

QUEENSLAND AGRICULTURAL JOURNAL

VOL. XI.

JUNE, 1919.

PART 6.

Agriculture.

IRRIGATION.

ECONOMIC AND PRACTICAL METHODS, No. 5.

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CULTIVATION.

The last, but not least, of important factors in making a success of irrigation, is cultivation, which is by far the most important of all the treatments meted out to the soil; for without thorough and systematic cultivation the full benefits of the irrigation waters cannot be attained, because it tends to make the actual cost of applying the water greater than if a thorough tilth is maintained, for it takes longer to effect a thorough watering when the ground is not properly cultivated, and longer for the water to soak into the ground when it is in this state, and there is a likelihood of an accumulation of surplus water on the headlands through having to run the water for a longer period than when good cultivation is maintained. With a deep and thorough cultivation, the water soaks in very rapidly, thus causing a great saving of time and water when irrigating. Another important point to be borne in mind is that, unless a deep and thorough cultivation is maintained, some soils are liable to run together through the influence of the irrigation waters, and become compact. Unless this is broken and disturbed, the evaporation will be great and rapid, necessitating a call for more water which, in all probability, will be detrimental to the plant, for under such circumstances it is difficult to keep an even supply of moisture, and over-abundance followed by a scarcity is not conducive to success. Deep cultivation should follow in the wake of irrigation.

Cultivation is much cheaper than the actual applying of the water, and is the only minimiser of applications, and assurance of success. If carried out thoroughly, it prevents evaporation of moisture from the soil, thus prolonging the effect of the waterings, at a less expense, with much more indirect benefits than a watering, as it puts the soil in a better condition for receiving the water, thus shortening the time in irrigating, and avoiding any likely surplus, as the soil will absorb it freely. Other great benefits which are derived from cultivating are the sweetening and aerating of the soil, which are indispensable for success, since such action upon the soil by the sun and air liberates plant food in large quantities, which otherwise would never be available for assimilation by the plant, thus gradually increasing the assurance of successful crops, for if plant food is kept in abundance, the crops are not so long in the ground, or growing, thus minimising any likelihood of loss through

adverse weather conditions and parasites, as the latter are less effective on a vigorous, healthy plant, hence there is a big chance of it outgrowing the pest.

The cultivator also plays another very important part in keeping down moisture-robbars in the shape of weeds and grass, which are capable of depriving the plants of enormous quantities of moisture. They also harbour insect pests, &c. Lines specially manufactured for weed-killing are the most effective, if such work is carried out on a hot, sunny day, for when weeds have their roots severed in such weather they wither and die very quickly.

If possible, plants should be set out so as to admit of cross-cultivation, which enables the best results to be derived from artificial watering, for enormous benefits are derived from same in the shape of moisture conservation and hoe work, as it practically disturbs all the surface soil. It is surprising to note the quality and quantity of crops that can be produced with a small amount of water, when given at the most appropriate times.

To make surplus water take the place of cultivation is suicidal for the reasons previously mentioned.

Cultivation is so closely allied to successful irrigation that it is practically a part of it.

[CONCLUDED.]

LUCERNE CULTIVATION.

In order to maintain lucerne fields in full profit, the application of liberal dressings of fertilisers is necessary. The Department of Agriculture, Victoria, has been making useful tests. These were conducted during a period of three years, and the results were made available recently. Lucerne sown without fertilisers gave a yield of 11 tons 8 cwt. in the three years, an average yield of 3 tons 16 cwt. of hay per annum. Lime applied at the rate of 1 ton an acre, or its equivalent in the form of ground limestone, gave increases of 21 cwt. and 32 cwt., which were sufficient to pay for the cost of the manure, and yield a net profit of 6s. 3d. and 18s. 6d. per acre respectively. The addition of phosphates, whether in the form of basic slag, super., or bonedust, effected increases ranging from 49 cwt. to 76 cwt., all of which were sufficient to pay for the cost of the manure, and yield a profit of from 29s. to £6 16s. 3d. an acre. Superphosphate applied at the rate of 2 cwt. per acre each alternate year was the most profitable of all the artificial fertilisers used in the tests. Nitrogenous manures applied in combination with phosphates and lime enabled the maximum crops to be raised, the increases over the unfertilised plots ranging from 4 tons 4 cwt. to 4 tons 7½ cwt. Though the gross returns were much higher than all other plots, the net profit from these dressings was not as high as that from superphosphate alone. The results served to show that lucerne yields could only be maintained in full profit by the application of liberal dressings of fertiliser. Analyses conducted in the laboratory showed that a good crop of lucerne hay at Werribee removed from the soil in one year enough nitrogen to supply the needs of twelve average wheat crops, and phosphoric acid sufficient for the needs of seven average wheat crops.—“Producers’ Agency.”

FLAX-GROWING.

In view of the guarantee of the Commonwealth Government for unthreshed flax of specified standard having been increased from £5 to £6 per ton to growers in 1919, the Commonwealth flax industry committee anticipates a considerable extension in the cultivation of this crop. The price of seed to the grower has been fixed by the committee at £25 a ton, or 12s. 6d. a bushel, and the rate of sowing recommended is from 60 lb. to 65 lb. to the acre. The committee wishes to point out that fibre flax requires a rainfall of not less than 26 in., with suitable incidence, and the land to be sown must be good and clean. One of the conditions to ensure full payment of the guaranteed price is the freedom of the crop from noxious weeds or an excess of undergrowth. Should any body of farmers in a suitable district contemplate the cultivation of flax under the Government guarantee, the flax committee would be glad to arrange for one of its members to visit the district. Ordinarily the cultivation of 400 acres in the same district would be justification for the erection of a flax mill. Co-operative companies of growers have been formed

at Buln Buln and Dalmore, Victoria, for the erection of mills to treat the crops, and there is every probability of these ventures proving successful. With regard to the 1918 flax crop, the Commonwealth Government, on the committee's recommendation, has agreed that any surplus, after milling and other expenses have been paid, shall be divided among the growers, and it is anticipated that this surplus will be considerable.—Exchange.

THE PRICE OF BROOM MILLET.

Reports from Victoria show that in certain districts the broom millet crop has recovered remarkably as the result of recent rains, and harvesting has now commenced. High prices are anticipated; but it has been pointed out to the growers that it is quite possible, even in their own interests, that the price may be fixed too high. There is a scarcity of broom millet throughout the world, and, as frequently happens in such cases, manufacturers are resorting to substitutes. One of these is a material known as bassine, which is imported from Africa and India, and which it is said can be landed in Melbourne at £30 per ton or less. The commercial representative of the Royal Victorian Institute for the Blind stated in a newspaper interview that bassine makes up into good broom and is more durable than millet, though less flexible. Last year, growers in the Wangaratta district of Victoria were paid up to £85 per ton for millet. A high-priced millet meant, in the end, a high-priced broom, which eventually would be regarded by the consumer as a luxury, and lead to the use of the cheaper substitute. Once the bassine broom got a footing in this country the people would not pay for the higher-priced article, and the millet growing industry would be killed. Growers were asking from £60 to £110 per ton for this season's millet, and some even more; but it was thought that £60 was about a fair thing, and even a little higher might be obtained, but growers are warned against the danger of insisting on too high a price.—“Farmers' Gazette.”

EXPERIMENTS WITH LINSEED IN 1918 IN NEW SOUTH WALES AND QUEENSLAND.

In 1907 experiments were made at the Biggenden State Farm in growing linseed for seed and straw by the then manager, Mr. D. Macpherson, and an accurate account of the conditions under which the crop was grown and of the results was kept, which led him to the conclusion that anyone having the necessary implements for handling wheat could also grow flax, and that so long as the market value of linseed did not go below that of wheat would receive a better return per acre, even if the seed only were marketed, owing to the more certain yield from the flax.

If we take into consideration the value of the fibre, and this is really the main product of the plant (estimated in pre-war time at £11 per acre), it must be admitted that there is every probability of the crop being a paying one. Since the war began, the prices of all commercial fibres rose to very high figures, and the price of linseed to-day in London is quoted at £29-£30 per ton.

Another consideration, and one which should have considerable weight with us, is that the crop is less dependent on climatic conditions than any of the cereals. Should the season be a wet one, it is probable that the crop of seed will ripen unevenly, and, in this way, a proportion of seed may be lost; but, even so, the yield of seed will still be a creditable one, and the crop of fibre will be extra heavy. If, on the other hand, dry weather should be persistent, neither the seed nor the fibre will be any the worse for eight or ten weeks of comparative dry weather before cutting. Again, flax likes a warm free soil; and as the soil on the Biggenden State Farm is very stiff and heavy, it is certain that the results there obtained could be greatly improved on in a lighter soil. Those results were 27 bushels of seed (60 lb. per bushel) per acre, and nearly 32 cwt. of straw.

IN NEW SOUTH WALES

trials were conducted by the Department of Agriculture at several of the experiment farms and on private properties in various parts of the State—in all, at twenty-three centres.

Owing to the unfavourable spring, all the plots, with the exception of five, were utter failures, while the yield in the others ranged from 180 to 252 lb. per acre.

The season in all cases was adverse, as the rainfall in almost every instance was much below the average. In some of the districts the total rainfall during the growing period was fairly good, but the spring proved abnormally dry. This had a serious effect on the linseed, whereas wheat, despite the hard conditions, returned fair to good yields.

Mr. H. E. McDonald, Chief Inspector, who superintended the New South Wales trials, adds to the above information (published in the March issue of "The Agricultural Gazette" of New South Wales) a table showing the yield of linseed as compared with other crops, as follows:—

Name of Experimenter.	Yield of Linseed per Acre.	Height of Linseed.	Yield of Other Crops.
	Lb.	In.	Bu. lb.
H. G. M. Thackeray, Wootton, Young	188	12	41 3 Ruakura Oats
H. C. Lowe, Dubbo	240	15	25 49 Yandilla King Wheat
J. T. Maunders, Pallaucallawa	252	Not given	Not given
W. T. Annison, Parkes	180	12	10 40 Hard Federation
R. O. Eulenstern, Gracevale, Henty	Complete failure due to dry spring	..	Not given
			25 0 Hard Federation
Cowra Experiment Farm	210	12-18	25 0 Yandilla King
Wagga Experiment Farm	Nil	6-9	24 0 Hard Federation
Bathurst Experiment Farm.. ..	Nil	6-9	19 40 Yandilla King
			19 40 Hard Federation
			Yield not yet available

For fibre purposes, the linseed practically failed in all cases, as the height in no case exceeded 18 inches, and ranged down to 4 inches.

FLAX-GROWING IN CANADA.

Turning to the progress of the production of linseed and flax in Canada, we find the following informative paper on the subject in the "Agricultural Gazette of Canada" in the issue of that journal for June, 1918. The concluding paragraph applies as much to the establishment of the industry in Queensland as it apparently does in the case of Canada:—

"In the House of Commons on 29th April, the member for East Middlesex introduced a motion having for its object the increased cultivation of flax in Canada. Dealing with the subject, after the member for East Middlesex had explained his motion, the Honourable the Minister of Agriculture said in regard thereto—

"There is no doubt whatever that our soil and climate are admirably adapted to the growing of flax for fibre purposes. That has been proven by years of successful growing in certain localities in which in the earlier days of the country's development the settlers found it necessary to grow flax in order to supply themselves with a good deal of the clothing they required. Impressed with the importance of the industry in Canada, the Department of Agriculture several years ago undertook certain experimental work in respect to it. That experimental work covered practically the whole development of the industry from the growing of the flax to the manufacture into twines. In carrying on this work the Department have grown experimental plots of flax in practically all of the experimental farms and stations in Eastern Canada. They have found that it can be grown very successfully, and I believe that the records show that the Gaspé Peninsula produces perhaps the best quality of fibre grown in Canada. Flax has also been grown in Western Canada. It cannot, however, be grown so successfully there for fibre purposes; the climate appears somewhat against it.

"The experimental farms have carried the work further. They have, on a small scale, quite an up-to-date set of machinery for carrying on the various operations of preparing fibre from the straw. In that way we are endeavouring to ascertain—first, the district from which the best fibre can be secured; and, second, the relative cost of turning it into the finished article in each district. That work will be of great advantage to the farmers of Canada who will be growing this flax later on.

"That the minds of our farmers have been turned to the growth of this plant for fibre purposes is evidenced by the fact that the acreage planted for fibre purposes is steadily increasing. In Western Canada we have grown flax in quite a large way for seed. The flax crop of Western Canada has run in yield of bushels from fifteen to twenty million per annum, and the results have been very satisfactory.

"Experiments have for several years been carried on with the ripened straw that results after threshing out the seed. This straw is ripened, and it has never been considered of any practical value for fibre purposes. Experiments, however,

have proven beyond any question of doubt that it can be converted into twines. I have in my office several samples of twine that have been manufactured in the city of Regina from fibre taken from flax straw. The product varies from fine hard twine, quite suitable for sewing harness and that sort of work, to coarser twine suitable for replacing ordinary binder-twine.

“Last year the crop of flax straw in Western Canada amounted to about 1,500,000 tons. Experiments have shown that each ton of flax straw will produce 270 lb. of twine in its various forms. If all that flax straw were converted into twine, it would produce something over 300,000,000 lb. of twine. Canada annually uses something like 60,000,000 lb. of binder-twine. Our source of supply is from two countries—the Philippine Islands, and the province of Yucatan in Mexico; and if those sources of supply for the raw material, the manila, and the sisal were cut off, it would leave the farmers of Canada, particularly those of Western Canada, where they are engaged in grain growing on such a large scale, in a bad position. Consequently it is a matter of the very greatest importance to consider how this at present wasted material can be utilised to ensure an adequate supply of twine to bind our crops. And if we can convert waste material into useful product, we are simply getting that much further ahead in an economic way. That phase of the question, in my judgment, is one of very great importance.

“If we survey the whole field again we shall find that probably the successful growing of flax for fibre purposes in Canada depends upon the cheapness of the labour we can secure. If we can replace manual labour by mechanical power, by the discovery and development of machines that will pull the flax, we certainly have all the natural facilities for a splendid development of this industry.”

NEGLECTED INDUSTRIES.

CASTOR OIL SEEDS.

During the late war the only lubricant used in the motors of aeroplanes was, and is to-day, castor oil.

The castor oil plant, as most people in Queensland know, grows wild or semi-wild in most parts of the State, but, unlike prickly-pear, sida retusa, nut-grass, and other plant pests, is easily got rid of. As a drought resister it can stand very dry weather, but if this continues too long the yield of seed is much reduced.

There are several varieties of the plant, and from an article on the subject in the “Journal of the Jamaica Agricultural Society” (Vol. xxi., No. 12) advocating its cultivation on a commercial basis, the varieties of seed are given as the small and large grey, which are the most common, but better varieties to grow on a commercial scale are the brown, the white, and the black seeds. During and since the war the demand for lubricants has increased considerably.

A correspondent of the journal mentioned wrote as follows on the subject:—“As everybody knows, mixed with mutton fat, castor oil remains unsurpassed as a lubricant, and the Germans had to resort to the use of heavy petrols mixed with animal, and even human, fat.

“The variety *Palma Christi* (*Ricinus communis*) is an annual plant in temperate countries, but in tropical countries, where its growth attains up to 15 feet in height, it is a vivacious, and even a perennial plant. Two varieties of *Palma Christi* seem to be found in Trinidad, both yielding a great quantity of oil; one producing greyish seed marked with dark stripes, and another giving violet or dark blue seeds. There is also a variety producing much larger seeds.

“One may depend,” says the writer, “on a crop of 325 to 400 kilos. (\$82 lb.) of seeds to the acre, according to the nature of the land and the variety of the plant. When freed from their legument, the seeds of *Palma Christi* yield up to 65 per cent. of oil; but if ground and pressed, while warm, without cleaning, a good percentage of oil is retained by the cake, and the yield is only from 35 to 37 per cent.

“*Palma Christi* leaves are considered an excellent fodder for milch cows, as the oilcake contains as much as 5 per cent. of nitrogen; it is a first-class fertiliser, although, on account of its laxative properties, it cannot be recommended as stock feed.

“Before the war the price of *Palma Christi* seed fluctuated between 60 and 70 dollars (£12 to £14) per ton, but since then it has gone much higher.”

Castor oil, in 1918, was quoted in London at £80 per ton.

In the following notes on the castor oil plant, Mr. D. Jones gives a digest of his investigations into the habits of the plant, its cultivation, &c.:—

THE CASTOR OIL PLANT (*RICINUS COMMUNIS*) IN QUEENSLAND.

BY DANIEL JONES.

THE GENESIS OF THE INDUSTRY.

It is somewhat difficult at this lapse of time to definitely ascertain to whom may be credited the distinction of attempting the establishment of this pursuit in this State.

Some forty years since, Mr. James Foote, then the representative of Ipswich in the State Parliament, essayed to deal in the article. He made some progress in respect to testing the oil values, and, I believe, purchased a quantity, paying the handsome price of 3d. per lb. for the castor beans.

This, with many of our old-time experiments in relation to the building up of what should be staple industries, encountered the apathy of the legislative authorities, who failed to appreciate the value of creating a home industry so vital to the needs of a growing State, more particularly as the castor plant thrives in Queensland to such an extent as to incur (needlessly) the ban of local authorities, who, without reason, class this useful plant as a noxious weed in many localities.

A due appreciation of the uses of this plant would speedily correct this false impression, and by this time we ought to have an export trade, both in beans as well as in oils, for medical and lubricating purposes.

The late Mr. Lewis A. Bernays, in his useful work "Cultural Industries for Queensland," mentions the excellent work done by Dr. Joseph Bancroft and Mr. Behrens, of Brisbane, who in those early days interested themselves in an attempt to place the industry on a commercial footing.

