1917	912	3·8	40·63	
Lady Margaret	Ayrshire	14 Sept., 1916	683	4·8	38·65	
Queen Kate	,, ...	30 June, 1917	971	3·4	38·58	
College Bluebell	Jersey	28 June ,,	773	3·8	36·43	
Princess Kate	Ayrshire	28 June ,,	683	4·4	35·37	
Auntie's Lass	,, ...	5 July ,,	852	3·4	33·84	
Buttercup ...	Shorthorn... ...	2 June ,,	779	3·5	31·90	
Confidence...	Ayrshire	25 June ,,	780	3·4	30·99	
Miss Bell ...	Jersey	1 Aug., 1916	562	4·6	30·45	
Rosine ...	Ayrshire	21 June, 1917	729	3·5	29·85	
Lady Loch II.	,, ...	3 June ,,	715	3·5	29·28	
Miss Security	Jersey	27 Mar. ,,	647	3·8	28·81	
Hedges Madge	Holstein	22 Mar. ,,	610	3·9	27·91	
Iron Plate ...	Jersey	6 Dec., 1916	491	4·8	27·78	
Thornton Fairetta	,, ...	30 June, 1917	410	5·4	26·17	
Skylark ...	Ayrshire	24 May ,,	539	4·0	25·31	
Lerida II. ...	,, ...	2 June ,,	563	3·6	23·74	
Snowflake ...	Shorthorn... ...	17 May ,,	499	3·9	22·83	
Cocoatina ...	Jersey	6 Mar. ,,	451	4·3	22·82	
Glade ...	Shorthorn... ...	29 Mar. ,,	504	3·8	22·45	
Constancy ...	Ayrshire	27 Dec., 1916	435	4·3	22·00	
Lady Spec...	,, ...	17 Jan., 1917	463	4·0	21·74	
Miss Betty	Jersey	27 Mar. ,,	469	3·9	21·46	
Violette's Peer's Girl	,, ...	18 Dec., 1916	304	5·9	21·23	
Miss Edition	,, ...	25 Dec. ,,	393	4·4	20·35	
Lilia ...	Ayrshire	11 June, 1917	536	3·2	20·01	

TANNING RABBIT SKINS.

Boil some wattle bark until it is of a thick, pasty consistence. Add enough water to make it the shade of brown required. Place the skin in the tan liquid, with the fur side of one resting on the skin side of the next, in layers till all are covered. Leave them in the liquor for a fortnight or twenty-one days—the longer period for preference. Then take them out, and peg them on a board, as when first dried. Leave them till thoroughly dry, and they will be fit for whatever use you may put them to. The skins should be a good brown colour.

Poultry.

REPORT ON EGG-LAYING COMPETITION, QUEENSLAND AGRICULTURAL COLLEGE, JULY, 1917.

The total number of eggs laid during the month was 8,820. Westerly winds prevailed during the month, which resulted in the majority of the light breeds going off slightly. The heavy breeds did not waver, and some fine laying records were put up. Morris wins the monthly prize in the heavy breeds with the fine total of 173. In the light breeds, Miss Hinze wins with 146 eggs. R. Burns's bird in the single test laid 31 eggs for the month, bringing her total to 112 eggs in 122 days. Walters's pen of black Orpingtons laid 116 eggs up to the 20th, laying six per day for twelve days running; on the 21st, two of the hens went broody. Broodiness has occurred in all the heavy pens in the six-hen test, with the exception of those owned by Claussen, Manson, and Morris. In the single test, G. W. Holland's G. bird was the only case of broodiness. The eggs of all the competing pens have been weighed, but owing to there being such a big majority under 2 oz., and taking into consideration the bad weather that was experienced during the time the weighings were taken, it is deemed advisable to take a second weighing in more favourable weather. The health of all the birds has been excellent. The following are the individual records:—

Competitors.	Breed.	July.	Total.
LIGHT BREEDS.			
E. Chester	White Leghorns ...	129	490
*G. H. Turner	Do.	128	431
W. Becker...	Do.	117	424
W. R. Crust	Do.	124	403
Oakland Poultry Farm	Do.	110	398
G. Chester	Do.	128	397
F. W. Leney	Do.	142	391
T. A. Pettigrove, Victoria	Do.	123	389
Chris. Porter	Do.	143	386
Moritz Bros., S.A.	Do.	136	379
*J. Zahl	Do.	111	377
*J. R. Wilson	Do.	116	369
T. Taylor	Do.	110	369
T. B. Hawkins	Do.	114	361
*A. W. Bailey	Do.	110	359
*J. M. Manson	Do.	143	356
J. G. Richter	Do.	129	353
Mars Poultry Farm	Do.	127	349
A. H. Padman, S.A.	Do.	75	345
*A. T. Coomber	Do.	114	341
Kelvin Poultry Farm	Do.	133	340
Quinn's Post Poultry Farm	Do.	139	337
C. Knoblauch	Do.	97	331

EGG-LAYING COMPETITION—*continued.*

Competitors.	Breed.	July.	Total.
LIGHT BREEDS—*continued.*			
D. Fulton	White Leghorns ...	125	322
R. Holmes	Do.	110	320
A. Shillig	Do.	117	319
*Mrs. J. R. D. Munro	Do.	113	319
*Dixie Egg Plant	Do.	118	309
Miss M. Hinze	Do.	146	299
F. Clayton, N.S.W.	Do.	11[illegible]	285
J. L. Newton	Do.	115	281
Geo. Williams	Do.	95	280
*C. C. Dennis	Do.	115	275
L. G. Innes	Do.	115	266
*T. Fanning	Do.	99	266
Mrs. W. D. Bradburne, N.S.W. ...	Do.	98	263
*A. E. Walters	Do.	123	256
J. Holmes	Do.	114	248
G. J. White	Do.	118	246
G. Howard	Do.	121	245
E. Cross	Do.	87	244
Mrs. J. Carruthers	Do.	111	240
Mrs. F. J. Sear	Do.	110	224
C. H. Singer	Do.	93	223
E. A. Smith	Do.	106	220
C. P. Buchanan	Do.	85	216
J. Ferguson	Do.	94	208
S. C. Chapman	Brown Leghorns... ...	86	206
*Dr. E. C. Jennings	White Leghorns ...	91	190
HEAVY BREEDS.			
*R. Burns	Black Orpingtons ...	151	444
A. E. Walters	Do.	157	408
W. Smith	Do.	155	405
F. A. Claussen	Rhode Island Reds ...	142	387
*Mars Poultry Farm	Black Orpingtons ...	138	386
W. S. Hanson, N.S.W.	Do.	147	358
*E. F. Dennis	Do.	151	337
D. Kenway, N.S.W.	Do.	114	337
Cowan Bros., N.S.W.	Do.	133	333
P. C. McDonnell, N.S.W.	Do.	131	319
H. Jobling, N.S.W.	Do.	111	303
Mrs. J. H. Jobling, N.S.W.	Do.	143	279
King and Watson, N.S.W.	Do.	121	268
F. Clayton, N.S.W.	Rhode Island Reds ...	79	241
*Oakland Poultry Farm	Black Orpingtons ...	128	230
C. B. Bertelsmeier, S.A....	Do.	138	228
R. Burns	S. L. Wyandottes ...	141	224
E. Morris	Black Orpingtons ...	173	213
*E. A. Smith	Do.	152	208
C. C. Dennis	White Wyandottes ...	109	207
*Kelvin Poultry Farm	Plymouth Rocks ...	120	190
*Miss M. Hinze	Black Orpingtons ...	141	174
J. M. Manson	Do.	134	174
*F. W. Leney	Rhode Island Reds ...	78	158
Totals	...	8,820	22,235

* Indicates that the bird is engaged in the single hen test.

RESULTS OF SINGLE HEN TESTS.

Competitors.	A.	B.	C.	D.	E.	F.	Total.
G. H. Turner	53	67	86	79	67	79	431
J. Zahl	76	55	82	27	80	57	377
J. R. Wilson	67	60	58	64	68	52	369
A. W. Bailey	36	47	71	69	67	69	359
J. M. Manson	65	54	51	53	59	74	356
A. T. Coomber	67	9	72	69	52	72	341
Mrs. J. R. D. Munro	86	46	46	46	25	70	319
Dixie Egg Plant	50	62	64	70	62	0	308
C. C. Dennis	53	43	15	51	55	58	275
T. Fanning	14	55	56	52	33	56	266
A. E. Walters	28	38	35	54	60	41	256
Dr. E. C. Jennings	20	11	33	44	63	19	190
R. Burns	51	40	83	58	100	112	444
Mars Poultry Farm	62	79	54	75	59	57	386
E. F. Dennis	52	46	67	69	71	22	327
Oakland Poultry Farm	70	27	28	23	67	15	230
E. A. Smith	27	23	28	65	37	28	208
Kelvin Poultry Farm	43	22	19	70	13	23	190
Miss M. Hinze	33	25	28	34	33	21	174
F. W. Leney	23	24	0	20	69	22	158

THE POULTRY INDUSTRY IN QUEENSLAND.

The following informatory paper on this subject was read by Mr. J. Beard, Instructor in the Poultry Industry, Department of Agriculture and Stock, at the Poultry Conference, held at the Queensland Agricultural College, Gatton, on 21st August last:—

As no doubt you are aware, the poultry industry for a number of years past has been very much neglected, and has been allowed to run its own course. This can be accounted for to some extent owing to the want of attention to this branch of rural industries in the past.

It is to be regretted that Australia has not yet decided that it should be self-supporting in the matter of poultry. Unfortunately, into some of the States, Queensland included, both eggs and egg pulp were being imported. I hope, and I feel certain you will agree with me, that the importation of eggs and pulp from the East will be unknown in the immediate future.

I regard the poultry industry of Queensland, so far, as being in its infancy, although it is annually progressing. In America big things were being done, and what the industry was doing for itself in America should strike all Queenslanders. It really showed how very important the industry was.

People need have no fear of the venture, and should have no need to think they were entering on a venture that was not an important one. A great deal had been done in Australia, and already the value of the production annually was close on £2,000,000.

