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Agriculture.

SCIENCE AND AGRICULTURE.

There are many farmers who poke fun at the scientific man who is trying to help agriculture, and at the "scientific" farmer (says "Garden and Field"). They assert that agriculture has nothing to learn from science, and they are quite content, they say, to go along the old lines.

Let us see now whether their assertions are correct. Smut disease is very prevalent this season in oatfields where untreated seed was planted, but is quite scarce in fields where treated seed was planted. This loss will amount to 15 or even 20 per cent. of the crop. Who devised the method of treatment? The scientific man. Who devised methods of spraying fruit trees and potatoes against insects and fungous disease? Again the scientific man.

Who gave us the information regarding the importance of clover and other leguminous crops in maintaining the supply of nitrogen in the

soil, and who furnished the information we now possess regarding fertilisers? Again, the scientific man. Who made the wonderful discovery regarding the part played by bacteria in dairying, in canning, in the keeping of food products? Who gave us knowledge of many of the diseases of live stock, so that we are able to guard the health of our animals? Again, the scientific man.

Who worked out practical systems of ventilation in barns and houses, and who made the wonderful improvements in farm machinery? Again, the scientific man. Who gave us the Babcock test? A scientific man. Who has given the improved breeds of cattle, the improved strains of grains? The scientific man.

And so we might continue our list of contributions of science to agriculture—in fact, there is not a single department of agriculture that has not been greatly benefited by science, and yet there are men who have no use for science! Every number of this paper contains contributions from science to agriculture. Present-day farming is largely the application of scientific methods to agriculture.

One important lesson we may draw from the foregoing remarks:—The average farmer can become a scientific farmer by intelligent reading of the best agricultural papers and bulletins. "The art of farming we learn by our hands; the science of agriculture we must learn from the investigations of men of science."

In the preface to a booklet issued by the Department of Agriculture and Stock, Queensland, entitled "Elementary Lessons in Agriculture," in 1908, the following remarks on "Agriculture and Science" will be found:—

"Agriculture to-day is no longer what it was in the early days of settlement in Queensland. Fifty years ago men began farming on rich scrub lands with no other capital than a few tools, strong arms, and determination. Few crops were then grown except corn and potatoes, and perhaps a little lucerne. No science was required; neither ploughs nor horses, nor up-to-date agricultural implements were seen on a farm, nor, indeed, could they have been used. The axe, the hand hoe, and the fire-stick were the means with which the old-time farmer carved out a home for himself, and did so successfully. But times have changed, conditions have altered, and he who would to-day become successful in the pursuit of Agriculture must be armed with a knowledge of the most modern methods of cultivating the soil, combating pests, &c.; and, to achieve his purpose, he must not only be a strenuous worker, but also a reader. His own methods may, to him, seem good, but they may have been improved upon, and all progress must be studied through the medium of agricultural journals and publications of many kinds dealing with the farming profession. If those who enter upon a farming life as a serious business will keep steadily before them that Science enters largely into the occupation of the farmer, the orchardist, the dairy farmer, market gardener, and stock-breeder, and will make it their business to utilise all they can of the means placed at their disposal by

Science, they cannot fail to overcome most of the difficulties with which they have to contend in the way of climatic conditions and of the numerous pests which tax the patience and ingenuity of the man on the land."

COMPLETE FERTILISERS FOR FARM, ORCHARD, AND VEGETABLE GARDEN.

In many localities a heavier dressing of artificial fertilisers may be profitable, using, for instance:—

2 cwt. superphosphate
1 cwt. sulphate of potash
½ cwt. sulphate of ammonia or nitrolim
} per acre;

or about ½ lb. of the mixture to each vine.

Green manuring, in addition to the yearly application of artificial fertilisers, is strongly recommended, and the crop should be ploughed under to a depth of at least 9 inches.

Liming the soil every five or six years, with about 1 ton of air-slaked lime or gypsum per acre, may also be very profitable.

LEMONS (LIMES AND CITRONS).

Citrus fruits may be grown from one end of the State to the other, provided that the soil is suitable, and for this reason the careful selection of the soil is of the greatest importance. The soil need not be extremely rich, but must be in good mechanical condition, friable and perfectly drained, with a free, porous subsoil. The soil most suitable is a deep, sandy loam, of reddish, brownish, or chocolate colour, and fairly rich in humus and lime. Clayey subsoils must be avoided.

Lemons grow and bear well in the coastal district, but the fruit is not of a high quality, and better results are obtained inland. Limes and Citrons, however, do particularly well along our eastern seaboard.

As soon as the trees come into bearing the use of artificial fertiliser will become profitable, both in regard to quantity and quality of the fruit. It is always best if the use of artificial fertiliser is combined with application of either farmyard manure, compost, or green manure.

A standard manure for citrus fruits can be made up, in accordance with any of the following formulæ:—

3 cwt. superphosphate
1½ cwt. sulphate of potash
2 to 3½ cwt. of sulphate of ammonia or nitrolim
} per acre;

or,

2 cwt. Thomas phosphate
1½ cwt. sulphate of potash
3 to 4½ cwt. dried blood
} per acre;

or,

4 cwt. meatworks manure (with blood)
1½ cwt. sulphate of potash
1½ cwt. nitrate of lime or nitrate of soda
} per acre.

The same quantities in pounds may be applied to trees of medium size, bearing in mind that trees about five years old require from 4 to 6 lb. of any of the above complete fertilisers, and that the amount can be increased up to 20 lb. per tree for very old large trees.

Fertilisers should be supplied regularly every year, and the manure should be well forked, chipped, or cultivated in.

In an old orchard the manure should be applied broadcast over the whole area. It is always advisable to divide the above quantities of manures into two lots, and apply one-half towards the end of winter, in July or August, and the other in December or January.

In order to allow anyone who has only a few trees to make up a dressing for each tree, a few complete fertilising mixtures are added, of which the lesser amounts ore for young trees and the large amounts for older trees:—

1.

2 to 6 lb. superphosphate
1 to 2 lb. sulphate of potash
2 to 4 lb. dried blood.

2.

2 to 6 lb. superphosphate
1 to 2 lb. sulphate of potash
1 to 3 lb. nitrolim or sulphate of ammonia.

3.

4 to 8 lb. bonedust
1 to 2 lb. sulphate of potash
2 to 4 lb. dried blood.

4.

3 to 7 lb. Thomas phosphate
1 to 2 lb. sulphate of potash
2 to 4 lb. nitrate of lime or nitrate of soda.

5.

4 to 16 lb. of a ready mixed fertiliser containing about 6 per cent. of water-soluble phosphoric acid, 10 per cent. of potash, and from 6 to 10 per cent. of nitrogen.

MANGO.

This tree will grow in almost any soil, from a sand to a heavy loam, amongst rocks, on gravelly and on shaley soil; it will thrive best, however, on a good loamy soil, containing plenty of lime, and under tropical conditions, as it will not stand heavy frosts. Young trees benefit mostly by a good mulching with farmyard manure. Older trees may be fertilised with artificial manures, applied in holes made by driving a crowbar into the ground, at intervals all round the tree, extending from 2 to 7 or more feet from the stem. A mixed fertiliser—

3 to 6 lb. superphosphate
2 lb. sulphate of potash
1½ to 2 lb. nitrolim or sulphate of ammonia } per tree,

is distributed amongst the various holes, which are then covered or filled up with soil.

For very large trees the quantities of fertilisers may be nearly doubled.

ORANGES.

The general remarks made on the cultivation of citrus fruits, under the heading of "Lemons," apply to oranges and mandarins.

Several of the most favoured varieties of oranges and mandarins do remarkably well on our well-drained, rich volcanic scrub soils, others again, like for instance the Seville orange, can be grown on heavier soil than that most suitable to sweet oranges.

The application of artificial fertilisers is generally very profitable, and improves both quality and quantity of the fruit; the following facts, however, have to be borne in mind. Inorganic nitrogen, as nitrogen in form of sulphate of ammonia or of nitrolim, produces a light-coloured, thin-skinned sweet fruit, which is of more particular importance in the case of Navel oranges. Organic nitrogen, nitrogen in form of blood, meatworks manure, &c., produces oranges with darker and coarser skin. Potash produces also light-coloured and thin-skinned fruits, which are inclined to be acid.

THE CONTROL OF WEEDS.

The "Queensland Sugar Journal," of 7th October, contains the following interesting note on the destruction of weeds amongst sugar-cane by means of a poisonous spray, contributed to the June issue of "Sugar," by Mr. W. E. Cross, Chemist to the United States Agricultural Experiment Stations:—

It appears that a series of experiments was recently carried out by the United States Department of Agriculture in co-operation with some of the State Experiment Stations, and with a number of scientific farmers.

In the first series no cultivation whatsoever was given after planting, the weeds being destroyed by a sharp hoe used horizontally, without disturbing the soil any more than absolutely necessary; in the other series the usual cultivation was practised. The average results of all the experiments showed that the plots which had only been weeded produced 95 per cent. as much fodder as that given by the cultivated plots, and 99·1 per cent. as much grain. The experiments thus appeared to show that the destruction of the weeds is the only benefit to be obtained from the cultivation of corn.

In Hawaii experimental work has led to a similar conclusion with regard to the cane crop. While this conclusion appears to be in opposition to the opinion that it is advantageous to turn over the soil between

the rows, it is to be noted that that method of cultivation invariably causes the destruction of some of the roots of the cane, and that, moreover, the lack of cultivation during the last six to eighteen months of the crop does not prevent the cane developing as rapidly during this period as during any other stage of growth.

As a result of these conclusions much attention has been given in Hawaii to studying out the best methods of destroying the weeds. The system which would appear to be the most satisfactory is that of Agee and Eckart, in which the weeds are sprayed with arsenite of soda. Two special spraying apparatus have been invented—the sled sprayer and the knapsack sprayer. The sled sprayer consists of an iron tank of about 100 litres capacity carried on a sled 3 ft. wide; it has three spray nozzles at each end, and sometimes a pressure gauge. In the case of the hand or portable sprayer, the arsenite tank is carried knapsack fashion on the back, and the spraying carried out by means of a hose.

There are two problems of importance that such a method of destroying weeds presents. The first is as to whether the addition of arsenite to the soil would have a prejudicial effect on the growth of the cane. Investigations along this line have shown that the arsenic, immediately after the application to the soil, loses its caustic properties, owing to the action of the iron and aluminium of the soil. Moreover, experiments carried out in Olaa, in which arsenic was applied to the soil between the rows at the rate of 5 lb. per acre each week for six months, showed that the arsenic had no injurious effect on the growth of the cane plant.

The second problem, as to whether the poison employed in the process damages the cane itself, has also been answered in the negative. It is true that, even with the best apparatus, small quantities of the spray cannot be prevented from coming in contact with the leaves of the young cane occasionally. But this is not a matter of importance, because it at most occasions a slight check to the cane, from which it recovers entirely within a few weeks.

It may be said that this method of weed control already has passed the experimental stage, as it has been adopted as a part of the normal field work in the extensive plantation of solution used at present is 5 lb. of arsenite to 100 gallons of Olaa. The procedure* there is as follows:—"The strength of water. It is Mr. Eckart's plan to do as much sled-spraying as possible, and to follow this, after a short interval, with a light hand-spraying to touch up the spots that may have been missed by the sleds. The cost of spraying at present is from 50 cents to 1 dollar for sled-spraying, and from 1 dollar to 1 dollar 25 cents for hand-spraying. The maximum amount of work for the sleds is 5 acres per day. The maximum for hand-spraying is a little over 1 acre."

The spraying should not be carried out during rain, but two hours after the rain the work may be started again. It has also been noticed that the middles remain clean for a much longer time after spraying

* Agee Bulletin 44 (Agricultural and Chemical Series), Hawaii.

than after the ordinary method of cultivation, so that often two sprayings are sufficient for the whole period of growth.

With respect to the economy of the new method, I may cite the following statement of a Hawaiian authority:—"By observing the proper rules and using ordinary intelligence, spraying can save a plantation in labour from 15 dollars to 30 dollars per year per acre."—Translated from "Revista Industrial of Agricole de Tucuman."

A NOVEL SILO.

A correspondent has a chimney length of half-inch thick iron from an old sugar-mill, with a diameter of 6 ft., and wishes to know how he can utilise it as a silo.

Mr. A. Morry, Surveyor to the Department of Agriculture and Stock, to whom the question was submitted, reports as follows:—

"The best way to utilise the chimney tube is to cut it through in the centre, thus giving two 15 ft. by 6 ft. tubes. These should be let into the ground about 12 ft., close together, leaving 3 ft. standing above the ground line.; 4 in. of good concrete (4—2—1) should then be put in the bottom of each for a floor, and well rendered so as to prevent water entering. Some water-proofing material, of which there are several kinds in the market, should be added to the concrete. A simple roof could be put over both silos, supported on bush timber, and a beam fixed over the centre of each, to which a block and pulley can be attached for convenience in emptying same. By this method, no portholes are required, nor appliances, such as elevators or blowers for loading, and the ensilage can be easily got out by means of the pulley block fixed as above stated, and attached to a light basket.

"The inside of the tubes should have two coats of cement wash before filling; and each time the silos are charged, a coat of either lime wash or cement should be given. These silos together will not hold more than 18 tons of chaffed and compressed silage."

THE DISCOVERY OF RADIUM IN COAL.

The "Fiji Planters' Journal" (September, 1915) takes from the "Scientific American" the following remarkable notes on the effects of a new product of coal, under the name of "lignaite," which has been discovered by two distinguished French chemists of Paris and Professor Scammell, M.S.C.I., of Hadleigh, Essex;—

By its use, it appears that radishes and other root crops are obtained nearly "five" times as large as those grown in untreated soil at the same time.

If this process could be generally adopted by our agriculturists in this country, the increase in the prosperity of the nation would be very large.

The initial cost of such a system has hitherto stood in the way of its general adoption.

But the recent discovery by MM. Detaille and Lafayaise, the two distinguished French chemists of Paris, and Professor Scammell, M.S.C.I., of Hadleigh, Essex, that coal contains radium, which, in the form of "lignaite," can be used for the radiumisation of the soil, places the process within the reach of every agriculturist in the country.

Fruits, flowers, and vegetables can be grown in a much "shorter" time, in much larger quantities, and of finer quality by the use of "lignaite," the cost of the treatment of an ordinary-sized garden being very trifling; the process is available for use by the humblest worshipper at the shrine of Flora.

Once more in the history of human progress the world is indebted to the brilliancy and originality of French scientific thought and research; and, with a view to enable the country at large to benefit by their discoveries, the eminent chemists mentioned are sending to all applicants full details of the best methods of applying the "lignaite" to the soil.

The importance of this discovery to the small landowner or cultivator is obvious; it is now possible for the man with 2 or 3 acres of ground to make a substantial profit each year, sufficient to keep his family and himself in comfort.

And this discovery—viz., medicatrix natural, the latest and most beneficent of the achievements of science—goes far to solve the land problem and pave the way for the reappearance of the sturdy peasant proprietor, the backbone of the country.

SEED POTATOES.

The Irish Department of Agriculture recommends not only the planting of seed potatoes whole, the size of a hen's egg, but that these should be immature, being dug before the tops have dried off. The reason given for this is that, once maturity is reached, deterioration begins to set in, the dying of the tops being an evidence of this. By lifting the tubers before that stage is reached, deterioration is arrested and the seed tubers are obtained at the time of their greatest vigour. We have often pointed out the advantages of sprouting seed potatoes before planting. (*See* Note on "Potato Planting," in the pamphlet on Market Gardening issued by this Department.) "Garden and Field" for November, 1915, says that the advantages claimed for sprouting are:—(1) It increases the yield by 25 per cent; (2) the crop matures earlier and can be lifted earlier; (3) sprouting enables planting to be done when conditions of weather and soil are most favourable, the sprouted seed being kept out of the ground for another week or two, if necessary, without detriment or actual loss of time; (4) there are fewer blanks, as no potato is planted that has not already started growth; (5) there will be less trouble from weeds, as the strong foliage developing from the sprouted seeds chokes, or, at least, checks, weeds so much that

they give very little trouble. Not more than two sprouts should be allowed to remain, and these should proceed from the rose end.

The difference in the results from sprouted and unsprouted seed was shown by an experiment made at the Queensland Agricultural College some years ago. A quantity of sprouted seed was selected from the barn, and planted; and at the same time, an equal quantity of unsprouted tubers were planted on an adjoining plot. The first lot quickly appeared above ground with scarcely a miss; the other lot came up much later, in a straggly manner, and there were about as many misses as there were plants.

THE PRICKLY-PEAR PEST.

The following remarks on Prickly-pear Destruction and Prickly-pear Selections appear in the last Annual Report of the Under Secretary for Lands:—

Considerable impatience has been manifested by holders of prickly-pear infested lands as to the results of Mr. O. C. Roberts' system of destroying the pear. Notwithstanding several drawbacks in the initial stages of his work, and further trouble caused by the European war, drought, &c., Mr. Roberts has made good progress in the destruction of the plants and the utilisation of the dead pear in the production of potash, and has demonstrated the effectual work of his arsenious trichloride gas system at a cost below anything yet obtained.

Pastoralists and selectors have again shown determination to deal with the clearing of their lands from prickly-pear and have done good work, the extent of which would have been increased but for the scarcity of labour for this kind of work and the droughty conditions prevailing generally.

The policy of the Department has been to encourage the selectors of prickly-pear lands as much as possible; and no forfeiture has been declared where the selector, although not strictly complying with the conditions, has shown a *bonâ fide* attempt to do so.

Pastoral Holdings.