THE HABITAT OF THE PLANT

In Queensland is extensive, indicating that it has a congenial home in this country. The writer has gathered excellent examples of beans out West in the Mitchell district, also in the Central district at Longreach, north of Townsville, and at Charters Towers, and has observed the plant thriving nearly as far inland as Hughenden. It will be noted that from the sea-coast to the far West the castor bean has a habitat in which it thrives. Judging by its behaviour under the different climatic conditions prevailing in these widely-spread localities, differing as they do in seasonal and climatic conditions, it will be seen that the plant is most adaptable to our soil and climate, and hence ought to become one of the most prized of any of our rural industries.

PESTS AFFECTING THE PLANT

are rarely met with when growing volunteer in its uncultivated state. It is not always so when introducing new sorts into fresh localities, as frequently a new enemy finds out the plant and makes it a host, rarely, however, so as to entirely jeopardise a crop. In its wild state comparatively few insects attack the plant, due in all probability to its being acclimated and thus largely immune to insect attack. New varieties when introduced, however, fall a prey to insect attack, principally from *Dichocrocis punctiferalis*, said to be identical with the Peach Moth, which on young plants ravages the stem and capsule to the injury of the bean in particular. The plant being of a very hardy type will, despite severe attack, if growing in congenial soil, hold out well, and, as age increases, become more immune to parasitical injury.

If the soil is badly drained, an unhealthy condition of the shrub ensues, and at times it becomes liable to infestation by a species of scale insect, one of the Aspidiotis, not, I am pleased to learn, the one so disastrous to fruit trees.

I have had some shrubs last season seriously injured by this scale. The plant, however, is able to resist most insect attacks if grown in congenial soil.

Slugs in and around Cairns, I am informed, do some damage to the tender plants soon after germination.

A leaf-eating insect, *Thyas Melicerte*, Drury, which in this State affects mangoes, abutilon, and castor oil plant, feeding on all of which, do some damage. On an experimental plot near Brisbane this insect has this season stripped a few of the castor plants entirely of their foliage. It pupates on the plant, usually selecting a leaf, which it curls, and draws a fine web around itself.

THE CULTIVATION OF THE CASTOR BEAN

calls for no great attention, for once the shrub has obtained a few weeks' growth it then, by virtue of its robust nature and hardihood, will endure a degree of neglect in tillage which other crops would not stand.

The land should be prepared much the same as for cotton or maize—ploughing about 4 in. to 5 in. deep, and harrowing to as fine a tilth as may be possible.

The seed should be sown about 1½ in. to 2 in. deep, two or three beans being dropped together, but not so close as to interfere when thinning the plants later on to one in a space. The quantity of seed required for an acre can be estimated on the basis of that of the large-sized bean, such as the Eureka, of which about twenty-eight beans make an ounce in weight. The smaller Red variety weigh about fifty-five beans to an ounce.

The Eureka type being a free-growing shrub, often reaching the height of 15 ft. in the second year of growth, with an equal spread of branches if in fertile soil, will require to be spaced about 12 ft. apart. The Red variety does not grow so big, but at times attains a height of 10 ft. to 12 ft. in its second year. From this it will be noted that the number of plants to the acre will not be large. If spaced 10 ft. by 10 ft., there will be 435 to the acre. Sowing time will be the earliest opportunity in the spring, so as to enable the plants to forge ahead before much weed growth is in evidence. It is hardly possible to safely till the ground between the plants once they have attained the height of 5 ft. or 6 ft., which they do in this climate within five months or so.

Judging by experimental plots near Brisbane, the only attention necessary is that the weed growth be cut down and the material spread around the trunks of the plants as mulch. This is practically all that is done on a couple of plots on which this crop was being tested. The plants are at present showing remarkable vigour, the seed being sown but six months since, and many of the shrubs are fully 10 ft. in height, with a corresponding spread.

Judging by the manner in which this plant grows in waste places, there is every likelihood of it lending itself to a new departure in method of tillage, particularly in districts not subject to a great degree of frost.

In many places in North Queensland I have observed castor plants sown so as to protect fowlhouses, as break winds, and shade for the not uncommon tin humpy of the pioneer settler.

It is quite possible to make a plantation without ploughing, and simply planting the seed in holes prepared as circumstances allow. In this way many a back yard or unused allotment might be utilised to profit. The unique foliage of the castor bean lends charm to any plot in which it thrives. Few of our ornamental plants show a more brilliant colouring than does the bright red spike of the Red variety. The larger and perhaps handsomer Eureka type shows in its light-green foliage and extensive leaf system perhaps the most attractive appearance of all our arborescent plants.

Except in regions of low frost temperatures, the foliage is a constant evergreen, and where frost attack is severe the plants are only a couple of months or so before they regain their foliage. After the first spikes appear no field tillage is recommended, as the implements employed may do damage to the plant.

THE YIELD OF CASTOR BEANS

will materially depend on the variety raised and the adaptability of the soil and climate. The writer has on occasions planted this crop on plots where the resulting growth was a complete failure.

On poor, sandy soils the plant fails to show that exuberance of growth in foliage and crop that it invariably does in a suitable soil.

The small Indian or Javanese sorts are not nearly so prolific in bearing as the larger Red or variegated Eureka type, though they mature earlier.

The American yield is set down as ranging from 15 to 25 bushels of 46 lb. to the acre in the Northern States, while in the South the yield is said to range from 35 to 40 bushels. Taking the highest estimate as the yield, it amounts to slightly over 1,800 lb. of beans to the acre. As there are at present no dependable data as to the possible yield in Queensland on a plantation scale, estimates must be made on such tests as have been carried out on minor plots.

My experiments in Brisbane and its suburbs have been confined chiefly to the Eureka bean, and tests carried on during the last eight years indicate that a very profitable industry can be created by handling this variety.

While it is freely admitted that a small plot of castor plants grown under ordinary conditions might not accurately indicate the yield of a more extended sowing, nevertheless, the data respecting the crop of a number of plants grown in different years, and under changing seasonal conditions, ought to show to what extent profits might arise from tillage under plantation conditions.

In the 1914 season one of my Eureka shrubs yielded 16 lb. weight of merchantable castor beans; and in 1917, six small plants, growing in unsuitable soil, gave a return of over 3 lb. of beans per plant.

The 1914 shrubs, which grew to a height of fully 15 ft., died in 1918, yielding in that season 9 lb. of beans from each tree. Corresponding returns have been realised from plants grown by friends in the suburbs to whom I furnished seed.

These gave this yield while attacked at times to a serious extent by the *Dichrococis* caterpillar, and to some extent were affected by the drought then fatally in evidence amongst other crops.

From these data, carefully collected, it may be assumed that it should be possible to raise at least $\frac{1}{2}$ to $\frac{3}{4}$ of a ton of castor beans per acre of the Eureka variety without extra care or attention. My plants received no tillage whatever from the period of sowing until the last crop was taken off. The Red varieties will not in all probability give an equal return, but half a ton and upward per acre may be a reasonable estimate.

THE YIELD OF OIL AND ITS VALUE

has been carefully investigated by the Federal Institute of Science and Industry, and very valuable data have been obtained from this source. Our Queensland species of castor have uniformly reached a fairly good analysis. Although in some instances the findings have not been identical in oil contents as furnished by the different laboratory tests, due, perhaps, to the age of the seed or mixing of several varieties may be accountable for any discrepancy arising, our beans show as good an oil content as any elsewhere produced. Near Melbourne the Bureau have established an experimental plot, on which they have collected some eighteen kinds, but it is not expected that the colder climate of Victoria will develop so high a class of bean as can be raised in the more congenial habitat such as it finds in this country.

The three highest analyses of Queensland beans so far tested relate to the Eureka variety, one analysis being given as 59 per cent. of oil content. A further test of the same bean resulted in a smaller analysis of oil content, due, perhaps, to the age of the seed supplied for the test. This is partly borne out by a later analysis which made the oil content 50 per cent. The several Red varieties collected at Roma and in the Lockyer district gave an oil content of 50 per cent. It is thus established that we have a good quality of bean to operate with if sufficient interest is taken in the subject.

Thus, a new industry, adaptable for family enterprise, and one requiring little capital of farming experience, is well within reach of all who entertain any idea of settling on the land.

The value of castor oil has been much enhanced by virtue of the fact that it is regarded as indispensable for aeroplane lubrication, having the unique merit of not freezing in high altitudes. This fact has increased the demand for the article, as well as materially enhancing the value of the oil.

It has been estimated that the demand for castor oil for present Commonwealth requirements will use up some 4,000 tons of castor bean annually, the bulk of which it is well within the ability of Queensland farmers to supply.

The present value of the bean in Melbourne is £20 per ton delivered in that city. From this it will be seen that a big and profitable industry can be inaugurated exclusively for our own advantage if taken actively in hand, not only to fill the Australian requirements, but when trade facilities are available in connection with factories to extract the oil, and there is no reason why a world market should not be within our ability to command.

THE HARVESTING OF THE BEAN

is by no means a difficult one, particularly if growing the best shelling types. Our river bank variety of bean, though very small, has in this respect a great merit by reason of the fact that it is eminently tractive in the manner in which it sheds its bean. In some sorts the capsule is so rigid that the bean must be expelled by force,

and several machines are devised having this object in view. The small Red bean, as far as observed, is hard to thrash out. The Eureka, however, usually has the merit of shedding at least two beans from the capsule without requiring any mechanical effort, the one remaining bean, evidently true to a natural law, that of survival, declines to come out, and must be mechanically treated to draw it out of the pod.

The harvesting of the crop depends on the type of bean which is grown. A freely-shedding bean can be placed on a sheet or clean floor in the sun, when, as the capsules dry, the beans pop out at times to some distance from the base. If growing very refractory sorts, the harvesting must be done without regard to sun-drying, as in that case only by mechanical methods can the bean be separated from the pod.

The Advisory Council of Science and Industry, writing on this matter, quotes Mr. W. W. Stockberger, of the United States Department of Agriculture, as follows:—"During the past season several manufacturing firms have been working on the production of a castor bean threshing machine, but these firms have not been uniformly successful. Machines built by the Seminole Manufacturing Company, Jacksonville, Fla., and the Appomattox Iron Works, Petersburg, Va., have been used with satisfactory results. I am unable to state the price at which they would deliver the machines to you, but to-day am writing to these firms, telling them of your needs, and asking them to forward to you descriptions of the machines with prices."

One difficulty in relation to mechanical treatment of the bean will relate to the dimensions of the bean itself. Taking as an example the size of beans of the Eureka types, compared with the smaller kinds of not half the bulk, it may be a difficult matter to adjust the machines to treat various sorts unless the machine is expressly built to thresh beans of varying sizes. Any machines designed for Australian use ought to have an adjustment of roller so that any size bean can be put through without damage.

The small Indian sorts mature the first of the crop in about four months from sowing. In this time, however, but a minor part of the crop is in evidence. The spikes continue to develop until the cold weather or frost arrests further growth. The Red and Eureka sorts will not bear so early, and these furnish but a few spikes until about twelve months old. From thence onward the returns become greater until the shrub dies. It is said to live for ten or twelve years in favourable locations.

The field harvesting is simple. The worker, armed with a sharp knife, cuts off the mature spikes, throws them into a receptacle for transport to a barn or outhouse situated so that if required a smudging can be given the pods. By this means much of the crop can be got ready if free-shedding sorts. I found with Eureka beans that this was quite enough to bring the bean from the capsule if well exposed to the sun. I have at hand, however, for some months examples of the Red beans which show no appearance of self-shedding whatever, so recourse must be had to some form of mechanical threshing yet to be devised.

If working on mature trees, say, from 15 ft. to 20 ft. in height or more, a cutter much on the principle of that commonly used in orchard pruning will be of service. This will enable the worker to reach spikes growing some distance from the ground, and thus expedite the harvesting.

A commonly accepted idea is that the castor bean is harmful to stock. This has no foundation; in fact, the experience of several farmers that I have discussed the matter with indicate conclusively that the plant, although not usually relished by cattle, is useful in times of drought, as evidenced in my own observation in drought areas in the past few months. Mr. Percy Biddles, one of the most experienced farmers of the Burnett district, in a recent conversation, emphatically endorsed the idea that the castor plant is in no sense injurious to stock, basing his statement on observations of its effect on his own cattle that had a liking for the foliage, which they ate without any evil effects ensuing.

In India it is said that the ryot commonly uses it as cut fodder for his animals.

The bean, however, if eaten by stock, which are not prone to do so, would cause injury, but long observation of cattle grazing amongst castor plants does not show that there is any danger from this source. Poultry keepers, particularly in the North,

favour the plant as a shade and protection for poultry-houses. I have frequently asked the poultry owner if ever any ill-effects happened the fowls through eating the bean, and always have obtained a negative reply.

Children have been known to suffer from eating them, but rarely does this happen, though the opportunity to do so is often at hand.

THE VALUE OF CASTOR BEAN MEAL.

has recently been the subject of research work by the Imperial Institute of London, who, in a bulletin, indicate the result of experiments in utilising the meal for pig-feeding.

"An account is given of trials carried out by the Veterinary Department of the Board in order to determine whether the residue of castor beans, after the removal of the oil, can be used satisfactorily for feeding pigs, and, in particular, to ascertain whether the toxic properties of the residue, which are due to ricin, can be removed by submitting the material to a high temperature. The heating process was carried out by the manufacturers, and the temperature employed is not recorded. The pigs refused to eat the meal when merely mixed with water, or when mixed with treacle. When, however, the meal was given with house-wash of good quality, which had been boiled and mixed with other meals, a considerable amount was consumed with good results. In no case were any symptoms of poisoning observed."

There is a possible chance, judging by the foregoing experiment, if any earnest chemist could give the time to the experimental work on lines indicated, of discovering a method of eliminating the toxic properties from castor beans, so that, much on lines that have been so successful in handling copra, in converting what some time since was a malodorous fat into an edible commodity of immense value and use, may be achieved. Any chemist who can demonstrate a way to make the castor oil into an edible fat will earn the goodwill of our community and place the castor-growing industry in the first rank of Queensland products.

The pomace, or residual matter, after oil extraction, has a value as a high-class fertiliser. A local chemist estimates it to be worth at least £7 per ton, containing as it does a high percentage of nitrogen, phosphoric acid, and potash, materials badly wanted for our orchard operations.

If tariff advantages can be adjusted in favour of this industry, particularly in relation to the importation of the raw article, there is every reason to expect another valuable addition to our primary industries of a subtropical nature, and one that will materially assist to people the empty North.

THE DOMESTIC USES OF THE CASTOR PLANT

are well recognised in the home circle, and recourse is invariably made to the castor oil bottle for many juvenile and adult ailments. Medical science admits valuable curative properties in the leaf of the plant in the form of poultices in cases of tumours, especially for application in instances of female breast troubles.

Some time since, while in a Western district a lady friend had considerable difficulty in obtaining castor leaves for this purpose, in order to carry out her physician's instructions.

Settlers can easily, by either utilising pressure or boiling the beans, procure enough castor oil for farm requirements in a very simple way. Application of sufficient pressure such as may often be obtained on a farm where baling of products is carried on, by arranging suitable receptacles for the seed and then expressing the oil. A method usually in vogue among Asiatics, is to crush the beans, tie them up in a bag and submit the material to a steady boil, skimming off the oil as it comes to the surface of the water. In this way oil can be got for farm needs either for lubrication or harness application. An English Trade Journal states that the stalk and leaves will make good paper pulp. The writer uses the kernel of a bean whenever the pocket knife wants oiling. A piece of kernel pressed into the joints of a knife, will oil the article in a cheap and satisfactory manner. It is said that poultry roosting in proximity to castor trees, will not become affected with vermin. A dubious merit is also claimed for this plant—viz., that it keeps mosquitoes away. As an ornamental pot plant, it has few that equal it in appearance, thriving under conditions in which other plants would fail. As a soil renovator, it has its claims for recognition in its ability to flourish in low-lying areas as is often seen in Brisbane which proves it to have a sanitary value not admitted by the authorities who proclaim it a noxious weed. A plant that lends beauty to waste places, draining, by transpiration, the wet stagnant soils, surely ought to have its merits recognised. It should be the duty of local authorities to at once remove the ban against the cultivation of so useful a plant, and do all they can to encourage the growth of a new industry.

Pastoral.

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

The Office of the Secretary of the undermentioned Herd Book Societies is 303 Queen street, Brisbane:—

The Australian Hereford Herd Book;
 The Shorthorn Herd Book of Queensland;
 The Jersey Herd Book of Queensland;
 The Illawarra Herd Book of Queensland;
 The Ayrshire Herd Book of Queensland;
 The Milking Shorthorn Herd Book of Queensland;
 The Holstein-Friesian Herd Book of Australia.

NOTE.—Animals registered in the Commonwealth Standard Herd Book are not necessarily eligible for entry in the Jersey Herd Book of Queensland.