From the returns supplied from the various petty sessions districts, ranging from Rockhampton to the southern borders of the State, and also

including the districts of Herberton, Cairns, and Mackay, which forwarded their returns and are here included, the following figures will enable you to form some idea of the value of the returns of the poultry industry. Unfortunately, towns such as Rockhampton, Bundaberg, Maryborough, Gympie, Brisbane, Ipswich, Toowoomba, and Warwick are not included in these returns. Large towns in America, and the other States of the Commonwealth, are not included in these annual returns.

The decrease in poultry in 1915 from that of 1914 was by no less than 208,573, and eggs by more than 10,500,000; taking the average price of eggs in 1915 at 1s. 6d. per dozen, the loss was over £65,000.

Dugandan with 33,839 common fowls, or 35,779 all kinds, and total egg production 135,033 dozen, although much less than 1914, is again in the first place.

Brisbane follows with 29,030 head of poultry (all kinds), and 127,058 dozen eggs.

Maroochy returns 100,542 dozen eggs, third place with only 16,348 birds. Harrisville and Gatton run very close in number of all fowl, 98 in favour of Harrisville, which returned 35,623 dozen eggs in excess of Gatton.

Rockhampton returned 19,333 birds, and 86,550 dozen eggs.

Rosewood returned 17,753 birds and 85,431 dozen eggs, which is a better average.

For the year 1916, Dugandan again heads the list with 39,874 fowls, showing an increase of 4,094, although the increase in eggs only totalled 787 dozen.

Brisbane also holds the second place again with 33,810 fowls, showing an increase of 4,780, while her egg supply increased by 30,806 dozen.

Harrisville and Gatton run very close again as to the number of fowls, 59 being in favour of Harrisville as against 98 last year; the latter also shows a return of 112,414 dozen eggs, being an increase of 42,458 over that of last year. Gatton egg returns show 69,956 dozen, an increase of 12,320 dozen for the year.

The following table will enable you to form some idea of the industry as it stands at the present time. I will not give you an outline of the whole of the districts embraced in the returns, as it would take up too much time. I will leave that for the Press to publish.

The totals are as follows for the years 1914, 1915, 1916:—

Year.	Fowls.	Ducks.	Geese.	Turkeys.	Others.	Eggs.
						Dozens.
1914	906,772	41,070	7,785	28,334	2,487	3,429,908
1915	729,163	25,321	6,166	15,688	1,559	2,554,687
Decrease ..	177,609	15,749	1,619	12,666	903	875,221

Total decrease of fowls, all kinds, 208,573.

Although the prospects of the industry were brighter for the year 1916, and show an increase over that of 1915, the returns still show a large falling off from the 1914 returns. The totals are as follows:—

Year.	Fowls.	Ducks.	Geese.	Turkeys.	Others.	Eggs.
						Dozens.
1916	821,016	38,499	7,196	21,046	2,925	2,782,914
Increase ..	91,853	13,178	1,030	5,378	1,366	228,227

The total increase for the year 1916 over and above the year 1915 was 112,805 fowls of all kinds, still showing a shortage of 95,768 fowls and 646,994 dozen eggs. I trust the foregoing returns will impress upon your minds that there is need for greater improvement. This can be done by organising the poultry industry and encouraging production, and secure the Australian market for the Australian producer.

I would like to have a few words on turkey-raising. It seems to be an established fact that turkey-raising in this State is on the decline, where years ago a flock numbering 100 or 200 was a profitable adjunct on the country farms. Now these birds are found but rarely, and then in flocks of a dozen or less, tolerated rather than fostered. The cause is hardly apparent. The thickening settlements have not yet encroached upon the solitude of many a backlying farm where green paddocks and sheltering timbered country offer ready for use the best possible food and shelter. True, they may damage to some extent the growing crops, but they will render services much more valuable than what they destroy in the wholesale destruction of grasshoppers and insects which threaten the farmer on every hand, and which they incessantly pursue as the principal article of their diet.

I will not touch on turkeys any more than to give you some idea of the turkeys raised in this State. I find for the year ended 1914, 28,334 turkeys were accounted for, while for 1915 we only got returns for 15,668, showing a decrease of 12,666. Putting them on the low average of 8s. per head means a loss of £5,066 8s. to the producer. For the year 1916 we got a more favourable return of 21,046, or an increase of 5,378 over the preceding year.

For the year 1915, Warwick takes first place by supplying 1,029, with Dalby second 1,004, Nanango 790, Beaudesert 673, and Harrisville 615.

For the year 1916, Dalby is easily first with 1,905, showing a very satisfactory increase of 901 turkeys. Warwick with only 1,079, showing only an increase of 50, takes second place, Beaudesert 912, Nanango 866, and Pittsworth 810. I have given the five leading districts for each year.

We have an ideal country for the production of high-class and utility poultry. No other portion of the world is so favoured in this respect, but the industry is still in its infancy. We should not fear over-production, as the demand for both eggs and poultry of the right kind is incessant.

IN-BREEDING.

It is quite amusing to hear the opinions expressed by many poultrymen on this great subject. The man who thoroughly understands breeding knows for a certainty that he will never make any advance in his work unless he adopts the principle, and he succeeds where he realises the inherent dangers of the principle. For there are dangers, and it is failure to realise this fact that is responsible for the condemnation of the system among those who have not thoroughly studied it. While in-breeding is the most effective means we have at command of fixing type, it is also the most effective means of perpetuating defects. Thus, in-breeding with desirable prepotent animals enables us to gain, in the shortest possible time, the ideal we are aiming at; in-breeding with ordinary birds, weak perhaps in constitutional vigour, leads only to disappointment and degeneration. It is well, therefore, that those who are antagonistic to the principle should maintain their prejudice against it. In-breeding is not for them; it is better left to the man who may be regarded as a professional in his work, and who is guided not alone by egg performance but by signs of constitutional vigour and desirable type. The exceptional layer may be a freak, and not improbably leave disappointing stock, and the male birds from an exceptional layer may be a most undesirable bird for the breeding pen. We would warn poultry men against the extreme policy of introducing new blood; by this means retrogression is invited. It should be a simple matter where a good strain has been once obtained to bring back fresh blood from a reliable breeder of good female stock to whom a cockerel has been sold for breeding purposes. This use of half-blood is the simplest means we have at command of perpetuating desirable type. But even with this method the half-blood introduced should be a prepotent bird, typifying masculinity in the whole of his make-up.—"New Zealand Farmer."

TURKEYS AND THEIR MANAGEMENT.

By J. C. BEARD, Instructor in the Poultry Industry.

While I have not had as much experience in raising turkeys as a good many others, I have had continued experience with them for thirty-five years. Hence, my remarks will be from a practical standpoint.

Generally it is considered that one male will mate with six to twelve females. Some people have even only used one male to twenty-five hens. The latter plan is very unwise, and not worth the risk of using only one male with your entire flock.

For the following reasons:—A female usually allows the male to tread once. If, from any cause, the male did not effect proper connection, the eggs would not be fertile, and the best part of the season would be lost, because the first hatch is considered the best.

The hen, after connection, selects a place for her nest. This is usually done by scratching up the earth, so as to make a hollow place in which to keep the eggs from rolling out. A great deal of the risk of

males not fertilising the eggs could be avoided in the following way:—Use two males alternately every day, but under no consideration allow both males to run with the females at the same time. If you do this, you will, as a rule, have bad luck, as the males will fight and, at times, hurt themselves as well as the females.

The lack of fertility in eggs and vigour in young poults is one of the main reasons for the decline in turkey breeding in this State. I feel certain that the main cause is in-breeding. There are many turkey breeders who, in the past, have not thought it necessary to obtain new blood, and who thought they could save a few shillings by borrowing a male from a neighbour, in this way using the same blood year after year. This has been done for so many years that the vitality has been about bred out. The vitality has got so low that it creates disease, and I am sure that many of the turkey diseases with which we have to contend have been caused by lowering the vitality of the turkey. I believe there is no other variety of birds in which the vital forces decrease so rapidly by in-breeding as in the turkey.

I think it possible, under proper management, to raise turkeys in every part of the State, and I believe, if farmers in general would be more careful about in-breeding, and would see that they have the proper kind of males to breed from, such as will introduce new, strong, hardy blood into their stock, they will be able to raise turkeys as they did in years gone by.

A WORD TO PURCHASERS.

When you wish to buy, first select a reliable breeder, and if you want breeding birds, you can easily purchase them at a reasonable figure; but if you want show birds for breeders (which are the best), do not expect them at common breeding stock prices, for no man's whole flock is composed of show birds, even if many of his old breeding stock were once show birds. If the breeder tells you that his birds were never beaten in a show, immediately learn where the birds were exhibited, whether in a local show or in a show like the National. No person has made a clean sweep at many large shows unless the competition was very small indeed.

Having selected your breeding stock, the next thing is to know how to feed. To ensure good health, the breeding stock must be provided with a variety of grain, grit, and charcoal. As a conditioner and health preserver, charcoal has no equal for the turkey family. When turkeys have free access to charcoal, very few will become sick or ailing. Good, sound short oats will be found the best all-round grain for turkeys, especially during breeding season. A small amount of maize and wheat can also be fed to good advantage. Over-fat specimens are, as a rule,

very poor breeders. Turkeys require a considerable amount of water, and should always have a liberal supply kept in the shade, free from the sun's rays. Where the breeders have the free range of the farm, they