The pastoral holdings leased without any special conditions of pear destruction and subsequently notified as pear-infested number 209. Of these 72 have been freed from pear by an expenditure of £5,485; 118 have been partially freed from pear at a cost of £65,099; while in the case of 19 holdings nothing has yet been done as regards the eradication of the pear.

Of the pastoral holdings to the number of 141 leased with a special condition providing for the destruction of prickly-pear, the condition in respect of 80 has been performed to date, at a cost of £16,780, and on the remainder, though the progress does not satisfy requirements, there has been an expenditure of £37,357.

Pear-infested Selections.

The total number of selections standing good on the 31st December, 1914, notified as pear-infested, is 3,043. This number is exclusive of prickly-pear selections and selections of land originally opened with a special condition providing for the destruction of prickly-pear. Of this number 1,286 have been entirly freed from pear by an expenditure of £39,156; 1350 have been partially freed at a cost of £125,138; while in the case of 407 infested selections no expenditure on pear destruction has yet been reported.

Of Agricultural and Grazing Selections applied for subject to a condition of pear destruction the condition has been satisfactorily performed in 82 cases, at a cost of £2,272 12s. 6d.; while in 82 cases in which the condition has not been fully satisfied, there has been an expenditure to the amount of £5,544 4s. 11d.

Prickly-pear Selections.

As regards Prickly-pear Selections, the main condition of the tenure has been satisfactorily complied with in 1,675 cases, at a cost of £92,541 3s.; while in 1,118 other cases the expenditure, though not up to requirements, reached the sum of £115,845 5s. 3d.

The total recorded expenditure for the year by pastoralists and selectors in destroying prickly-pear on pastoral holdings and selections of all tenures, not including those forfeited or surrendered during the year, is £98,888 8s. 10d.

The total recorded expenditure by lessees and selectors in destroying prickly-pear on pastoral holdings and selections of all tenures to 31st December, 1914, is £505,221 7s.

Experimental Station.

Work at the Experimental Station, Dulacca, was continued throughout the year under the supervision of Dr. Jean White-Haney, officer in charge. Dr. White-Haney's report on the work done is a detailed report covering all the experimental work now in hand.

WHEAT AND MAIZE CROPS OF THE UNITED STATES OF AMERICA FOR 1915.

No nation in the history of the world ever harvested a crop remotely to be compared, either in bulk or value, with the harvest of grain and fruit which the farmers of the United States have gathered this year. A large part of it will be sold to Europe's hungry and fighting millions. Remarkable as was the crop of 1914, in itself far excelling all previous records, the reports of the experts of the Department of Agriculture, compiled and made public, show that the harvest of 1915 will exceed it in almost every particular.

The wheat harvest this fall may possibly, for the first time in the history of the country, go above 1,000,000,000 bushels. Experts on prices

calculate this crop will stand the country in about 1,135,100,000 dollars (£227,020,000). The farmers are expected to put 960,000,000 dollars (£192,000,000) of this directly into their own pockets. The increase in the wheat crop is practically entirely due to the increased acreage under cultivation this year. The average yield per acre is slightly below that of last year, being put at 16·3 bushels to the acre. The maize crop, like the wheat, is threatening to pass another memorable mark, by turning out 3,000,000,000 bushels, the estimate now being 2,918,000,000 bushels. This is an increase over last year's yield of 245,000,000 bushels.

The expansion of the corn crop is due at once to an increased acreage under cultivation, and to a better yield per acre. This crop will probably represent close on three-fourths of the world's total production. The oat crop, the third of the three great leaders, has increased over last year's record, by nearly 25 per cent., the figures being—For this year, 1,402,000,000 bushels; for last year, 1,141,000,000 bushels. The year's barley crop will, it is estimated, amount to 217,000,000 bushels, or 22,000,000 bushels more than last year; the rye crop has been increased from 43,000,000 bushels to 44,000,000 bushels; the rice crop from 24,000,000 bushels to 30,000,000 bushels; 18,000,000 bushels of buckwheat have been raised, against 17,000,000 in 1914.

POTATO-GROWING IN CENTRAL QUEENSLAND.

Writing on 4th November, Mr. J. Newman, a successful farmer at Scrubby Creek, in the Rockhampton District, gives the following advice to potato growers:—

"The Potato (*Solanum tuberosum*), which takes second place only to the cereals as a food-producing plant, has, at the time of writing, become something of a luxury, as new potatoes are now selling in Rockhampton at £1 per cwt., and are being retailed there at 3d. per lb.

"Potato-growers are now busy harvesting and marketing their summer crop, which, in some localities, is turning out fairly well—all grown by irrigation.

"As this is the only crop in the year from which sets can be saved for the next planting (February-March), I give the result of my experience in the matter of keeping them, which is a somewhat difficult, and often disappointing business.

"The potato moth and its larvæ are, in nine cases out of ten, responsible for the destruction of seed potatoes in this district, and the old way of throwing the tubers in a heap, possibly on the ground, in some corner of the barn, and covering them with straw or bags, is simply courting disaster.

"For the February-March planting, sets are best planted whole on account of the great heat and moisture in the soil.

"Select your sets not less than 1½ in. in diameter, and fill into bags, and, as you fill in, dredge over them lightly a mixture of 1 lb. of black pepper, and one tin of insectibane, thoroughly mixed.

"Should any larvæ which may be in the tubers hatch out, they will be immediately asphyxiated, and any moths or other insects entering from outside will share the same fate.

"Set the bags on end on a boarded floor in a cool and dry place in the shed, and, once a month thereafter, turn all out and examine them; then, after discarding any bad ones, re-bag, sifting in a little more of the insectibane and pepper mixture.

"As planting time approaches it will be found that they have become somewhat shrivelled, and can be compressed between the finger and thumb like indiarubber; this is no detriment to them, as, after being planted, they will quickly absorb from the soil the water which the tropical atmosphere has extracted from them.

"Scrub land is the soil *par excellence* for this crop, and I know such land which has produced heavy crops twice a year by irrigation for the last twenty years, and is still doing it.

"The February-March planting is dug in May and June, and, as the winter planting commences in July, the farmer has a busy time. The July planting is a more simple matter, as the land is generally cool and moist, and in these conditions large potatoes may be used by cutting them into pieces, each bearing one or two eyes.

"The seed for this planting is imported from the South, and just here I would caution the grower against the Potato Blight (*Phytaphthora infestans*). I have seen it in seed imported from Sydney, and when planted I have seen the black spot on the leaf indicating its presence; but this was some years ago, and I believe the climate here is too dry for the disease ever to become a meance to our crops.

"To grow potatoes here farmers must have some kind of irrigation plant. Oil engines are not expensive, and my experience is that farmers never pay for them, because they pay for themselves, and, in addition, they pay to the farmer many times their own cost in clear profit in a few years."

AGRICULTURAL NOTES—THE LOCKYER DISTRICT.

By CUTHBERT POTTS, Principal of the Queensland Agricultural College.

Since my arrival at the College at the end of September, weather conditions have been extremely unfavourable; but it is at such a time as this that small variations in field practice show the most pronounced differences in results. Consequently, we are able to draw certain conclusions which should be of considerable value in subsequent years.

Hay Crops.—In regard to all these crops the time of planting was most striking; but even more pronounced was the time of ploughing. In one of the paddocks a portion was ploughed in December and January, and planted with wheat, skinless barley, and oats early in May. Another portion was ploughed in March, and after good rains. Part of this was planted with barley and peas on 15th July; while the rest of this area, together with land which was ploughed in June, was planted with oats on 16th July. The early-planted oats, wheat, and

barley on the early-ploughed areas all did well. The barley and peas on the March-ploughed land did fairly well; while the oats, which were planted over an area partly ploughed in March and partly in June, gave an indifferent crop on the March-ploughed area and no crops on the June-ploughed portion. These results, obtained inside the confines of one single paddock, are very significant. Undoubtedly the good yields obtained on a portion of the area were due to the early ploughing, which gave the land a few months' fallow, and thus the surface was open and loose for the ready intake of rain; but the results must be partly attributed to the early planting.

Thus, in this district, where dry springs are the normal condition, and where excessively dry times occasionally occur, there seems every indication that early ploughing and early planting for hay crops is good practice.

A word of caution is required to prevent disappointment. In exceptionally good years a system of fallow may prove slightly more expensive than late ploughings, and in normal years there may be nothing very pronounced in its favour; but in an exceptionally dry season, such as this, the advantage gained in one year will more than compensate for more than ten to twenty years of slightly varying results. It is the average of years that tells—not the speculation on a single season.

Lucerne.—Being faced with every indication of an excessively dry spring and shortage of grass and fodder, 50 acres of lucerne were cultivated with a spring-tooth harrow early in October. The object was to conserve as much soil moisture as possible, and thus get some growth on which to graze horses and sheep. The result was so successful that a lucerne renovator was procured (there are several good makes on the market), and another 100 acres of lucerne cultivated. In every case, the cultivated areas have shown a marked improvement in growth; and up to the present we have succeeded in keeping some forty young horses and 400 lambs in good condition and growing well. Had this cultivation been done in the late autumn instead of the early spring, the results should have been much better for two reasons:—

(1) In autumn one is familiar with the heavy dews that form. This dew is not moisture from the air which has condensed and fallen to the soil, but instead, it is part of the moisture which, rising from the warm soil into the cooler air, has condensed and fallen to the surface of the land. Dews, then, are an indication of the rate at which the soil is losing moisture, and cultivation will check this loss;

(2) With a loose surface, the soil will take in any rain that may fall more rapidly and more deeply.

Coupling these together, late autumn cultivation of lucerne should undoubtedly pay for itself in such times as these.

Pigs.—Prime pigs are selling at exceptionally high prices at present. Lately we marketed three pigs of average live weight of 170 lb., and

netted a return of £7 10s. each, or something over 10d. per lb. live weight. Certainly, these are abnormal prices; but even at half these rates pigs would pay.

Where lucerne can be so successfully grown as in the Lockyer Valley, pigs, if properly managed, should be amongst the surest and quickest sources of income.

With arrangements for the young pigs to graze on lucerne, or even to be fed with lucerne hay in racks, and finally fattened on home-grown maize, root crops, green barley, sweet potatoes, &c., pig-raising should be a very attractive enterprise. This is especially so as there is every indication that pork will remain up in price, while pig-raising offers one of the quickest ways of recovering from the effects of the present drought.

Water Conservation.—In this district probably the greatest problem is the supply of water for stock. Several wells that have been sunk have obtained water far too alkaline for stock use; and this seems to be a usual occurrence in the higher and more sandy portions of the valley. Furthermore, the upper reaches of the Lockyer Creek have ceased running. Consequently there seems only one course open, and that is the conservation of surface waters. The first step in this direction is a series of weirs on the Lockyer Creek, which would ensure a good supply of water for stock and possibly for irrigation.

Reporting on the Oat crops at the College, Mr. C. S. Clydesdale shows the following results:—

CALCUTTA OATS.

These oats were imported from F. H. Brunning, Melbourne, by the Department of Agriculture, and forwarded to the Queensland Agricultural College for trial.

The results have been remarkably good, considering the weather conditions under which they were grown.

The following gives the rainfall from the months they were sown until harvesting:—

	Points.
May	196
June	5
July	125
August	162
September	112
Total	600

This is the first time that these oats have been grown in this district, and have proved a success. Of course, this being the first year of trial, it does not imply that they are always going to be a success; but it is intended to save all seed and go on with further trials.

The land was prepared during the months of December and January, the area sown being 5 acres 3 roods.

The sowing commenced on the 11th May, 1915; planting 1½ bushels of seed per acre, using the ordinary seed drill.

The oats came through nicely and made excellent growth, stooling out well, growing to a height of 4 ft.; nice and fine in straw, with a large amount of flag; thus much resembling the Sixty-day Oat. It is apt to lodge a little, but nothing to prevent the use of the reaper and binder. There was little or no rust. Carter's Improved Tartarian oats, grown under identical conditions and alongside the Calcutta oats, were affected with rust.

These oats have proved the best with us this season, although we had some eleven varieties growing.

The oats were allowed to go to seed. Harvesting was commenced on the 29th September, giving a total yield of 11 tons, which works out at 1 ton 18 cwt. 1 qr. per acre.

They are not threshed out yet, but it is expected that there will be somewhere about 50 bags or 150 bushels.

VARIETY TRIALS.

Oats.

There were nine varieties of oats imported from New Zealand and Scotland, and experiments were carried out with these in 1½-acre plots. The following are the names:—New Zealand varieties: Twentieth Century, Golden Rein, American Banner, New Kerson, Great Mogul. Scotland varieties: Leader, Mounted Police, Beserkers, Prolific, Record.

The land was twice ploughed, twice harrowed, and three times disc cultivated, and was in excellent order. The sowing was commenced on 18th May, 1915; and 1½ bushels of seed per acre were sown with the ordinary seed drill. The land was rolled after sowing.

The following table will give fuller particulars:—

Name of Variety.	Area	Imported From.	Quantity of Seed per Acre.	When Sown.	When Up.	Coming in Ear.	When Harvested.	Field.	
								Hay.	Hay Saved for Feed.
	acre.							T. C. Q.	C. A.
Twentieth Century	1	New Zealand	1½ B	18-5-15	27-5-15	4-10-15	21-10-15	1 0 0	6 0
Golden Rein ...	1	New Zealand	1½ B	18-5-15	27-5-15	4-10-15	21-10-15	1 17 0	...
American Banner	1	New Zealand	1½ B	18-5-15	27-5-15	2-10-15	21-10-15	1 9 0	...
New Kerson ...	1	New Zealand	1½ B	19-5-15	27-5-15	7-9-15	9-10-15	1 4 0	5 0
*Great Mogul ...	1	New Zealand	1½ B	19-5-15	27-5-15	...	...	5 0 0	...
*Leader	½	Scotland ...	1½ B	19-5-15	27-5-15	...	...	1 17 2	...
Mounted Police ...	½	Scotland ...	1½ B	19-5-15	27-5-15	21-10-15	11-10-15	0 15 0	...
Beserker's Prolific	½	Scotland ...	1½ B	19-5-15	27-5-15	21-10-15	11-10-15	0 17 0	...
Record	½	Scotland ...	1½ B	19-5-15	27-5-15	21-10-15	11-10-15	1 3 0	...

* Green feed.

The weights shown in the above table are not from areas as given. An experiment of feeding down the varieties was tried.

On 20th July the whole area was divided in halves by sheep hurdles, and the sheep turned in and allowed to graze. This portion of the plots proved a failure, only growing about 6 in., and then coming into ear; so it can be reckoned as half-acre in place of acre-plots, and quarter-acre in place of half-acre plots.

These oats did fairly well considering the weather conditions, but were very coarse, and had suffered considerably from the ravages of rust, smut, and caterpillars. All varieties had a large amount of flag, and in some instances were apt to lodge. Having only small quantities of the original seed, it was found necessary to save a small portion of two varieties for further trials.

The best of all of these varieties was New Kerson, which was the earliest, and was not so coarse in the straw.

BY-PRODUCTS OF A COTTON CROP.

Owing to the want of experience as to the value of the by-products of a cotton crop, ginners, in the halcyon days of cotton-growing in Queensland, threw away thousands of pounds sterling annually. Cotton seed, after passing through the gins, carries a certain amount of short fibre which is not removed by either the saw or roller-gin, and was looked upon as valueless. The American cotton-ginners, on the other hand, very soon discovered that there was money in this so-called refuse, which goes by the name of "linters"; and they invented a special gin with which to recover it. This gin has two saws closely set which take off the smallest fibres adhering to the seed, thus recovering from 46 to 72 lb. of fibre per ton of seed, which readily sells at £3 per ton. During the process, these linters pass into a condenser, and then through rollers on to a steel core, which revolves slowly and winds off the lint in the form of a compressed bat, about 1 in. in thickness, forming it into a cylindrical roll, when it is ready for market.

A well-grown crop of Uplands cotton will, in a fair season, return from 1,000 to 2,000 lb. of seed cotton per acre, and 1,000 lb. of this contains about 600 lb. of seed. Thus, roughly, 100 tons would give about 53 tons of seed, the linters from which would amount to 2,650 lb., or, approximately, 1 ton 4 cwt., which, at £3 per ton, would be worth £3 12s. Now, as to the other by-products. The re-ginned seed is run through machines which separate the hulls from the kernels. One ton of kernels will yield near half-a-ton of hulls worth 12s. 6d. per 600 lb. of seed. Next, we have the oil. The kernels, after being hulled, yield 30 per cent. of their weight in the shape of oil. The 300 lb. of kernels, which constitute one-half of the weight of the seed, yield 12 gallons of oil, or about 90 lb., worth 20s. per cwt. in its crude state, or about 16s. for the 12 gallons. And there is yet another by-product of value—the oil-cake, which represents 210 lb. At the low price of £5 per ton, these 210 lb. are worth nearly 10s. (Since the war, prices for these products are much higher.)

The hulls, mixed with cotton-seed meal, form a superior food for stock for which there is a steady demand for the whole supply. In

the United States of America the value of the cotton-seed oil amounts to nearly £4,000,000, and of the cake to £2,500,000 annually; and Queensland ginneries thus threw away during the progress of the American civil war, something like £120,000, the value of the by-products of 26,000,000 lb. of cotton lint which alone brought £1,300,000 in the Liverpool markets.

MARKET GARDENING.

PRODUCE OF A SMALL VEGETABLE GARDEN.

As showing what can be done in the way of raising vegetables on a small suburban allotment, given a fair supply of manure, a compost heap, and a good water supply, we have received the following particulars from a resident of the suburb of Milton. The soil (he states) is very gravelly and overlies stiff red clay, and has been under cultivation for over fifteen years.