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
DAIRY BREEDS.				
AYRSHIRES.				
L. H. Paten	"Jeyendel," Calvert, S. & W. Line	8	21	Ayrshire Herd Book of Queensland
J. H. Paten	Gwandalan, Yandina	6	21	Do.
Queensland Agricultural College	Gatton	4	40	Do.
State Farm	Warren	3	83	Do.
J. W. Paten	Ayrshire Park, Wanora, Ipswich	10	42	Do.
J. H. Fairfax	Marinya, Cambooya	9	55	Do.
J. Holmes	"Longlands," Pittsworth	6	20	Do.
H. M. Hart	Glen Heath, Yalangur	7	21	Do.
F. A. Stimpson	Ayrshire Stud, Fairfield, South Brisbane	7	77	Do.
M. L. Cochrane	Paringa Farm, near Cairns	5	21	Do.
John Anderson	"Fairview," Southbrook	7	34	Do.
JERSEYS.				
T. Mullen	"Norwood," Chelmer	3	20	Jersey Herd Book of Queensland
Queensland Agricultural College	Gatton	2	31	Do.
M. W. Doyle	"Oaklands," Moggill	4	12	Do.
G. A. Buss	Bundaberg	1	15	Do.
R. Conochie	Brooklands, Tingoorra	9	21	Do.
W. J. Barnes	Millstream Jersey Herd, Cedar Grove	10	37	Do.
W. J. Affleck	Grasmere, N. Pine ..	6	31	Do.
J. N. Waugh and Son	Prairie Lawn, Nobby	3	28	Do.
W. J. H. Austin	Hadleigh Jersey Herd, Boonah	2	11	Do.
State Farm, Kairi	Kairi, <i>via</i> Cairns ..	4	16	Do.
H. D. B. Cox	Sydney (entered in brother's name)	3	16	Commonwealth Standard Jersey Herd Book
GUERNSEYS.				
Queensland Agricultural College	Gatton	2	2	Eligible, but no Guernsey Herd Book of Australia

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—*continued.*

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
DAIRY BREEDS— <i>continued.</i>				
HOLSTEINS.				
Queensland Agricultural College	Gatton	2	9	Holstein-Friesian Herd Book of Australia
George Newman ..	"St. Athan," Wyreema	9	92	Do.
F. G. C. Gratton ..	"Fowlerton," Kingsthorpe	1	15	Do.
R. S. Alexander ..	Glenomond Farm, Coolumboola	1	3	Do.
Ditto	Ditto	1	..	Holstein-Friesian Herd Book of New Zealand
S. H. Hoskings ..	St. Gwithian, Toolooloowah	..	..	Holstein-Friesian Herd Book of Australia
C. Behrendorff ..	Inavale Stud Farm, Bunjurgun, Q.	3	9	Do.
E. Swayne	West Plane Creek, Mackay	1	2	Do.
ILLAWARRA.				
A. Pickels	Blacklands Stud, Wondai	4	62	Illawarra Herd Book of Queensland
J. T. Perrett and Son	Corndale, Coolabunia	3	43	Do.
W. T. Savage	Ramsay	2	22	Do.
Hunt Bros.	Springdale, Maleny ..	3	62	Do.
MILKING SHORTHORNS.				
P. Young	Talgai West, Ellinthorp	2	42	Milking Shorthorn Herd Book of Queensland
W. Rudd	Christmas Creek, Beaudesert	2	10	Do.
A. Rodgers	Torran's Vale, Lane-field	1	9	Do.
W. Middleton	Devon Court, Crow's Nest	3	27	Do.
A. K. Yorksten ..	"Dunure," Miles ..	2	8	Do.
BEEF BREEDS.				
SHORTHORNS.				
T. B. Murray-Prior ..	Maroon, Boonah ..	2	37	Queensland Shorthorn and Australian Herd Books
C. E. McDougall ..	Lyndhurst Stud, Warwick (2)	25	100	Queensland Shorthorn Herd Book
Godfrey Morgan ..	"Arubial," Condamine	3	6	Do.
W. B. Slade	E. Glengallan, Warwick	2	20	Do.
HEREFORD.				
A. J. McConnell ..	Dugandan, Boonah	19	36	Australian Hereford Herd Book
E. M. Lumley Hill ..	Bellevue House, Bellevue	45	127	Do.
Tindal and Son ..	Gunyan, Inglewood	50	400	Do.
SUSSEX.				
James T. Turner ..	The Holmwood, Neurum	2	4	Sussex Herd Book of England

RECORD PRICES FOR SHORTHORNS.

The English mail brings news of great trade in stud Shorthorn cattle at the February sales, at which Argentine and American buyers operated freely. At Penrith the British record price of 4,750 guineas was obtained for the champion bull, Gartley Lancer, bought by Mr. M. Marshall for the Argentine. This price compares with the previous record of 4,700 guineas, paid for a bull calf at the last sales at Collynie, in Scotland, and the previous English record for a bull of 4,500 guineas, which had stood since 1885. At the Penrith sale 228 bulls and 147 females sold for an aggregate sum of £46,705.

Windsor Knight, the King's champion bull of the Birmingham Show, early in February, realised 4,200 guineas, which was paid by an Argentine buyer. The reserve bull, exhibited by Earl Manners, was also sold for 4,200 guineas, but to an English breeder. Donnington's Court, a bull that was second to the King's champion in his class, was bought by Mr. Evan Jones for Australia, at 1,000 guineas.

Another notable sale, at the Perth Show sales, was of Lady Cathcart's champion bull to Mr. W. Duthie, the noted Scottish breeder, for 4,000 guineas.

REPATRIATION CATTLE SALE.

Considerable interest was aroused in the "repatriation cattle sale" held at Marshlands, near Wondai. These cattle, comprising 1,400 head, were donated some three years ago by district graziers for the benefit of returned soldiers of the South Burnett district. The scheme originally was suggested by Mr. E. J. McConnell, of Marshlands, who not only contributed largely, but has grazed and superintended the cattle ever since. There was a good attendance of buyers, and the dispersal of the cattle was entrusted to John Bridge and Co., Ltd., who carried out the work free of any commission charges. Mr. D. M. Allen, of that firm, was in charge of the details, and Mr. J. Claude Henderson (Deputy Comptroller of Repatriation, Brisbane), represented the Federal Government. The total sum realised for the 1,400 head was £6,000 which is claimed to be very satisfactory, considering the limited demand for stock at the present time owing to the fear of a shortage of water in the district during the coming winter. A feature of the sale was that a number of lots were put up exclusively for returned soldiers, and good competition resulted. The cattle were presented in good condition and were arranged in lots. The chief buyers were Lord Brothers, of Eskdale, and G. D. Fox, of Wigton, as well as a number of small holders.

SHEEP ON COASTAL AREAS.

A very interesting report from Inspector of Stock J. H. Macarthy has been received relative to the keeping of sheep on coastal areas. Following is a resumé of the report:—"Mr. George Clark, farmer, of Tabragalba, informed the inspector that sheep combined with farming have given him very good results during the past twelve months.

Recently he sent a consignment of shorn fat lambs (six months' old) to Enoggera for sale and they netted him 23s. per head, while the fleece taken from them yielded 4s. 6d. per head; thus the lambs returned him net £1 7s. 9d. per head—an excellent return. Mr. Clark also sold some wethers bred on the farm (aged sixteen months) for £1 15s. 6d. per head, in addition to 12s. 6d. per head for the wool shorn off them.

In regard to the chief trouble of farmers who keep sheep on coastal areas—i.e., stomach worms, Mr. Clark took no chances, but drenched his sheep with one of the drenches recommended by the Department of Agriculture and Stock.

This is only one of the many instances where sheep have been successfully bred and fed on coastal areas, to which the Departmental records can testify.

There have been some failures, it is true, but a proportion of failures is bound to be found in any business.

The world is more than ever hungry for meat and wool, and it is to be feared that the flocks of Australia have been sadly depleted during the past five or six years. In Queensland alone the numbers have receded from about 23,000,000 in 1915 to under 14,000,000 in 1919. New South Wales is suffering now from the worst drought ever experienced in the sheep districts. There is thus every likelihood of prices keeping at present levels for years. Therefore, all farmers should keep, at least, 100 sheep as a most profitable side line. There is always sheep feed on coastal areas, even in the driest times.

The Horse.

A NEW ZEALANDER'S VIEW OF PERCHERONS.

Born in Scotland, I have for many years been breeding Clydesdales in New Zealand. When the war broke out I returned to England, but was turned down by the fighting forces in both British and French armies, by reason of the fact that I had passed fifty. I was finally accepted as an ambulance driver in the French army, and served in the thick of it for two and one-half years. Disabled for further service, I was retired, and am on my way back to New Zealand to render there such aid as I can give. My experience in service in France has convinced me that the Percheron horse excels all other draft breeds. My observation on the battlefields has shown me that the Percheron can do all that any of the other draft breeds can, and a good deal more. Percherons excel in constitution. I have seen them exposed to the most inclement weather, without shelter, driven oftentimes to the limit, then swung to one side and left standing for hours in a bitter storm, and under these most adverse conditions they manifested a hardiness, a resistance to wind and wet and cold, and an ability to survive on limited rations of most indifferent character, that far excelled all other breeds subjected to the same conditions. This power to survive while others were going unserviceable or dying I term constitution, and in this the Percheron far excels all others. I have seen them as purebreds drawn from the Perche, and their grades drawn from America, and in this all-important essential they are unequalled.

Next to their constitution I rate their activity. Heavy gun horses of Percheron breeding proved far superior to all other breeds in their ability to go out and trot at a good fast clip for a long distance, and in activity and sure-footedness in putting guns into places over broken ground. Their speed, activity, and handiness I consider amazing, when the difficult character of the terrain is considered.

Their docility is equally important. Balking or jibbing is virtually unknown among them, and they can be hitched together in any desired combinations without trouble. This is of incalculable value on the battlefield, for in tight places cool, level-headed horses are as valuable as brave men. Time and again I have known horses to be killed by shell fire when going into action, but no trouble was encountered in cutting out the dead horses and in taking the guns through with what remained. Excitable, rattle-headed horses, or those inclined to fight each other, are an abomination under such desperate conditions, and in steadiness and coolness under fire, due to docility, the Percheron horses by far excel all other draft breeds, as thousands of artillerymen will testify from actual experience with them under fire.

I have already assisted one of my relatives, who owns 5,000 acres in Staffordshire, England, to select the foundation animals for a stud there. They are already in Britain and are doing splendidly. I am purposely returning through the United States to see the American-bred Percherons, and from what I have seen I am confident that as soon as ship transportation eases up, some Percherons will be taken from the United States to New Zealand and Australia.

It takes a good deal to convert a Scotchman to a breed not of his own country, but the stress of war has changed many ideas we have heretofore held. I am convinced that the Percheron is the most valuable draft breed in the world, and I intend to have some of them in the not far distant future.—“Farm Bulletin.”

RECORD PRICE FOR MAIZE.

During the month of April this year the price of maize rose steadily until the high price of 8s. 10d. per bushel was reached for a prime consignment from Beenleigh, and another lot from Caboolture realised 8s. 9d. per bushel, or about 1s. per bushel over the highest price obtained for this cereal towards the end of March. In May, maize was sold for 10s. per bushel. In December last prices ranged from 5s. 6d. to 6s. per bushel. Lucerne chaff also, owing to the commencement of the cold weather in April, took a considerable leap upwards at the Roma Street Markets, from £8 and £9 to £13 and over per ton. Sweet potatoes, which usually bring from 4s. to 5s. 6d. per cwt., were sold at 13s. In May the price of maize touched 9s. 7d. per bushel.

Dairying.

CIRCUMSTANCES INFLUENCING MILK SECRETIONS.

Age.—A cow in good health continues to improve in milk-yielding capacity up to her seventh or eighth year. The milk of a young cow is richer in fat, while that of an aged cow is reduced in total solids.

Period of Lactation.—A cow attains her highest yield, as regards quantity, about six to eight weeks after calving; thence she declines till she grows dry about the 300th day in average cases. The total solids in the milk increase as the quantity decreases, the increase being in the fat and casein, while the albumen and milk sugar may become reduced.

Period of Year.—A flush of young grass in early summer stimulates the milk yield of cows in whatever period of lactation they may be, while the dry, brown pastures and hot weather in autumn cause a shrinkage of the same. In the hot weather of summer there is an increase of olein in the butter fat, while in the cold weather of winter there is more stearin developed. Thus butter is softer in summer and harder in winter, irrespective of temperature.

Food.—The food largely influences the quantity of the milk and the proportion of cream and butter obtained therefrom. The result of investigations tends to show that while the composition of the milk is little, if any, altered by a change in the nature of the food (or only temporarily altered), the "churnability"—i.e., the proportion of butter which can be obtained from the milk produced by different foods—varies according to the nature of the food, as hereafter shown.

Water Supply.—A plentiful supply of good water is necessary both in summer and winter, but more especially in hot summer weather, to enable cows to milk well. According to experiments made at Geneva (New York) with seven different breeds, they require about 5 lb. of water to every 1 lb. of milk yielded; every 1 lb. of dry food requiring 3 to 4 lb. of water.

Temperature.—Cows give their largest yield when kept at a temperature of 63 degrees F. This is often exceeded in summer in European and American countries where cows are housed, while in winter it is found impossible to keep the air of the cowhouses up to this from the natural heat of the animals alone, and at the same time have proper ventilation, while if they are turned out for exercise they are more likely to take chills in coming from a high temperature. All things considered, 55 degrees F. is the most suitable temperature.

Temperament.—An animal with a healthy, well-developed nervous organisation will milk better than one with a sluggish, phlegmatic temperament—i.e., the most intelligent cow is the best milker. Such an animal requires very careful treatment, however, otherwise she will degenerate into a nervous, fidgetty, restless animal, easily frightened, with a correspondingly adverse effect on the milk yield.

Oestrus.—The service heat affects some cows very little, but in most cases the quantity of the milk is reduced, the specific gravity is decreased, the percentage of fat reduced (to 1 per cent. sometimes), and the butter made from the same is white (or nearly so) in colour. These changes disappear quickly—lasting from two to three days—immediately the oestrus is over.

Treatment.—Gentle treatment is of the utmost importance, as anything that ruffles the animal makes her unwittingly "hold up" her milk, and eventually largely decreases the daily yield; and it is thus of importance that she should never be hunted with dogs, struck, or harshly spoken to, but be petted as much as possible.

Milking.—Quick milking and clean milking largely increase the quantity of milk and the percentage of butter fat therein, while slow and slovenly work reduces the yield in every way and permanently "dries up" the cow. Good milking will do more to increase the yield than any other circumstances, while an inferior milker will injure the animals more than all other good treatment will counteract. Babcock found, as the average of several experiments, that quick milking produced from 2 to 13 per

cent. more milk, which was 10 per cent. richer in fat, than that produced by slow milking; and this superiority continued for several months until the cows naturally began to decline.

CHURNABILITY OF BUTTER FAT.

*Proportion of Total Buller Fat in Milk obtained by Churning,
according to the Food used.* Per cent.

Pasture and bran	91.16
Pasture alone	86.64
Hay, maize meal, and bran	84.18
Hay and bran	81.37
Ensilage (mixed)	81.25
Hay and maize meal	74.63
Ensilage and maize meal	65.69
Hay and starch refuse (gluten meal)	63.89

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF APRIL, 1919, IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING APRIL, 1919 AND 1918, FOR COMPARISON.

Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.		Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.	
	April.	No. of Years' Re-cords.	April, 1919.	April, 1918.		April.	No. of Years' Re-cords.	April, 1919.	April, 1918.
<i>North Coast.</i>					<i>South Coast—continued:</i>				
	In.		In.	In.		In.		In.	In.
Atherton	4.25	18	5.91	4.33	Nambour	4.64	23	7.46	7.16
Cairns	11.65	37	17.76	8.23	Nanango	1.87	37	1.38	1.33
Cardwell	9.81	47	13.09	7.70	Rockhampton ...	2.27	32	4.93	3.88
Cooktown	9.33	43	3.63	6.82	Woodford	4.14	32	3.27	2.53
Herberton	4.31	32	2.61	3.29					
Ingham	8.63	27	13.77	8.19	<i>Darling Downs.</i>				
Innisfail	21.74	38	20.52	17.56	Dalby	1.31	49	0.84	1.13
Mossman	11.33	11	17.28	6.81	Emu Vale	1.25	23	0.53	2.77
Townsville	3.70	48	2.79	2.62	Jimbour	1.39	31	0.59	1.27
<i>Central Coast.</i>					Miles	1.49	34	1.59	2.16
Ayr	2.73	32	3.85	1.84	Stanthorpe	1.76	46	nil	1.31
Bowen	3.03	48	2.77	2.27	Toowoomba	2.53	47	1.64	1.58
Charters Towers ...	1.71	37	3.81	1.02	Warwick	1.42	32	0.29	3.41
Mackay	6.85	18	9.13	9.25					
Proserpine	6.70	16	11.14	8.35	<i>Maranoa.</i>				
St. Lawrence	2.92	48	3.43	7.82	Roma	1.31	45	0.51	3.17
<i>South Coast.</i>									
Biggenden	1.69	20	2.26	3.06	<i>State Farms, &c.</i>				
Bundaberg	2.85	36	1.53	4.81	Bungeworgorai ...	1.22	5	0.25	2.92
Brisbane	3.60	68	1.99	1.70	Gatton College ...	1.82	20	0.26	1.63
Childers	2.42	24	0.92	4.04	Gindie	1.19	19	2.20	2.70
Crohamburst	5.42	25	7.13	5.64	Hermitage	1.49	13	0.47	3.61
Esk	2.67	32	1.66	1.38	Kairi	3.59	5	3.75	4.08
Gayndah	1.33	48	2.10	2.07	Sugar Experiment	5.28	22	9.52	8.42
Gympie	3.09	49	3.57	3.17	Station, Mackay ...	1.38	5	2.31	2.95
Glasshouse M'tains	4.68	11	4.88	4.48					
Kilkivan	2.10	40	1.35	1.99					
Maryborough	3.27	48	2.49	3.35					

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for April this year, and for the same period of 1918, having been compiled from telegraphic reports, are subject to revision.

GEORGE G. BOND, State Meteorologist.

Poultry.

REPORT ON EGG-LAYING COMPETITION, QUEENSLAND AGRICULTURAL COLLEGE, APRIL, 1919.