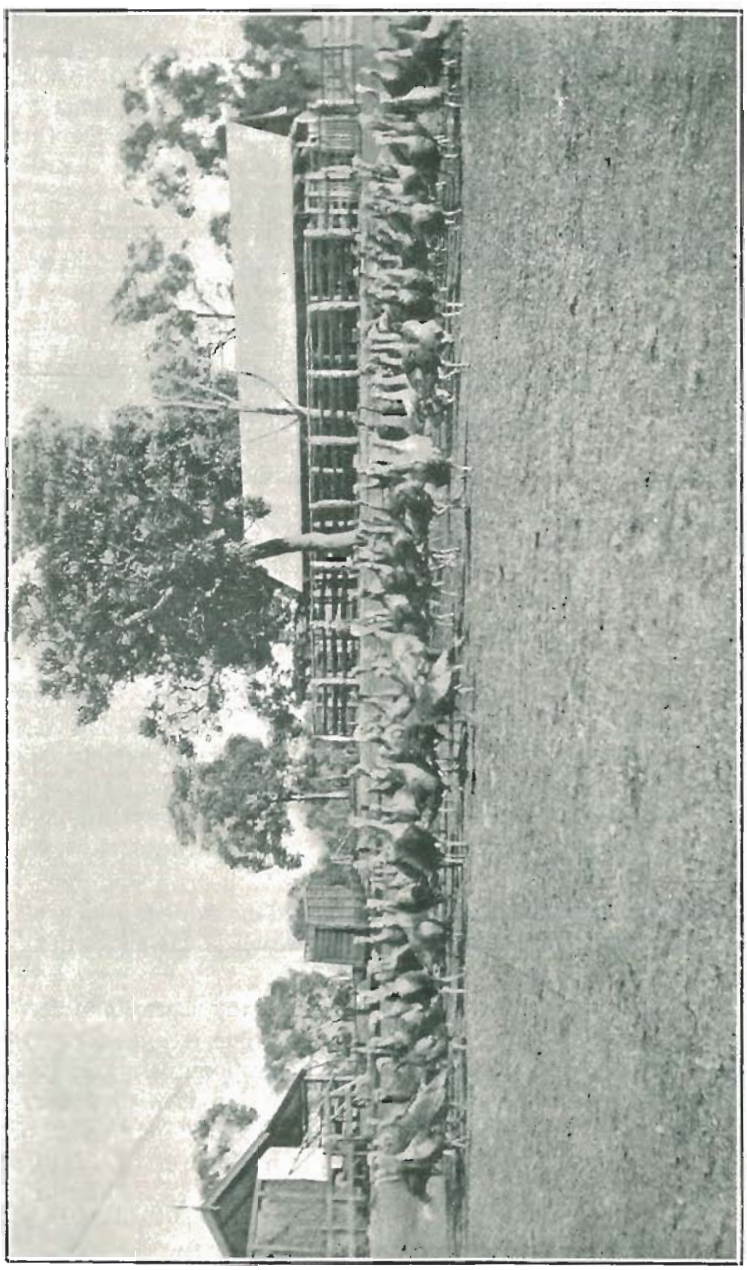

PLATE 19.—TURKEYS AT LARGE.

require very little grain food after they commence to lay. Many farmers hatch the first laying of turkey eggs under ordinary hens. While some make a success by this method, many more make a failure, as young

poults do not thrive with ordinary hens. For two principal reasons—namely, proper food and lice.

In their natural state, the young poults live almost entirely on insect food, which is not, and cannot be provided where brooded with the ordinary hen. Therefore, you would be feebly trying to make them thrive on food entirely foreign to nature. The better plan would be, when you have more eggs than the turkey hen can cover, to put all surplus eggs under ordinary hens at the same time as you set the turkey hen; and, as the eggs under the ordinary hen begin to chip, put them under the turkey hen, otherwise she may not take to them after their being hatched with the ordinary hen.

Having finished hatching, the time has arrived to try and rear your poults. These require no food for thirty-six hours after hatching. As a rule, many young turkeys are killed by over-feeding. On a farm where the hen turkey and her poults have plenty of range, it is best to feed them only twice each day, once in the morning and again at night. Young turkeys can live on insects and many small grasses which they relish. You will always find that food they get in the paddocks will keep them in better condition than anything you can give them. In seasons when there is a good supply of grasshoppers the turkey will live almost entirely on them.

When young turkeys have to be fed the best food I know of is stale bread, but be sure the bread is not sour. Moisten the bread with new milk that has been brought to three-parts boiling point, and allow it to cool before moistening the bread. This must be fed crumbly by pressing out the milk with your hand. This can be fed for three or four weeks. Then gradually get them to eat cracked wheat and maize. These grains should be scalded, as it will then assist digestion, but do not feed it until it has thoroughly cooled. Indigestion is very prevalent among turkeys, both young and full-grown. If the season is getting late and the warm weather sets in, discard maize in any form, as this is overheating and is the cause of many troubles in young turkeys.

Another splendid feed is hard-boiled eggs with onions chipped fine. To either feed some powdered charcoal should be added, which serves as a grit and prevents sourness of the crop, which is the cause of many deaths.

If your poults should have diarrhœa from any cause, one feed of boiled rice will usually stop the trouble. Another common, but sure, relief is to give them red pepper—say one tablespoonful. Mix it with about two tablespoonfuls of pollard. Then moisten it with water, but not wet enough to make it sticky. Cut it up into about four or six parts and in oblong shape, put them into an oven, and bake hard. It is well to have a few always in hand, as after baking, they will keep for a long time in a dry place.

If you have a turkey, either old or young, with a bad case of diarrhœa, give one pill three times a day until the droppings are improved. Then give a tablespoonful of castor oil, if the turkey is full grown, or a teaspoonful to a young poult. This treatment will often stop the worst cases of diarrhœa.

INDIGESTION.

As a rule a turkey grows very fast, and has an appetite like an ostrich, but without on ostrich's digestive ability, as the natural way for a turkey to eat is to pick up a grain here and there in such a manner as to give the digestive organs a grain at a time to digest, then the digestive mill grinds slowly, without being clogged. This method of feeding keeps up a steady circulation and the turkey keeps growing larger and stronger, the digestive organs being developed as the turkey grows, and they are therefore better able to do their work when more food is required to be digested to build up a large frame. On the other hand, when the poults are overfed the machinery is clogged, and there is a general smash up, the effect being similar to that caused by throwing a bushel of maize into a corn cracker. The machine will do its work all right if fed slowly, as will the digestive organs of a turkey. A turkey is a voracious eater, and will eat as often as you feed it.

There are other causes that will bring death with very nearly the same symptoms. One is lice, and another is lack of sharp grit and charcoal. A turkey cannot grind its food without grit any more than a miller can grind wheat without millstones. We might as well try to chew our food without teeth. In many cases, it is the absence of sharp grit that is the cause of them going off colour and eventually dying. If they get a little sharp grit in their food every morning, it keeps their grinding apparatus in perfect order. Very young birds do not find the grit of their own accord, and as they grow older they are liable to gorge themselves with the grit as soon as they discover it, thereby clogging their digestive organs, while a small quantity in their food each morning keeps them in excellent condition.

The only road to success with turkeys is to keep them healthy. Give them plenty of exercise, commencing by letting them run through the middle of the day at three or four days old. Keep the lice off, and with good clean water to drink, they will have very few diseases. But exercise they must have. On no account let them run in the grass until the dew is off, or in the grass on rainy days. This is one of the chief causes of white diarrhœa, a good remedy for which is new milk boiled, in which a little nutmeg is grated and stirred well while boiling. This to be given the poults to drink when cold. This is also a sure remedy for any kind of chickens.

TO PREVENT LICE.

Before setting the hen and placing the eggs in the nest, sprinkle tobacco dust in and around the nest, and again on the twenty-fifth day. By these means, you will quite, or almost, avoid any lice. But to make sure, it would be as well to rub a little pure lard on to each of the poult's heads. Dust both the mother and poults with some well-known brand of insect powder. If you think this too expensive, you could make up some yourself by obtaining 1 lb. flower of sulphur, 1 lb. of carbolic powder, and 2 lb. of fine white wood ashes, thoroughly mixed, and used from a duster made from any round tin with a few small holes perforated in the lid, as in a pepper box. Look carefully for the lice, for they are hard to find. Lice will kill a poult in a very short time.

TO ACHIEVE SUCCESS IN TURKEY RAISING.

Breed only from vigorous well-matured stock.

Keep stock in healthy condition.

Do not let poults run in wet grass.

Do not overfeed or starve young poults.

Make war on the lice.

Prevent disease by disinfection.

Use your best judgment and common sense.

Give plenty of range. The turkey is naturally a wild bird, and will not thrive in confinement.

Good grit, oyster shell, charcoal and fresh water should not be forgotten as an important part of their ration.

SPADE UP FEEDING PLACES.

In many places feed for the flock is scattered on the ground, and the chickens are continually fed within a small space, says a bulletin of the W.A. Department of Agriculture. The surface of the ground soon becomes foul with the droppings of the flock. True, the sunshine acts as a germicide, and if the space is at all sloping the washing of the rain helps to keep the surface clean, but generally the spot is level and often muddy. The ground quickly becomes contaminated with the continual tramping of the flock, and if there be one sick fowl the whole flock may soon become infected. This is especially true with small chicks and young turkeys. The first advice given in cases of general loss is "change your feeding place," but it is often impossible to find another location so convenient and accessible.

The poultry specialist of the University of Manitoba points out that the spading-up of the feeding place once or twice per week will bring good results. It will tend to purify the ground, and it will induce exercise on the part of the flock, which is always desirable. Especially is this true when the flock is confined in yards, and green feed, so necessary, is difficult to obtain. If grain is scattered, as one spades up the ground much will be buried so deep that hens will not scratch it out and it will be thrown up at the next spading with green, succulent blades that are greatly relished by the flock.

This method of spading up the feeding places is often worth trying, and the results in avoiding infectious diseases and improving the general health of the flock should be watched; with, of course, the reservation that the constant turning over of the same soil in a small run may eventually mean the working and reworking of heaps of droppings, which is not good.

The Horse.

MULE RAISING IN AUSTRALIA.

By E. BAYNES.

The usefulness of mules depends in a great measure upon the circumstance that they combine in a remarkable degree the constitutional attributes of their parents on both sides. Descended originally from the species of wild ass inhabiting the rocky semi-desert of Upper Egypt, where food is scarce and the heat intense, the jacks transmit to their hybrid progeny the faculty for resisting privation and withstanding tropical heat, which horses do not possess.

The value of mules cannot be overestimated. This has for a long time been realised in most parts of the world, although in England and Australia ignorance and prejudice have debarred their use on any big scale.

The testimony of those who have had experience of both horses and mules is convincing as to the superiority of the latter. They live longer and are able to withstand the effects of hard work for a greater number of years; they are constitutionally stronger, and less liable to sickness, to which horses are subject; they can be kept on coarser and cheaper food, and they are hardier and able to resist extremes of temperature, especially heat. Their narrow and small hoofs make them more sure-footed than horses, and they can pick their way over mountains and on the edge of precipices without much risk of disaster, and in positions such as these show more pluck and caution than horses.