Between 5th September and 6th November (about nine weeks), the following quantities of vegetables were obtained (Jerusalem artichokes from the previous season left over until October) :—

Cauliflowers, 2 dozen; cabbages, 3 dozen; parsnips, 24 bunches; carrots, 26 bunches; turnips, 10 bunches; lettuce, 3 dozen; beetroots, 15 bunches; mustard and cress, 20 bunches; parsley and mint, 6 bunches; tomatoes, 10 lb.; Jerusalem artichokes, 20 lb.; broad beans (a failure), 2 lb.

Fruit.—Papaws, 126; peaches, 30 dozen; grapes (1914), 110 lb.; coffee, 10 lb. (parchment, which was roasted and ground at a Brisbane establishment); apples, Rome Beauty, 3 dozen; passion fruit (now ripening); papaws coming on but being attacked by flying foxes; coffee, ripe; apples, a fair crop set; grapes, a good crop well advanced.

The whole of the garden has been again well dug and manured, and crops of cucumbers, squashes, Lima and Kentucky Wonder beans, tomatoes, carrots, parsnips, Jerusalem artichokes, sown, some of which were in flower in November.

The garden contains about 2⅓ perches, not including the space allotted to fruit-growing. The owner reckons he saves more than 1s. a day by growing his own vegetables, instead of buying them. The labour is done entirely by himself before and after business hours.

ECONOMY IN FOOD.

The Journal of the Board of Agriculture, London, gives the following sensible advice, which dwellers in even cities in Queensland can carry out without much trouble. With a town supply of water, much money can be saved by growing vegetables and keeping fowls. We, ourselves, have kept up a supply of vegetables during the present dry time and high prices for vegetables, for the past five months, and the supply still continues. The Board of Agriculture makes an appeal to country people and to town dwellers who have a bit of garden ground. It says:—

"*Everyone*, who lives in the country and has a garden, can produce *something* to eat—the more the better: vegetables, fruit, poultry, eggs, milk, cheese. Plant at once what you can, and prepare in all possible ways for next year's cropping! Every plant in your garden may save you money! Produce all you can; buy as little as possible! Cultivate thoroughly! Destroy insect pests and weeds! Prepare manure! Preserve and store your crops with the greatest care! The finest harvesting may be rendered useless by bad storing. Protect from the weather! Destroy vermin! Store your own vegetables! Bottle your fruit or make jam or pulp of it! Preserve your eggs when abundant! Cure your own bacon! Eat little meat! Replace meat by milk, cheese, peas, beans, and lentils, which are as rich in flesh-formers as meat, and much cheaper. Use more vegetables! Eat more fruit! Bake your own bread: it will be cheaper and better! Use whole-meal flour from home-grown wheat, barley, and oats. Good, wholesome bread can be made from:—(1) Household flour, or whole-meal flour; (2) ½ household flour and ½ barley-meal; (3) ⅞ whole-meal flour and ⅛ fine oatmeal; (4) ⅘ whole-meal flour and ⅕ maize meal; (5) ¾ household flour and ¼ boiled potatoes; (6) oatmeal; (7) barley meal. Cook vegetables by steaming! Boiling in water reduces their food value! Cook potatoes in their skins! Waste nothing! Buy nothing from abroad that can be produced at home!"

"Next year's cropping" does not affect the Queensland market gardener. With a plentiful supply of water and manure, there is not a month in the year during which vegetables of some description cannot be grown.

The following list of vegetables which may be planted each month, where climatic conditions are favourable, will show what may be done even on a 16-perch allotment:—

January.—French beans, brocoli, cabbage, carrots, celery, cress, lettuce, endive, peas, parsnips, radish, turnips.

February.—About the same crops, and potatoes.

March.—Onions, cabbages, potatoes, beans, beet, &c.

April.—Same as previous month.

May.—Transplant onions, cabbages, and rhubarb.

June.—Rhubarb, strawberries, cabbage, cauliflower, lettuce, peas, watercress.

July.—Asparagus, cauliflower, carrots, spinach, beans, onions, &c.

August.—Peas, beet, cucumber, tomatoes, Jerusalem artichokes, pumpkins, cabbage, cauliflower, parsnip, radish, carrot, potatoes, maize.

September.—French and English beans, Lima beans, beet, parsley, lettuce, egg plant, cucumbers, melons, pumpkins, vegetable marrows, squashes, carrots, parsnips, tomatoes.

October.—It is not advisable to sow cabbage this month, owing to trouble with the fly; but all the above and rosella seed may be planted.

November.—French beans, melons, brocoli, cress, cucumbers, lettuce, rosella, pumpkins, &c.

December.—The same as for January.

Pastoral.

DESTRUCTION OF PRICKLY-PEAR BY THE COCHINEAL INSECT.

The Under Secretary for Lands (Mr. G. Graham), when discussing the prickly-pear question last month, said:—"The cochineal insect is doing such wonderful work in the destruction of prickly-pear that people in the Charters Towers district are fearing that it will kill all the pear and leave them without any to burn and feed their stock with while the dry weather remains."

The cochineal insect was brought from Colombo, Ceylon, on the Orvieto in February, 1913, by the Prickly-pear Travelling Commission, and was placed on a bad patch of pear at Sandy Creek, in the vicinity of Charters Towers. The insect has done really wonderful work in the eradication of the pest, and the success realised has been beyond all expectations.

Mr. Graham has issued instructions to the Land Commissioner at Charters Towers to put up notices that any persons destroying the cochineal insect on pear on Crown land will be prosecuted.

The "Tropical Agriculturist," Ceylon, writing on this subject in that Journal in September, 1915, recalls that, in January, 1913, Dr. T. H. Johnston, Lecturer in Biology at the University of Queensland, and Mr. Henry Tryon, Government Entomologist and Vegetable Pathologist of Queensland, visited Peradeniya to inquire into means used to destroy the prickly-pear. They discovered at Matara the Ceylon Wild Cochineal Insect (*Coccus indicus*) feeding on some Prickly-pear (*Opuntia monocantha*), which the inhabitants stated used to exist in great quantity, but for some reason which they could not explain was disappearing. They procured specimens of the plant and parasite, and a little breeding farm was established at Henaratgoda. At the same time, the Northern Province Prickly-pear (*Opuntia dillenii*) was also planted. The insects established themselves on *Opuntia monocantha*, and two boxes of plants carrying a quantity of the scale were despatched to Brisbane early in 1914. At the time of writing the little patch of *Opuntia monocantha* has been almost exterminated by the parasite, but all efforts to establish it on *Opuntia dillenii* have proved unavailing.—"Annual Report of the Director of Agriculture, Ceylon, 1914."

CARAWAY SEEDS.

The seed should be sown in the autumn in drills 1 ft. apart. The plants, when strong enough, are to be thinned out to 8 in. apart in the rows. The land will require an occasional hoeing and cultivation to ensure a satisfactory crop, which will be produced in the following summer. The seed may be obtained from Messrs. E. and H. Hackett, Rundle street, Adelaide. It is usually sold at 6d. and 1s. per packet.

Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

MILKING RECORDS OF COWS FOR MONTH OF OCTOBER, 1915.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Commercial Butter.	Remarks.
			Lb.	%	Lb.	
Miss Melba	Holstein	30 Sept., 1915	1,035	3·5	42·30	
Sweet Meadows	Jersey	28 Sept. ,,	578	5·4	36·89	
Miss Edition	,, ...	27 Sept. ,,	774	4·0	36·34	
Gretchen ...	Holstein	16 Aug. ,,	968	3·0	33·79	
Miss Lark ...	Ayrshire	8 Sept. ,,	738	3·5	30·21	
Iron Plate ...	Jersey	21 Feb. ,,	468	5·4	29·88	
Mischief ...	Ayrshire	27 Sept. ,,	798	3·2	29·78	
Rosebud II.	,, ...	11 Oct. ,,	671	3·7	29·08	
Windyhill Davidina	,, ...	21 Aug. ,,	649	3·3	28·86	
Bluebell ...	Jersey	20 June ,,	574	4·2	28·83	
Sylvia ...	Shorthorn ...	25 Aug. ,,	666	3·6	28·08	
Lady Margaret	Ayrshire	14 Oct. ,,	594	4·0	27·89	
Noble Dot ...	Jersey	2 May ,,	478	4·9	27·62	
Lady Twylish	,, ...	5 June ,,	494	4·7	26·02	
Lennie ...	Ayrshire	23 July ,,	654	3·4	25·97	
Lady Dorset	,, ...	10 Aug. ,,	567	3·4	22·52	
Lady May ...	,, ...	7 Mar. ,,	497	3·8	22·13	
Pauline ...	Shorthorn... ...	17 Sept. ,,	620	3·0	21·64	
Laurette ...	Ayrshire	9 Oct. ,,	582	3·2	21·62	
Netherton Belle	,, ...	23 April ,,	433	4·2	21·37	
Miss Belle ...	Jersey	2 July ,,	368	4·9	21·26	
Lilia ...	Ayrshire	19 Aug. ,,	606	3·0	21·15	
Nellie II. ...	Shorthorn... ..	20 July, 1914	510	3·4	20·26	

From 1st to 20th October the cows received a ration of 35 lb. panicum ensilage daily, in addition to natural pasture; from 21st to 31st October they grazed on lucerne and wheat paddocks.

ADVICE TO PIG-BREEDERS.

The Department of Agriculture and Technical Instruction for Ireland consider that the following opinions expressed by the Committee on the Irish Pig Breeding Industry cannot be too widely known:—

1. The numbers of pigs in countries which export bacon to Great Britain are falling off, and it may be anticipated that, in consequence, exports of bacon will shrink, and that Irish bacon will be in great demand. The number of pigs in Ireland should, therefore, be increased.

2. It is not necessary to cook meals for pigs. Steep the meals in cold water and feed raw; just as good results will be obtained, and labour and fuel will be saved.

3. About 5 cwt. meal will produce 1 cwt. pork.

   Given in conjunction with other foods—About 4 lb. potatoes equal 1 lb. meal in feeding value; about 6 lb. separated milk equal 1 lb. meal in feeding value.

   Separated milk given with meal and potatoes is now worth 2d. per gallon.

4. Farmers should breed the pigs they fatten, and thus secure the profit of both breeder and feeder.

5. More home-grown foods should be procured for feeding to pigs. Barley, oats, and potatoes are most suitable.

The Department learn that some farmers have used cod-liver oil in the food for pigs. This is a most undesirable practice, as the oil imparts an objectionable, fishy flavour to the pork.

"OVERRUN" IN BUTTER-MAKING.

The term "overrun," which is so puzzling to many of our dairy farmers, is thus explained by "Hoard's Dairyman":—Butter is composed of fat, water, salt, casein, a little milk sugar, and ash. The supplier is paid for his milk or cream according to its fat test; but since water, salt, casein, milk sugar, and ash are added to it, more pounds of butter are made than there are pounds of fat received from the farmer. The difference between the fat deliverd to the creamery and the butter made constitutes the overrun, which amounts to 18 per cent. with whole milk and 20 per cent. with cream. In other words, this overrun is made up of water, salt, casein, milk sugar, and ash. In average butter there are about 83 lb. of fat in 100 lb. of butter; in other words, 17 lb. constitute the overrun. Of course an allowance is made for this in the O'Callaghan chart on which most of our factories work.

THE EFFECT OF CANE-TOP FODDER ON THE CONSISTENCY OF BUTTER.

As a result of feeding sugar-cane tops to dairy cattle in Barbados, the statement is definitely made by at least one dairyman, that the consistency of the butter produced is adversely affected as soon as the cows are fed on cane tops.

Cane tops are the most readily available green fodder on certain estates for a considerable part of the year, and would seem to be a food eminently suited to the production of milk and butter. It is found, however, that a diet of sugar-cane tops results in the production of a soft butter without grain. This is an undesirable quality, and, in addition, such butter is more difficult to work and to free from the butter-milk.

It would be interesting and useful to have the results of experience in other tropical localities with regard to the feeding of sugar-cane tops to dairy cattle.—"Agricultural News," Barbados.

The Horse.

SKIN DISEASES OF HORSES.

"Veterinarius" writes on the subject in the "Live Stock Journal," London:—

The prevalence of skin diseases of a parasitic nature can be accounted for by the greater movements of horses during the year of war than at any previous period in our history, not excepting the time when so many thousands of horses were exported to South Africa. Then we drew upon almost every country with horses to spare, and large numbers were purchased from our present enemies, the Hungarians. For many years past it has been all a part of the German bluff to make us believe that veterinary science and sanitary science and police had been so well developed and in advance of ourselves that infectious diseases were better managed and almost non-existent in the German Empire, and that the means of diagnosis and the successful treatment were in that region of the world so much better understood that we could alone be successful by copying their methods *and purchasing their products*. The journals devoted to pharmacy in this country and the interests of pharmacists had begun, nay even dared, to utter their suspicions that all was not well with us in buying German proprietary articles when we might have produced at much less cost curative substances of equal or greater value. The thoroughness of the plan was as great as that by which the bottle and other trades were captured from us—but that is another story.

Skin diseases on the Continent of Europe, like swine fever and other infectious maladies, have always been more prevalent and less under control than in these Islands, and yet—and yet—our own professors and teachers bowed the knee in reverence to things German and forsook the well-tried home products for the hybrid and synthetically produced foreign proprietary articles protected by their names and trade-marks, and "made in Germany" was a recommendation when it should have been a warning.

Mange was prevalent in the early months of the year, both psoroptic and symbiotic, while the more virulent type, known as sarcoptic, was by no means rare. Seasonal influences are great, just as in one year flights of ladybirds afford much pleasure to children and the next year hardly any are to be seen. If the ordinary rules of reproduction applied to parasites, there would be an increased number in the year following a prolific one, but such is not the case. Some at present unknown factor militates against the further propagation of an infectious disease just at a time when it seems to have developed an invincibility. If this were not so, then the world's inhabitants would be destroyed by parasites. It is perhaps not generally known that the less virulent types of mange never die out in the stables and byres of those farmers who leave everything to the "Nature cure," which is such an easy way of avoiding trouble and expense for the time, but usually has to be paid for dearly at some future period. The stalled ox and the poor cow during winter—

the late months more especially—develop wrinkles on the neck and baldness about the root of the tail as the result of symbiotic mange mites. This trouble is accepted as a matter of course, because it is quite usual with a certain class of owner, and they would be surprised if told that the trouble was caused by mites, and could be prevented or cured at the beginning of the winter by cheap and efficient dressings.

Another example of mange which is localised and not suspected is that which causes horses of the Shire type to spoil their feather by rubbing one leg over the other. A symbiot is at work, causing an irritation for his own profit. He is not a borer, who can pierce the skin for the nutriment he requires, and is for the most part quiescent when the horse is out of doors, but at night, or when the farm horses are standing in the stall, he combines with his fellows in a march across country, so to speak, and this trampling of myriad little feet causes itching. The host stamps and rubs; the abrasions caused by the shoe or opposite hoof give off serum or a fluid of the kind upon which these parasites feed. Thus they accomplish their object at the expense of their host without any special effort of their own. Their presence, as in the cattle form previously mentioned, is not so much as suspected by the farmer, who generally thinks a horse is disposed to have grease if he stamps and rubs in the stable at night. He does not know that this annoying, sleep-disturbing, and disfiguring malady can be easily cured, but he purchases grease-balls, and gives nitre and sulphur or other remedies to act upon the kidneys, which have nothing to do with the trouble.

The diagnosis is not difficult, and if the owner is in doubt he will not do wrong in following the directions given below.

Plaster thickly with soft soap the whole of the affected area and some few inches beyond it. Leave the soap on all night, and in the morning wash the parts with plenty of warm water. *Warm* we have said advisedly, and we do not mean *hot* water, for it has yet to be generally known that the thick skin of the bullock and the horse is more easily scalded than the thin skin of the cook or the insensitive hand of the manual labourer. The soap does not kill the mites. It prepares the way. It causes the outer layer of the skin to swell up and become loosened, so that the parasiticide or killer to follow comes into contact with all that would otherwise lurk in security and in sufficient numbers to reproduce and repopulate the affected region. There is a wide choice of destroyers, and most of the popular disinfectants of 5 per cent. strength prove effective. All the coal tar series can be relied on, and there is no objection to their employment, save that a certain amount of resin is present, and this inclines to mat the feather on a Shire. For such we may use a similar strength of chloride of zinc in water or tobacco juice which can be purchased of horticultural supply merchants. It does not pay duty, and is cheap. If only a small quantity is needed, we may use 1 oz. of common shag tobacco to the pint of water, or if very fully convinced of the importance of national economy the heel taps from our pipes may be infused in boiling water.

[The above is corroborated by Mr. McGown, Veterinary Surgeon to the Department of Agriculture and Stock, Queensland.—Ed. "Q.A.J."]

Poultry.