The total number of eggs laid for the month was 4,187. The birds are now settling down nicely, and very few indeed show signs of moulting. There were two deaths during the month, but these birds have been replaced. Nine cases of sickness required attention. There was one case of broodiness in the heavy section. The heavy breeds have settled down somewhat better than the light breeds, a number of the latter being very undecided to get into regular work. Some good scores in the heavy section may be looked forward to, provided the weather still holds good during next month. The feeding in this section is all that can be desired. The following are the individual scores:—

Competitors.	Breed.	April.
LIGHT BREEDS.		
*Dixie Egg Plant	White Leghorns ...	116
*W. Hindes	Do.	106
J. H. Jones	Do.	99
*J. M. Manson	Do.	96
*Range Poultry Farm	Do.	94
*G. W. Hindes	Do.	90
*Quinn's Post Poultry Farm	Do.	90
*Thos. Taylor	Do.	90
*Dr. B. C. Jennings	Do.	89
*W. Lyell	Do.	89
*Haden Poultry Farm	Do.	87
S. McPherson	Do.	84
Geo. Williams	Do.	83
S. W. Rooney	Do.	82
*H. Fraser	Do.	80
*E. A. Smith	Do.	80
Geo. Trapp	Do.	80
*C. P. Buchanan	Do.	75
Mrs. N. Charteris	Do.	72
*B. Caswell	Do.	67
*W. Becker	Do.	67
G. J. Byrnes	Do.	66
B. Chester	Do.	66
Oakleigh Poultry Farm	Do.	63
*T. Fanning	Do.	62
H. A. Jones	Do.	61
*L. G. Innes	Do.	58
C. A. Goos	Do.	57
*O. W. J. Whitman	Do.	54
N. A. Singer	Do.	53
*Mrs. R. Hunter	Do.	53
H. O. Jones	Do.	51
W. A. Wilson	Do.	47
R. C. J. Turner	Do.	40
W. Morrissey	Do.	29
*Mrs. L. Anderson	Do.	27
*Mrs. A. G. Kurth	Do.	27
J. H. Dunbar	Anconas	22
G. H. Kettle	White Leghorns ...	10
*J. J. Davies	Do.	7
J. W. Newton	Do.	0

EGG-LAYING COMPETITION—*continued.*

Competitors.	Breed.	April.
HEAVY BREEDS.		
*E. M. Larsen	Black Orpingtons ...	122
Geo. Nutt	Do.	113
*R. Burns	Do.	160
*Nobby Poultry Farm	Do.	95
*R. Holmes	Do.	94
*A. E. Walters	Do.	88
*W. Smith	Do.	88
*D. Fulton	Do.	82
*E. F. Dennis	Do.	80
*A. Shanks	Do.	78
Mrs. M. E. Smith	Do.	71
*Kelvin Poultry Farm	Plymouth Rocks ...	67
*Jas. Ferguson	Chinese Langshans ...	57
*E. Morris	Black Orpingtons ...	56
A. Homan	Do.	55
R. B. Sparrow	Do.	50
C. H. Singer	Do.	43
*T. Hindley	Do.	42
*H. Puff	Rhode Island Reds ...	36
*Mars Poultry Farm	Black Orpingtons ...	34
*W. H. Reilly	Chinese Langshans ...	21
H. Ashworth	Black Orpingtons ...	13
J. A. Cornwell	Do.	13
*T. B. Barber	Do.	12
*F. W. Leney	Do.	8
A. Gaydon	Do.	0
Total	...	4,187

* Indicates that the pen is engaged in single test competition.

DETAILS OF SINGLE HEN PENS.

Competitors.	A.	B.	C.	D.	E.	F.	Total.
LIGHT BREEDS.							
Dixie Egg Plant	18	18	21	21	19	19	116
W. Hinde	23	22	11	7	18	18	99
J. M. Manson	14	13	18	17	17	17	96
Range Poultry Farm	15	18	13	22	11	15	94
G. W. Hinde	17	17	18	15	9	14	90
Quinn's Post Poultry Farm	10	16	18	15	19	12	90
Thos. Taylor	19	10	12	15	19	15	90
Dr. Jennings	15	16	16	10	13	19	89
W. Lyell	9	16	19	15	15	15	89
Haden Poultry Farm	18	18	17	15	17	2	87
H. Fraser	7	18	17	15	5	18	80
E. A. Smith	8	17	19	18	0	18	80
C. P. Buchanan	0	18	13	9	17	18	75
B. Caswell	2	3	15	18	15	14	67
W. Becker	21	9	18	16	0	3	67
T. Fanning	19	1	14	9	7	12	62
L. G. Innes	13	7	8	7	13	10	58
O. Whitman	16	18	9	0	10	10	54
Mrs. R. Hunter	8	17	10	12	4	2	53
Mrs. A. G. Kurth	10	5	9	3	0	0	27
J. J. Davies	0	0	1	0	6	0	7
Mrs. L. Anderson	1	15	0	0	10	1	27

DETAILS OF SINGLE HEN PENS—*continued*.

Competitor.	A.	B.	C.	D.	E.	F.	Total.
HEAVY BREEDS.							
E. M. Larsen	20	23	15	18	23	23	122
R. Burns	18	18	12	25	10	17	100
Nobby Poultry Farm	16	17	3	23	15	21	95
R. Holmes	24	22	15	10	22	1	94
A. E. Walters	7	18	19	16	11	17	88
W. Smith	19	21	4	3	19	22	88
D. Fulton	12	20	18	17	17	1	82
E. F. Dennis	20	2	20	20	0	18	80
A. Shanks	12	12	19	24	0	11	78
Kelvin Poultry Farm	23	8	12	1	10	13	67
Jas. Ferguson	12	15	8	0	11	11	57
E. Morris	16	21	0	8	11	0	56
T. Hindley	24	11	0	6	0	1	42
H. Puff	13	0	7	16	0	0	36
Mars Poultry Farm	0	16	3	3	0	12	34
W. H. Reilly	6	1	6	8	0	0	21
T. B. Barber	3	6	0	0	0	3	12
F. W. Leney	2	0	0	6	0	0	8

POULTRY FOODS.

By J. C. BRÜNNICH, F.I.C., Agricultural Chemist.

The results of the analyses of the various poultry foods on the market clearly indicate that some manufacturers of such foods charge far too high a price for their mixtures. Again, nothing appears to be gained by making and selling a large number of different mixtures, under various names, as in most cases the foods are practically the same, and could be easily replaced by mixtures made by the poultry farmer himself, by adding a little bonemeal, or bone and meat meal, to his pollard and bran mash.

The calculation of a comparative food value is not easy, but some close and fair approximation is obtained by taking the analyses and putting a monetary value on to the different valuable food constituents. For our purposes proteins and phosphoric acid, the most valuable constituents, are taken as 3d. per unit, carbohydrates and fibre at 1d. a unit, crude fat or oil at 2d. a unit, and lime at $\frac{1}{2}$ d. a unit; understanding as unit value the cost of 1 per cent. per cwt. of food.

Some foods contain small amounts of spices and iron, for which no value has been calculated and added, because the quantities of such stimulants required are exceedingly small.

The units chosen are very liberal because we find that in all the common by-products used as food, like bran, pollard, key meal, and Meggitt's meal, the value calculated from the analyses is found to be slightly higher than the actual market value of such foods, but in all the manufactured mixtures the market price is very much higher, and in a few cases quite exorbitant.

The ratio of proteins and carbohydrates is of importance in poultry foods, and as a rule a ratio of about 4—between $3\frac{1}{2}$ and 5 is desired—which means that about four times the amount of carbohydrates, fibre, and fat are present, as compared with the amount of true protein. Foods like maize, at present quite out of question as a poultry food on account of its high price, contains too much carbohydrates, having a ratio of 8.4. Of course, analysis alone is not always sufficient to decide a value of a food, and microscopical examination is often necessary to prove the absence of injurious substances. Crushed wheats areals have been put on the market containing too much refuse, and particularly bunt spores, which would make their use dangerous for poultry food.

ANALYSES OF POULTRY FOODS.

	Moisture.	PROTEIN.		Carbohy- drates, &c.	Fibre.	Oil and Fat.	ASH.				Protein Ratio.	Market Price, per cent.	Actual Value, per cent.
		Crude.	True.				Crude.	Insoluble.	Lime.	Phosphoric Acid.			
	%	%	%	%	%	%	%	%	%	%		s. d.	s. d.
Bone and meat meal ..	4.34	36.51	35.74	[1.84]	[3.88]	1.68	51.75	.22	26.75	19.10	.2	15 0	14 7
Pea meal	10.05	21.44	18.02	61.39	2.35	2.05	2.72	.04	.34	.59	3.8	18 0	11 1
Megitt's meal	9.50	26.63	23.06	35.86	9.70	11.85	6.46	1.24	.67	1.72	3.2	10 0	12 0
Maize meal	10.65	10.50	9.89	67.57	5.21	4.55	1.52	.06	.13	.40	8.4	20 0	9 4
Key meal	8.75	18.37	17.00	43.45	13.35	9.80	6.18	.14	.50	.88	4.0	8 0	10 10
Polly meal.. ..	8.05	19.81	19.68	61.31	5.50	3.65	1.68	.26	.16	.54	3.8	11 0	11 4
Bran	11.00	15.90	15.00	55.40	8.20	4.90	4.60	.18	.36	2.00	5.0	8 0	10 2
Pollard	10.50	17.40	15.50	56.80	6.00	4.90	4.60	.17	.35	1.88	4.8	8 0	10 4
Commercial Mixed Poultry and Chick Foods—													
1	.90	18.88	13.62	39.90	4.85	3.25	32.22	2.76	16.16	6.77	3.9	60 9	9 8
2	7.15	19.25	17.50	53.26	4.15	3.55	11.64	1.88	.83	.72	3.7	67 0	9 11
3	7.80	32.75	30.81	21.71	4.80	7.20	25.74	.62	12.70	9.65	1.4	18 0	13 6
4	9.50	11.07	8.71	71.23	3.28	3.00	1.92	.30	.25	.57	9.3	17 0	9 0
5	9.64	13.87	10.94	67.53	3.32	3.34	2.30	.24	.34	.78	7.2	19 6	9 5
6	10.55	14.09	10.34	66.18	2.76	4.04	2.38	.29	.34	.76	7.6	17 6	9 3
7	8.50	32.02	28.25	18.13	4.55	5.80	31.00	.24	14.86	11.53	1.3	18 0	13 7
8	13.10	17.69	15.75	52.29	7.50	1.90	7.52	1.04	2.01	2.46	4.1	14 7	9 10
9	12.50	15.63	13.65	57.12	4.85	2.40	7.50	.28	3.02	3.03	4.9	13 2	9 8

The Orchard.

FRUITGROWERS' CONFERENCE.

NOTES IN CONNECTION WITH A CONFERENCE OF FRUITGROWERS, HELD IN THE LAND COURT ROOM, EXECUTIVE BUILDINGS, BRISBANE, ON THURSDAY AND FRIDAY, 3RD AND 4TH APRIL, 1919.

A conference of fruitgrowers was held in the Land Court Room, Executive Buildings, Brisbane, on the 3rd and 4th April, 1919, commencing at 10 a.m. on the former date.

Owing to indisposition, the Honourable the Minister for Agriculture was unfortunately unable to be present to open the conference, but his place was taken by the Under Secretary, who, on his behalf, welcomed the delegates and expressed the hope that the industry would be materially benefited as a result of their deliberations.

Mr. Brown, Montville, apologised for the absence of Mr. R. J. Warren, M.L.A., owing to an important business engagement, and later, Mr. Warren attended to express his regret that he was unable to stop right through the deliberations, and he also expressed the hope that the industry would be benefited as a result of the conference.

The following is a list of the delegates present:—

- D. Pfrunder—Applethorpe Fruitgrowers' Association;
- J. McLean—Beerwah and Coochin Creek District Farmers and Fruitgrowers' Progress Association;
- J. Macdonald—National Agricultural and Industrial Association;
- S. Lamont—Horticultural Society of Queensland;
- W. E. Dean—Buderin Mountain Fruitgrowers' and Progress Association;
- C. R. Warriek—Caboolture P.A. and I. Society;
- W. A. Gibson—Cleveland A.H. and I. Society;
- H. Mungill—Fletcher Fruitgrowers' Association;
- A. Butchart—Ipswich Horticultural Society;
- McKeon—Kilkivan P.A. and I. Association;
- J. R. Morris—Mapleton Fruitgrowers and Farmers' Progress Association;
- F. Copley—Wide Bay and Burnett P. and A. Society, Maryborough;
- T. H. Brown—Montville Fruitgrowers, Farmers' and Progress Association;
- W. W. Mallet—Maroochy P.A.H. and I. Society, Nambour;
- H. Harding—Rosewood A. and I. Association;
- A. J. Buchanan—Brighton Farmers and Fruitgrowers' Progress Association, Sandgate;
- A. H. Paget—The Summit Fruitgrowers' and Progress Association;
- H. C. Cowie—Woodford District Fruitgrowers' Association;
- S. J. McBaron—Cooloolabin Farmers and Fruitgrowers' Association, Yandina;
- F. M. Ruskin—Zillmere A.H. and I. Society;
- C. Johansen—Fruitgrowers' Association, Ballandean;
- J. Aird—Fruitgrowers' Association, Bli Bli;
- C. R. Wilson—Fruitgrowers' Association, Glasshouse Mountains;
- T. R. Miller—Fruitgrowers' Association, Perwillowen, Nambour;
- W. H. Parker—Queensland Fruitgrowers' Industrial Trading Society, Brisbane;
- Jas. Collins—Fruitgrowers' Association, Redland Bay;
- A. C. Woods—Fruitgrowers' Association, Rochedale;
- E. Smallman—Fruitgrowers' Association, Wellington Point;
- H. Randall—Fruitgrowers' Association, Wymum West;
- A. Keers—Fruitgrowers' Association, Beerburrum;
- Jas. Wayman—Fruitgrowers' Association, Broadwater, Stanthorpe;
- D. McLaurin and H. Freeman—Fruitgrowers' Association, Currumbin;
- C. R. Warriek—Fruitgrowers' Association, Elimbah;
- W. Kuhn—Fruitgrowers' Association, Palmwoods;
- I. A. Dakin—Fruitgrowers' Association, Thulimbah;

R. E. Whiting—Fruitgrowers' Association, Wamuran, Kileoy Line;
 W. W. Mallet—Maroochy P.A.H. and I. Society, Nambour;
 W. Ellison—Fruitgrowers' Association, Landsborough;
 J. A. Loggie—Manly Road Fruitgrowers' Mutual Benefit Association;
 R. J. Warren, M.L.A.—North Coast Fruitgrowers' Association.

After the roll had been called the Director of Fruit Culture was voted to the chair, and after thanking the delegates for the honour they had conferred upon him, he called upon Mr. T. H. Brown (Montville) to open the discussion upon the first item on the agenda paper, viz.:—The necessity for combined action by fruitgrowers in the formation of a non-political and non-trading association to deal with and watch the interests of the fruitgrowing industry throughout the State.

Mr. Brown gave an outline of the events which led up to the calling of the conference, referring to a communication from his association to the Department of Agriculture and Stock, asking that such a conference be called, and following this with the action that was taken at a conference of fruitgrowers held at Palmwoods during this spring, when it was decided to form a North Coast fruitgrowers' association.

He stated that when the growers of the North Coast had realised that, through their want of organisation, they were not reaping the full benefits of their industry, they had taken steps which resulted in the formation of the present North Coast Fruitgrowers' Association.

He then dealt with the success that had been attained by this organisation in the transport by train of bananas and pineapples to the Southern markets, thereby enabling the growers to dispose of these fruits at a time when the coastal shipping trade was practically at a standstill, and without which the greater portion of the fruit would, in all probability, have been lost or realised such a low price on the local market as to be unremunerative.

Mr. Brown strongly urged the importance of organised effort, and pointed out the benefits to be derived therefrom. He was in favour of the growers in all fruit districts being organised for mutual protection, and trusted that, once such local organisation was effected, an association as outlined in the agenda paper, would be an established fact.

The Chairman then called upon Mr. W. H. Parker, the chairman of the Queensland Fruitgrowers' Industrial Trading Society, and President-elect of the forthcoming Interstate Fruitgrowers' Conference, to be held in Brisbane at the end of May.

Mr. Parker endorsed the remarks made by Mr. Brown, and emphasised the extreme importance of organised effort. He gave a brief outline of the working of the Queensland Fruitgrowers' Industrial Trading Society, and showed the good results that had accrued from the formation of that society. He also referred to the recent Interstate Conference of Fruitgrowers, held in Launceston, Tasmania, and showed that organisation had already received great attention in New Zealand, Victoria, and Tasmania.

With respect to New Zealand, he informed the conference of the splendid work that had been done, and pointed out the advantages to be derived from the formation of a strong Queensland Association which would, he hoped, eventually work in conjunction with similar associations in the different States of the Commonwealth and the Dominion of New Zealand.

He gave the conference much valuable information, and his remarks were listened to with much appreciation.

The discussion was continued by Mr. Dakin, the chairman of the combined associations of the granite belt, who also supported the idea of a Queensland association, and agreed with the principles expressed, but pointed out that he and his co-delegates from Stanthorpe and district were not empowered to bind their associations in any way, though they were prepared, on their return to their individual associations, to strongly recommend their joining in the formation of a combined association such as that outlined, and they would point out the benefits to be derived from the existence of a Central Executive.

Mr. W. E. Dean (Buderim) stated that his association strongly supported the formation of a Central Executive, with the ultimate idea of combining with the other States, and he endorsed the remarks of the previous speakers.

Mr. Paget (The Summit) supported the remarks of Mr. Dakin, and pointed out the advantages that had been derived by the Stanthorpe growers from their local conferences of fruitgrowers, to which each fruitgrowing centre in the granite belt sends two delegates from its association, the meetings taking place in Stanthorpe.

As an instance of the value of organised effort, Mr. Paget pointed out the success that had been attained by their association with respect to the limiting of the importation of American apples, and expressed the opinion that there was no necessity for such importation, as the different fruitgrowing districts of the Commonwealth were quite capable of producing all the apples required for consumption within the Commonwealth, as the late keeping varieties grown in the Southern States could be held over till the early ripening varieties of the Stanthorpe district were ready. He considered there should be no break in the supply of this essential fruit, provided its distribution was properly regulated.

Mr. C. R. Wilson endorsed the need for organisation, and pointed out that in New Zealand, such bodies were of a co-operative nature, being trading societies.

After further discussion the question as to whether an association such as that outlined in the agenda paper was needed was submitted by the Chairman, and a resolution to that effect was moved by Mr. J. R. Morris, seconded by Mr. C. R. Wilson, and carried unanimously.