These all-round advantages of mules over horses in the way of economy of keep outweigh the disadvantages with respect to certain uses. It is conceded at once that a mule is not as fast as a horse, and the heaviest draught mules are not as good as the heavy Clydesdales for actual pulling power; but an ordinary team of mules will beat the ordinary team of horses for pulling and for travelling great distances where food is scarce.

There are two distinct types of jacks in Europe. Those for getting heavy draught mules are bred in Poiton, in the West of France. The height of these is about 15 hands. In America, where hundreds of thousands of mules are bred each year, the Spanish or Catalonian jacks are the most popular. The Kentucky mules are famous all over America, and owe their fame to two Catalonian jacks imported to America in about 1830 or 1840 and crossed with the ordinary female donkeys of the State. They have produced a most useful strain of mule-breeding jacks. It is said that all the best mules in America owe their quality to the infusion

of those two jacks. So highly appreciated are mules in the West States that in 1890 150,000 mules were foaled. At the present time something like 200,000 are foaled annually.

Anyone who has visited America must be struck with the numbers used. One sees them doing heavy dock work and railway work in the country, ploughing and ordinary farm work, and they are invaluable in mining and pack work. They will carry over 200 lb. over rough, high country, if properly loaded.

It is generally considered that three mules can be kept on fodder that would only be sufficient for two horses. They are peculiar creatures, and it has been proved they will pull better if a mare is in the lead, for, having been foaled and brought up by mares, they have a great affection for horses and a corresponding dislike for asses. With regard to the question of the fertility of mules, it appears to be admitted on all hands that they are absolutely sterile when paired together. The objection that is taken to mules on the score of bad temper and obstinacy may be dismissed by the remark that, in the opinion of competent judges, these so-called vices are the outcome of mismanagement and cruelty to beasts of highly-nervous temperament, which require kindness and intelligence in handling.

In a letter, dated September, 1916, to a friend of mine, Colonel Peacocke, of the Remount Department of India, and an officer of the War Office, says: "The American mule has been a perfect revelation to many people—all of them as quiet as sheep, and the percentage of mules to horses in all veterinary hospitals, and the wastage of mules compared to horses, is very small. We have brought them in three classes: (1) a few heavy mules, 16-17 hands weighing from 1,300 lb. to 1,500 lb., for use of heavy guns in Egypt; (2) artillery draught mules 15·2, weighing about 1,100 lb., and (3) what we call carters, that which can go in draught in the limbered service waggons. I fancy when her soldiers go home they will, all of them, have nothing but praise for the American-bred mule. I wish Australia would go in for breeding mules."

Mr. J. S. Love, of Townsville, a gentleman who probably knows more about the remount question than most shippers—i.e., the type of horse required, &c.—has been importing many high class blood stallions to breed remounts on his own stations, and has lately gone in for mule breeding. We went to great trouble and expense in getting two really high-class Spanish jacks, and as these are doing duty in the far North, ideal country for mule breeding, I anticipate Mr. Love will make a success of it. I should think his lead worth following.

I have endeavoured to show some of the many good points of the mule, and I hope breeders in Queensland will go in for it. We have great areas of second-class land in the State, rough, stony ridges which are admirably adapted for mule breeding; but to those who are thinking of taking it up, let me caution them to be careful about the jack, the selection of the jack is of as much importance as that of a good sire in horse breeding. Never forget like begets like.

The Orchard.

THE "DUNNING" SEEDLESS ORANGE.

Notice having appeared in a previous issue of the "Agricultural Journal" respecting a new Navel orange named "Dunning's Seedless," specimens of this fruit have been obtained by the Director of Fruit Culture, Mr. A. H. Benson. Same have been photographed, and are reproduced herewith.

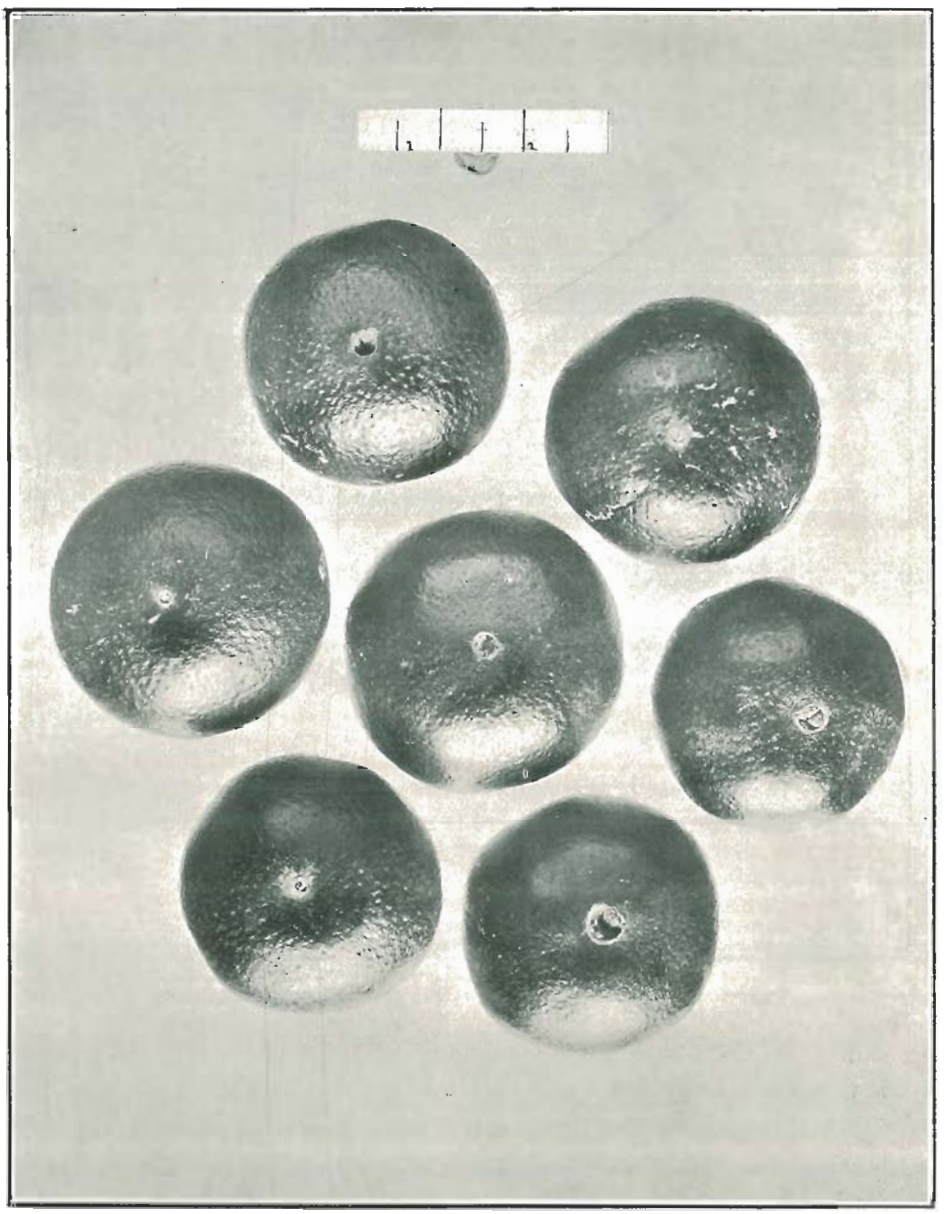

PLATE 20.—THE "DUNNING" NAVEL ORANGE.

Respecting this orange the Director states:—The fruit is of large size, averaging about 3¼ in. in diameter. In shape it is flatter than the average Washington Navel. The skin is of good colour and texture, and of moderate thickness, individual specimens possessing remarkably thin

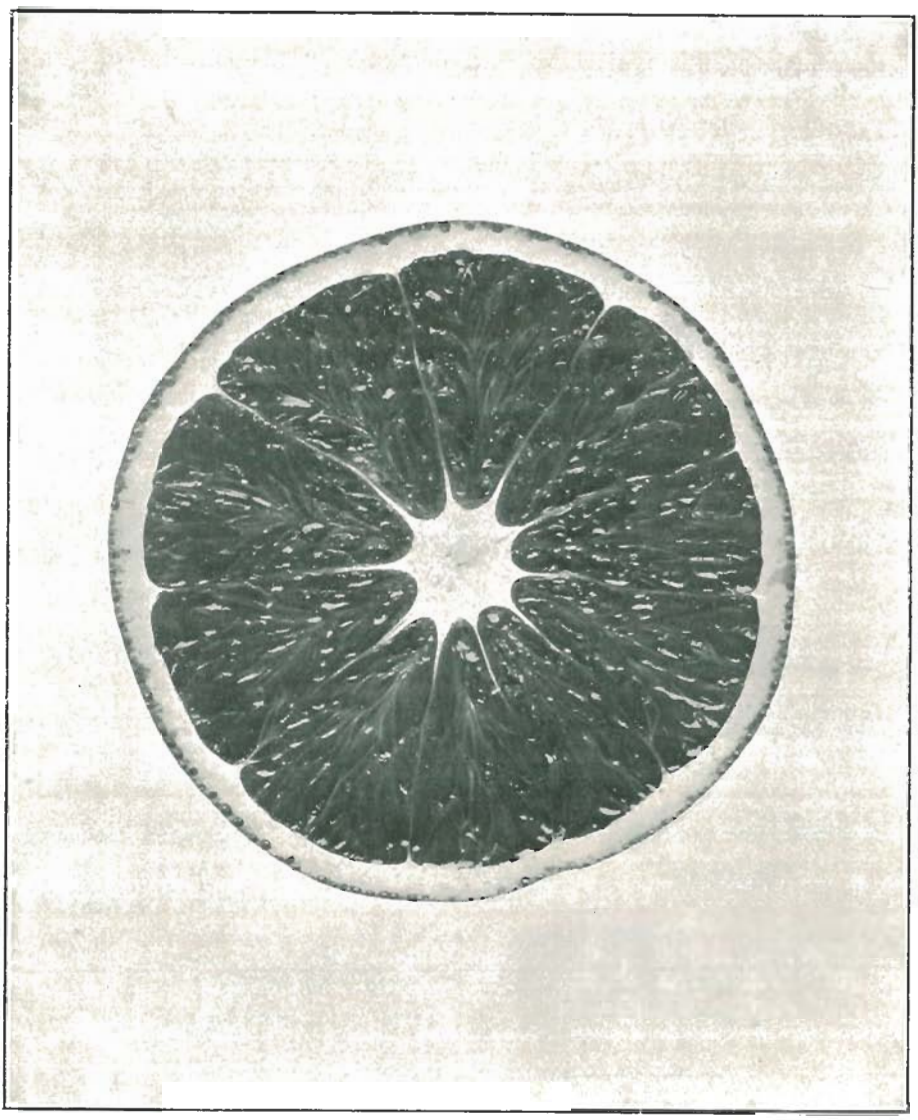

PLATE 21.—SECTION OF THE "DUNNING" SEEDLESS ORANGE

skins. It differs from the Washington Navel in that the skin at the base is very much thinner as a rule than it is in this variety.