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

Seven thousand six hundred and thirty eggs were laid during the month, an average of nearly 144 per pen. This is a fine performance, but, if the present hot dry weather continues, the laying is sure to fall off, as our green feed is just about finished. C. E. Bertelsmeier's White Leghorns win the monthly prize with 164 eggs. The following are the individual records:—

Competitors.	Breed.	Oct.	Total.
Jas. McKay	White Leghorns ...	130	908
C. E. Bertelsmeier, S.A....	Do.	164	900
J. Gosley	Do.	142	886
Mrs. Munro	Do.	144	884
Mrs. J. Jobling, N.S.W.	Black Orpingtons ...	114	878
J. D. Nicholson, N.S.W.	White Leghorns ...	148	868
A. W. Bailey	Do.	151	863
J. M. Manson	Black Orpingtons ...	146	861
Kelvin Poultry Farm	White Leghorns ...	152	860
A. H. Padman, S.A.	Do.	159	855
S. E. Sharpe	Do.	138	853
J. R. Wilson	Do.	153	853
E. F. Dennis	Do.	155	853
King and Watson, N.S.W.	Do.	148	838
J. M. Manson	Do.	159	822
A. T. Coomber	Do.	150	814
O.K. Poultry Farm	Do.	160	814
C. T. Clark	Do.	138	809
T. Fanning	Black Orpingtons ...	140	808
E. A. Smith	White Leghorns ...	154	801
H. Hammill, N.S.W.	Do.	139	800
E. Le Breton	Do.	131	798
E. V. Bennett, S.A.	Do.	146	795
C. Knoblauch	Do.	147	794
W. Parker	Do.	156	789
W. Purvis, S.A.	Do.	151	788
R. Burns	Black Orpingtons ...	144	786
T. Fanning	White Leghorns ...	143	783
F. Clayton, N.S.W.	Do.	149	777
Cowan Bros., N.S.W.	Do.	151	773
R. Jobling, N.S.W.	Do.	146	772
W. Meneely	Black Orpingtons ...	133	766
R. Burns	S. L. Wyandottes ...	140	757
Moritz Bros., S.A.	White Leghorns ...	143	757
Geo. Tomlinson	Do.	125	757
Cowan Bros., N.S.W.	Black Orpingtons ...	144	755
W. Lindus, N.S.W.	White Leghorns ...	148	752
Derrylin Poultry Farm	Do.	145	752
E. A. Smith	Black Orpingtons ...	157	742
Wm. Lyell	White Leghorns ...	139	739
R. Jobling, N.S.W.	S. L. Wyandottes ...	120	736

Competitors.	Breed.	Oct.	Total.
J. Zahl	White Leghorns (No. 1)	151	723
G. H. Turner	Do.	137	711
J. H. Gill, Victoria	Do.	160	709
J. G. Richter	Do.	146	709
J. Aitchison	Do.	137	706
J. Zahl	Do. (No. 2)	127	683
Loloma Poultry Farm, N.S.W. ...	Rhode Island Reds ...	145	685
E. Pocock	White Leghorns ...	144	668
F. Clayton, N.S.W.	Rhode Island Reds ...	143	604
S. Chapman	Brown Leghorns ...	132	590
W. H. Forsyth, N.S.W.	White Leghorns ...	145	579
J. R. Johnstone	Plymouth Rocks ...	121	438
Totals	...	7,630	41,001

State Farms.

STATE FARM, BUNGEWORGORAI.

The Manager reports for the month of October that dry conditions have prevailed, only 16 points of rain having been recorded, making a total of 520 points for 1915.

The temperature recorded averaged 89·9 degrees Fahr.

As regards the wheat crops, these were very light, but it was hoped that sufficient seed for next season's operations would be obtained. Only the light soils yielded any return. Teff grass proved its ability to survive under conditions fatal to most crops in the early stages of growth. The grape crop was fairly promising, but citrus trees suffered much from the drought. Cattle and horses were in fairly good condition, but the old mares were not likely to survive unless rain were to fall early in November.

THE LARGEST CHEESE EVER MADE.

Some very large cheeses have been occasionally made in Australia; but our cheesemakers have never produced one which came within tons of one made in Lawrence County, New York, which was sent to the Panama Exposition at San Francisco, the weight of which was given at 6 tons. A cheese was made in September, 1892, at Perth, Ontario, Canada, which weighed 22,000 lb. net, or, in other words, 11 tons. This cheese was exhibited at the Chicago Fair in 1893. It required the milk from twelve factories for more than two days to make the Canadian cheese. The total quantity of milk used was 207,200 lb. Thus the Canadian Jumbo holds the record.

The Orchard.

FROST PREVENTION.

We have, for several years, pointed out to orchardists and others that the damage done by early and late frosts to blossoming fruit trees, vines, sugar-cane, &c., can be mitigated or even entirely prevented by very simple means. Owing to the comparatively inexpensive character of the material used in damp, smudge fires, these seem the best adapted for common use in orchards, vineyards, and gardens. Low-growing plants, such as pineapples, can be protected with but little expense by coverings of straw and other light materials. It seems that there is an idea that in October all danger from frost is over, but those who remember the 2nd, 3rd, and 4th days of October, 1899, know that such is not the case. In that year sharp frosts swooped over a large portion of the State. Never, in the history of wheat-growing in Queensland, has such a calamity occurred in October as the destructive frost of 1899. Far and wide on the Darling Downs, vast stretches of country were waving with billowy crops of wheat and barley just burst into ear. Suddenly, when all were rejoicing in the splendid harvest prospects, the calamitous frosts occurred, and it was found that nearly the whole of the crops on the lowlands were hopelessly ruined, and the disaster was further intensified in some districts by a hailstorm which destroyed what the frosts had spared. We believe that the frosts extended to the Central districts, and did much damage to the canefields.

Meteorological science is to-day so far advanced as to enable scientists to foretell a frost from twenty-four to to forty-eight hours in advance. This is an important point gained, and a warning of such a length enables one to make some preparations for saving at least a portion of a crop.

The fruitgrowers of Stanthorpe might, had a warning been received last October, have been saved much of the loss occasioned by the frost.

The most effective preventive is thick smoke, and this can be produced in several ways. One is by making heaps of wood, weeds, old cornstalks, or rotten straw. These should be lighted in the early morning, say, about 4 a.m.; and very shortly the fields will be covered by an artificial cloud, hanging like a curtain a little height above the soil. It should be borne in mind that if, in the winter, one thermometer is placed close to the ground, and another at a height, say, of 4 or 5 ft. above it, the temperature during a clear frosty night is from 10 to 12 degrees lower close to the ground. The smoke will be perfectly sufficient to prevent any damage by frost, provided the temperature on the ground does not fall lower than 6 degrees of frost—that is, to 26 degrees Fahr.

This protection is largely employed in America, France, New Zealand, and other countries. On this subject, a contemporary writes:—"With large supplies of crude oil available, Americans burn same in smudge pots on nights when the temperature falls to about 35 degrees,

and if the temperature falls lower more fires are lit, and consequently the temperature is raised considerably above the danger point. In New Zealand districts liable to frosts, the growers cut benzine tins in half and use them as receptacles for burning coal. Already these methods have saved thousands of pounds to growers, as the temperature can be actually raised fully 10 degrees to 12 degrees on frosty nights. One disastrous frost can wipe out the fruitgrower's expected harvest and nullify the laborious work of a year. The cost of installing these preventive measures is very slight, but it is an insurance against total or partial loss. It must be distinctly understood that it is necessary to make more than a big smoke on nights when the frost is serious. The temperature must be actually raised above freezing point (32 degrees Fahr.); in fact, it is an advantage to raise the temperature to above 35 degrees."

We shall revert to this important matter of frost prevention at a future date, when fruitgrowers at Stanthorpe, and in other districts liable to frost, may think it worth while to take a little trouble to save their crops.

THE COLD-WATER CURE FOR WOOLLY APHIS.

That hosing with plain cold water will keep woolly aphis in check, if done frequently and forcibly enough, is contended by a writer (Coleman Phillips) in the "Canterbury Times." It is a practicable idea for the owners of suburban gardens, although it may not commend itself to commercial orchardists; and it at least has the merit of being absolutely harmless to the trees. The writer also has a good deal to say about the injurious effects of poisonous sprays, and the desirability of encouraging the natural enemies of the different insect pests, some of which is debatable matter. But in regard to the cold-water cure he says:—

"My orchard of about 1,000 trees surrounds the house, and I found lately that two lengths of garden hose (50 ft. each) from the high-pressure water taps would command most of the trees. I had tried everything against the woolly aphis (kerosene and red oil emulsions, hand painting, &c.—all the oil remedies, in fact), and failed. I have not been successful with kerosene emulsion making; sometimes it goes well, sometimes badly, and I think this is the general experience; but it is a very useful remedy to have ready at hand.

"In spite of all I did the trees were becoming worse, so I resolved upon hosing the apples with plain cold water. The effect was simply marvellous. The trees remained clean for three weeks to a month, when I gave them another hosing. I hose four times in summer (in December, January, February, and March), as it is in these months the aphides increase. But the plan is to hose whenever the pest shows itself at all badly, even once a week. Two boys get over the orchard in a couple of days, one hosing, the other searching out ahead, and also going over the trees that have been hosed to discover missed spots.

"I try to hose just before the arsenate spray for Codlin moth; not that I believe in the arsenate at all, as I will show directly, but I am compelled by law to do it. After hosing a tree, churn up the soil beneath it with water for a little while to bury any of the aphides that are washed off. The hosing gives the trees a drink when they badly want one; it does not kill any natural enemy, which, unfortunately for us, all are conspicuous now by their absence, and it washes off a lot of other germs hostile to the health of the tree. The strong jst of water cleans out spiders, earwigs, aphides, &c., which congregate near the fruit buds, and the whole tree looks as clean as a new pin. These harmful aphides give in to nothing but force. And most of our spraying pumps are of little use. An oil-engine force or motor pump, costing anything over £100, is too expensive for small orchardists, but these pumps would give an orchard a wash down once a fortnight quite well and easily. It is this plain washdown I recommend, no matter how it is done, as the rain has not force enough to dislodge the woolly aphis.

"I do not say that the hosing washes all the aphides out of the crevices, because no force will do that. Only the searching little feelers and mouths of the natural enemy will get into these crevices, wherein lies their enormous use in upholding nature's balance. What I do affirm is that the hosing so keeps down the woolly aphis (and also washes off other harmful pests) that the evil is under control, and the next season's fruit buds are not injured. I do not say that we can entirely do without arsenate, Bordeaux, and red oils just yet; but I suggest that we should turn our attention to gradually dispensing with these poisons by breeding and turning out the natural enemy all over the Dominion, and then hosing our trees with plain cold water."

CONTROLLING THE WOOLLY APHIS.

Under the supervision of a special commission, M. Celestin Duval carried out on 19th August, 1913, at Boulonge-sur-Seine, experiments in controlling Woolly Aphis (*Shizoneura linigera*). He used for the purpose a liquid insecticide prepared by himself, the composition of which he kept secret. An apple-tree covered with colonies of this aphis was sprayed with the insecticide; after about an hour all the insects reached by the liquid were dead, while no signs of scorching were observable on the leaves. On other trees treated in the same way, eight or ten days previously, there were no living aphids to be seen, nothing remaining but traces of the insects reduced to ashes. It thus seemed, in the opinion of the commission, that the method was efficacious and practicable. Being free from all necessity for reserve, M. Duval made known in 1914 the composition of his insecticide. According to the prescription of the inventor, the following solution must be used in case of leaves, young shoots, or wood of several seasons, during the growing seasons—Formula I.: Rain water, 10 gallons; carbonate of potash, 6½ oz.; sulphoricinate of soda, 4 lb.; methylated spirit, 2 lb.; strong extract of tobacco (10 per cent.), 1 lb. The spray gradually dissolves the waxy

coating of the aphids, so that finally all of them (females and young) are turned into a sort of dense paste, which soon dries up and becomes of a greyish colour. During the last two or three weeks of the vegetative period, when the leaves are about to fall naturally, and there is no fear of harming them, the following

STRONG SOLUTION

is used if there are still any aphids:—Formula II.: Rain water, 10 gallons; potash from ashes, 1 lb. or 19 oz.; sulphoricinate of soda, 4 lb.; strong tobacco extract, 2 lb.; methylated spirit, 2 lb. Although the insects are at this time encased in a thicker and less permeable wax envelope, they cannot resist the action of this mixture. The time comes when the sexual and fertilised females lay their winter eggs. In order to destroy the latter, all the holes, crevices, and cavaties of the cortex are painted over with the following composition:—Formula III.: Rain water, 10 gallons; soft soap, 35 lb.; sulphoricinate of soda, 5 lb. Finally, to destroy the aphids in their last refuge, which is the roots on which the sexual females assemble after having laid their eggs, a kind of basin is excavated round the foot of the tree so as to expose the roots on which the insects have gathered; then they are

WELL WATERED

with the solution of Formula I., or, if necessary, Formula II. As soon as they are seen to be dead the basin is filled in. M. Duval believes that if these different prescriptions are followed woolly aphis will disappear from the trees of a plantation.—"Monthly Bulletin of the International Institute of Agricultural Intelligence."

GRAFTING: REMOVAL OF BINDING.

A number of trees of various kinds have been grafted by officials of the Department in different villages. It is obviously impossible for them to return again to each village merely in order to remove the binding, and this must be left to the tree-owners themselves. The latter are invariably instructed on this point; but yet again and again the matter is neglected, and one frequently sees trees which have been sadly disfigured in consequence of the bandage having been left on too long. The bandage should be removed not later than 15 or, at most, 20 days after grafting. If left on beyond that time, the circulation of sap is interfered with, and whereas the new graft will develop and swell out above the head of the stock, that portion of it which remains under the binding will be undeveloped, and at the grafting point the graft will become so weak that it will be liable to be broken by any light wind.

The success of the binding operation is shown by the bud swelling, and then the head of the stock must be cut off to about 4—6 in. above

the union, so as to enable us to fasten to it the first season's growth and prevent it from being blown off. The remaining 4—6 in. of the stock's head should be furnished with leaves. Should there be no leaves, the stock should be cut off at a higher point, as the leaves are indispensable for the circulation of sap and for the success of the grafts. The remaining head of the stock must be cut just above the graft the following season.—"Cyprus Journal."

FRUIT TREE AND GRAPE VINE PRUNING.

We have received from the author, Mr. George Quinn, Horticultural Instructor to the Department of Agriculture, South Australia, a copy of his "Handbook for Fruit and Vine Growers," just published. In arranging the order of the subject matter, Mr. Quinn says that the sequence given is "that which a good many years of close and varied observation have led me to believe to be that which will be found the most conducive to obtaining a good grounding in the essentials of this fascinating subject." From beginning to end—from the basic principles of pruning to the framing of the tree, and to the renovation of old trees, to summer and winter pruning—the entire book places clearly before the fruit-tree grower and the vigneron the successive operations to be carried out for the formation of a successful orchard or vineyard. The instructions for the work and the reasons for it are given so clearly and in such simple language devoid of all unnecessary scientific verbiage, which in some treatises on orchard work serve only to confuse the non-scientific orchardist, that any reasonably intelligent man can follow and act upon them with little difficulty. The book, which covers 277 pages, and is most profusely illustrated with exceptionally good photographs, should prove of the greatest value to all engaged in fruit-growing, whether professionally or as amateurs. Mr. Quinn has by his work done a great service to them all.

BANANA CULTURE.

The Director of Fruit Culture (Mr. A. H. Benson) does not recommend the planting of maize between the rows of bananas. The only crops which should be so planted are crops for green manuring, which will tend to increase the organic matter in the soil as well as supply nitrogen for the use of the banana plants. Bananas are gross feeders, and the growing of any crop such as corn between the rows would be apt to deplete the soil of the plant foods which are required for the production of first-class bunches of bananas.

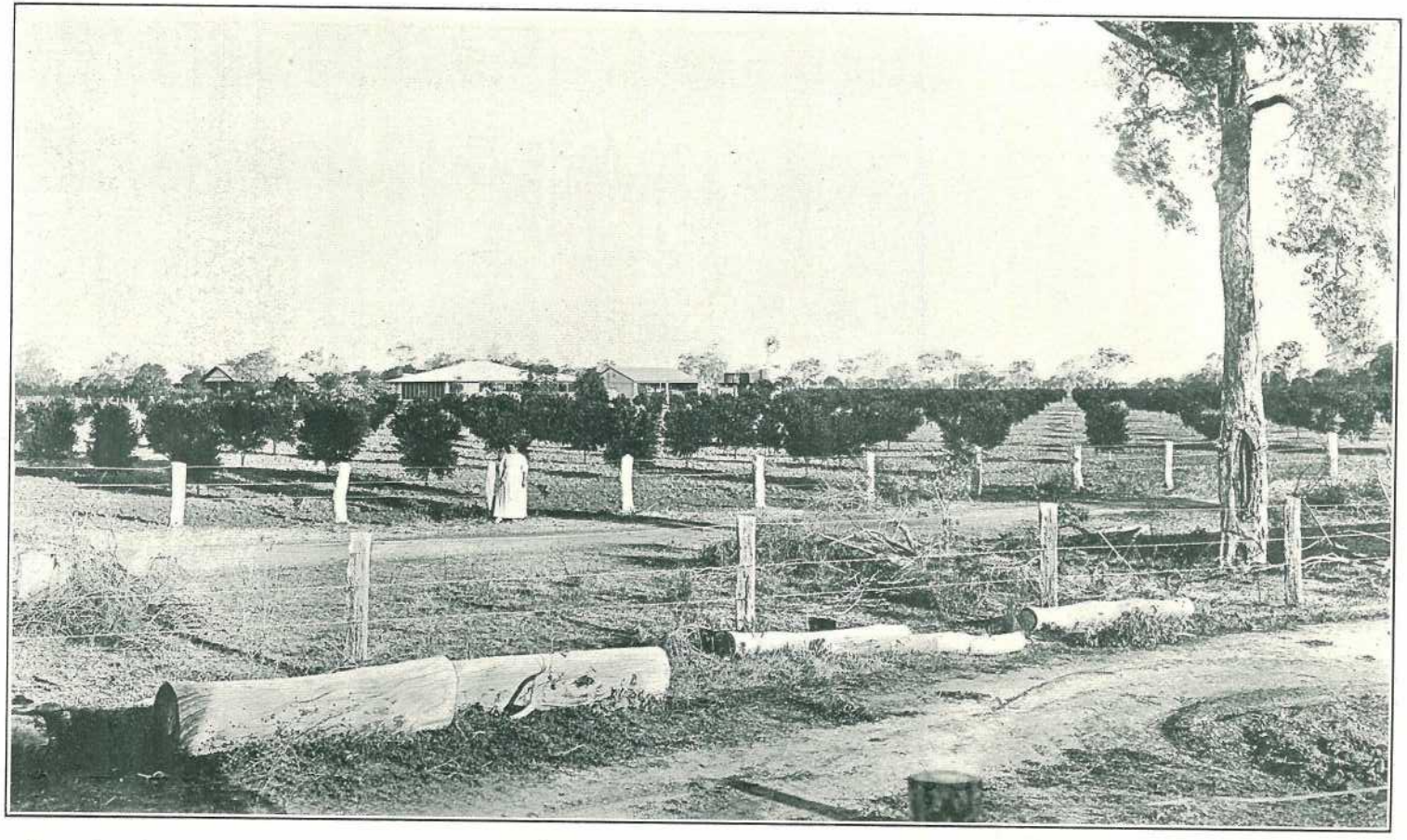


PLATE 23.—BOWEN: PORTION OF A CITRUS PLANTATION, SHOWING EMPEROR MANDARINS PLANTED 2½ YEARS AGO. DWELLING-HOUSE AND PACKING-SHED IN THE BACKGROUND.