Mr. Wilson then moved, as it had been considered advisable to form such an association, the name should be "The Queensland Federated Fruitgrowers' Association." This was seconded by Mr. Parker, and after discussion was carried, the Stanthorpe delegates refraining from voting.

The question of determining the best means to be adopted to bring such association into effect was next considered. Mr. Dakin (Thulimbah) recommended that the matter be placed before the whole of the fruitgrowers' associations of Queensland, and that they be asked to organise on lines similar to those already in operation in the North Coast and Stanthorpe districts. He pointed out the necessity of having the assistance of every association of fruitgrowers, and suggested that each delegate present should, on his return, bring this matter before his association.

The question having been raised as to the Stanthorpe delegates not having power to commit their associations to any definite action, Mr. Dakin pointed out that he had no doubt they were really at one with the other delegates in their desire to take such measures as would tend to the general advancement of the fruitgrowing industry, and with regard to the formation of a central body he had no doubt but that they would fall into line.

In order that associations, similar to those in existence in the North Coast and Stanthorpe districts, be formed, Mr. Brown suggested that the State of Queensland should be divided into six fruitgrowing districts as follows:—

- (1) Stanthorpe;
- (2) South Coast;
- (3) Metropolitan (as far as Caboolture);
- (4) North Coast (Caboolture to Gympie);
- (5) Wide Bay and Burnett district (Gympie to Rockhampton);
- (6) Bowen and the North;

with power to add. He submitted this as a motion, which was seconded by Mr. McBaron (Cooloolabin). Mr. Morris supported the motion, which, after discussion, was carried.

In order to give effect to this, a resolution proposed by Mr. A. C. Wood's (Rochedale), and seconded by Mr. W. H. Parker, to the effect "That it be a recommendation from this conference to the fruitgrowers of Queensland to form fruitgrowing associations in each fruitgrowing district," was carried.

After the adjournment for lunch, the question of the formation of district councils was considered, and it was pointed out by Messrs. Dakin, Brown, and McBaron that as only the North Coast and Stanthorpe districts had such councils, the other districts, as outlined, should at once get to work and form their associations (if necessary) and district councils. Mr. Brown was of opinion that the districts not already organised should be prepared to send delegates to another meeting in a few months' time to form the central executive.

The Chairman strongly endorsed the necessity for the different districts which did not already possess fruitgrowing associations to organise and form such associations for the purpose of delegates from these associations meeting and forming a district council on the same lines as those now in existence in the Stanthorpe and North Coast districts.

Mr. Ellison (Landsborough) and Mr. Brown supported this opinion.

After further discussion the following motion was moved by Mr. J. McLean (Beerwah), and seconded by Mr. H. Randall (Wynnum West):—"That, in the opinion of this conference, the delegates representing those districts who do not

possess an executive body in their midst, urge upon the growers of their districts the necessity of organising into fruitgrowers' associations, and that these associations form a district executive." This motion, on being put to the meeting, was carried by 23 votes to 9.

In order to give effect to this resolution, Mr. Ellison suggested that interested persons in each of the districts should take upon themselves the calling together of the fruitgrowers of their respective districts. Mr. Brown strongly supported the suggestion, and Messrs. Gibson, Smallman, Whiting, Woods, Ruskin, McBain, and Copley promised to do their best to bring the matter before the growers of their districts.

At this stage, Mr. Mallet, as Vice-President of the North Coast Fruitgrowers' Association, promised that members of their executive would be only too glad to give any assistance they could to bodies in other districts, in the way of addressing meetings and pointing out the advantages already derived by the North Coast association, provided their out-of-pocket expenses were paid. The Chairman also promised to give similar assistance where any bodies of growers required same.

Mr. Paget suggested that three months be given to the unorganised districts to organise and form their district councils, and then proposed, "That, in the opinion of this conference, three delegates from each district council should meet in Brisbane within three months from the date of the conference to further the formation of the Queensland Federated Fruitgrowers' Association." This motion was seconded by Mr. Brown, and carried.

The Chairman, in order to place the fullest information in the hands of the growers, promised to communicate with the States of Victoria and Tasmania and the Dominion of New Zealand, and ask that a number of copies of the rules and constitution of their central fruitgrowers' associations be supplied.

It was decided to leave the question of the scope of the work to be undertaken by the proposed central association to the meeting of delegates to be held within the next three months, Mr. Wilson pointing out that special attention should be given to the question of providing better marketing facilities in order to prevent gluts.

This concluded the discussion, and as time permitted the Chairman asked if there were any matters of interest to growers that any delegate wished to bring forward.

Mr. McBain (Aspley) brought up the question of second-hand cases, and pointed out the disability that growers were under by having to pay excessive prices for such cases. The matter was fully discussed by many of the delegates, and it was suggested that the case, instead of being sold with the fruit, should remain the property of the seller.

Mr. Dakin and the Chairman pointed out that the ownership of the cases is purely a matter of trade usage, as there is no reason why, if the growers throughout the State are unanimous on the matter, the case should not remain the property of the seller of the fruit or vegetables exactly the same as occurs in the biscuit trade where the tin is charged for and the charge refunded when the tin is returned. The matter was therefore deferred to the consideration of the central executive when that body is formed.

Several growers pointed out that they had already been able to make arrangements for the return of their cases, so that the conference considered there should be no difficulty in making this condition general where the fruit is sold within the State of Queensland.

Mr. Morris then brought up the question of the potash supply for orchardists, and pointed out the disability that fruit and vegetable growers were under through their inability to obtain a supply of this essential plant food. He pointed out how necessary this material was for the grower of pineapples, bananas, and citrus fruits.

The Chairman endorsed the remarks of Mr. Morris as to the value of potash, and stated that he had received information that a potash nitrate salt was likely to be placed on the Australian market before the end of the year, and he further expressed the opinion that, as soon as the restrictions governing the export of potash from Germany were withdrawn, supplies would accordingly become available in Australia, and prices eventually return to something approaching their pre-war value.

Mr. Brown pointed out that the Federal Government had already been approached on the question of their obtaining a supply of potash for fruitgrowers and controlling its distribution. Mr. Mallet mentioned that the Queensland Farmers' Union had also moved in this matter, and he further submitted the following resolution:—"That a letter be sent through the Minister for Agriculture to the Minister for Trade and Customs, drawing his attention to the absolute necessity for an immediate

supply of potash for the fruitgrowers of Queensland, especially considering the fact that a large number of returned soldiers are being settled on the land for fruitgrowing purposes, and further recommending that the Commonwealth authorities should control the supply." This motion was seconded by Mr. Brown, and on being put to the meeting was carried unanimously.

Prior to the adjournment, a further discussion took place on the running of the fruit trains, and several matters of interest were dealt with, particularly the difficulty of filling a truck at the smaller stations. The advantage of the trains for the carriage of vegetables, such as tomatoes and cucumbers, was also pointed out, and the Stanthorpe delegates expressed the hope that next season they would be in a position to co-operate and forward a quantity of early fruits for the Southern markets.

On the motion of Mr. Ruskin, seconded by Mr. Dakin, a hearty vote of thanks was accorded to the North Coast Fruitgrowers' Association for bringing about the present conference.

The conference then adjourned till the following day.

FRIDAY, 4TH APRIL, 1919.

On resuming business, the Chairman stated that at the special request of the Stanthorpe delegates, who were attending a deputation to the Railway authorities, the first item on the agenda paper for that day, viz., the discussion on the advisability of amending the Diseases in Plants Act, &c., would be deferred until their return to the conference. In the meantime, the question of deciding what matters it was desirable to submit to the Interstate Fruitgrowers' Conference was proceeded with, Mr. Parker (as President-elect of the Interstate Conference) being called upon for a few remarks.

Mr. Parker pointed out that it was at present proposed to hold the conference at the end of May, and the last information he had received from the secretary, in Melbourne, was to the effect that the conference should be held. The speaker, however, pointed out that on account of the quarantine regulations, in his opinion, it was doubtful whether the conference would be held at the time proposed. At the same time it was essential for them to make all the necessary arrangements for the holding of the conference.

He pointed out the good work that had been done by similar conferences in the past, and asked for the support of the various fruitgrowing associations in the State in making the forthcoming conference a success. With regard to the agenda paper, he mentioned that the subject of "Bitter Pit" would be brought forward by Mr. H. Tryon, the Government Entomologist and Vegetable Pathologist, as it was a subject he considered of the greatest possible interest to the apple-growers of the Stanthorpe district.

He stated that other matters resulting out of the recent conference, held at Launceston, would also be discussed.

The Chairman asked if there were any matters the delegates wished to be submitted to the Interstate Conference, and a motion was proposed by Mr. J. McLean, and seconded by Mr. C. R. Warrick: "That it be a recommendation from this conference that the matter of uniform grade marking be submitted to the forthcoming Interstate Fruitgrowers' Conference, and that the question of fixing a grade standard for citrus and tropical fruits be considered." This was carried unanimously.

In reply to a request from a delegate the Chairman called upon Mr. Freeman, of Currumbin, for information respecting the methods employed by him in the grading and packing of bananas for the Southern markets.

Mr. Freeman stated that he invariably graded his fruit for size and quality, only packing large fruit, of equal quality in the same case for his first grade, and similar fruit of even quality in the second grade, the third grade consisting of smaller and more uneven quality fruit.

In packing, after lining the case with either paper or dried banana leaves, in the case of the first grade he always placed the cut end of the hands downward on the bottom of the case, taking care that the fruit was packed as firmly as possible till the bottom layer was completed. The top layer was then placed point to point with the bottom layer, and the top of the case, when the packing was completed, was treated in the same manner as the bottom and sides.

In the case of the second grade fruit the hands were packed with the cut surface at the sides and the points of the hands meeting in the centre, and if there were

any spaces left, then fruit of equal size to that contained in the hand was used to fill in such spaces. This method of packing was continued until the case was full. The same course was carried out in the case of the third grade.

His experience was that the systematic grading of the fruit, both for size and quality, was a material benefit to him financially. A vote of thanks was accorded Mr. Freeman for his valuable information.

Considerable discussion then took place on the question of the importation of fresh fruit from America, and eventually, on the motion of Mr. Dakin, seconded by Mr. Pfrunder, the following resolution was carried:—"That it be a recommendation from this conference that the Interstate Conference take into consideration the Federal control of the importation of American fresh fruit when the present embargo is raised."

The question of having a citrus case of uniform shape and capacity was submitted by Mr. Brown, who was in favour of making the use of a case similar to that used for the packing of imported American citrus fruits the standard.

Considerable discussion took place on this subject, some of the delegates being of the opinion that owing to the width of the ends of the case there would be considerable difficulty in the matter of shrinkage as the timber dried. Others again strongly favoured the flat packer, both Messrs. Dean, of Buderim Mountain, and James Collins, of Redland Bay, being strongly in favour of this particular sized case.

The Chairman pointed out that a large amount of latitude respecting the shape of the cases in which to pack citrus fruits was allowed under the Fruit Cases Act, and that already a case identical in shape and capacity to that used by the Californian growers for shipment to Australia was legalised.

It was therefore decided to leave the matter in abeyance and to allow growers to use such cases as they deemed most suitable, provided they were of the standard capacity.

The question of altering the dimensions of the tropical fruit case, which is used for packing pineapples and bananas, was submitted by Mr. Smallman, who pointed out the anomaly that at present existed in that, in the case of the flat packer, the tops, bottom, and sides required timber 28 inches long, whereas the tropical fruit case only required tops, bottoms, and sides of 26 $\frac{3}{4}$ inches. He therefore suggested that, if possible, the tropical fruit case should have its tops, bottoms, and sides of the same length as that required in the flat packer, but in order to do this it would be necessary to reduce either the width or depth of the case. After discussion, in which many delegates took part, it was decided, on the motion of Mr. Brown, seconded by Mr. Smallman: "That it be a recommendation from this conference to the growers of the North Coast and South Coast districts, that tests be made with a pineapple case having 28-inch tops, bottoms, and sides, and of the same cubic capacity as the present tropical fruit case, viz., 3,564 cubic inches, and that a report be submitted to the conference to be held within three months' time."

As there was still some time before the lunch adjournment, the Chairman asked if there were any other matters that delegates wished to bring forward, and Mr. Aird (Bli Bli) pointed out the disabilities that growers were under in there being no fixed standard of quality for either insecticides or fungicides. Several delegates gave their experiences in this matter, and eventually, on the motion of Mr. Aird, seconded by Mr. Dakin, it was unanimously decided: "That it be a recommendation from this conference to the Minister for Agriculture that he introduce legislation for the purpose of standardising preparations used for the destruction of insect, fungus, and other pests."

The conference then adjourned for lunch, and on resuming business,—

Mr. Brown (Montville) read a very interesting paper on the advisability of enforcing the registration of orchards and strongly emphasised the need for registration in the interests of the growers.

Mr. W. E. Dean (Buderim) stated that they had come to the conclusion at a meeting a couple of weeks previously that it was necessary for something further to be done, and they thought a fee should be charged, the fee to be as light as possible on the small man or a man just starting, and to be on a sliding scale.

The Chairman gave an outline of the charges in Western Australia, and Mr. W. H. Parker of the registration charges in New Zealand.

Mr. Kuhn (Palmwoods) was opposed to the registration fee, as the growers in his neighbourhood were doing their best to combat the pests, and, in addition,

most of the citrus pests were to be found in the forests and scrubs surrounding their orchards, and for that reason he did not think the compulsory registration would have the desired effect.

Mr. Whiting stated that in his district the people kept their orchards clean, and so were not in favour of paying taxation to help to keep the other man's orchard clean.

Mr. Dakin (Thulimbah) referred to a meeting held in his district, where all the growers were in favour of some such action being taken, but when it came to the meeting of the affiliated societies in Stanthorpe the majority could not see their way to support the present proposition. He thought the matter was one which should be referred further for consideration, and that it was a matter for the sovereign body, when properly constituted, to make recommendations on.

Mr. Parker supported Mr. Dakin's opinion, and was of the opinion that the federated body, when properly formed, would propose legislation for themselves and tax themselves.

He referred to the unsatisfactory position in connection with the fruit-fly pest and the lure which had been discovered, and expressed the opinion that the Government should have the lure and sell it, making its use compulsory where the fly was prevalent. Even if it were supplied at cost price he did not consider the Government would lose anything over the transaction.

The Chairman also agreed with Mr. Dakin's opinion, and considered that when the growers realised the benefit that would accrue from the systematic destruction of pests they would fall in with the ideas of the Thulimbah association. He also referred to the increase in the matter of the codlin moth in the Stanthorpe district during the present year, owing to a large extent to a lack of unanimity in fighting the pest. He would do his best, through his inspectors, to keep the Stanthorpe growers combating the pest, as otherwise it would be a serious menace to the growers of apples and pears.

Eventually, on the motion of Mr. Dakin, seconded by Mr. Brown, it was unanimously decided, "That this conference refer the question of amending the Diseases in Plants Act to the serious consideration of the Queensland Federated Fruit-growers' Association when that body has been properly constituted."

The Chairman referred to the investigations that had been carried out in connection with the fruit-fly lure and the efficacy of the lure in attracting the male and female flies, and called on Mr. Harvey, the discoverer of the lure, to address the meeting on the subject of his work.

Mr. Harvey, in response to the chairman's invitation, gave a very instructive outline of the discovery of the lure, and the experiments conducted in perfecting it and manufacturing traps with which to use it.

Mr. Paget (The Summit) stated that when the lure was finally placed on the market in a commercial form Mr. Harvey would find he had the growers at his back.

Mr. Harvey invited the growers at any time to submit their questions in writing, and he would be only too pleased to answer them.

On the motion of Mr. Paget, seconded by Mr. Brown, a hearty vote of thanks was accorded to Mr. Harvey for the able way in which he had put the matter before the conference, and the manner in which he had taken up the matter of the destruction of the fruit-fly.

The Chairman further referred to the work done by Mr. Harvey, and expressed the opinion that, as far as fixing the lure was concerned, he had been entirely successful. He also stated that, with the assistance of the Agricultural Chemist, he had been successful in emulsifying the lure and mixing it with various poisons.

Mr. Harvey expressed his intention of following the matter out to a successful issue.

General Matters.

The matter of the deputation that had waited on the General Traffic Manager was discussed at some length, and Mr. Dakin expressed the opinion, which was generally accepted, that the unsatisfactory unloading of perishable produce at Roma Street could not be rectified until more platform space could be provided and arrangements could be made for a staff to unload the fruit before the carters came to take it away.

It was pointed out that the amount of perishable produce damaged in the unloading and handling was a serious loss to the producers, and at the same time meant an increase in price to the latter.

Mr. Dean (Buderim Mountain) pointed out that a large percentage of the shortages reported—in the way of bananas, for instance—consisted of fruit damaged by the rough handling and left lying in the bottom of the trucks at Roma Street.

Mr. Parker was of the same opinion, as he had had the same experience with regard to consignments for his society.

Mr. Johansen considered more damage was done in this way than by the fruit-fly.

With regard to spraying for codlin moth, he thought it was too expensive to spray two or three times a year, but the Chairman considered it was only in exceptional cases that it would not pay to spray two or three times, if necessary.

Mr. Parker brought up the matter of timber for fruit cases and its export to the South, and informed the conference that the chairman was arranging to have a sample case of each timber suitable for the purpose to be on view at the forthcoming Interstate Conference of Fruitgrowers. He thought it was a matter of vital importance for the growers to get their timber as cheaply as possible, especially under present conditions.

Mr. Ellison also expressed his views on the matter of the export of case timber.

Mr. Mungill asked whether any of those attending the conference knew of an efficacious way of dealing with the "Rutherglen fly."

The Chairman was not aware of any definite remedy, even from Victoria, where it did an enormous amount of damage, but suggested the use of heavy masses of smoke.

Mr. Aird referred to the fly, which had been imported for the destruction of the lantana pest, and asked for information as to the result of the experiments carried out in Queensland, and as to whether the fly attacked other plants in the absence of lantana.