With respect to the Navel, this is usually very indistinct, and there is seldom any waste in the fruit which occurs when the Navel is large and distinct.

The flesh is firm, of good quality, and the flavour is excellent. The fruit is practically seedless, as it is only very occasionally that a seed is met with. The percentage of rag in the fruit is small.

With regard to the tree, the habit of growth is strong and vigorous, with large dark-green leaves. The tree is very thorny.

Owing to the fact that it is a Queensland-raised seedling, it is extremely likely that the good bearing qualities it has already developed will be maintained, and if this is so it will be undoubtedly a very much more profitable variety to grow than the Washington, which is frequently an uncertain cropper.

The Dunning's Navel has also one further advantage, and that is, owing to the inconspicuous navel, there is not the same chance of the fruit being attacked by the larvæ of the spotted peach moth, which frequently causes serious injury to the older sorts of Navels by boring into the fruit from the navel, which forms a natural protection for the egg of the moth and the newly hatched larvæ.

THE CASABAS AND THEIR CULTIVATION.

Referring to a fruit new to Queensland, which was introduced by Mr. Mobsby, of the Agricultural Department, on his return from the Panama Exposition, and who has since successfully raised the plant, Mr. B. Harrison, F.R.H.S., of Burringbar, New South Wales, writes in the local newspaper:—

"These magnificent fruits are as yet practically unknown here, where they could be grown as easily as melons or pumpkins. They are totally distinct from ordinary rock or water melons, and in a class by themselves. In California, U.S.A., where the climate is similar to ours, they are very profitable, and are grown extensively, and hundreds of car loads are forwarded to the Eastern States each season. There are many varieties, the best of which appears to be the Improved Hybrid, Golden Hybrid, Beauty, and White African; they all possess a most delicious flavour, and are more nutritious and sustaining on account of the firmer flesh than ordinary melons. They ripen up to quite late in the fall, and keep well into early winter, and if stored in a cool place will keep still later. Varieties placed in a sunny window for a few days will ripen well. In appearance most of them resemble a hard, heavy, wrinkled melon, and vary in weight from 10 lb. to 20 lb. The vines are robust and vigorous, and the foliage is larger than that of rock melons, and they are very

prolific. When the soil is not rich it should be well worked and manured, planting two to three seeds in each hill 12 ft. to 13 ft. apart. The soil should be kept loose round the plants until the vines begin to run, when they should be earthed up. When wanted for market, to which they carry well, the fruit should be taken from the vines when they lose their green lustre, but should not be eaten until about a week or so after they turn yellow, or give slightly under pressure as with a mellow apple. The flesh is firmer than that of ordinary rock melons, without any stringiness, and the flavour is splendid. Their cultivation should prove very lucrative to our farmers, who should readily obtain from 1s. to 3s. each for them, and they can be marketed right into the winter months, when other melons have disappeared."

Mr. Mobsby distributed some forty or fifty seeds from fruit produced in his own garden, and next season should see a considerable number of these melons on the market.

AN EASY WAY OF CURING LEAF CURL.

"A fruit farmer of many years' experience in Tasmania," says the "Tasmanian Fruitgrower" (7th July), "guarantees that a wire nail, if large enough, if not a piece of plain wire, driven through the trunk of a peach or plum tree will speedily cure the worst case of leaf curl."

"A CART HORSE WHICH WILL TROT."

A correspondent of the "Live Stock Journal," London, remarks:—"We have it now from Lord Derby that the type of horse most required for the Army is 'a cart horse which will trot,' and the sooner we begin to breed him the better. It is to be hopd that the Board of Agriculture will commence by offering some inducement to breeders to produce stallions of the type required, as, unless the sire is of the right type as well as the dam, we shall by further cross-breeding make it far harder in the future than it has been in the past to produce what we require." If Lord Derby's dictum be correct, why import the Percheron while we have in the Clydesdale a horse that can move a weight and trot with it?

It is interesting, in view of the experiment being made with the Percheron in England, to note that British artillery officers at the front are speaking in high terms of the Suffolk for artillery purposes. Lord Lonsdale, by the way, according to recent Home exchanges, has purchased three Suffolk mares to cross with his Percheron stallion!

Horticulture.

FOUR METHODS OF PROPAGATING GLOXINIAS.

The first, by seeds—When sown the seed should only be *very slightly* covered with very fine soil, and watering must be done with a fine rose can or, better still, with a garden syringe. The tin, pot or pan, should be covered with glass and shaded with paper. The glass requires to be turned over or wiped daily to remove the moisture that collects on the under surface. As soon as the seedlings can be handled they must be pricked off into other tins, or better, small pots—one to a pot. When established, a cool part of the veranda, but not a windy part, will provide a suitable position for them, and all that is necessary is to remove them to larger pots or tins as the growth of the plant demands. They should have received their last potting by Christmas.

After potting, the plants, which are inclined to be top-heavy, often refuse to stand upright, and there is a temptation to build the soil up higher to support them. This is fatal! Instead, take a few small pieces of stick and support the head of the plant by thrusting the sticks into the soil around the neck. Matches are ideal for this purpose.

A second is by dividing the old corms by cutting them so as to leave buds on each division (it is not advisable to split into more than two pieces).

A third method, by taking the young spring growths from old corms and striking them as cuttings. The latter method usually requires bottom heat, *i.e.*, heat beneath the cutting bed, produced either by decaying manure or hot water pipes, &c.

And lastly, but probably the most simple, is the leaf-cutting method. There are two ways of using the leaves. They may be inserted in the soil with a portion of the leaf stalk attached just as a cutting would be. A bulb will form at the base of the leaf stalk, and is then grown on in the usual way. Or a leaf with the mid-rib cut through at the back at a distance of about an inch apart may be pegged down flat on the soil surface and covered with glass as in the case of the seed. Numerous bulbs will form along the mid-rib where the cuts have been made and can be re-potted when the leaf decays.

These last two methods enable the grower to quickly work up a stock of any favourite colours or styles of flowers, but it must be noted that neither will be successful unless well matured leaves are used. Leaf cuttings enable one to work up a stock of these plants with little or no expense, for it is often possible to beg a leaf where one would have to buy a plant.

SOIL.

Mr. W. Stubbins, of Cape Town, South Africa, recommends—1 part good garden soil; 1 part leaf mould; ½ part old decayed cow manure (or 1 lb. Clay's fertiliser per bushel of soil); ½ part peat or chopped cocoanut fibre (rooted if possible); sharp sand to keep soil open.—"South African Gardening."

Tropical Industries.

SUGAR AND COTTON IN THE WEST INDIES.

THE RUSH TO PLANT SUGAR-CANE.

It will be admitted everywhere that the West Indies have experienced an extraordinary stroke of good fortune in that favourable seasons and high prices for sugar have prevailed for the last two years, since the beginning of the war. It is only to be expected that such conditions should render cane cultivation an attractive proposition and should tend to obscure the minds of those interested in this crop as to other aspects of the agricultural situation.

The increased interest that is being taken in sugar-cane is well reflected by the distribution of plants from the various Botanic Stations. It will perhaps serve a useful purpose to quote a few figures. In St. Vincent in 1913-14, the number of cuttings distributed was 8,500; in 1914-15, this jumped to 17,550; while in 1915-16 the high distribution was fairly well maintained at 14,900. In St. Lucia, during 1915-16, 3,000 cane cuttings were distributed to Crown land purchasers against nil the previous year. In Antigua, in 1915-16, the number of cuttings distributed was 254,617, which is about double the normal distribution. The case of Montserrat is even more striking. In 1913-14 there were 2,332 cane cuttings distributed: in 1914-15, 11,900; and in 1915-16, 17,676.*

The enticing aspects of sugar-cane cultivation have been shown to be responsible for considerable extensions of the area devoted to this crop. Some of this land was previously under cotton, and this fact brings up a point of special economic importance. It seems that owing to an unfavourable season there is likely to be a shortage of West Indian cotton next year. At the same time the demand for fine staple cotton in England is steadily growing stronger, owing to its employment for special purposes incident on the war. Consequently, abnormally high prices are likely to prevail. Under such conditions there may be more in cotton than in sugar, while from an Imperial point of view, West Indian cotton is obviously a most important product to produce since the mother country is dependent on these islands for its chief supply. Again cotton possesses an advantage over sugar in that it will stand indefinite storage, while the crop itself occupies the land for only half

*During the year 1916-1917, the Queensland Sugar Bureau distributed 1,000 tons of sugar-cane cuttings gratis to growers in this State.—ED. "Q.A.J."

the time required by sugar-cane, which allows of the cultivation of provision crops, fitting in well with the policy of more locally produced food.

The general line of argument, then, which it is sought to bring forward is the need for giving attention to the present agricultural position as a whole, and the danger that lies in allowing one's outlook to be obscured by the boom in sugar. Manifestly the position of the sugar-cane planter to-day is an extremely good one, but he should remember that there are four prime factors to his prosperity—market, season, labour, and ships. It is the last two which are of fundamental importance at the present time.

The revived interest which these figures and the previously mentioned facts convey is obviously the outcome of the favourable conditions of production recorded at the beginning of this article. The position of the grower is perfectly understandable: chances (of none too frequent occurrence) are in favour of big profits from cane cultivation, and the grower is seizing, and rightly seizing, his opportunity. But from a colonial point of view, from the point of view of the community, it is well to acknowledge the fact that the rush to plant sugar-cane is merely to fill a partial vacuum produced by the war, and it is well to remember that this, like conditions of climate, may change at any moment. The results might then be disastrous.—"Agricultural News," Barbados.