PLATE 24.—YOUNG PINE SUCKERS (SMOOTH LEAF) ON A BOWEN PLANTATION.

Horticulture.

THE PIGEON PEA.

Mr. W. McLean, of Spring Vale Experimental Farm, Boggabri, New South Wales, sends us the following notes of the *Cajanus Indicus*, or Indian Pigeon Pea:—

The seed should be planted in early spring, about 2 in. deep, and be well watered, when a light crop of peas may be obtained at the end of the summer. If frosts are severe, cover the plants lightly during the first winter. The tree will bear flowers throughout the winter, and towards the end will be one mass of flowers and pods. My trees are now so covered with flowers and pods that I have to prop the limbs up to keep them from breaking off. I may mention that the seeds are easily germinated. The tree is a quick grower, and very ornamental, and, once well established, is fairly hardy and mostly always in flower. The peas can be used dry or green.

Mr. McLean also contributes the three following items of interest to fruitgrowers and others:—

GRAPE TOMATO.

This tomato is little known in these States. It makes an attractive arbour vine, with a profusion of delicious fruit for preserving, and it is very easily grown. Seeds require to be planted early in spring, so as to give the vine a long summer.

RADISH (THE CHINA ROSE).

This is a radish that is little known. It is a delicious radish, with a beautiful colouring from light red, at the top, to almost pure white at the tip; very suitable for private gardens.

FEIJOA SELLOWIANA, OR PINEAPPLE GUAVA.

This is a fruit suitable in many parts of Australia. A relative of the common guava, but very much superior to it. The fruits are considered delicious by many people, and a few of them will perfume a room with a pleasing fragrance. It is considered hardy, and will stand frost, down to 10 degrees above zero. It is considered very ornamental as a hedge shrub. It is very ornamental when in flower.

SOWING PEPPERINA SEEDS.

Mr. J. F. Bailey, Government Botanist, advises that the seed be sown about half an inch deep, in soil placed in a shallow box, at the bottom of which a layer of charcoal covered with dry grass should first be placed for drainage. When the seedlings are about 2 in. high, pot each off into a receptacle, such as a 1-lb. jam tin (assuming that a 4-in. flower pot is not available) filled with soil. Holes should be made in the bottom of the tin, and other drainage requirements provided, as above stated. When the plants are about 15 in. high, plant out (during showery weather, if possible) into the permanent situations. Keep the soil continually moist from the time of sowing the seed until the plants have become firmly established.

Tropical Industries.

COFFEE AND COFFEE RUST IN JAVA.

In Doctor Copeland's report on a visit to Java, published in the "Philippine Agriculturist and Forester" (April, 1915), he discusses the subject of disease, and, as he states in the following extract from his report, it would appear that a new species of pest of known parentage has appeared which has characters specifically different from those of the parent coffee rust in Ceylon. The extract referred to was republished in the "Agricultural News," Barbados, of 28th August, and reads as follows:—

"The coffee rust attacked Java several years before it reached the Philippines, and absolutely nothing but difference in the two Governments is responsible for the fact that Java has still an exceedingly important and profitable coffee industry, while that of the Philippines has been dead for the past twenty-five years. The Javanese Government met the coffee rust promptly with a fight by means of fungicides, by selection of the most resistant plants to be found locally, and by the importation of every other kind of coffee which could be found in the world. The result is that the various speciee of coffee which are now being experimented with at Los Banos, and in almost every other similar institution in the tropics, have all been brought to our attention by the Government of the Dutch Indies. The first of these to show great promise was Liberian coffee. This was widely heralded as a rust-resisting species, and was extensively planted in Java, and to a lesser extent in many other parts of the Old World tropics.

"It developed after a time that the quality of the marketed Liberian coffee was such that it could only be raised with a profit where labour is exceedingly cheap, and that even here it was at a serious economic disadvantage. The Dutch Government met this difficulty by a careful study of methods of preparation, with the ultimate result rather recently obtained—and for which, although I have myself made a considerable study of the subject, I was absolutely unprepared—that the Liberian coffee produced in Java is now being marketed at a price above that of the Arabian coffee for which Java itself is so famous.

"A wholly new and unexpected difficulty then presented itself. The Liberian coffee began to be attacked by rust, and these attacks increased in virulence year by year, until the coffee rust of Java now attacks Liberian coffee with approximately the same violence as Arabian. This is at the same time a matter of prodigious practical importance, and a fact of the utmost scientific interest. Neither the coffee nor the coffee rust is native in Java. It is practically impossible that the rust which now attacks the Liberian coffee should be anything else than a descendant of the rust which was formerly able to attack Arabian coffee but not Liberian. In other words, the pest has in the course of a number of years developed wholly new properties. Uninfected Liberian coffee has been exported from Java and raised elsewhere, and found immune to the

rust of the other regions. At the same time, new importations of Liberian coffee, immune to rust in the places of origin, have been brought into Java and promptly attacked. Now, the ability to live on a particular host is in very many cases regarded as a good specific character of a fungus. It can accordingly be regarded as definitely established that there has been developed in Java during the last twenty-five years a fungus of known parentage, but which now has characters specifically different from those of the parent coffee rust of Ceylon. This is the most satisfactory case known to me in the whole realm of science, of the evolution of a new species from a known parent within a definitely known length of time, and under conditions which are a matter of satisfactory record.''

Statistics.

RAINFALL IN THE AGRICULTURAL DISTRICTS.

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

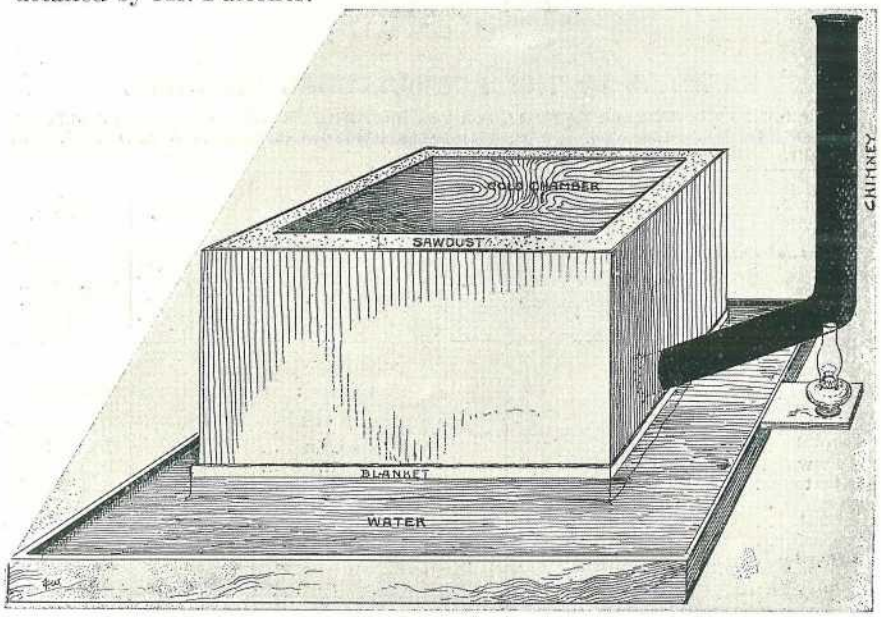
Divisions and Stations.	Average Rainfall.		Total Rainfall.		Divisions and Stations.	Average Rainfall.		Total Rainfall.	
	Oct.	No. of Years' Records.	Oct., 1915.	Oct., 1914.		Oct.	No. of Years' Records.	Oct., 1915.	Oct., 1914.
North Coast.	In.		In.	In.	*South Coast*—continued:	In.		In.	In.
Atherton	0·74	13	0·25	1·50					
Cairns	1·60	27	0·17	2·32	Nanango	2·28	27	0·83	3·12
Cardwell	1·74	27	0·78	3·14	Rockhampton ...	1·65	27	1·72	5·69
Cooktown	0·94	27	1·35	0·86	Woodford	2·74	27	0·21	3·92
Herberton	0·96	27	0·19	0·95	Yandina	3·28	21	0.83	6·25
Ingham	1·39	22	3·35	3·39					
Innisfail	2·45	27	2·01	7·33	*Darling Downs.*				
Mossman	3·31	5	1·51	4·22					
Townsville	1·18	30	0·15	0·38	Dalby	2·27	27	0·38	1·45
					Emu Vale	2·60	17	0·31	2·16
Central Coast.					Jimbour	2·01	24	0·16	0·99
					Miles	2·09	27	0·42	2·73
Ayr	0·88	27	3·44	0·08	Stanthorpe ...	2·48	27	0·33	2·46
Bowen	0·88	27	2·02	0·54	Toowoomba ...	2·56	27	0·26	3·96
Charters Towers ...	0·75	27	0·03	0·01	Warwick	2·42	27	0·02	2·70
Mackay	1·69	27	0·99	3·86					
Proserpine	1·48	11	1·95	3·18					
St. Lawrence ...	1·69	27	2·08	5·77	*Maranoa.*				
South Coast.					Roma	1·84	25	0·16	0·82
Biggenden	2·23	14	1·01	4·05	*State Farms, &c.*				
Bundaberg	1·97	27	0·80	6·36					
Brisbane	2·71	64	0·25	2·47	Gatton College ...	2·56	14	0·05	3·96
Childers	2·02	19	0·27	4·95	Gindie	1·17	13	0·83	4·43
Crohamhurst ...	3·74	22	0·21	6·42	Kamerunga Nurs'y	1·53	23	0·25	3·71
Esk	2·45	27	0·50	3·66	Kairi	...	...	Nil	0·84
Gayndah	2·24	27	0·11	2·94	Sugar Experiment				
Gympie	2·42	27	0·16	4·94	Station, Mackay	1·60	16	1·61	4·75
Glasshouse M'tains	3·40	6	0·20	3·45	Bungeworgorai ...	...	...	0·16	1·36
Kilkivan	2·59	27	0·45	1·19	Warren	...	...	3·09	2 85
Maryborough ...	2·11	27	0·11	5 00	Hermitage ...	2·15	7	0·20	1·90

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

Science.

ARTIFICIAL COLD.

At the request of a correspondent, we reprint an article on the above subject which we received in 1902 from Mr. G. Monks, One-mile, Gympie, a very instructive and interesting paper read by Mr. John Falconer, C.E., at an agricultural conference held in Bundaberg in June, 1893. As we are now approaching the hottest summer months, perhaps some of our readers might like to make a trial of the process as detailed by Mr. Falconer.



The general idea is thus stated:—When by any process, a change is produced in the form of matter, it undergoes certain developments; thus, when gas under pressure becomes liquefied, it gives off a great amount of heat, and when it again is allowed to expand it takes up heat from its nearest surroundings. That is the principle in all plans or systems whereby artificial cold is produced. If, when air is compressed in a cylinder, it is surrounded by water, the temperature of the cylinder will be reduced; but when the air is released again, if it be conducted through a pipe surrounded by water, the latter will be frozen, as the air in expansion takes up as much heat as it had before it was cooled after being reduced, and it takes up heat from whatever it comes in contact with. Mr. Falconer exhibited a cylinder into which gas had been pumped with great force, until there was a pressure inside it of nearly 300 lb. per square inch. Now, if a small pipe were attached to this cylinder, and the pipe were conducted through a bucket of water, the expanding

liquid gas would recover from the water all the heat it had before it was condensed and liquefied in the cylinder, and the expanding of the gas would cause the absorption of the heat surrounding the pipe and reduce the temperature of the water until it becomes frozen.

A model of a safe was then shown. Of this safe the author said—

"Twenty years ago I designed and had constructed for a friend near Brisbane a dairy on the principle here shown, and on the hottest day in summer you could always be sure that the dairy was a cool place; it was constructed on the side of a hill, and is in use to the present day (1893). The model was thus described:—A box having the appearance of an ordinary safe. It is double, and between the inner and the outer boards there is a packing of sawdust, which is a non-conductor of heat. It is airtight, except at the bottom. It stands in an open trough in which there is water, and around the bottom there is a casing of four plies of blanketing. At the side there is an air chimney, and under the elbow of the pipe is an ordinary kerosene lamp, the chimney of which enters the funnel through a small tube. The combustion of the air in the lamp creates an expansion of the air in the funnel; if the lamp is turned up high, a roaring is heard in the funnel, caused by the rush of expanding air through it, for the heated air passing up the funnel causes a partial vacuum in the box, expanding the air in it, and causing a draught. The outer air having no inlet, except through the wet blanket, becomes rarified in its passage through the chamber, and the desired effect—*i.e.*, cold storage—is produced, for the expanding air must get heat, and it gets it from whatever it comes in contact with; in other words, the heat is drawn from whatever is in the chamber to supply the requirement of a natural law. If a larger lamp is used, the expansion becomes greater, and whatever is in the chamber will be frozen.

The dairy constructed by Mr. Falconer was built on this principle, with a brick chimney. Butter was kept in it for months in sound condition, and the interior was so cold that no one would care to remain in it for half-an-hour.

We have, unfortunately, not got the model of Mr. Falconer's safe, but Mr. Monks has suggested the accompanying construction.

BANANA ASH.

A sample of banana ash was recently forwarded to Mr. J. C. Brünnich, Agricultural Chemist, for an estimate of its potash contents. This sample has been analysed with the following result:—

"The sample of crude banana ash submitted, contained in percentage:—

Potash	16·6
Lime	5·0
Phosphoric acid	1·4
Insoluble, chiefly carbon	34·7

This ash would be worth, at the present time, about £8 per ton. The yield is very small (about 1 per cent.), which agrees with our previous analyses; and the commercial utilisation of the banana stalks for production of potash manure is out of question. At the same time, it shows the importance of allowing the stalks to rot in the fields to return their mineral constituents to the soil."

LIME REQUIREMENTS OF QUEENSLAND SOILS.

BY J. C. BRÜNNICH AND E. H. GURNEY.

The application of lime to our agricultural lands has been advocated for years in this Journal and by the officers of the Department, and recent investigations appear to indicate that the need for liming is even greater than anticipated.

Every farmer is familiar with the term **sour** or **acid soil,** but may not be aware of the far-reaching effect which the reaction of the soil has on the production of crops. A soil may have an **acid, neutral,** or **alkaline reaction;** and its fertility may largely depend on this condition.

Although most of our fertile agricultural soils have a slight acid reaction, it may be safely asserted that the great majority of crops would do better if lime could be added in sufficient quantities to reduce this acidity and make the reaction as near as possible neutral. A few crops are the exception, and, for instance, potatoes do better and are freer from disease when grown on slightly acid soil.

A **high acidity** in a soil affects the plants adversely by a direct action on the root system, and by an indirect action on the micro-organisms in the soil. A **high alkalinity** again is not an advantage, and if such alkalinity is due to soda carbonate, the soil may be quite sterile.

The acidity of a soil is easily tested, by bringing the moist soil into contact with blue litmus paper, which according to the degree of acidity will become more or less reddened; when done with care, a fair idea with regard to the amount of lime required for such soil may be obtained.

The actual amount of lime present in a soil, whether found by extracting with hydrochloric acid or dilute citric acid, is not a sufficient guide to tell the farmer what amount of lime should be added to bring the soil to neutrality; and from the table published at the end of this paper it can be easily seen that some soils, containing a fair or even high amount of lime, are still in need of a heavy dressing with lime.

F. T. Veitch elaborated an accurate estimation of soil acidity with the aid of lime water ("Journal American Chemical Society," 1902, Vol. XXIV., p. 1120); and the results obtained by his method of the lime requirement of a soil show a fair agreement with the crop results on the addition of lime.

Quite recently H. B. Hutchinson and K. McLennan published a simple and rapid method for the determination of **lime required for soil neutralisation** ("Journal of Agricultural Science," 1915, Vol. VII., Part 1); and this method was used for the testing of some of our typical Queensland soils. The results of these tests are appended in tabulated form. In the table the amounts of lime (expressed as CaO) found by analysis are given in percentage, and the amount of lime necessary for neutralisation of the soil to a depth of 12 in. are given in cwt. of lime carbonate per acre. [A percentage of ·056 of lime oxide (CaO) or ·1 of lime carbonate ($CaCo_3$) is equal to about 17½ cwt. of lime oxide or 31·2 cwt. of lime carbonate per acre-foot.]

Air-slaked stone or **quicklime,** when applied to a soil, will have the most powerful and quickest action; it not only neutralises any acidity, but has a very strong action on the organic matter present in the soil, and also on the micro-organisms in the soil, with a partially sterilisation effect.