The Chairman promised to secure the desired information as soon as possible from Mr. Tryon, the Government Entomologist, and ask that Mr. Aird be communicated with direct by that officer.

Mr. Parker referred to the insects introduced into the State to combat the nut grass; and the Chairman stated that he had been informed of a species of mealy bug destroying nut grass, but the land had to be left idle for some considerable time to allow the insect to carry out the work.

Votes of thanks were unanimously accorded to the Chairman and Secretary and to the Land Court for the use of the room.

This concluded the business of the conference.

NOTES ON THE HANDLING, PACKING, MARKETING, AND GROWING OF PINEAPPLES.

By E. SMALLMAN, "Campsie," Ormiston, representing A.H. and I. Society, Wellington Point, read at the late Fruitgrowers' Conference held in Brisbane on 3rd and 4th April last.

CASES.

In making cases, always clench the nails in the ends, use sound timber only for the sides, and double-bank all thin timber, and do not be sparing of the nails. I use $1\frac{3}{4}$ by 13 nails.

MAKING.

Make the cases so that the lids are nailed on with the grain of the wood; this enables your agent to open them without damaging the timber to any great extent. Brand the end of cases, so that it will read right when the case is lid upwards; also brand lid and number of pines in case.

PACKING.

If obtainable, use dry blady-grass, which I consider the best for the purpose, as, if the fruit gets wet in transit, it will not suffer as much as if packed in softer grasses. Some growers pack in summer grass and other soft grasses; the fruit opens up with a very bad appearance if packed in these grasses, as the packing breaks up into powder.

I have known some growers to pack in newly-cut summer grass—can you expect a good result when these cases are opened up in the Sydney or Melbourne markets? If you have a patch of bananas, you will find the dead leaves make an excellent packing. During the recent drought I used this packing with good results. Avoid cutting the leaves too high, as the leaf-stalk is thick in the upper parts.

GATHERING FRUIT.

Cut with a knife, leaving a short length of stalk on the fruit, and handle carefully to avoid bruising. I carry off the fruit in baskets to a lorry. I prefer a lorry, as you can carry a quantity to your packing shed without piling them high enough to bruise the lower fruit. (Of course, you could not use a lorry on hilly ground.)

PACKING FRUIT.

I have a movable stand on which to place my case, and can pack directly from the lorry. I arrange the packing so that each fruit is surrounded with grass, with a good layer at bottom and top of case; by this means, whichever way the case has a bump, the grass forms a buffer and saves the fruit from damage. Never pack your fruit above the level of the case. How often you have seen the boards rounded on top of the fruit! Can you expect this fruit to be delivered in good order? The pines are bound to get flattened out in carriage, with the result that the juice is running out at the end of the journey and the fruit quite sour.

Although I have had to accept lower prices during gluts, I can say that I have never received such a low price that it did not give me a profit; this result is, I think, owing to the great care I have taken in packing the fruit. I think, when packing, you should put yourself in the place of the purchaser, or, in other words, follow the "Golden Rule."

BRAND.

Adhere to the brand you start with, and pack all your good fruit under this brand—second grade, you can have another brand for. The result is that your best fruit gets well and favourably known, and will be bought up from your agents without the cases even being opened. My Sydney agents inform me that my brand "Campsie" is now so well known that the fruit is often sold before the arrival of the consignment. The benefit to me is obvious. Should the consignments be heavy by this train or boat, my fruit would have been sold before the prices declined. I always advise agents as to quality of fruit and number of fruit in cases, so that they will get my letter before the arrival of the consignment. Very inferior fruit I never pack. Some years back I sold my fruit for twelve months for shipment to Coolgardie, West Australia. My contract was to wax stalks and paper the smooth-leaf variety, and pack in blady grass. I understood the fruit carried well and gave every satisfaction.

IMMATURE FRUIT.

The shipment of green fruit has been a great drawback to the pineapple industry. I think, if the growers would only keep some of the green fruit, such as they are packing, and try and eat it, say a week after, they would realise how they were imposing on the fruit-eating public.

I am hopeful that the shipping of this class of fruit may be prohibited at some future time, as it reacts on the grower and damages the whole trade. The other day, when walking through the markets with Mr. Gibson, we saw some Ripley Queen pines from my district that were so immature that they were quite unfit for any purpose whatever. At the present time, Ripley Queen pines (if coloured) are selling in Brisbane at a very high price; hence the temptation.

GROWING FRUIT.

Endeavour to grow large Ripley Queen and Rough-leaf pines and medium-sized Smooth-leaf (say, 15 to 18 per case). To keep down the size of Smooth-leaf, plant them close; the first crop of Smooth-leaf I planted 10 ft. apart and 1 ft. 6 in. in row (single rows). The result was that my fruit averaged 10 lb., many weighing 12 lb. This was a lesson to me, as, the fruit being so large, it met with a poor demand at low prices.

Botany.

LOMATIA SILAIFOLIA—A POISONOUS FLOWER.

By C. T. WHITE, Government Botanist.

Description.—A shrub, usually of 2 to 3 ft., the young shoots and flowering branches often hairy, with minute hairs. Leaves very much cut and divided, light green. Flowers white, conspicuous, in racemes or panicles (simple or branched sprays) at the ends of the branches. Fruit about an inch long, opening when ripe along one edge; seeds closely packed in the fruit, pale-brown, with a thin almost membranous wing.

Var. induta.—Differs from the normal plant in the under surface of the leaves being densely clothed with brown silky hairs.

Distribution.—Both the normal form and the variety are common plants on the sandy lands of the coast and on the ranges of South-eastern Queensland. The normal form is also common in New South Wales. So far as known the variety is confined to Queensland.

Poisonous Properties.—About a year ago Mr. C. A. Brown brought into the Department a number of flowering sprays of *Lomatia silaifolia*, and stated that he had observed that bunches placed on the tables attracted and killed flies. This observation was interesting, as A. G. Hamilton, writing in the "Proceedings of the Linnean Society of N.S.W." (vol. xlii., p. 20), had recorded the fact that flies feeding on the nectar of *Lomatia* flowers died in numbers, and further stated that Dr. J. M. Petrie was of the opinion that hydrocyanic (prussic) acid was the cause.

At that time Mr. F. Smith and myself were engaged on an investigation into the distribution of hydrocyanic (prussic) acid containing compounds in the members of the Queensland flora; a number of flowering sprays of *Lomatia silaifolia* were obtained, and, on examination, gave strong positive tests for hydrocyanic acid, also on this and on several other occasions leaves were tried but always with negative results.* Dr. Petrie has also recorded negative results with this species, so it would appear that the poisonous properties reside wholly in the flowers.

To substantiate this I recently received specimens from Mrs. E. Geissmann, Tambourine Mountain, with the following notes:—"Under separate cover I am sending you a small branch of a shrub that grows (though not very plentifully) up here. It bears a white flower, and is very pretty to look at. We have (or rather had) one growing in the small paddock near the house, and during Monday we lost three poddy calves through eating some of it—at least we blame that, as there does not seem to be anything else that could cause it. We chopped the thing out, but would much like to know what it is, and whether it is known to be poisonous." On further inquiry, it was ascertained that the calves had nipped off and eaten the flowering branches.

Flowers of the variety *induta* were recently obtained, and in testing them these also yielded strong positive results for hydrocyanic acid.†

General Notes.—It is quite a handsome shrub, and has been introduced into European gardens, its finely cut foliage and pretty white flowers rendering it a desirable species for garden culture.

According to Dr. J. B. Cleland ("Proceedings of the Linnean Society of N.S.W.," vol. xxxvii., p. 591), before the war *Lomatia* leaves were exported to Germany in bundles for decorative purposes.

* Smith and White.—Proc. Roy. Soc. Queens., vol. xxx., p. 88.

† Smith and White.—Proc. Roy. Soc. Queensland, vol. xxxi.

PLATE 24.—*LOMATIA SILATFOLIA*.

(Flowers white.)

A—Flowering shoot.

B—Young seed capsule.

C—Old seed capsules from which the seed has been shed.

D—Seed with membranous wing.

(All natural size.)

Entomology.

CANE-GRUB INVESTIGATION.

The General Superintendent of the Bureau of Sugar Experiment Stations has received the following report on Cane-grub Investigation from the Entomologist to the Bureau, Dr. J. F. Illingworth:—

“The abundant rains at the beginning of April have improved cane condition materially. Even the fields suffering from grubs have improved where they were not already too far gone.

“During the past month I made a survey of the Herbert River district, and found a most gratifying scarcity of grub-injury.

“HERBERT RIVER DISTRICT.

“This district, like the Mulgrave and most other cane areas, has suffered for want of rain, with the result that they will harvest only about half a crop. The lack of grub-injury this year is very fortunate. Even in the areas that were formerly badly infested they are not showing, and digging under the stools failed to reveal them.

“The only assignable reason for this immunity is that cultivation has been continuous because of the dry weather. The farmers in some areas told me that a good lot of beetles were on the wing, and the lack of foliage on the feeding trees in these localities bears out their statements. In several localities, however, where the beetles were very numerous in former years, they did not appear at all this last season—in fact, they have been scarce since the drought of 1915.

“During my limited time I was able to make a thorough survey of all the cane areas which had been infested in recent years through the generous assistance rendered by the officers of the Colonial Sugar Refining Company's mills. In very few places were we able to locate any grubs at all by digging under stools, and in no case were there enough to do serious harm. This is certainly remarkable, and must be due to the better cultivation this year.

“I had a communication recently from Mr. J. Wittrup, president Halifax Planters' Club, urging me to visit the district. He took me to several farms that had suffered in former years from grubs, but there is no indication that the crop is going to suffer this season. These farmers use meatworks manure, and the cane is of a fine dark-green colour.

“Mr. Wittrup called attention to a small field (A. Baxter's) lying alongside a forest of young Moreton Bay ash trees, which were almost defoliated. He told me that the beetles were exceedingly abundant in this timber, and that the cane never suffered from grubs. It is certainly a notable example of the relation of prevailing winds to infestation, for these feeding trees lie to leeward of the cane, and the country to windward is all open—not a tree within half a mile.

“Mr. W. Walker, at Ripple Creek, told me that he is ploughing up considerable numbers of grubs where he is turning down beans, and that the beetles were abundant on feeding trees near his house this year, but that the cane has never suffered on either side of the creek. The soil is rich alluvial deposit, which may possibly account for the immunity.

“Mr. Walker also remarked that the birds did good work on the beetles, which emerged over a very long period this year.

“The farm of D. and E. Mullans, near Hawkins's Creek, though not showing the usual infestation from grubs, has a most interesting experiment with sulphate of ammonia. They applied the chemical to twenty-two rows in a field of Badila ratoons, using about 2 cwt. per acre. The treated cane is a beautiful dark-green colour, and about double the size of the remainder of the field, which is very yellow. The fertiliser was applied at just the right time—after the rains started in January.

“The farm of Combo and Co., which lies in the same narrow valley, shows no sign of grubs in the places where they have appeared every year. Mr. Combo told me that he cut the feeding trees along the stream before the beetles flew in December. There are other feeding trees, however, within half a mile to windward, so I presume that the late cultivation has done as much here in making the cane free from grubs.

"A visit to the newer cane areas, far up the river on the Victoria side, revealed no infested fields, even where grubs did considerable damage last year. The dry weather has stunted the cane in places, but there is none of the characteristic yellowing caused by grubs.

"Mr. E. Freeman, cane inspector at Victoria Mill, called my attention to a farm belonging to Mr. M. Deloughery, in the 'Pocket,' which has produced seven crops of cane right among the trees without any cultivation at all. This farmer has had no trouble from grubs, and cuts 50-ton plant crop. The feeding trees are on every side. It is a case hard to understand, for Mr. Cole, on a farm alongside, cultivates his cane, and has had trouble from grubs since the second crop on new land. The scrub, with fig and other trees, is to windward, but Mr. Cole is having these cut out, so we shall have an opportunity to note the result upon future crops.

"Mr. W. Tooth told me that he has had trouble every year with grubs on his high ground, but none are showing this season, though feeding trees are abundant to windward.

"Mr. Tooth says that the cane laying near the scrub is not as badly infested as that on the ridge further back. This observation agrees with our experience, for the beetles naturally come to rest on these elevated spots.

"The distribution of grubs is not always easy to explain, but in every case where they have infested fields in former years there are feeding trees to windward within half a mile to account for their presence.

"It is interesting to note that none of these infested fields are in the older districts, where the feeding trees have been cleared away, though the land used to be infested in the early days.

"GREENHILLS ESTATE.

"Entering the plantation on the north, everything appears most favourable for a good crop; but as soon as one passes the high ground at the centre of the estate a terrible scene of devastation opens up. It looks as if a severe drought had struck it, in many places the tops being entirely dry. Fortunately, this year there has been no severe wind, and very little of the cane has fallen. The roots of these drying stools are all eaten off, however, and it is an easy matter to pull them over with one hand, for the soil is exceedingly friable.

"A bird's-eye view of the estate under these conditions is most instructive, for it shows decidedly what I have been trying to emphasise in recent reports—that infestation has a very definite relation to the prevailing winds and feeding trees. The part of the field adjoining the feeding trees, to windward, is often less injured than that of the higher ground further back, as I have noted above. Evidently the beetles, in their blundering flight, follow the lines of least resistance, and come to rest on any elevated area. At any rate, it is common experience that the high ground is most severely affected; it is always in these parts that the injury first appears, possibly because the soil is more leached out and poorer.

"It was most distressing to observe soon after I sent in last report, and before the refreshing rains, that the splendid cane of P3 was about to succumb. It will be recalled that part of this field was treated with a green crop of Mauritius beans, the effect of which was most remarkable upon the cane. The grubs were very noticeable in the untreated part of this field a month ago, but the cane of the treated portion continued a healthy green, and had every appearance that it was going to resist the attack. The dry weather continued too long, however, and this beautiful field went brown in a week. Evidently the extra humus of the beans was not enough to carry the grubs over the trying period. With abundant, normal rainfall, however, the cane would doubtless have come through in good shape. Anyway, the added humus staved off the injury for more than three weeks, thus showing that this is a step in the right direction.

"A second disappointment has been the field C3 treated with sulphate of ammonia. Like the beans, this chemical showed a marked stimulus to the crop, and at the time of writing last report I had great hopes for a successful result. The lack of rain, however, proved too trying, and the cane finally went yellow.

"Arsenic, at the rate of 10 lb. per acre, sprayed or dusted on the vegetation at the time of ploughing the ground preparatory to planting, is proved to be of little or no value in destroying the grubs. All the plots treated in this way have succumbed. It may be necessary to use more of the poison, but before we draw any conclusions we must wait the results of other experiments. Those we have under way would indicate that the poison has considerably more effect when applied near the roots of the young plants.

“ON THE VALUE OF CULTIVATION.

“Standing out in marked contrast to the surrounding devastated areas are the fields which chanced to get intensive cultivation at just the critical time. In each of these cases the planting was late (October), and necessarily the cultivation followed through the flight of the beetles. The field of first ratoons (lower half of L6) is showing most remarkable growth, and only slight infestation on one edge. It was cut in November, and the ratooning coincided with the flight of the beetles. It certainly now looks as if we would get another good crop in the midst of this infested area with no other treatment than proper cultivation.

“Then, too, the 40-acre field of plant-cane, J1, still has a fine dark-green colour, in marked contrast to the devastated fields on every side of it. Only in a few spots along the trau-line is there any indication of grubs, and these do not appear to be spreading, for the recent rains have improved the colour and vitality.

“Digging shows that the grubs are beginning to go down; many of them are yellow, showing they have finished feeding, so the most of their devastation is probably over. Continued rains may possibly revive much of the injured cane if it has time to make new roots before it falls over.

“MERIMA PLOTS.

“These plots are located on high ground, where they suffer considerably from any continued drought. During the dry weather, in March, signs of grubs began to appear on the edges of several of the plots, but in no case has the yellowing extended further into the plots, and the indication now is that the critical period is past, and that we will have a fair cut. None of the injured cane has fallen, so with good rains it will all revive.

“It is interesting to observe that the cane in the plot treated with lime (CaO), at the rate of 1 ton per acre, has a beautiful dark-green colour—the best of all the plots, though the soil in that part of the field is rather poor, being on the highest ground. The meatworks manure appears to be attractive to the grubs, since there is considerable yellowing along the edge of this plot. On the other hand, meatworks manure, mixed with white arsenic, placed in the drill after planting, is showing good results; the cane is of good size, and shows little grub-injury, even where only 10 lb. of arsenic was used per acre. In the plot where 20 lb. of arsenic was used with 5 cwt. of meatworks manure per acre, no signs of grubs have yet appeared. It is too early yet to draw definite conclusions, but these indications are encouraging.”

The General Superintendent of the Bureau of Sugar Experiment Stations, who is at present on an official visit to the North Queensland sugar areas, states, with regard to the Mackay district, that five rains have recently fallen, which will go a long way to improve the present crop. The cane is now generally of a healthy colour, and growing well, though in places it is backward owing to the dry season. No regular wet season has been experienced this year, but the rains that have fallen have been of great service, and have kept the cane growing. The varieties at the Sugar Experiment Station have made excellent progress, especially Q813, Q903, Q1121, Q970, and H.Q.458. Some of the selected new Papuan canes are also doing well. At Plane Creek, upon the farm of Messrs. Brooks and Co., Q903 has grown a remarkably fine crop, and Q813 is also doing well. Great damage to cane in the Mackay district is being done by the bird known as the coot or redbill. It is anticipated there will be a fairly good crop at Mackay this season if the weather continues favourable.