SOCIETIES, SHOW DATES, ETC.

Sandgate.—Brighton Farmers' and Fruit-growers' Progress Association. A. E. Streeter, secretary.

Malanda, No. 2.—The Eacham Pastoral, Agricultural, and Industrial Society. Duncan Brown, secretary. Show dates: 29th and 30th August, 1918.

Nerang.—South Queensland and Border Agricultural and Pastoral Association. H. A. Weedon, Secretary. Show Date, 5th October, 1917.

Jardine—Jardine Farmers', Dairymen's, and Fruitgrowers' Association. F. Malcozka, Secretary.

Botany.

ILLUSTRATED NOTES ON THE WEEDS OF QUEENSLAND.

By C. T. WHITE, Acting Government Botanist.

No. 11.

"DEVIL'S FIG" (SOLANUM LARGIFLORUM, *n.sp.*)*

Full Botanical Description.—A large scrambling shrub, the branchlets and foliage densely villous with stellate hairs. Prickles not very numerous on the branches, very rare on the petioles and under surface of the leaves, and none on the inflorescence. Leaves petiolate, rarely entire, usually irregularly sinuate, oblique at the base, thinly covered on the upper surface with a stellate pubescence, densely stellate-tomentose on the under surface and petioles, broadly ovate, acuminate, length 3-5½ in., breadth 2-3¾ in. Peduncles axillary once or twice forked, bearing numerous flowers on slender pedicels. Calyx thinly stellate-pubescent at the time of flowering 1½ lines long, with acuminate teeth on lobes somewhat enlarged in fruit and divided into ovate lanceolate lobes. Corolla white, deeply lobed, about ½ in. diam., lobes densely tomentose on the central portion outside. Fruit globular, glabrous, ½-¾ in. diam.

Habitat.—Kin Kin, *Francis and White.* (Type specimens.)

Notes on the Species.—We also have specimens of this *Solanum* in the Queensland Herbarium from Bundaberg and Childers, and it, no doubt, is to be found in other localities. It has always been placed previously as a southern form of *S. Dallachii,* and as such I left it until Mr. A. Francis, some few months back, drew my attention to it being a great pest in the Kin Kin district, and soon after that, a letter was received by the Home Department from the Noosa Shire Council asking for the botanical name of the plant, and that it be proclaimed a noxious weed. As the plant differs in some respects from *S. Dallachii* and does not seem to agree with any extra-Australian species, I have determined to name it as above. A more technical account is reserved for the next *Botany Bulletin.*

Acknowledgment.—My thanks are due to Professor A. J. Ewart, Government Botanist, Melbourne, for kindly comparing specimens of *S. largiflorum* sent him, with Mueller's type specimens of *S. Dallachii,* in the collections under his charge.

* As this paper describes a new species it is necessarily somewhat technical.

PLATE 22.—"DEVIL'S FIG" (SOLANUM LARGIFLORUM).

Botanical Name.—*Solanum* (derivation unknown) *largiflorum* (the specific name is given on account of it bearing numerous flowers. The flowers are not large in comparison with other species of the genus. In a genus of several hundred species such as Solanum, it is rather a difficult matter to choose suitable new specific names).

Local Names.—"Devil's Fig" is the common vernacular; it is also known as "Chinese Fig." This latter name is undesirable as the plant is a native, not an introduction; the name "Chinese Fig" does not necessarily point to the plant being an alien, as this adjective is often applied to undesirable plants: for instance, throughout Western Queensland *Bassia Birchii* or *Anisacantha Birchii* is universally known as "Chinese Burr," though the plant is endemic in Australia.

The aboriginal name "Koori" of the old Bundaberg natives given under *Solanum Dallachii* by F. M. Bailey ("Queensland Flora," p. 1087) belongs to this new species.

Eradication.—It is customary on our coastal "scrub" farms to allow such weeds as these Native Solanums (Wild Tobacco, Kangaroo Apple, Potato Bush, &c.) to run their course and die out; as the plant under notice, however, is about to be proclaimed a noxious weed more stringent measures will have to be taken in its control. Where the plants are few they may be grubbed out; cutting off close to the surface of the ground if carried out repeatedly should exhaust the vitality, but the treatment would have to be persistent to be successful; a little brine or a small amount of caustic soda and arsenic about the cut surface would prove useful. Spraying with arsenical solutions is not likely to prove of value and is out of the question where cattle are running, but an arsenical solution injected into the main root or branch should prove successful.

THE PRICE OF SEED COTTON FOR THE 1917-18 CROP.

For next season, in consequence of the increased price of cotton in the home and other markets abroad, the Department of Agriculture and Stock has decided to offer cotton-growers in Queensland 2d. per lb. for the next season's crop, under the same conditions as for this and the last crop. That is to say, that growers, instead of 1¾d. per lb., will receive an advance of 2d. per lb. on all cotton delivered at the State Ginnery, Brisbane, and at the close of the season's ginning, when the cotton is sold, will participate in all profits accruing after the expenses of ginning, baling, and marketing have been deducted. The effect of this advance in price will be that farmers will receive as much as, or possibly even more, for their cotton than they received in the palmy days of cotton-growing in Queensland during the American Civil War. Cotton seed, for September or October sowing, is supplied gratis by this Department.

Entomology.

THE SUGAR-CANE GRUB PEST.

The following "Notes on the Grub Pest" have been received from Dr. Illingworth by the General Superintendent of the Bureau of Sugar Experiment Stations. They are particularly interesting from the fact that they constitute Dr. Illingworth's first impressions, and secondly lay great stress on the benefit to be derived from cultural operations, especially the use of lime and green manure, the frequent use of which has been so long advocated by the Sugar Bureau:—

"Though we have been handicapped, to date, by a lack of transportation facilities, we have managed to get about somewhat, making observations with regard to the various factors determining the degree of grub-infestation, in the region about Gordonvale.

"The tremendous importance of the problem impresses one at once, upon viewing the great areas laid waste in districts like Meringa or Green Hills. Apparently there is no easy road to success in combating such a pest. Introduction of parasites would probably be of little avail, since we are here dealing with native insects. It is a well-understood fact that introduced parasites have only been used successfully against introduced pests. The fact of the matter is, we already find a number of parasitic and predaceous insects working against the grubs, but they are unable to show any marked results because they are themselves attacked by other parasites. There are, however, bacteria and parasitic fungi doing efficient work in some fields, especially under proper conditions of moisture, &c.; our excavations at Green Hills would indicate that approximately one-third of the grubs succumb to the attack of these organisms. We have not yet been able to determine how widely these friendly agents are distributed in the infested districts, but they certainly lend themselves to artificial propagation and transplanting, so that no field needs to be without them.

"In testing the soils of badly infested fields they were all found to be very poor in humus, and usually contained no lime—two factors which would appear to be of vital importance to the growth of sugar-cane in a grub district. First, the main food of the grubs is decomposing organic matter in the soil, which, if it is lacking, forces them to feed upon living roots of plants. Second, lime not only improves the character of the soil by hastening the humification of plant tissues, and making it possible for leguminous plants to store up a cheap and abundant supply of nitrogen, but its action is also very favourable to the development of the fungous parasites. It is a well-known fact that neither organisms of decay nor disease-forms will develop well in acid soils—*i.e.*, soils containing no lime.

"Apparently the general custom in all the grub-districts has been to destroy the principal humus-forming elements by burning all the trash, and failing to rotate cane with a green crop. So far we have only discovered one farmer who is working his land along the lines that science would suggest, and it is interesting to note that his farm, though originally rather poor land, is now among the best in the region about

Gordonvale; furthermore, he is not troubled with grubs, though the cane of near-by farms went down because of them. Moreover, this particular farm has better soil to-day than when it was opened up about twenty years ago. As to the treatment: The land was given a dressing of lime at the rate of about 1 ton per acre; a crop of beans was then turned under preparatory to planting cane. After two ratoons, and ploughing in all the trash, another crop of beans was worked into the soil, and in addition about 5 cwt. of meatworks manure per acre. This rotation has been followed up, with the result that our tests now show an abundant supply of humus. Recently, with the addition of about 2 cwt. of nitrate of soda per acre, this land has shown remarkable results. The crop is easily 50 per cent. better than that of an adjoining farm which was planted at the same time. I must not neglect to add that this farmer cultivates well, which is not only an important factor in plant development but may be shown to have considerable bearing upon grub control. This control would come about through the conservation of soil moisture, which would not only stimulate the growth of the cane, making it more resistant to the attacks of grubs, but the conserved moisture would also be of material assistance to the development of fungous organisms destructive to the grubs. These parasites cannot work in dry soil; hence, it is a well-recognised fact that grubs are more destructive in a dry season, or upon dry soils.

"The action of nitrate of soda or sulphate of ammonia is a marked stimulation of plant-growth and root-development, which makes the cane more resistant to the attack of grubs. Where there is a rapid renewing of roots as they are eaten off by grubs, the cane is able to hold its footing and does not go down before the winds. This point was well illustrated in one field that we visited—a part of which had been treated with about 2 cwt. of sulphate of ammonia per acre. The cane of part of the field was all down, while right to the line in the treated plot it stood erect and vigorous. The untreated portion could not be ratooned, because all the stools were too much out of the ground.

"As far as our observations have gone the indications are that high-lying fields are attacked worse than those on lower ground. This may be explained upon the grounds of weathering. Naturally, both humus and lime are leached out of high-lying soils, and tests show these soils to be very poor in both these elements.

"The use of arsenious poisons for the destruction of the grubs, as suggested by Mr. Jarvis, is very promising. Since we already know that they feed largely upon humus and decomposing soil substances, it would appear to be simply a matter of properly supplying and poisoning these organic bodies in the soil, preparatory to cane-planting. Fortunately, humus shows a marked affinity for arsenic, which has a defloculating action upon soil, making it more retentive to moisture. Chemical tests of certain soils of Hawaii, which have been treated with arsenic for the destruction of weeds for the past five years, show that all of the poison has remained in the top 4 inches of soil without injuring in any way the roots of the growing crop. If we can make use of arsenic as a weed-killer, and at the same time poison the food-supply of the grubs, it will certainly be a profitable procedure.

"Experiments are now being undertaken with 10 acres in one of the worst grub-areas on Meringa Farm, in order to test out the various suggestions as outlined above. This land is divided up into fifteen plots, from which we hope to get some conclusive results.