As a rule, we recommend to our farmers the use of **lime carbonate,** in form of finely ground **limestone** or **marble,** or **coral and shell sand;** but, in order to be effective, the limestone must be ground as fine as possible.

Hitherto it was considered necessary to apply the lime as a top dressing, as the leaching effect of rain water will tend to wash the lime into the soil; but recent experiences have shown that this action is extremely slow, and for this reason it is better to thoroughly mix the lime with the soil after application by ploughing or scarifying.

Unfortunately, at the present time, some prohibitive prices have been charged for agricultural lime in some instances, and, although limestone screenings are obtainable at the quarry for 5s. to 7s. 6d. per ton, as much as £2 10s. per ton has been charged for shell sand of inferior quality. Any finely-ground limestone should not cost more than about 10s. per ton, so that in most localities the cost of lime to the farmer, after paying all charges for freight, &c., should not be more than £1 to £1 10s. per ton; and at such a price the farmer could profitably apply the necessary heavy dressings.

It would be very interesting and of great value if on some farms experiments were made applying the amounts of lime recommended for neutralisation, and to compare the crops obtained from limed and unlimed portions for a few seasons.

Locality.	Soil.	Per Centage Lime (CaO), Soluble in—		Reaction.	Lime Required. Lime Carbonate ($CaCO_3$). Cwt. per Acre.
		Hydrochloric Acid.	Citric Acid.		
Yandina	Black loam (swampy)	0·27	·0274	Strongly acid	150
Buderim Mountain	Chocolate sandy clay	0·27	·0980	Acid	100
Cooroy	Brownish fine sandy loam	0·11	·0764	Very acid	94
Proserpine	Brown clay	0·47	·0824	Acid	94
Mackay	Chocolate fine sandy loam	0·95	..	Acid	87
Buderim Mountain	Sandy clay	0·37	·1195	Acid	78
Proserpine	Brown sandy clay	0·43	·1000	Acid	78
Woodford	Brown sandy loam	0·20	·0818	Strongly acid	78
Bundaberg	Reddish-brown loam	0·46	·0826	Slightly acid	70
Rockhampton	Grey sandy clay	0·43	·0936	Strongly acid	47
Ayr	Yellowish-grey loam	0·28	·1074	Acid	41
Kingaroy	Chocolate fine sandy loam	0·41	·2244	Acid	41
Mulgrave	Brown sandy loam	0·32	·0575	Acid	39
Nambour	Brown medium sandy soil	0·12	·0914	Acid	37
Beenleigh	Brown fine sandy loam	1·57	..	Acid	31
Bundaberg	Reddish fine sandy loam	0·54	·1978	Acid	31
Greenmount	Dark-brown loam	1·36	·2454	Acid	28
North Arm	Yellowish-grey sandy clay	0·18	·1312	Slightly acid	27
Westwood	Dark-grey sandy clay	1·56	·2500	Slightly acid	27
Ayr	Greyish-brown loam	1·04	·1474	Acid	26
Stanthorpe	Grey sandy clay	0·18	..	Acid	25
Bundaberg	Red volcanic clay	0·58	·1812	Acid	25
Tarampa	Greyish sandy loam	1·70	·2424	Acid	22
Gatton	Black medium sandy soil	1·07	·1975	Slightly acid	22
Miles	Brown medium sandy soil	0·31	·0736	Acid	16
Murgon	Dark-grey sandy loam	0·86	·2660	Neutral	12
Mackay	Brown loam	0·92	·2064	Acid	12
Bowen	Brown sandy clay	1·48	..	Neutral	6
Goombungee	Dark alluvial sandy loam	0·73	·1364	Acid	5
Bungeworgorai	Dark-buff sandy clay	0·21	·0620	Neutral	0
Nobby	Black sandy loam	2·19	·2922	Slightly alkaline	0
					Lime ($CaCO_3$) in excess of neutrality; Cwt. per Acre.
Fassifern	Light-brown clay	1·26	·4000	Neutral	*1*
Westbrook	Black sandy loam	1·60	·3216	Neutral	*1*
Bowen	Dark-brown sandy loam	1·47	..	Neutral	*8*
Rosewood	Grey sandy clay	0·98	·3392	Strongly alkaline	*11*
Kynuna	Brown fine sandy loam	1·77	·5606	Alkaline	*17*
Greenmount	Black loam	2·86	·4782	Alkaline	*25*

Botany.

NOTES BY THE GOVERNMENT BOTANIST.—No. 1.

PLANTS POISONOUS TO STOCK.

Owing to scarcity of feed during the past season several plants, at other times almost untouched, have caused considerable injury to stock. Among these, *Hoya australis* and *Gastrolobium grandiflorum* have been particularly severe; and the following interesting accounts regarding their effects on stock have been received:—

WAX-FLOWER (*HOYA AUSTRALIS*).

This succulent twiner has for many years been looked upon with disfavour by stockowners, and was referred to by Bailey and Gordon in "Plants Reputed Poisonous to Stock" (1887) as the cause of the deaths of a number of sheep while being driven through a scrub in which a quantity of it was growing.

During the past few months quite a number of letters have been received from stockowners from different parts of the State forwarding this plant for identification, with the remark that they suspected it of causing losses amongst stock. As, judging from the numerous specimens received for name and information, the plant does not seem very well known, it has been deemed advisable to publish the following description and notes, together with a figure which should aid in its identification.

In December, 1914, specimens were forwarded from J. J. O'Dempsey, Freestone Creek, as causing the death of several cattle; these specimens were submitted to the Agricultural Chemist (J. C. Brünnich), who reported that they did not respond to the specific tests for the more commonly recurring organic poisons (prussic acid, saponin, and alkaloids).

In August last, a quantity of the plant was forwarded to the Editor of the "Queensland Grazier" by A. J. McCanny, Nanango, with the following remarks:—"Last week two fat bullocks died in one of my paddocks; in fact, one bullock was not quite dead when I found him. He had been down some hours and could not get up, and the whole time I was with him he was in a fit of convulsions. I afterwards skinned him and opened him up; he was a perfectly sound bullock, with one exception, and that was in the part called the 'Bible.' I felt this, and it was as hard as a rock; and when I opened it, the contents, instead of being soft, were hard and dry and very light. Some of the leaves of the plant now sent were found in the stomach."

These specimens were handed over to the Director, Stock Experiment Station, Yeerongpilly, who reported as follows:—"Four guinea pigs were placed in a cage on the 7th instant (August), and fed with *Hoya* vine. Two of the youngest ones developed symptoms of paralysis on the

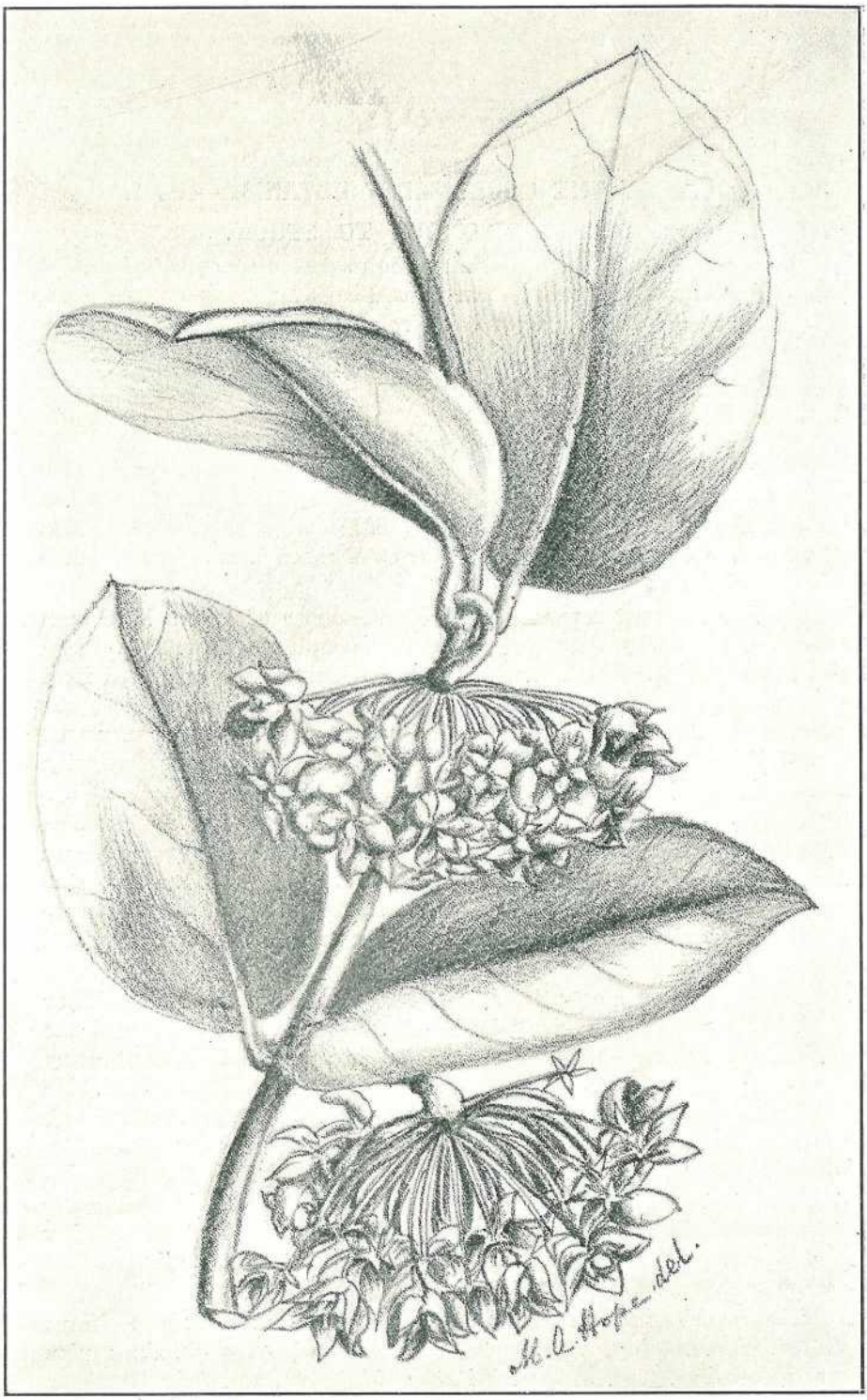


PLATE 25.—WAX-FLOWER (*Hoya australis*).

second day; one died on the third day, and one on the fourth day; the remaining two guinea pigs, which were older, developed only slight symptoms of paralysis, but eventually recovered."

About the same time, the Department received a letter from H. H. C. West, Jandowae, who reported the loss of 15 head of cattle through eating this plant. All seemed to be affected in the kidneys and hind quarters, but that other cattle had recovered, especially those drenched with Epsom salts.

A. McGown, M.R.C.V.S., recommends the following remedy:—"1 lb. Epsom salts and 1 lb. treacle should be given as soon as the animal is noticed to be sick, which should be followed daily with 2 dr. potassium iodide dissolved in half a pint of water."

The following is a brief description of the plant:—

"A succulent twiner, glabrous or the leaves sometimes with a few scattered hairs. Leaves thick, fleshy, on short stalks, ovate, obovate or nearly orbicular, obtuse or shortly pointed, rounded or almost cordate at the base, 2-4 in. long. Flowers white, in simple umbels borne on short stalks. Fruit (follicles) several inches long, slender; seeds numerous, with tufts of silky hairs attached."

WALL-FLOWER OR HEART-LEAVED POISON BUSH.

(*GASTROLOBIUM GRANDIFLORUM.*)

With regard to this well-known plant of the north-western parts of the State, the following information received from H. A. Crawford, Maryvale Springs, Yalleroi, are of such interest that they are here given to supplement the former articles in this Journal—namely, September, 1889, by F. M. Bailey; and August, 1908, by J. C. Brünnich. In a letter dated the 15th of September last Mr. Crawford writes:—"There are a great many conflicting opinions regarding it still being poisonous after it is cut, even among men who have had years of experience amongst it. I myself fed two sheep in a pen with some which had been cut for three months and five days, and both sheep appeared to eat an equal quantity of it. One died, and the other was hardly affected at all—just seemed a bit sick for a few days, but not enough to stop it from eating and drinking as usual." After reading the above-mentioned articles, Mr. Crawford, in a further letter, states:—"The poison in this plant cannot be of a volatile nature, as I have known the dry plants, which have been cut and lying out exposed to the weather, to kill both horses and sheep when it had been cut three months and five days. I opened a horse which had died from eating this dried poison, and the stomach appeared to have patches of a white hard substance like solidified froth adhering to it, and the tissues of the stomach appeared to be very tender. You could poke your finger through it anywhere. The first symptoms the horses showed were that they stood with their heads down close to the ground and their legs wide apart. You could ride up to them and crack a whip alongside of them, and they would not appear to know you were there. If hit with the whip, they would take a few steps forward and seem to have hard work to keep their balance and could

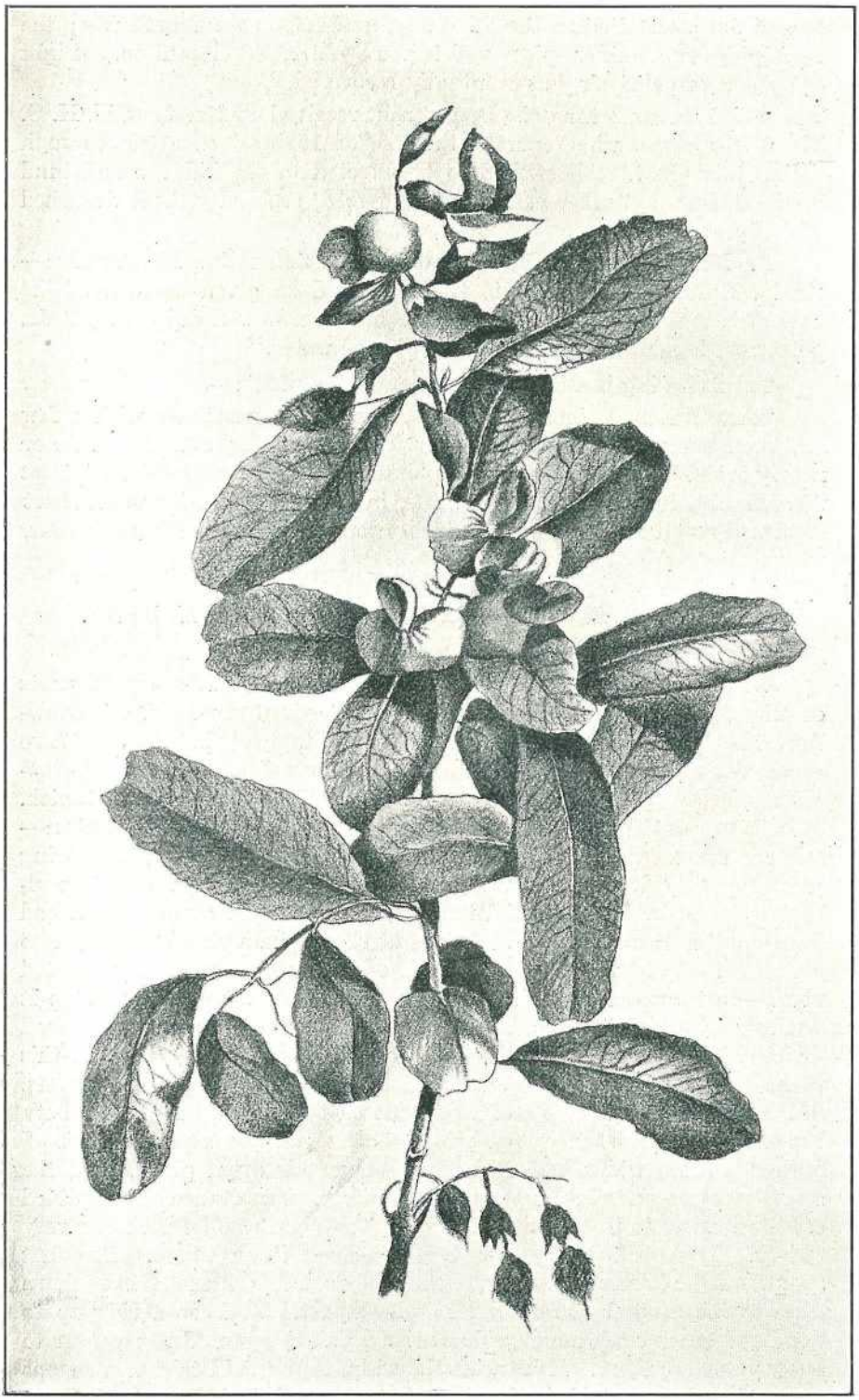


PLATE 26.—WALL-FLOWER OR HEART-LEAVED POISON BUSH (*Gastrolobium grandiflorum*).

only do so by walking with their legs wide apart. In almost every case, the lips swelled up considerably, and in some cases also the whole head, and they kept their mouths open slightly with the saliva dripping out as if their mouths had been burnt. The inside of the mouth also looked as if it had been scalded or burnt in patches. In the later stages they all appeared to get spasms and twitchings, and very often would spin round several times before they would fall down. They would get up again, and would stand with legs wide apart, with the ears and muscles all twitching and the flank muscles continually contracting as if with griping. They all appeared to go blind, and the eyes would not blink if a stick was waved close to the eye unless it happened to touch the eyelashes. I tried to drench several with oil, but could not get any to swallow. Some that were put into a yard with water kept dipping their mouths into it and letting it run back into the trough. These afterwards recovered. Some of them passed what seemed to be the mucous lining of the stomach or bowels, and from then on began to eat a little. The sheep, which I fed in a pen, and which died, showed similar symptoms to the horses. Out of nine horses poisoned in one night three died and the rest recovered."