At the Lower Burdekin district, due to the continued dry weather, the cane was very backward. Where irrigation had been carried out early the crops were very much better, but in the hope of the usual wet season setting in many farmers had postponed irrigation, and some of these were only now commencing to irrigate when the cane was showing signs of distress. Plantings were deficient last year, and, due to the immense crops harvested, much actual farm work fell behind. The yield, therefore, this year will be a small one, and it is at present doubtful if 120,000 tons of cane will be cut for the three mills. At the sugar experiment plot of Mr. Mackersie the new Papuan canes were making good progress, while the Queensland seedlings had done remarkably well. Some fine big cane of these varieties was seen at Mr. Craig's farm—viz., Q1121, Q813, and Q903. The Q813 was a 50-ton crop, and large quantities of this kind were being sent to Proserpine for plants. These varieties, raised by the Queensland Acclimatisation Society some years ago, were taken in hand by the Bureau of Sugar Experiment Stations, and after careful nursing were ultimately distributed. They appear to be giving excellent results from Bundaberg to the Lower Burdekin.

The General Superintendent of the Bureau of Sugar Experiment Stations has received the following report on the application of molasses to sugar-cane from the Field Assistant, Mr. J. C. Murray:—

“With reference to the use of molasses by Mr. W. Jackson, of North Eton, this farmer has five varieties growing that have been treated with this product. The following is a list of the canes, and how treated:—

“*Badila*.—In preparing the ground for this variety, four ploughings were given, and the land treated with filter-press cake and molasses to the extent of 3,000 gallons per acre broadcast. After the first ratoon was cut the stools were treated with molasses by running along a dray with a tank on it and letting the molasses pour over the stools. The treatment made a great difference in the cane. In no case was the fertiliser (molasses) placed on land that had an acid reaction.

“Incidentally no harm is done to the earthworm by this treatment. Some stools of the *Badila* that happened to miss the molasses were a long way behind the others as regards growth, colour, and general appearance. This variety on Mr. Jackson's farm looks better than any other *Badila* in the Mackay district.

D.1135.—This variety was treated in the same manner as the *Badila*, but it is on a piece of land that is badly drained and inclined to acidity. No improvement noticeable.

“*Q.855*.—This variety has been treated in the same manner as the *Badila*. Mr. Jackson claims a great advance in tonnage and a heavier density since using molasses. The cane looks very healthy and strong.

“*H.Q.458*.—This variety has been treated in the same way as the others, and looks healthy and vigorous.

“*Q.813*.—This is a first ratoon crop, and will probably cut 30 tons to the acre. The land was treated in the same manner as the *Badila*.

“As regards the *D.1135*, the land showed an alkaline reaction when first treated with molasses in 1916, but it has since developed a slight acidity. Probably it should have had a heavier treatment of filter-press at the offset.”

THE MANUFACTURE OF WHITE ARSENIC IN RHODESIA AND IN QUEENSLAND.

In view of the vast importance to Rhodesia and South Africa of having an assured supply of dip, and the manufacture of white arsenic on a commercial scale, a considerable amount of attention was devoted during 1917 to prospecting for arsenical ores, and large bodies of mispickel were found to exist within reasonable distance of a railway line which could supply South African requirements of arsenical compound for many years to come. The manufacture of white arsenic was brought to a successful stage early in 1918, and by the end of that year about 100 tons per month were produced, assaying about 99 per cent. As_2O_3 , and it is interesting to note that this grade is obtained from the ore in one operation. The manufacture of arsenite of soda and dips has also been undertaken. Experiments in the recovery of arsenic as a by-product have also been conducted in one of the Rhodesian goldmines, but the results are not yet obtainable.

In Queensland much attention has of late been given to prospecting for arsenical ores, and the high price ruling for arsenic stimulated its production in the Stanthorpe district, where the yield in 1918 was nearly 199 tons, of a value of £2,981 as compared with only 32 tons in quantity and £580 in value for 1917. The bulk of the output was from the Beecroft mine, near Sundown, and the remainder from the Orient leases at Carpenter's Gully. At the first-mentioned mine, where operations were continued throughout the year, the ore is treated by jigging and screening, and the concentrates, which are estimated to contain 30 per cent. arsenic, are despatched to Bendigo, Victoria.

In the State arsenic mine at Jibbinbar, in the Stanthorpe Field, the main shaft has been sunk (March, 1919) to 106 ft. An eastern cut No. 1 has proved the lode channel 11 ft. thick, and in No. 2 cut, 9 ft. thick. Both cuts carry a strong lode 2 ft. thick on the footwall. A concentrating and furnace plant are now in course of construction.

General Notes.

SOCIETIES, SHOW DATES, ETC., 1919.

BEENLEIGH.—Agricultural and Pastoral Society of Southern Queensland. F. W. Wuth, Secretary. Show dates: 11th and 12th September.

BOONAH.—Fassifern Agricultural and Pastoral Association. Show dates: 15th and 16th May.

CLERMONT.—Peak Downs Agricultural, Pastoral, and Horticultural Society. Show dates: 4th and 5th June.

GYMPIE.—Gympie and District Fruitgrowers' Association. Show dates: 27th and 28th August.

HERBERTON.—Herberton Mining, Pastoral, and Agricultural Association. Show dates: 21st and 22nd April.

LONGREACH.—Longreach Pastoral and Agricultural Society. F. C. Longworth, Secretary. Show dates: 6th and 7th May.

NORTH PINE.—The Pine Rivers Agricultural, Horticultural, and Industrial Association, G. W. Armstrong, Secretary. Show dates: 13th and 14th June.

PALMWOODS.—Palmwoods Fruitgrowers' Association, V. Bath, Secretary.

TAROOM.—Taroom Agricultural and Pastoral Association: Show dates: 13th and 14th May.

PERFECTION IN DISINFECTANTS.

It is stated that since the New York Department of Water Supply added a small amount of chlorine to the water not a single case of typhoid fever has occurred which could be traced to the city water. A far more remarkable achievement in water purification, however, is presented by the equipment devised by British chemists for the use of the army in France. It was so perfect that an equipment on a barge could pump foul water from a canal and deliver it in large quantities purified for drinking purposes. In view of the New York success, it is proposed that chlorinated water be used for sprinkling the streets to prevent the spread of infection. This proposal has been anticipated to some extent by the popular borough council in the East End of London, which for many years has provided, under the direction of the Medical Officer of Health, free supplies of such disinfectant produced by an electrical process. It is freely used for public baths and washhouses, for cleaning hospitals and other public institutions, for flushing drains, and for other sanitary purposes. Electricity is passed through a solution of certain salts, converting the liquid into an effective non-poisonous disinfectant which can be stored unimpaired for long periods.

ELECTRIFIED SEEDS IN GREAT BRITAIN.

During the 1918 harvest in Great Britain some remarkable results were obtained from "electrified seeds." Mr. H. E. Fry, an electrical engineer in Dorset, England, has developed a process of stimulating seeds so that they yield healthier and more prolific crops. The process consists of soaking the seeds in a solution of common salt, sending a current of electricity through the solution, and subsequently drying the seeds. Trials have been made with electrified wheat, barley, and oats in comparison with non-electrified seeds from the same sack and sown on adjoining ground. The electrified seeds threw up more straws, which were so much stronger than the normal that they withstood storms which laid the non-electrified harvest low. The gain in yield per acre varied in different parts of the country from 5 to nearly 20 bushels per acre for oats, and from about 5 to 7 bushels for wheat. Barley showed an increase of 16 bushels in another recorded case. Twenty-seven farmers in South Devon realised an average gain per acre of £4 13s. after deducting the cost of treatment, which is only a few shillings per sack. This, the latest British contribution to the promising science of electroculture is being investigated by the subcommittee of the Board of Agriculture of Great Britain, which is making a scientific study of the influence of electricity on plant life.—"Industrial Publicity Service, London."

A WORLD'S RECORD IN COMPETITIVE EGG-LAYING.

At the recent egg production held at the Hawkesbury Agricultural College, the outstanding feature perhaps is the total of 533 eggs laid in two years by a Black Orpington hen entered by Mr. C. Judson. This stands as a world's record in competitive laying. Mr. Judson, with a total for the two years of 2,789 eggs from six hens, is another Hawkesbury record, and by these two performances of his hens, he carries off both of the champion trophies offered for competition. His six hens laid eggs to the value of £15 8s. 2d., another record. In the first year's laying, the pick of Mr. A. Drayton's Black Orpingtons laid 324 eggs, which is the best individual score that has been achieved at the Hawkesbury. The aim is to beat the world's record, which is 336 eggs. When that has been achieved, the object will be to obtain 365 eggs in 365 days.

SOLAR OVENS.

In view of the scarcity of coal or wood in many tropical regions it is interesting to note the report recently made by Sir F. Nicholson, describing valuable experiments in the employment of solar ovens. These consist of stout teakwood boxes, blackened inside and fitted with a double glass top. They are suitably insulated, and with simple apparatus a temperature of from 240 degrees to 275 degrees Fahr. is easily obtained during the middle of the day from 11 a.m. to 3 p.m., and 290 degrees with the aid of a single glass mirror. The oven once constructed, the "Journal of the Royal Society of Arts" points out, costs nothing, and for all mere baking or cooking purposes it is a very efficient and cheap utilisation of sun-heat, suitable for many applications. The disadvantage attached to the process—namely, the hours possible for hot meals being reduced to those in the hottest period of the day—must not be overlooked.

TO MEASURE FELLED TIMBER.

Simple Rule.—Take the girth of the timber round the middle with a string; one fourth part of this girth, squared and multiplied by the length, will give the solidity in cubic feet.

EXAMPLE I.

A log 20 ft. long is 36 in. round the middle; a fourth part of 36 in. is 9 in., the square of 9 in. is 81 in., therefore 81 in. or 6 ft. 9 in., multiplied by 20 ft. = 135 ft. cube; but to reduce that to our Australian standard measure, 135 cub. ft. must be multiplied by 12, thus 135 ft. x 12 = 1,620 superficial feet one inch thick.

In Australia sawn timber is always measured by the superficial feet, one inch thick, and all thicknesses except below $\frac{1}{2}$ in. are reduced to the standard of 1 in. in thickness.

EXAMPLE II.

Two pieces of sawn timber 20 ft. long by 8 in. by 2 in. would be written thus:—
 8×2 Pine $2/20 = 20 \times 2 = 40 \times 8 = 320 \div 12 = 26$ ft. 8 in. $8 \text{ in.} \times 2 = 53$ ft. 4 in.;
 or short, $20 \times 2 \times 8 \div 12 \times 2 = 53$ ft. 4 in. super., 1 in. thick.

EXAMPLE III.

$6 \times 2\frac{1}{2}$ pine $5/10, 4/6, 3/9$:

There are 5 pieces 10 ft. long = 50

There are 4 pieces 6 ft. long = 24

There are 3 pieces 9 ft. long = 27

$$\begin{array}{r}
 101 \times 6 \times 2\frac{1}{2} \\
 6 \\
 \hline
 12) 606 \\
 506 \\
 \hline
 506 \\
 24 \\
 \hline
 530 \\
 253 \\
 \hline
 1263
 \end{array}$$

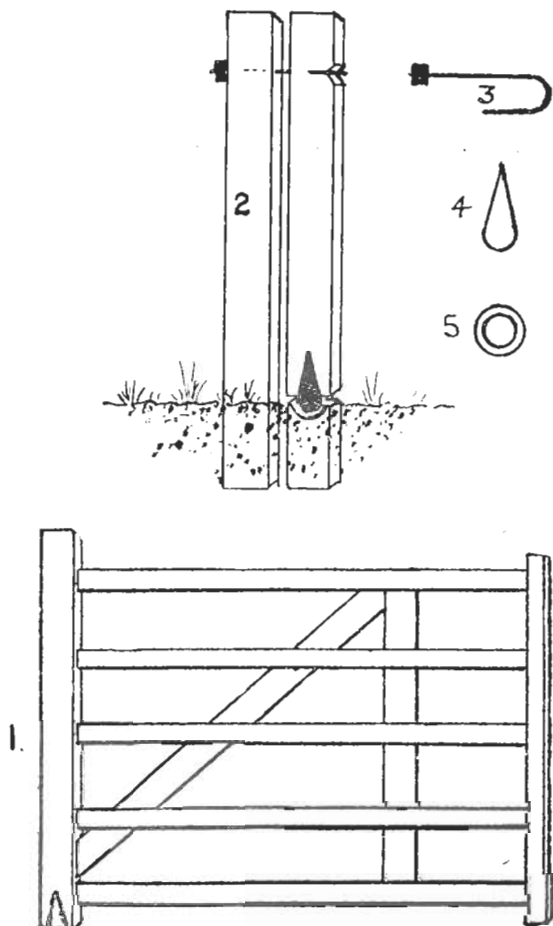
126.3 super. feet 1 in. thick.

A USEFUL GATE HINGE.

Amongst the troubles of landowners, tenants of rented houses, and others is that of "sagging" gates. In all directions in the suburbs of our cities and towns gates are to be seen dragging on the ground owing to the posts being out of the perpendicular. Here is a simple way out of the difficulty, contributed by a correspondent of the "Farmers' Gazette." He writes:—

"It is on account of the hinge that I am sending this, although the gate is the strongest and lightest that I have seen. Having been a blacksmith for over twenty years before I went on the land, I think I am in a position to know the cheapest and most reliable hinge for any gate. I have made this kind for the heaviest dip gates, and the price was 2s. 6d. each. Other gates I have seen hung, and made the hinges and gate as high as 25s. for a double gate. I have also seen gates swung with these, and working just as smoothly after fifteen years' service. The beauty of it is that it does not wear the gate back, although this is what you would expect; it will not wear half an inch in ten years. The peg and ring are my own improvement. Being a blacksmith, it does not cost me anything, and makes a thorough job. Usually the gate is just rounded and put in the block in the old-fashioned way. If anyone is outback, a piece of fencing wire doubled a few times and put tightly around the post acts just as well as the round iron ring. In the gate you will notice that the stays only go three parts of the way across. The fault of most gates is that there is too much weight at the front, where it is not needed, and only makes it sag."

The figures supplied show that the gate is made up of 3 x 1 battens, placed side by side with $\frac{3}{4}$ -in. bolt through them, except the upright nearest the hinge, and that is 3 x 3 or 4 x 3.



TEE SISAL HEMP MARKET.

As we have advised intending growers of sisal in Queensland there are large stocks of this fibre in Mexico and in the United States of America, accumulated in consequence of the incidence of the war. In the former State, stocks amount to some 380,000 bales, and in the latter to 180,000 bales, while stocks of East African are full both in Britain and in Africa. The price has already fallen to 15 cents (7½d.) per lb., equal to about £70 per ton, in America, and in all probability will fall still more as soon as shipping space becomes available. There has lately been no business done in Mauritius hemp, several hundred bales having been offered at £65 per ton. Under present labour conditions there is no likelihood of any profit to be made in the sisal hemp industry. Some years ago, when there was no labour unrest, sisal sold at £24 per ton in Queensland left a handsome profit, but under present conditions there is more money in raising 1,000 sheep on the coast than in 1,000 acres of sisal. See "Sheep on Coastal Areas" in the issue of this *Journal* for June, 1919.

FEEDING VALUE OF LUCERNE.

A feeding trial was recently conducted in Nebraska, U.S.A., to test the claim that lucerne is equal to bran as a factor in a ration for cattle or sheep. Six pairs of cows were selected, each pair being made to match as closely as possible in breed, lactation period, previous record, milk flow, percentage of fat, and so forth. Then one cow from each pair was placed in one group called group A, and the other cow from each pair was placed in a second group, called group B.

Group A were fed on a grain ration consisting of four parts ground maize, two parts bran, and one part oil meal, and group B were fed on four parts ground maize, two parts chopped lucerne, and one part oil meal. At the end of fifteen days group A were put on to the lucerne ration, and group B on the bran ration. When another fifteen were passed group A were put back on to the bran and group B on to the lucerne, and fifteen days later again the changes were worked once more. The test was duplicated by being conducted twice—the first time from 1st December, 1916, to 30th January, 1917 (two months), and the second time (for three months) from 1st March, 1917, to 30th May, 1917.

During these periods, the milk from the cows was weighed daily, the butter-fat content ascertained, and the weights of the animals themselves recorded.

The cows while on the bran gave 22,886 lb. milk, containing 794 lb. butter fat, and lost 32 lb. in weight. The same cows during similar periods and under similar conditions, but receiving chopped lucerne instead of the bran, gave 22,741 lb. milk, containing 786½ lb. butter-fat and gained 240 lb. in weight.

Thus, there was a slight decrease in the total weight of milk and a loss of 7½ lb. butter, but this was more than overcome by the gain of 272 lb. in the weight of the cows. Evidently the lucerne was fully equal to the bran in feeding value.—"Pastoral Review."

CRUSHING DATES: 1919 SEASON.

The "Australian Sugar Journal" for 9th May publishes the following probable dates when cane crushing will begin in the Queensland sugar districts:—

Speaking generally, the crushing season this year will necessarily be later than usual, owing to the prolonged drought through which the country has passed; and it is still uncertain as to what mills will start in some of the southern districts, owing to the shortage of cane available. It has been estimated that of the total number of mills in Queensland, there are probably about ten which will not turn a roller this season. The following dates are of course liable to alteration, according to seasonal developments; but they are as near as can be ascertained at the time of going to press:—

Goondi	About middle of July
Mourilyan	Second week in July
Victoria (Herbert River)	24th June
Pioneer (Burdekin)	15th August
Inkerman (Burdekin)	5th August
Pleystowe Central, Mackay	Mid-July
Moreton Central, Nambour	Mid-August
Alberton	September
Steglitz Mill Co.	18th August
Kalamia (Burdekin)	Some time in July

The Markets.

PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR MAY, 1919.