"It is rather early for us to make recommendations, but we should certainly say: 'Conserve the humus and apply lime'; later we may be able to suggest the best method of poisoning the grubs. In the meantime, make use of every known method of combating these terrible pests."

SUGAR-CANE PESTS.

The Bureau of Sugar Experiment Stations has received from Dr. Illingworth, the Entomologist at Gordonvale, the following report by the Assistant Entomologist, Mr. E. Jarvis:—

Work has recently been devoted principally to the study of the external anatomy and metamorphosis of certain of our more injurious cane beetles.

An illustrated treatise dealing with the habits and life-history of *Lepidiota frenchi Black* was prepared, and submitted to the Bureau of Sugar Stations.

I may state that the manuscript in question embodies an account of the egg and early larval instars—hitherto unknown to science—together with a technical description of the imago stage; while noteworthy specific structural differences between this insect and a closely related cane beetle (*Lepidiota*, No. 683) are also discussed and figured where necessary.

I wish to record the occurrence at Gordonvale last May of a new lepidopterous pest of minor importance affecting sugar-cane. The insect in question is a pretty hesperid butterfly named *Padraona hypometoma Lower*, a detailed description of which has been published by Lower (Revision of Australian Hesperidæ, Trans. Royal Soc. South Aust., Vol. XXXV., 1911), who records its previous occurrence at Herberton and Kuranda in March, and near Sydney in April.

At Gordonvale this butterfly was noticed eating the leaves of young cane plants growing in pots placed on a verandah at the laboratory. Although measuring scarcely an inch in expanse, its dark-brown wings contrasted with rich orange-yellow render it a fairly conspicuous insect, the latter colour being arranged in the form of an oblique stripe near outer margin of fore wing, and a large triangular blotch on costa of same, while a broad transverse band placed below two spots crosses the middle of the hind wing.

The pupa, which is about ⅝ of an inch long, is pale brownish-yellow with a dull red U-shaped plate on dorsal surface of anal segment, bearing two very short pointed horns, that part of its edge lying between them being scalloped, and the extremity of the anal segment flattened vertically and furnished with numerous yellow bristles.

This is the fourth species of Hesperidæ found attacking cane near Gordonvale, the other three—two of which occur also on sugar-cane in Java—being recorded in Bulletin No. 3 of this office (p. 22-25).

Since its publication, however, an additional butterfly (*Melanitis leda Lain.*) and a moth (*Mocis frugalis Fab.*) have been mentioned in monthly reports as occasionally destructive to the foliage of cane plants, so that our list of cane pests now includes sixteen lepidopterous insects.

General Notes.

NEW BOOKS.

We are in receipt of two books which should prove of much value to inexperienced, and even to experienced, men engaged in bush work, such as timber-getting and hauling, and in general forestry work. The contents of "A Hand Book for Rangers and Woodsmen" should be especially useful to Crown Land Rangers in this State, allowing for certain modifications in the matter of camp equipment, such as clothing, saddlery, provisions, &c., the details of which are more applicable to travel and camping out in the climate of North America than to the genial sub-tropical climate of Australia. Construction work is admirably dealt with, and the notes on this subject, especially in the matter of fencing of various descriptions, are of great interest to our bush workers. Other subjects ably dealt with are "The Care of Horses," "Identification of Live Stock," "Rope Fastening and Knots." There is a vast amount of valuable information in this book of 420 pages. Explanations of the various subjects treated are clear and intelligible, and the book is rendered of further value by the profuse illustrations. It is the work of a practical American forester, Mr. Jay L. B. Taylor, Forest Ranger, United States Forest Service. The book is well worth the price, 11s. 6d. The publishers are Messrs. Chapman and Hall, Limited, London.

The second book is said by the author, J. Arden Ferguson, A.M., M.F., Professor of Forestry at the Pennsylvania State College, U.S.A., to be an outgrowth of lectures given to agricultural students on "Farm Forestry" throughout several years, and is written for study by students of Agricultural Colleges and in High Schools. The denudation of our forests of hard and soft woods in Queensland, which has been going on for the past sixty years, without any attempt in the past to keep up the supply of our most valuable timbers, such as red cedar, beech, pine, silky oak, &c., as well as our splendid hardwods of the eucalyptus family, gives rise to the serious question of how to replace these timbers. The Forestry Department of the State is to-day fully alive to the necessity for forest reserves and for supplying, by tree-planting, the yearly deficiency. As Mr. Ferguson says, "Farm Forestry is a branch of the general subject of forestry, and aims to grow a crop of forest trees where it is impossible to utilise the land for other and more valuable purposes; thus forestry and agriculture go hand in hand in the use of all the land on the farm. The book deals with the natural methods of starting and reproducing a woodlot; with caring for the growing trees, protection and management; harvesting the products, contents of logs and trees; estimating the trees in the woodlot for board feet and cordwood, the use of perishable woods for fence posts, and how to treat them; and concludes with a suggested

list of practicum exercises that could be given in connection with a course in farm forestry. From beginning to end the book is highly interesting, and, if applied to forestry in Queensland, should be instrumental in inducing many farmers, part of whose land is unsuitable for general crops, to plant various trees which would be a valuable legacy to posterity. The price of this valuable addition to the literature of forestry is only 6s. The publishers are Messrs. Chapman and Hall, Covent Garden, London.

Department of Agriculture and Stock,
Brisbane, 20th July, 1917.

BURSARIES, QUEENSLAND AGRICULTURAL COLLEGE.

An examination will be held on the 18th and 19th December next in Brisbane and elsewhere, as may be decided upon, according to the localities where the candidates reside, for four bursaries at the Queensland Agricultural College. These entitle the holders to free board and instruction as resident students, and are tenable during good behaviour and the pleasure of Parliament for a period of three years. Candidates must not be less than sixteen or more than eighteen years of age on the 1st January, 1918.

Application for examination must reach the Under Secretary for Agriculture and Stock, Brisbane, not later than the 17th November next, and must be accompanied by (1) a certificate of birth; (2) proof that the applicant has resided for two years in Queensland, or that his parents have resided there for three years preceding the examination—this certificate to be attested by a magistrate; (3) a medical certificate that he is of sound constitution and in good health.

Past or present students at the Queensland Agricultural College will not be allowed to compete at this examination.

The examination will include English, mathematics, and nature knowledge, all on the standard and as outlined in the syllabus of the fifth class of the Queensland State schools.

In the event of two candidates receiving the same number of marks, the number of marks allotted to the examination in the elements of agriculture shall determine which candidate shall have the precedence, unless the Minister decides otherwise.

Unless the winner of a bursary takes up his residence at the college within one week after the commencement of the college year, he shall forfeit his right to a bursary. Except during the recognised vacations, the three years' residence at the college shall in every case be continuous, unless leave of absence for a specified period is granted by the Minister.

Further particulars on application to the Under Secretary.

WM. LENNON, Secretary for Agriculture and Stock.

The Markets.

PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR AUGUST, 1917.

Article.		AUGUST. Prices.
Bacon	lb.	9d. to 1s.
Barley	bush.	2s. to 2s. 6d.
Bran	ton	£5 15s.
Broom Millet	„	£20 to £22
Butter	cwt.	158s. 8d.
Chaff, Mixed	ton	£4 10s.
Chaff, Oaten	„	£7
Chaff, Lucerne	„	£4 to £7
Chaff, Wheaten	„	£3 15s. to £4 15s.
Cheese	lb.	9½d.
Flour	ton	£12
Hams	lb.	1s. 3d. to 1s. 4d.
Hay, Oaten	ton	...
Hay, Lucerne	„	£3 10s. to £5
Honey	lb.	...
Maize	bush.	3s. 2d. to 3s. 3d.
Oats	„	2s. 10d. to 3s. 9d.
Onions	ton	£17 to £18
Peanuts	lb.	3d. to 4d.
Pollard	ton	£6 10s.
Potatoes	„	£8 to £11
Potatoes (Sweet)	cwt.	2s. 6d.
Pumpkins (Cattle)	ton	£2
Eggs	doz.	8d. to 9d.
Fowls	per pair	3s. 3d. to 7s. 9d.
Ducks, English	„	3s. to 4s.
Ducks, Muscovy	„	4s. 9d. to 8s. 3d.
Geese	„	8s. to 9s.
Turkeys (Hens)	„	9s. to 9s. 6d.
Turkeys (Gobblers)	„	15s. to 18s. 6d.
Wheat	bush.	3s. 6d. to 4s.
Hares	each	3s.

VEGETABLES—TURBOT STREET MARKETS.

Cabbages, per dozen	2s. 6d. to 5s. 6d.
Cauliflowers, per dozen	8s. to 11s.
Celery, per bundle	..
Beans, per sugar bag	6s. to 10s.
Peas, per sugar bag	6s. to 13s. 3d.
Carrots, per dozen bunches	1s. to 1s. 6d.
Chocos, per quarter-case	2s. to 3s.
Beetroot, per dozen bunches	8d. to 9d.
Lettuce, per dozen	1s. to 2s.
Marrows, per sack	...
Parsnips, per bundle	7d. to 10d.
Rhubarb, per dozen bundles	...
Sweet Potatoes, per sugar bag	2s. 6d.
Table Pumpkins, per ton	£2 5s.
Tomatoes, per quarter-case	2s. 6d. to 8s. 3d.

SOUTHERN FRUIT MARKETS.

Article.	AUGUST. Prices.
Bananas (Queensland), per case ...	9s. to 14s.
Bananas (Tweed River), per case...	...
Bananas (Fiji), per case ...	4s. 6d. to 6s.
Bananas (G.M.), per bunch ...	5s. 6d. to 7s.
Bananas (G.M.), per case ...	...
Custard Apples, per twelve to fifteen tray	...
Guavas, per case ...	2s. to 4s.
Lemons (Local), per bushel-case ...	2s. 6d. to 3s. 6d.
Mandarins, per case ...	4s. to 5s.
Oranges (Navel), per case ...	6s. to 14s.
Oranges (other), per case ...	4s. to 5s.
Papaw Apples, per half-bushel-case ...	1s. 6d. to 2s.
Passion Fruit, per half-case ...	4s.
Persimmons, per half-case ...	...
Pineapples (Queens), per double-case ...	8s. to 13s.
Pineapples (Ripleys), per double-case ...	7s. to 9s.
Pineapples (Common), per double-case ...	6s. to 7s.
Tomatoes, half-bushel-case ...	6s. to 10s.