BARB-WIRE INJURIES.

We are frequently asked what is the best way to deal with injuries sustained by stock—especially horses—by contact with barbed wire. Dr. A. S. Alexander, Department of Horse Breeding, Wisconsin advises:—

"After a barb-wire accident, do not apply axle grease or any rancid ointment to the wound. Wash the wound thoroughly with warm water. Then clip the hair as close as possible around it, and wash again to remove any hair or other foreign substance.

"When sand or hair has lodged in the depths of a deep cut, never use a wet sponge to clean it out. Use a piece of absorbent cotton or cotton batting. There will be much less risk of infection.

"It will be useless to put stitches in a wound that is very deep or ragged, or that is located in a place not in perfect rest when the animal is making natural movements.

"Dry dusting powder has a healing effect on barb-wire wounds and other large moist cuts and abrasions. Such a powder may be prepared cheaply by mixing together equal parts of slaked lime, sulphur, and charcoal.

"Prevent lock-jaw dangers in nail wounds of the hoof by opening them up freely, which provides drainage for serum and pus. Saturate with a solution of corrosive sublimate and water in the proportion of 1 to 500. Cover with dusting powder, absorbent cotton, and a bandage. This treatment should be repeated daily until the wound is healed."

[Mr. McGown, M.R.C.V.S., Veterinary Surgeon to the Queensland Department of Agriculture and Stock, is quite in accord with this treatment for barb-wire wounds.—Ed. " Q.A.J."]

Entomology.

REPORT OF THE ENTOMOLOGIST TO THE BUREAU OF SUGAR EXPERIMENT STATIONS.

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

"At this time of the year, when neither grubs nor beetles are procurable for experimental purposes—the former having transformed into pupæ from which the latter have not yet emerged—opportunity is afforded for reviewing past work and preparing for future investigations. The present season is unusually interesting, owing to the continuance of dry weather and consequent establishment of abnoraml climatic conditions which are certain to exercise important influences on the economy of soil-frequenting larvæ.

"In a previous report, when alluding to what I have termed meteorological control, it was mentioned that during September and October, 1914, larvæ of our mealy-backed cockchafer had pupated unusually near the surface and large numbers had been ploughed up on volcanic soils. This exceptional circumstance was no doubt due to the abundant rainfall experienced at Gordonvale during August, 1914, thirteen days of which were wet, the registered amount having exceeded the average for that month by an additional 3·45 in. It has already been pointed out that excessive wet about that time of year tends to induce grubs to pupate near the surface, and, should hot weather set in shortly after pupation and continue for a month or so, great numbers of pupæ lying in light volcanic and sandy soils under seed cane would be likely to perish owing to the earth above them drying out before they were able to transform into beetles.

" Unfortunately, as foretold in a previous monthly report, further rains about the end of October, 1914, put an end to our hopes in this direction, by maintaining ideal soil conditions for the development of cane beetles. To the occurrence of this latter rain must, I think, be attributed in great measure the severity of the recent outbreak at Greenhills, where no less than 25 tons 11 cwt. of grubs were collected during March, April, and May, 1915, at a cost of £749 sterling.

"It appears more than likely that this serious monetary loss would have been very considerably reduced had the dry weather continued throughout October.

"No rain fell at Gordonvale last month, and as on outcome of prolonged drought grubs infesting light soils started to pupate about the middle of August, three weeks earlier than last year.

"Wishing to ascertain the position of existing pupæ, tests were applied on the 3rd October to a plot of affected volcanic land by digging a number of pits 5 ft. square by 2 ft. deep at varying distances apart.

" The first four holes contained collectively 23 pupæ, 4 larvæ, and 1 beetle of *Lepidiota albohirta,* besides 32 grubs of other species of Scarabacidæ (principally *L. frenchi*) in various stages of growth.

No pupæ were unearthed nearer than 1 ft. from the surface, and none deeper than about 15 in.

"The majority were lying in earth that was nearly dry.

"A month later further tests were made on the same piece of land, when it was found that the soil had become slightly drier and fully 20 per cent. of pupæ perished; while the remained had transformed into beetles which were resting in their pupal chambers awaiting the occurrence of rain sufficiently heavy to soften the ground and enable them to escape.

"Should the present weather conditions continue, it will be interesting to note the effect of drought on these adult insects imprisoned in the soil."

MEASUREMENT OF CATTLE BY WEIGHT.

To arrive at a close estimate of the weight of cattle, mere guesswork is not reliable. There is, however, a rule by which the weight can be very accurately determined. There is one condition in connection with this method, which cannot easily be adapted to the guessing competition of the fat bullock, say, at the National Association's Exhibition at Bowen Park. That condition is that the competitor must be able to handle the beast, and this, of course, cannot be permitted, where the weight has to be arrived at by merely studying the build and condition of the animal.

THE RULE IS—

Multiply the square of the girth by 5 times the length. Divide the product by 21. This gives the net weight of the animal in imperial stones of 14 lb. Or, to obtain the weight in scores, divide by 30.

EXAMPLE.

An animal girths 7 ft., and is $5\frac{1}{2}$ ft. in length.

The square of the girth is $7 \times 7 = 49$; 5 times the length is $27\frac{1}{2}$. Then $49 \times 27\frac{1}{2} = 1{,}347\frac{1}{2}$.

Divide this by 21. Result: 64 stones 2 lb., or 898 lb. Or, dividing by 30. Result: 44 scores 18 lb., or 898 lb.

If the animal is very fat, $\frac{1}{15}$ should be added to the weight thus obtained; if not moderately fat, $\frac{1}{15}$ should be deducted.

General Notes.

A GOOD FLY GLUE.

1. Melt together 6 parts of colophony, 4 of rapeseed oil, and 3 of resin.

2. Eight parts of resin, 4 parts each of turpentine and rapeseed oil, and ½ part of honey.

3. Boil to a thick paste 1 lb. of resin and 3½ oz. each of molasses and linseed oil. Apply either of these mixtures to a thick stick, and plant it in a pot filled with sand.

POLLINATING TOMATOES.

The Biologist of the New South Wales Department of Agriculture has tried a practice in vogue in the Channel Islands (Guernsey, Jersey, Alderney, and Sark), where large quantities of tomatoes are raised for the early London market. There the tomatoes are staked, and boys are frequently sent round daily to strike the stakes with a stick. The shaking thus received by the plant is said to promote pollination, and to result in a larger production of fruit. The Biologist mentioned tried the experiment with tomatoes grown under glass, and, whatever other causes may have operated, he obtained excellent results.

FUMIGATION OF EGYPTIAN COTTON SEED.

The "Board of Trade Journal" publishes the following note in regard to Egyptian cotton seed:—

H.M. High Commissioner for Egypt reports to the Foreign Office that the Egyptian Ministry of Agriculture is anxious to call the attention of all purchasers of Egyptian cotton seed to the desirability of insisting on its fumigation at the port of shipment, with the object of destroying the pink boll worm which it may contain.

It is almost certain that this parasite first reached Egypt in bales of imperfectly ginned cotton from India, and it is very probable that it will be introduced into other countries where Egyptian cotton seed is sown, unless the seed is previously fumigated.

With a view to eradicating the pink boll worm in Egypt, measures are being taken to introduce a law requiring the fumigation of all cotton seed in Egypt.

It will be some time before these measures can be universally adopted owing to the absence of adequate machinery, but in the meantime the Ministry of Agriculture is ready to fumigate small amounts of seed, supplying a certificate of fumigation with the consignment.—"Agricultural News."

MONEY IN WATTLE BARK.

In the Report of the Durban Chamber of Commerce for 1914 it is stated that the Natal wattle bark trade has suffered a check by reason of the war. The exports for the first seven months of 1914 amounted to 47,663 tons, as compared with 39,899 tons in the corresponding period of the previous year; but the total amount exported in 1914 was only 58,132 tons, valued at £286,399, as compared with 65,042 tons, valued at £309,268, in 1913. Had conditions been normal, it is stated, the exports for 1914 would have exceeded those of 1913.

The wattle-tree thrives so well in Queensland, that it appears surprising that a large business in the wattle-bark industry has not long since been built up. At one time small quantities of wattle bark were obtained, principally about Dalveen; but of late nothing has been heard of an industry which brings in from £286,000 to £309,000 per annum in South Africa.

THE "AUSTRALIAN SUGAR JOURNAL."

Those who are interested in sugar-growing in Queensland will welcome the November issue of this Journal for many reasons, the main one being that, besides the usual interesting current topics on the Sugar Industry—as, for instance, on Sugar Conferences, Workers' Accommodation Bill, Experiment Work in other Lands, &c., it gives, in this issue, a *resumé* of the Auditor-General's Report on Central Sugar Mill Companies for 1914-15. The operations of these mills are not given much space in even the newspapers published in the Sugar Districts; but we have it here almost *in extenso*, so that growers and millowners can compare notes on their respective activities. The articles in "Sugar District Notes" are also most interesting and of very great value, not only to existent cane-growers, but to prospective investors. On the whole, the November issue of the "Sugar Journal" is, in our opinion, a most valuable record of the Sugar Industry in Queensland, and well worthy of careful study.

PRICES FOR PIGS.

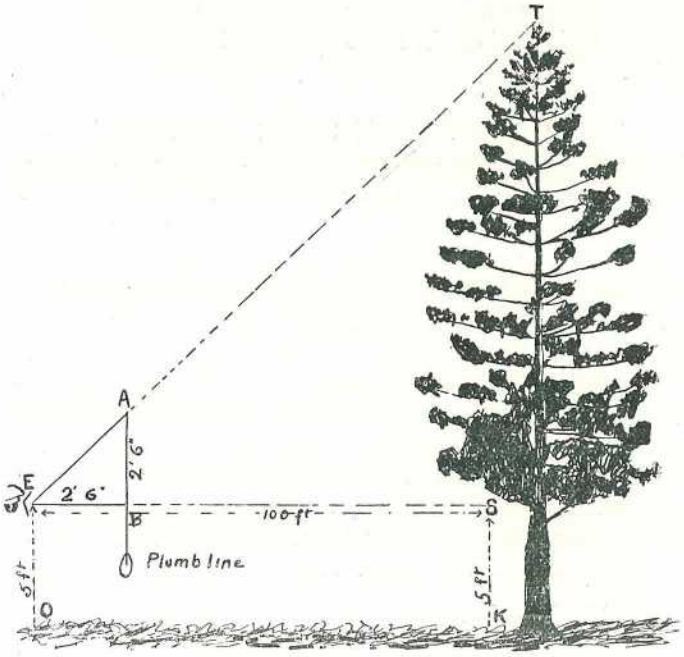
Referring to a note on high prices paid for pigs at Maryborough, which appeared in the October issue of this Journal, Mr. W. H. Davidson, Wilmount, Tambourine Mountain, writes:—"About the same date (7th September), 'back-fatters' at the Nerang pig sales sold for £9 5s., which is the highest price paid for a factory pig in this State, that I have heard of so far. Your correspondent at Tinana quotes the *maximum* price for a fat pig at Maryborough, but as the weight is not given, it leaves one in doubt, but I can quote, probably, the *minimum* for a fat pig sold at Maryborough about the year 1873, when my father sold a white pig weighing slightly over 500 lb. for £1 10s. I believe backfatters reached the vicinity of £20 this last winter in Melbourne." Mr. Davidson forwards two cuttings from the "Australasian" of August and September, 1915, in which the prices of prime backfatters ranged from £8 to £18.

PRICE OF SILK COCOONS.

Latest advices from European sources give the price of Russian cocoons as from £1 8s. to £2 8s. per poud (36 lb.)—about 9¼d. to 1s. 4d. per lb.; 1,600 cocoons go to 1 lb., and 1 acre of land will produce 300 lb. of cocoons.

MEASUREMENT OF STANDING TIMBER.

Mr. L. M. Daniel, Elsternwick, in forwarding the accompanying sketch to "The Leader," writes:—Selectors and others frequently want to find out the quantity of timber in a standing tree. The method described here will give the contents of timber in a tree approximately, and does not take into account accurately the whole of the limbs. Cut



a piece of pine or deal board into a triangle right-angled at (B). Let the observer place the long edge of board to his eye, and move backward or forward (on level ground) until the edge of board exactly coincides with top of tree, taking care that the plumb line is along edge AB, and hangs steady. Now measure from eye to butt of the tree (say, 100 ft.). This distance, plus the height of eye from the ground, is the height of the tree. (*See* example in illustration.) ES plus EO equals TK. ES equals 100 ft; SK or EO equals 5 ft; therefore height of tree is 105 ft. Cubic contents of tree approximately. To find the cubic contents of tree, multiply the square of half the diameter of tree by 3·14, and multiply this product by half the height of tree:—Diameter of tree is 4 ft.; square of ½ diameter equals 4 by 3·14 by 52·5 equals 659·4 cubic feet."

Another simple method of ascertaining the height of a tree can be used on a sunshiny day.

Cut a stick about 12 in. long. Place it upright in the ground. Note the height of the stick above the surface and measure the length of the shadow thrown by it. Then measure the shadow of the tree. Suppose this to be 20 ft., and the shadow of the stick to be 6 in. The question then is:—If a stick 12 in. high throws a shadow 6 in. long, how tall is a tree which throws a shadow 20 ft. long (240 in.)? By simple proportion—

6 : 240 :: 12 : 480, or 40 ft.

This example obviously requires no calculation, as both stick and tree throw a shadow equal to half their height.

NATIVE ANIMALS ABSOLUTELY PROTECTED.

Tree Kangaroo (all species of Dendrolagus).
Wombat, Duck Mole or Platypus, Hedgehog, or Echidna.
Flying Squirrel or Opossum Mouse.

A CLOSE SEASON FOR NATIVE BEARS AND OPOSSUMS.

It has been notified, in the *Government Gazette*, 5th November, 1915, that Native Bears and Opossums are totally protected throughout Queensland from the 1st November in each year to the 30th April in the following year, inclusive.

Those interested in the fur trade, trappers, dealers in skins, and young people who take their holidays in the bush, who are fond of "mooning" 'possums and bears and flying squirrels, will do well to note that severe penalties attach to the breaking of the law in this respect. The penalty for killing these animals during the abovementioned close season is up to £5. Cyanide of potassium and other poisons lately used for killing fur-bearing animals are expressly unlawful, and anyone making use of such substance is liable to a fine of £10. By a clause in the Act, however, when Opossums are found to injure any field or garden crops, it is lawful to destroy them. Aboriginals may also kill any marsupials or native bears for food, but it is unlawful to sell or buy any skins thus procured.

ERADICATING COUCH GRASS FROM A HEDGE.

When couch grass has been allowed to make a heavy growth on land unoccupied by crops, it can be got rid of by repeated working; but where it encroaches, as often happens, beneath a Duranta or Privet hedge, it is more difficult to deal with it. The "Nor'-West Farmer," Manitoba, gives the following advice in the latter case to a correspondent:—

"There are two methods that occur to us as being likely to be practical. One is to take two strips of tar paper. Lay one down lengthwise, like a carpet, alongside the row of shrubs. Lay the other strip down the other side. Cut in from the sides at points opposite the shrubs, so as to push one piece well over the other, and so cover every inch of ground down the row, except just where the shrubs come through. This will seal the ground below the paper. Then throw an inch or so of soil

over the paper, so as to hold it down tightly in place. By sealing up the area absolutely, the couch grass beneath will be smothered out in one season, or, at the most, in two. It may be necessary to use four strips in order to get a wide enough area. If the hedge plants are small, they may suffer somewhat for lack of rain about the roots, but one could easily see if any harm was resulting.

"The other method is to spread a heavy mulch of strawy manure about the rows. This could be done at any time of year. Spread the mulch widely enough. This will not be especially good treatment for the caraganas, but the effect of it on the couch grass will be to cause it to develop its system of root-stocks right up at the surface of the ground. The next year one can select a hot dry time in July to remove the mulch. Then fork up, carry off, and burn the spreading root-stocks. We have known of this plan being tried in the West with reputed success. One must remember, however, that couch grass root-stocks are full of buds, and that even an inch of the root-stocks will produce a new plant. The extermination, therefore, must be thorough, and any bit of root escaping must be dug out when it grows later on.

"We should prefer to try the tar paper method first."

Answers to Correspondents.

GAS LIME.

"E.B.," Palmwoods—

Gas lime may be used like ordinary air-slaked lime, broadcasted at the rate of 1 ton per acre. It is very rare that this lime contains any injurious substance. You will find full information about the value and use of lime in the issue of this Journal for May, 1914.

DROMOTHERAPY—YEOMAN.

"IGNORAMUS," Enoggera—

Dromotherapy is a term derived from the Greek word *dromas,* running. Hence Hippodrome. It is the term for a kind of running adopted in military drill—the science of running. From this root also the camel known as the Dromedary derives its name, as being a swifter animal than the Bactrian camel, which has two humps on its back, the Dromedary having only one. The word "Yeoman" has no reference to a farmer, as many suppose. In the time when England was celebrated for its archery, the Yew-tree was very much in requisition, as all the bows used at the battles of Crecy, Poictiers, Flodden, and Agincourt were made of this wood. Those who bore the bow in battle were called "Yew-men," whence was derived the term "Yeomen." Doing "yeoman service" implied service on the battlefield, not on the farm.

The Markets.