Article.										MAY.
										Prices.
Bacon	...	...	...	...	...	...	...	...	lb.	9d. to 11d.
Barley	...	...	...	...	...	...	...	...	bush.	4s. 7d.
Bran (Warwick)	...	...	...	...	...	...	...	...	ton	£9
Broom Millet	...	...	...	...	...	...	...	...	"	£60 to £90
Broom Millet (Sydney price)	...	...	...	...	...	...	...	...	"	£75 to £90
Butter (First Grade)	...	...	...	...	...	...	...	...	cwt.	177s. 4d.
Chaff, Mixed	...	...	...	...	...	...	...	...	ton	£8 to £10 10s.
Chaff, Oaten	...	...	...	...	...	...	...	...	"	£10 to £10 15s.
Chaff, Lucerne	...	...	...	...	...	...	...	...	"	£9 15s. to £10 15s.
Chaff, Wheaten	...	...	...	...	...	...	...	...	"	£9 10s.
Cheese	...	...	...	...	...	...	...	...	lb.	11½d.
Flour	...	...	...	...	...	...	...	...	ton	£12
Hams	...	...	...	...	...	...	...	...	lb.	1s. 3d. to 1s. 10d.
Hay, Lucerne	...	...	...	...	...	...	...	...	ton	£7 10s. to £9 15s.
Hay, Oaten	...	...	...	...	...	...	...	...	"	...
Hay, Wheaten	...	...	...	...	...	...	...	...	"	...
Honey	...	...	...	...	...	...	...	...	lb	4d. to 5d.
Maize	...	...	...	...	...	...	...	...	bush.	9s. 9d. to 10s. 3d.
Oats	...	...	...	...	...	...	...	...	"	...
Onions	...	...	...	...	...	...	...	...	ton	£14 to £18
Peanuts	...	...	...	...	...	...	...	...	lb.	5d. to 8d.
Pollard	...	...	...	...	...	...	...	...	ton	£6 5s.
Potatoes	...	...	...	...	...	...	...	...	"	£12 to £18
Potatoes (Sweet)	...	...	...	...	...	...	...	...	cwt.	9s.
Pumpkins (Cattle)	...	...	...	...	...	...	...	...	ton	£4 to £5
Eggs	...	...	...	...	...	...	...	...	doz	2s. 3d. to 3s. 1d.
Fowls	...	...	...	...	...	...	...	...	per pair	4s. to 9s.
Ducks, English	...	...	...	...	...	...	...	...	"	3s. 6d. to 3s. 9d.
Ducks, Muscovy	...	...	...	...	...	...	...	...	"	4s. to 8s.
Geese	...	...	...	...	...	...	...	...	"	6s. 6d.
Turkeys (Hens)	...	...	...	...	...	...	...	...	"	11s. to 12s.
Turkeys (Gobblers)	...	...	...	...	...	...	...	...	"	20s. to 34s.
Wheat (Milling)	...	...	...	...	...	...	...	...	bush.	4s. 6d. to 5s.

VEGETABLES—TURBOT STREET MARKETS.

Beans, per sugar-bag	...	...	...	...	...	...	1s. 6d. to 3s. 3d.
Beetroot, per dozen bundles	...	...	...	...	...	...	1s. to 2s.
Cabbages, per dozen	...	...	...	...	...	...	2s. to 8s.
Carrots, per dozen bunches	...	...	...	...	...	...	1s. to 2s. 3d.
Cucumbers, per dozen	...	...	...	...	...	...	9d. to 1s. 6d.
Lettuce, per dozen	...	...	...	...	...	...	9d. to 1s.
Marrows, per dozen	...	...	...	...	...	...	9d. to 3s.
Parsnips, per dozen bunches	...	...	...	...	...	...	1s. to 2s.
Peas, per sugar-bag	...	...	...	...	...	...	7s. to 15s. 9d.
Potatoes (Sweet), per cwt.	...	...	...	...	...	...	9s.
Pumpkins (table), per cwt.	...	...	...	...	...	...	5s. to 7s.
Tomatoes, per quarter-case	...	...	...	...	...	...	7s. 6d. to 13s. 3d.
Turnips, per dozen bunches	...	...	...	...	...	...	4d. to 9d.
Turnips (Swedes), per cwt.	...	...	...	...	...	...	8s. to 10s.

SOUTHERN FRUIT MARKETS.

Article.	MAY.	
	Prices.	
Bananas (Queensland), per case	...	
Bananas (Tweed River), per case	20s. to 30s.	
Bananas (Fiji), per bunch... ..	...	
Bananas (G.M.I., per bunch	...	
Lemons, per bushel-case	4s. to 7s.	
Mandarins (Queensland), per case	14s. to 16s.	
Oranges (Queensland), per bushel-case	18s. to 22s.	
Passion Fruit (Queensland), per bushel-case	8s. to 14s.	
Pears, per bushel-case	9s. to 12s.	
Pineapples (Queens), per double-case	20s.	
Pineapples (Ripleys), per case	15s. to 18s.	
Pineapples (Common), per case	8s. to 14s.	
Tomatoes, per half-case	4s. to 10s.	

PRICES OF FRUIT—TURBOT STREET MARKETS.

Apples, Eating, per bushel-case	10s. to 16s. 6d.
Apples, Cooking, per bushel-case	13s. to 15s. 6d.
Bananas (Cavendish), per dozen	4d. to 7½d.
Bananas (Sugar), per dozen	4d. to 7d.
Citrons, per hundredweight	16s.
Cocoanuts, per sack	15s. to 25s.
Custard Apples, per quarter-case	4s. to 8s.
Lemons (Lisbon), per quarter-case	7s. to 9s. 6d.
Mandarins, per case	9s. to 15s.
Oranges, per case	7s. to 12s.
Papaw Apples, per case	1s. 6d. to 6s. 6d.
Passion Fruit, per case	14s. to 17s. 5d.
Peanuts, per lb.	...
Pears, per case	8s. to 14s.
Persimmons, per quarter-case	...
Pielmelons, per dozen	...
Pineapples (Rough), per dozen	1s. 9d. to 4s.
Pineapples (Smooth), per dozen	2s. 6d. to 8s.
Pineapples (Ripley), per dozen	3s. 6d. to 8s. 6d.
Rosellas, per sugar-bag	3s. 6d. to 5s. 6d.
Rockmelons, per dozen	...
Sugar-melons, per dozen	...
Tomatoes (prime), per quarter-case	8s. to 10s.
Tomatoes (inferior), per quarter-case	1s. 6d. to 3s.

TOP PRICES, ENOGGERA YARDS, APRIL, 1919.

Animal.	APRIL.	
	Prices.	
Bullocks	£19 10s. to £25	
Bullocks (Single)	£27 10s.	
Cows	£15 2s. 6d. to £20 2s. 6d.	
Merino Wethers	40s.	
Crossbred Wethers	45s. 6d.	
Merino Ewes	38s.	
Crossbred Ewes	37s. 3d.	
Lambs	32s. 6d.	
Pigs (Bacon)	101s.	
Pigs (Porkers)	70s.	

ASTRONOMICAL DATA FOR QUEENSLAND.

Times Computed by D. EGLINTON, F.R.A.S.

TIMES OF SUNRISE AND SUNSET. **AT BRISBANE.**

1919.	MAY.		JUNE.		July.		AUGUST.	
Date.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.
1	6.13	5.17	6.30	5.0	6.39	5.3	6.30	5.18
2	6.14	5.16	6.30	5.0	6.39	5.3	6.30	5.18
3	6.14	5.15	6.31	5.0	6.39	5.4	6.29	5.19
4	6.15	5.14	6.31	5.0	6.39	5.4	6.28	5.19
5	6.15	5.13	6.32	5.0	6.39	5.5	6.28	5.20
6	6.16	5.13	6.32	5.0	6.39	5.5	6.27	5.21
7	6.16	5.12	6.33	5.0	6.39	5.5	6.26	5.21
8	6.17	5.11	6.33	5.0	6.39	5.6	6.26	5.22
9	6.17	5.11	6.34	5.0	6.39	5.6	6.25	5.22
10	6.18	5.10	6.34	4.59	6.39	5.7	6.24	5.23
11	6.19	5.9	6.34	4.59	6.39	5.7	6.23	5.23
12	6.19	5.9	6.35	4.59	6.39	5.8	6.23	5.24
13	6.20	5.8	6.35	4.59	6.38	5.8	6.22	5.24
14	6.20	5.8	6.36	4.59	6.38	5.9	6.21	5.25
15	6.21	5.7	6.36	5.0	6.38	5.9	6.20	5.25
16	6.21	5.6	6.36	5.0	6.38	5.10	6.19	5.26
17	6.22	5.6	6.37	5.0	6.37	5.10	6.18	5.26
18	6.23	5.5	6.37	5.0	6.37	5.11	6.17	5.27
19	6.23	5.5	6.37	5.0	6.37	5.11	6.16	5.27
20	6.24	5.4	6.37	5.0	6.36	5.12	6.15	5.28
21	6.24	5.4	6.38	5.0	6.36	5.12	6.15	5.28
22	6.25	5.3	6.38	5.0	6.36	5.13	6.14	5.29
23	6.25	5.3	6.38	5.1	6.35	5.13	6.13	5.29
24	6.26	5.3	6.38	5.1	6.35	5.14	6.12	5.30
25	6.26	5.2	6.39	5.1	6.34	5.14	6.11	5.30
26	6.27	5.2	6.39	5.1	6.34	5.15	6.10	5.31
27	6.27	5.2	6.39	5.2	6.33	5.15	6.9	5.31
28	6.28	5.1	6.39	5.2	6.33	5.16	6.8	5.32
29	6.28	5.1	6.39	5.2	6.32	5.16	6.7	5.32
30	6.29	5.1	6.39	5.3	6.32	5.17	6.6	5.33
31	6.29	5.0	...	...	6.31	5.17	6.5	5.33

PHASES OF THE MOON.

The Phases of the Moon commence at the times stated in Queensland, New South Wales, Victoria, and Tasmania.

U. M.

7 May (First Quarter 9 34 a.m.
 15 " ○ Full Moon 11 2 a.m.
 23 ") Last Quarter 8 4 a.m.
 29 " ☾ New Moon 11 12 p.m.

The Moon will be at its farthest distance from the earth on the 14th, and at its nearest on the 29th, when there will be a total eclipse of the Sun visible in Africa and S. America, but not in Australia.

5 June (First Quarter 10 22 p.m.
 14 " ○ Full Moon 2 28 a.m.
 21 ") Last Quarter 3 33 p.m.
 28 " ☾ New Moon 6 53 a.m.

The Moon will be at its farthest distance from the earth on the 10th, and nearest on the 26th.

5 July (First Quarter 1 17 p.m.
 13 " ○ Full Moon 4 2 p.m.
 20 ") Last Quarter 9 3 p.m.
 27 " ☾ New Moon 3 21 p.m.

The Moon will be farthest from the earth on the 8th, and nearest on the 21th.

4 Aug. (First Quarter 6 12 a.m.
 12 " ○ Full Moon 3 40 a.m.
 19 ") Last Quarter 1 56 a.m.
 26 " ☾ New Moon 1 37 a.m.

The Moon will be farthest from the earth on the 5th, and nearest on the 18th.

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, Cannamulla, 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 May, June, and July, and to the middle of August may be roughly arrived at by adding 20 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.

[All the particulars on this page were computed for this Journal, and should not be reproduced without acknowledgment.]

Orchard Notes for July.

THE SOUTHERN COAST DISTRICTS.

The notes for the month of June apply to July as well. The first crop of strawberries will be ripening during the month, though extra early fruit is often obtained in June, and sometimes as early as May, under especially favourable conditions. Look out for leaf-blight, and spray for same with Bordeaux mixture, also watch for the first signs of the grey mould that attacks the fruit, and spray with the sulphide of soda wash. The larvæ of the cockchafer, that eats the roots of strawberries, should be looked for, and destroyed whenever found. Pruning of citrus and other fruit trees may be continued; also, the spraying with lime and sulphur. Where the ringing borer, that either attacks the main trunks or the branches at or near where they form the head of the tree, is present, the main stems and trunks should either be painted or sprayed with the lime and sulphur wash during the month, as the mature beetles that lay the eggs that eventually turn to the borers sometimes make their appearance during the month, and unless the trees are protected by the wash they lay the eggs, which hatch out in due course and do a lot of damage. Keep the orchard clean, so that when the spring growth takes place the trees may be in good condition. There is usually a heavy winter crop of pineapples ripening during this and the following month, particularly of smooth leaves. See that any conspicuous fruits are protected by a wisp of grass, as they are injured not only by frost but by cold westerly winds.

THE TROPICAL COAST DISTRICTS.

See the instructions given for the month of June. Keep the orchards clean and well worked. Prune and spray where necessary.

THE SOUTHERN AND CENTRAL TABLELANDS.

Where pruning of deciduous trees has not been completed, do so this month. It is not advisable to leave this work too late in the season, as the earlier the pruning is done after the sap is down the better the buds develop—both fruit buds and wood buds; thus securing a good blossoming and a good growth of wood the following spring.

Planting can be continued during the month; if possible, it should be finished this month, for, though trees can be set out during August, if a dry spell comes they will suffer, when the earlier planted trees, which have had a longer time to become established, will do all right—provided, of course, that the land has been properly prepared prior to planting, and that it is kept in good order by systematic cultivation subsequent to planting.

Do not neglect to cut back hard when planting, as the failure to do so will result in a weakly growth.

As soon as the pruning is completed, the orchards should get their winter spraying with the sulphur linewash, and either with or without salt, as may be wished. See that this spraying is thoroughly carried out, and that every part of the tree is reached, as it is the main treatment during the year for San José and other scale insects, as well as being the best time to spray for all kinds of canker, bark-rot, moss, lichens, &c.

Where the orchard has not been ploughed, get this done as soon as the pruning and spraying are through, so as to have the land in good order for the spring cultivation. See that the work is well done, and remember that the best way to provide against dry spells is to keep moisture in the soil once you have got it there, and this can only be done by thorough and deep working of the soil.

When obtaining trees for planting, see that they are on good roots, and that they are free from all pests, as it is easier to prevent the introduction of pests of all sorts than to eradicate them once they have become established. Only select those varieties that are of proved merit in your district; do not plant every kind of tree that you see listed in a nurseryman's catalogue, as many of them are unsuited to our climate. The pruning of grape vines may be carried out in all parts of the tablelands other than the Stanthorpe district, where it is advisable to leave this work as long as possible, owing to the danger of spring frosts.

Where grape vines have been well started and properly pruned from year to year, this work is simple; but where the vines have become covered with long straggling spurs, and are generally very unsightly, the best plan is to cut them hard back, so as to cause them to throw out good strong shoots near the main stem. These shoots can be laid down in the place of the old wood in following seasons, and the whole bearing portion of the vine will be thus renewed.

Where vineyards have been pruned, the prunings should be gathered and burnt, and the land should receive a good ploughing.

Farm and Garden Notes for July.

FIELD.—The month of July is generally considered the best time to sow lucerne, for the reason that the growth of weeds is then practically checked, and the young lucerne plants will, therefore, not be retarded by them, as would be the case if planted later on in the spring. If the ground has been properly prepared by deep ploughing, cross-ploughing, and harrowing, and an occasional shower occurs to assist germination and growth, the lucerne will thrive so well that by the time weeds once more appear it will be well able to hold its own against them. From 10 to 12 lb. of seed drilled, or 15 to 16 lb. broadcast, will be sufficient for an acre. This is also the time to prepare the land for many field crops, such as potatoes, maize, oats, and barley for green fodder; also, rye, vetches, tobacco, cotton, sugar-cane, field carrots, mangolds, swedes, cannaigre, &c. Early potatoes, sugar-cane, and maize may be planted in very early districts, but it is risky to plant potatoes during this month in any districts liable to late frosts or in low-lying ground. Under such conditions, it is far better to wait until well into the following month. The greatest loss in potatoes and sugar-cane has been, on more than one occasion, experienced in September, when heavy frosts occurred in low-lying districts in the Southern portion of the State. During suitable weather, rice may be sown in the North. The coffee crop should now be harvested, and yams and turmeric unearthed.

KITCHEN GARDEN.—Should showery weather be frequent during July, do not attempt to sow seeds on heavy land, as the latter will be liable to clog, and hence be injurious to the young plants as they come up. The soil should not be reworked until fine weather has lasted sufficiently long to make it friable. Never walk over the land during wet weather with a view to sowing. The soil cakes and hardens, and good results cannot then be expected. This want of judgment is the usual cause of hard things being said about the seedsman. In fine weather, get the ground ploughed or dug, and let it lie in the rough till required. If harrowed and pulverised before that time, the growth of weeds will be encouraged, and the soil is deprived of the sweetening influences of the sun, rain, air, and frost. Where the ground has been properly prepared, make full sowings of cabbage, carrot, broad beans, lettuce, parsnips, beans, radishes, leeks, spring onions, beetroot, eschalots, salsify, &c. As westerly winds may be expected, plenty of hoeing and watering will be required to ensure good crops. Pinch the tops of broad beans which are in flower, and stake up peas which require support. Plant out rhubarb, asparagus, and artichokes. In warm districts, it will be quite safe to sow cucumbers, marrows, squashes, and melons during the last week of the month. In colder localities, it is better to wait till the middle or end of August. Get the ground ready for sowing French beans and other spring crops. Sow Guadua beans (snake gourd) at the end of September.

FLOWER GARDEN.—Winter work ought to be in an advanced state. The roses will now want looking after. They should already have been pruned, and now any shoots which have a tendency to grow in wrong directions should be rubbed off. Overhaul the ferneries, and top-dress with a mixture of sandy loam and leaf mould, staking up some plants and thinning out others. Treat all classes of plants in the same manner as the roses where undesirable shoots appear. All such work as trimming lawns, digging beds, pruning, and planting should now be got well in hand. Plant out antirrhinums, pansies, hollyhocks, verbenas, petunias, &c., which were lately sown. Sow zinnias, amaranthus, balsam, chrysanthemum tricolor, marigolds, cosmos, coxcombs, phloxes, sweet peas, lupins, &c. Plant gladiolus, tuberoses, amaryllis, panceratium, ismene, crinums, belladonna, lily, and other bulbs. Put away dahlia roots in some warm, moist spot, where they will start gently and be ready for planting out in August and September.