PRICES OF FRUIT—TURBOT STREET MARKETS.

Article.	AUGUST. Prices.
Apples, Eating, per bushel case ...	15s. to 16s. 6d.
Apples, Cooking, per bushel case ...	10s. to 15s.
Bananas (Cavendish), per dozen ...	1d. to 3½d.
Bananas (Sugar), per dozen ...	2½d. to 3d.
Cape Gooseberries, per quarter-case ...	6s. to 7s. 6d.
Citrons, per hundredweight ...	...
Cocoanuts, per sack ...	12s. to 15s.
Cumquats, per quarter-case ...	...
Custard Apples, per quarter-case ...	...
Granadillas, per quarter-case ...	...
Lemons (Lisbon), per quarter-case ...	5s. to 6s.
Limes, per quarter-case ...	...
Mandarins, per quarter-case ...	7s. to 12s.
Oranges (Navel), per quarter-case ...	9s. to 11s.
Oranges (Seville), per hundredweight ...	10s.
Oranges (other), per case ...	1s. 6d. to 3s.
Papaw Apples, per quarter-case ...	1s. to 2s. 9d.
Passion Fruit, per quarter-case ...	5s. to 8s. 3d.
Pears, per quarter-case ...	8s. to 12s.
Peanuts, per lb. ...	3d. to 4d.
Persimmons, per quarter-case ...	...
Pineapples (Ripleys), per dozen ...	10d. to 2s.
Pineapples (Rough), per dozen ...	9d. to 2s.
Pineapples (Smooth), per dozen ...	1s. to 2s. 3d.
Pomeloes, per hundredweight ...	...
Quinces, per quarter-case ...	...
Rosellas, per sugar bag ...	...
Strawberries, per dozen boxes ...	5s. to 17s. 6d.
Tomatoes, per quarter-case ...	2s. to 7s.

TOP PRICES, ENOGGERA YARDS, JULY, 1917.

Animal.	JULY. Prices.
Bullocks	£22 to £23 15s.
Cows	£16 5s. to £18
Merino Wethers	40s.
Crossbred Wethers	47s. 3d.
Merino Ewes	30s. 3d.
Crossbred Ewes	47s.
Lambs	37s. 6d.
Pigs (Porkers)	...

Statistics.

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF JULY, 1917, IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING JULY, 1917 AND 1916, FOR COMPARISON.

Divisions and Stations.	Average Rainfall.		Total Rainfall.		Divisions and Stations.	Average Rainfall.		Total Rainfall.	
	July.	No. of Years' Records.	July, 1917.	July, 1916.		July.	No. of Years' Records.	July, 1917.	July, 1916.
North Coast.	In.		In.	In.	*South Coast*—continued:	In.		In.	In.
Atherton	0·82	15	0·30	2·68	Nambour	2·75	20	0·36	3·41
Cairns	1·52	34	Nil	2·93	Nanango	1·75	34	0·52	3·62
Cardwell	1·43	44	0·49	2·96	Rockhampton ...	1·47	29	0·41	2·68
Cooktown	0·96	40	0·09	2·07	Woodford	2·67	29	0·27	2·69
Herberton	0·55	29	0·22	3·03					
Ingham	1·45	24	0·09	6·48					
Innisfail	4·66	35	0·54	8·42					
Mossman	1·48	5	0·02	2·60	*Darling Downs.*				
Townsville	0·59	45	Nil	3·37					
					Dalby	1·84	46	0·67	2·50
					Emu Vale	1·46	20	0·74	1·88
Central Coast.					Jimbour	1·78	28	0·60	2·14
					Miles	1·81	31	0·81	3·43
Ayr	0·47	29	Nil	3·84	Stanthorpe ...	1·97	43	1·57	2·40
Bowen	0·93	45	Nil	2·70	Toowoomba ...	2·05	44	0·47	2·29
Charters Towers ...	0·56	34	Nil	1·24	Warwick	1·84	29	0·77	1·97
Mackay	1·59	45	Nil	5·22					
Proserpine	0·88	13	Nil	4·20					
St. Lawrence ...	1·25	45	Nil	3·09	*Maranoa.*				
					Roma	1·43	42	0·23	2·56
South Coast.									
					State Farms, &c.				
Biggenden	1·27	17	0·65	3·26					
Buudaberg	2·04	33	0·22	2·15	Bungeworgorai ...	1·02	5	0·14	2·75
Brisbane	2·28	66	0·55	2·00	Gatton College ...	1·42	17	0·40	1·57
Childers	1·72	21	0·23	3·10	Gindie	1·01	17	0·37	4·44
Crohamhurst ...	2·92	25	3·23	0·57	Hermitage ...	1·50	10	0·92	2·05
Esk	2·03	29	0·63	2·12	Kairi	0·99	4	*	2·51
Gayndah	1·51	45	0·73	3·14	Kamerunga ...	1·35	26	0·02	3·64
Gympie	2·17	46	1·14	3·46	Sugar Experiment				
Glasshouse M'tains	2·49	8	0·22	3·60	Station, Mackay	1·23	19	Nil	5·08
Kilkivan	1·75	37	0·85	3·19	Warren	0·95	4	0·70	2·99
Maryborough ...	2·01	45	0·53	2·79					

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for July this year and for the same period of 1916, having been compiled from telegraphic reports, are subject to revision.

* Return not received.

GEORGE G. BOND, Divisional Officer.

ASTRONOMICAL DATA FOR QUEENSLAND.

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

TIMES OF SUNRISE AND SUNSET AT BRISBANE AND THE PHASES OF THE MOON.

1917.	SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.	
Date.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.
1	6·2	5·34	5·29	5·47	4·59	6·5	4·46	6·28
2	6·1	5·34	5·28	5·48	4·58	6·6	4·46	6·28
3	6·0	5·35	5·27	5·48	4·58	6·7	4·46	6·29
4	5·59	5·35	5·26	5·49	4·57	6·7	4·46	6·30
5	5·58	5·36	5·25	5·49	4·57	6·8	4·46	6·31
6	5·57	5·36	5·24	5·50	4·56	6 9	4·46	6·32
7	5·55	5·36	5·23	5·50	4·55	6·9	4·46	6·32
8	5·54	5·37	5·22	5·51	4·54	6·10	4·46	6·33
9	5·53	5·37	5·20	5·51	4·54	6·11	4·47	6 33
10	5·52	5·38	5·19	5·52	4·53	6·11	4·47	6·34
11	5·51	5·38	5·18	5·52	4·52	6·12	4·47	6 34
12	5·50	5·39	5·17	5·53	4·52	6·13	4·47	6·35
13	5·49	5·39	5·16	5·53	4·51	6·14	4·47	6·35
14	5·48	5·40	5·15	5·54	4·51	6·15	4·48	6·36
15	5·47	5·40	5.14	5·54	4·50	6·16	4·48	6·36
16	5·45	5·41	5·13	5·55	4·50	6·17	4·48	6·37
17	5·44	5·41	5·12	5·55	4·49	6·18	4·48	6·38
18	5·43	5·42	5·11	5·56	4·49	6·19	4·49	6·39
19	5·42	5·42	5·10	5·56	4·48	6·19	4·49	6·40
20	5·41	5·42	5.9	5·57	4·48	6·20	4·50	6·40
21	5·40	5·43	5·8	5·57	4·47	6·21	4·50	6·41
22	5·39	5·43	5·7	5·58	4·47	6·22	4·51	6·42
23	5·37	5·44	5·6	5·59	4·47	6·22	4·51	6·42
24	5·36	5·44	5·5	5·59	4·47	6·23	4·52	6·43
25	5·35	5·45	5·4	6·0	4·47	6·24	4·52	6·43
26	5·34	5·45	5·3	6·0	4·46	6·24	4·53	6·43
27	5·33	5·45	5·3	6·1	4·46	6·25	4·53	6·44
28	5·32	5·46	5·2	6·1	4·46	6·26	4·54	6·44
29	5·31	5·46	5·1	6·2	4·46	6·26	4·55	6·44
30	5·30	5·47	5·0	6·3	4·46	6·27	4·56	6·45
31	...	...	5·0	6·4	4·46	...	4·57	6·45

The times given are for the whole of Queensland, New South Wales, and Victoria, where the same Standard Time is observed.

			H.	M.	
1 Sept.	○	Full Moon	10	28	p.m.
8 ,,	☽	Last Quarter	5	5	,,
16 ,,	●	New Moon	8	28	,,
24 ,,	☾	First Quarter	3	41	,,

The Moon will be at its greatest distance from the earth at midnight on the 14th, and at its least distance on the night of the 30th.

1 Oct.	○	Full Moon	6	31	a.m.
8 ,,	☽	Last Quarter	6	14	p.m.
16 ,,	●	New Moon	12	41	,,
24 ,,	☾	First Quarter	12	38	a.m.
30 ,,	○	Full Moon	4	19	p.m.

The moon will be furthest from the earth on the 12th, and nearest to it on the 28th.

7 Nov.	☽	Last Quarter	3	4	a.m.
15 ,,	●	New Moon	4	28	,,
22 ,,	☾	First Quarter	8	29	,,
29 ,,	○	Full Moon	4	41	,,

The Moon will be furthest from the earth on the 9th, and nearest to it on the 24th.

7 Dec.	☽	Last Quarter	12	14	a.m.
14 ,,	●	New Moon	7	17	p.m.
21 ,,	☾	First Quarter	4	7	,,
28 ,,	○	Full Moon	7	52	,,

The Moon will **cause an** ***Annular Eclipse*** of the *Sun* on **December 14th, but it will not be visible in Queensland. On the 28th** there will be a ***Total Eclipse*** **of the** ***Moon*** **between 7.38 and 7.55 p.m. It will be** partly eclipsed for an hour and a-half before and after totality.

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 18 m., 30 m., 38 m., and 49 minutes, respectively, later than at Brisbane at this time of the year.

At Roma the times of sunrise and sunset during September, October, and November, may be roughly arrived at by adding 16 minutes to those given above for Brisbane.

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.

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.

THE 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.

THE 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.

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. 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.