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

Article.		NOVEMBER. Prices.
Bacon	lb.	1s. 2d. to 1s. 4½d.
Bran	ton	£4 15s.
Broom Millet	"	£37
Butter	cwt.	140s.
Chaff, Mixed	ton	£8 to £10
Chaff, Oaten	"	£10 to £12
Chaff, Lucerne	"	£13 to £14
Chaff, Wheaten	"	£8 10s. to £9 10s.
Cheese	lb.	11d.
Flour	ton	...
Hams	lb.	1s. 3½d.
Hay, Oaten (Victoria)	ton	£16
Hay, Lucerne	"	£8 to £9
Honey	lb.	3d. to 4½d.
Maize	bush.	5s. 9d. to 5s. 10d.
Oats	"	3s. to 4s. 9d.
Onions	ton	£7 10s. to £8
Peanuts	lb.	3d. to 4d.
Pollard	ton	£6 10s.
Potatoes	"	£20
Potatoes (Sweet)	cwt.	3s. to 4s.
Pumpkins	ton	£10
Eggs	doz.	1s. to 1s. 2d.
Fowls	pair	4s. to 7s. 6d.
Ducks, English	"	3s. 9d. to 5s.
Ducks, Muscovy	"	5s. to 6s. 9d.
Geese	"	3s. 6d. to 5s.
Turkeys (Hens)	"	9s. to 11s.
Turkeys (Gobblers)	"	17s. to 22s.
Wheat (Chick)	bush.	5s. 9d to 6s.
VEGETABLES.		
Cabbages, per dozen		2s. 6d. to 7s. 6d.
Cauliflowers, per dozen		...
Beans, per sugar bag		2s. to 7s. 6d.
Beetroot, per dozen bunches		9d. to 1s.
Carrots, per dozen bunches		9d. to 1s.
Chocos, per quarter-case		2s. 6d. to 3s. 9d.
Cucumbers, per dozen		3d. to 1s. 2d.
Custard Marrows, per dozen		2s. to 4s.
Vegetable Marrows, per dozen		2s. to 4s. 6d.
Parsnips, per dozen bunches		...
Lettuce, per dozen		...
Peas, per sugar bag		2s. 6d. to 10s.
Celery, per dozen bunches		1s. 6d. to 2s. 6d.
Sweet Potatoes, per cwt.		3s. to 4s.
Table Pumpkins, per cwt.		6s. to 8s.
Tomatoes, per quarter-case		2s. 6d. to 8s. 6d.
Turnips, per dozen bunches		8d. to 9d.
Rhubarb, per bundle		1s. to 1s. 6d.

SOUTHERN FRUIT MARKETS.

Article.	OCTOBER. Prices.
Bananas (Queensland), per case	13s. to 15s.
Bananas (Fiji), per case	22s.
Bananas (G.M.), per case	20s.
Bananas (G.M.), per bunch	6s. 6d.
Mandarins, per case	15s. to 20s.
Mangoes, per case	6s. to 8s.
Oranges (Navel), per case	17s. to 20s.
Oranges (other), per case	7s. to 12s.
Passion Fruit, per half-bushel case	3s. to 12s.
Lemons, per bushel case	9s. to 12s.
Papaw Apples, per double-case	6s. to 7s.
Pineapples (Queens), per case	12s. to 15s.
Pineapples (Ripleys), per double-case	9s. to 11s.
Pineapples (Common), per case	7s. to 8s.
Strawberries (Queensland) per tray	4s. 6d. to 10s.
Tomatoes, per quarter-case	7s. to 10s.
Cucumbers, per case	20s.

PRICES OF FRUIT—TURBOT STREET MARKETS.

Article.	OCTOBER. Prices.
Apples (Tasmanian), per case	14s. to 22s.
Apples, Cooking, per case	12s. to 15s.
Apricots, per case	5s. 6d. to 10s. 4d.
Bananas (Cavendish), per dozen	2d. to 4½d.
Bananas (Sugar), per dozen	2d. to 4d.
Cape Gooseberries, per quarter-case	7s. to 10s.
Cherries, per case	5s. to 10s.
Cocoanuts, per sack	12s. to 15s.
Custard Apples, per quarter-case	5s. to 8s.
Granadillas, per quarter-case	...
Lemons (Lisbon), per case	5s. to 8s.
Loquats (Mammoth), half-bushel case	5s. to 11s.
Limes (Choice), per case	7s. to 8s.
Mandarins, per half-case	3s. 6d. to 5s. 6d.
Mangoes, per case	5s. to 7s.
Oranges (Navel), per case	8s. to 12s.
Oranges (other), per case	8s. to 12s.
Papaw Apples per quarter-case	2s. to 4s. 8d.
Passion Fruit, per quarter-case	5s. to 8s.
Peaches, per case	1s. 6d. to 3s. 6d.
Peanuts, per pound	3d. to 4d.
Rosellas, per sugar bag	...
Pineapples (Ripley), per dozen	5s. to 9s.
Pineapples (Rough), per dozen	5s. to 6s.
Pineapples (Smooth), per dozen	8s. to 16s.
Rockmelons, per case	3s. to 12s.
Strawberries, per dozen pint boxes	5s. to 12s.
Strawberries, per tray	4s. 6d. to 10s. 6d.
Tomatoes, per quarter-case	2s. 6d. to 8s. 6d.
Watermelons, per dozen	7s. to 12s.

TOP PRICES, ENOGGERA YARDS, OCTOBER, 1915.

Animal.	OCTOBER. Prices.
Bullocks	£20 5s. to £28 2s. 6d.
Cows	£15 5s. to £17 7s. 6d.
Merino Wethers	32s. 6d.
Crossbred Wethers	32s.
Merino Ewes	28s.
Crossbred Ewes	35s. 6d.
Lambs	36s.
Pigs (Porkers)	45s.

Messrs. Clark Bros., stock and station agents, Bundaberg, inform us that early in November prices ruled high for pigs. One barrow pig, bred and fattened on Tantitha Station, was sold for £8 7s. 8d., and two barrows, fattened on Wombah Station, fetched £7 11s. and £7 1s., respectively. These were record prices for the district.

LONDON QUOTATIONS.

Cotton (Uplands), 6·89d.; S.I. cotton, 18d. to 30d. per lb.

Jute, £25 10s. per ton.

Sisal hemp, £35 10s. per ton.

Rubber: Fine hard Pará, 3s. per lb.; plantation, first latex crêpe, 3s. 1½d.; smoked sheet, 3s. 0¼d.

Copra (S.S.), £28 2s. 6d. per ton.

TIMES OF SUNRISE AND SUNSET AT BRISBANE—1915.

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

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

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

PHASES OF THE MOON, 1915.

On or about the 150th Meridian, East Long.

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

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

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

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

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

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

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

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

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

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

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

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

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

Orchard Notes for January.

THE SOUTHERN COAST DISTRICTS.

The fruit of the month in this part of the State is the grape, and its gathering and marketing will occupy the attention of growers. Care should be taken to cut the fruit when cool and dry, and if it has to be sent any distance the stems of the bunches should be allowed to wilt before the fruit is packed, as the berries will then hang on to the bunch better, and the bunch carry in better order. Select the fruit carefully, grade it, and pack firmly so that it will not bruise in transit. If to be sent long distances, pack in crates holding from four to six 6-lb. baskets. Pines will be ripening in quantity towards the end of the month. Gather before fully coloured, and, whether for Southern or local markets, pack and handle carefully to prevent bruising. Do not ship the fruit too green for the Southern markets, as doing so is apt to spoil the trade. Send good fruit to the canneries. Small pines and crippled fruit are no good to canners, and the sooner our growers realise that it only pays to grow good fruit the better for them and for the canners, as if the latter cannot get good fruit it is impossible for them to put out a line of goods that will not only be a credit to the State, but for which a world-wide market can be obtained.

Passion fruit should not be allowed to lie about for days on the ground before gathering, as if so, they are apt to become fly-infested.

Watermelons and rockmelons are still in season.

Watch any late peaches, Japanese plums, or other fruits liable to be infested with fruit fly, and gather and destroy all infested fruit, or, better still, grub the trees out and burn them, as they only breed flies to destroy more valuable fruit. Mangoes will be ripening during the month. See that all fly-infested fruits are destroyed, as they will only breed up further crops to destroy later ripening fruits.

Citrus orchards can be cyanided during the month for scale insects, and spraying for Maori with the sulphide of soda wash should be continued where necessary.

Mangoes can be budded during the month, as well as citrus and deciduous trees. Tropical fruit trees can be transplanted, taking care to choose dull weather and to cover same from the direct rays of the sun till they have become firmly established. Pines and bananas can still be planted.

THE TROPICAL COAST DISTRICTS.

See that all bananas are covered with netting, as the fly is usually at its worst at this time of year.

Mangoes will be going off. See that they are not allowed to remain about on the ground to breed flies for the Autumn crop of oranges. Longan, litchi, and other fruit are in season. As the month is often a

very wet one, little cultivation can be done in the orchards. Strong undergrowth should, however, be kept down with a hoe or scythe. Tropical fruits of all sorts can be planted. Look out for Maori on citrus fruits, and spray when necessary.

THE SOUTHERN AND CENTRAL TABLELANDS.

January is a busy month in the Stanthorpe district; apples, pears, plums, peaches, and nectarines being in season. Do not gather the fruit too immature; at the same time, don't allow it to be over-ripe. Gather dry, handle carefully, and grade and pack in attractive cases. Keep the fruit as cool as possible, and ship in well-ventilated cars. Keep a sharp lookout for fruit fly, and take every possible means to prevent its spreading, even going as far as to gather and destroy the whole of the fruit on any infected trees, as if kept in check during the month the bulk of the fruit ripening during February will be free.

Keep a sharp lookout also for codling moth, examine the bandages on the trees at least every ten days, and destroy all larvæ found therein; also gather and destroy all moth-infected fruit.

Gather Bartlett pears as soon as they are large enough, and store away in a cool shed to ripen; when they show signs of ripening, market—not before. If sent down green, they will sell for cooking and only fetch a small price. The right stage at which to gather is when the fruit is fully developed, and the flesh has lost its woody flavour, but is still quite hard. This is usually before the fly has stung it, and if gathered at this stage the fruit will ripen up properly without shrivelling, and develop its full flavour.

These remarks apply also to the Downs country, which is somewhat earlier than Stanthorpe.

The crop of the month in the Western tablelands is the grape; and the remarks I have made respecting this fruit when grown in the Southern Coast districts apply equally here. The fruit should be gathered dry, and wilted before it is packed. Too large cases are often used; cases holding from 20 to 30 lb., or crates holding six 6-lb. baskets, are preferable, the latter being the best package for shipping the fruit long distances. Keep the orchards well cultivated, and, where water for irrigation is available, give citrus trees a watering during the month, unless there has been a sufficient rainfall. When the orchard is irrigated, see that thorough cultivation follows the irrigation, so as to conserve the moisture in the soil.

Red Scale, which is prevalent on citrus trees in the dry Western country, should be treated during the month. Cyaniding is the best remedy.

Farm and Garden Notes for January.

FIELD.—The main business of the field during this month will be ploughing and preparing the land for the potato and other future crops, and keeping all growing crops clean. Great care must be exercised in the selection of seed potatoes to ensure their not being affected by the Irish Blight. Never allow weeds to seed. This may be unavoidable in the event of long-continued heavy rains, but every effort should be made to prevent the weeds coming to maturity. A little maize may still be sown for a late crop. Sow sorghum, imphee, Cape barley, vetches, panicum, teosinte, rye, and cowpeas. In some very early localities potatoes may be sown, but there is considerable risk in sowing during this month, and it may be looked upon merely as an experiment. Plant potatoes whole.

KITCHEN GARDEN.—A first sowing of cabbages, cauliflower, and Brussels sprouts may now be made in a covered seed bed, which must be well watered and carefully protected from insect pests. Sow in narrow shallow drills; they will thus grow more sturdy, and will be easier to transplant than if they were sown broadcast. The main points to be attended to in this early sowing are shading and watering. Give the beds a good soaking every evening. Mulching and a slight dressing of salt will be found of great benefit. Mulch may consist of stable litter, straw, grass, or dead leaves. Dig over all unoccupied land, and turn under all green refuse, as this forms a valuable manure. Turn over the heavy land, breaking the lumps roughly to improve the texture of the soil by exposure to the sun, wind, and rain. In favourable weather, sow French beans, cress, cauliflowers, mustard, cabbage, celery, radish, for Autumn and Winter use. Sow celery in shallow, well-drained boxes or in small beds, which must be shaded till the plants are well up. Parsley may be sown in the same manner. Turnips, carrots, peas, and endive may also be sown, as well as a few cucumber and melon seeds for a late crop. The latter are, however, unlikely to succeed, except in very favourable situations. Transplant any cabbages or cauliflowers which may be ready. We do not, however, advise such early planting of these vegetables, because the fly is most troublesome in February. For preference, we should defer sowing until March. Still, as "the early bird catches the early worm," it is advisable to try and be first in the field with all vegetables, as prices then rule high. Cucumbers, melons, and marrows will be in full bearing, and all fruit as it ripens should be gathered, whether wanted or not, as the productiveness of the vines is decreased by the ripe fruit being left on them. Gather herbs for drying; also garlic, onions, and eschalots as the tops die down.

FLOWER GARDEN.—To make the flower beds gay and attractive during the Autumn and Winter months is not a matter of great difficulty. Prepare a few shallow boxes. Make a compost, a great part of which should consist of rotten leaves. Fill the boxes with the compost, then sow thinly the seeds of annuals. Keep the surface of the soil moist, and when the young seedlings are large enough to handle life them gentle one by one with a knife or a zinc label—*never pull them up by hand,* as, by so doing, the tender rootlets are broken, and little soil will adhere to the roots. Then prick them out into beds or boxes of very light soil containing plenty of leaf mould. Then keep a sharp lookout for slugs and caterpillars. Keep a supply of tobacco dust on hand, and scatter this in the path of the slug, and he will cease from troubling you.

All kinds of shrubby plants may be propagated by cuttings. Thus, pelargoniums, crotons, coleus, and many kinds of tropical foliage plants can be obtained from cuttings made this month. After putting out cuttings in a propagating frame, shade them with a piece of calico stretched over it. Be careful not to overwater at this season. Propagate verbenas, not forgetting to include the large scarlet Fox-hunter. Verbenas require rich soil. Palms may be planted out this month. If the weather proves dry, shade all trees planted out. With seed boxes, mulch, shade, water, and kerosene spray, all of which imply a certain amount of morning and evening work; the flower garden in Autumn and Winter will present a charming sight and will afford light and profitable work for girls with spare time on their hands.

An exhaustive booklet on "Flower Gardening for Amateurs" has been issued by the Department of Agriculture and Stock, and may be obtained from the Office. Price, 2s.

LIST OF AGRICULTURAL, HORTICULTURAL, AND PASTORAL SOCIETIES AND ASSOCIATIONS IN QUEENSLAND.

Societies and associations desirous of being registered and placed on the above list must make application to that effect, and forward to the Under Secretary for Agriculture and Stock the following particulars:—

Number of members who have paid their subscriptions for 1915.

Number of meetings held by the Society during 1915.

Date of the last meeting.

Name of the Secretary for 1915.

It is equally necessary that prompt notice be given to the Editor of changes in the Secretaryship of any Society or Association, a matter which is much neglected. Furthermore, information concerning dates on which shows are to be held must be forwarded to the Editor at least six weeks before the Show date. If these suggestions are not complied with, the Society whose Secretary neglects to supply the required information will be liable to be struck off the list of Societies published monthly in the Journal.

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1915.	1916.
Allora ...	Central Downs Agricultural and Horticultural Association	J. C. Marshall ...	17 and 18 Feb.	16 and 17 Feb.
Aloomba, *vid* Cairns	Aloomba Farmers' Association ...	Hugh A. Niven ...		
Amberley ...	Amberley Farmers' Progress Association	J. T. Goldsborough		
Atherton ...	Atherton Agricultural, Pastoral, and Industrial Association	H. McKnight ...		
Atherton ...	Atherton Table Land Agricultural Society	H. McKnight ...	22 and 23 Sept.	
Ayr	Lower Burdekin Farmers' Association	R. W. Edwards ...		
Ayr	Lower Burdekin Pastoral, Agricultural, and Industrial Association	C. G. M. Boyce ...		
Bajool ...	Bajool and Ulam Farmers' Progress Association	A. T. Mitchell ...		
Ban Ban, *vid* Wetheron	Dundar Branch of the Queensland Farmers' Union	Geo. Gwynne ...		
Banyan, *vid* Cardwell	Banyan and Tully River Agricultural Association	A. J. Harman ...		
Barcaldine ...	Barcaldine Pastoral Agricultural and Horticultural Association	W. J. P. Chambers		
Beaudesert ...	Logan and Albert Agricultural and Pastoral Society	M. Selwyn Smith	11 and 12 May	11 May
Beenleigh ...	Agricultural and Pastoral Society of Southern Queensland	Capt. C. G. Gehrmann	23 and 24 Sept.	
Beenleigh ...	Logan Farmers' and Industrial Association	Wm. G. Winnett ...		
Beerwah ...	Coochin Creek District Agricultural and Progress Association	E. F. Jones ...		
Berwen ...	Haughton River Farmers' Association	James Griffith ...		
Biggenden ...	Biggenden Agricultural and Pastoral Society	C. J. Stephensen ...	22 and 23 June	
Bin Bin, *vid* Byrnestown	Bin Bin Farmers and Settlers' Association	Milo Burke ...		
Blackall ...	Barcoo Pastoral Society	C. M. Pegler ...		
Blenheim ...	Blenheim and District and Farmers' Progress Association	W. A. Zerner ...		
Blythedale ...	Blythedale Agricultural Progress Association	J. L. Quinn ...		
Boonah ...	Fassifern and Dugandan Agricultural and Pastoral Association	J. McKenzie ...	19, 20, and 21 May	17 and 18 May
Boowoogum...	Brooyar Farmers' Progress Association	Jas. Cahill ...		
Bowen ...	Bowen Farmers' Association... ...	H. Reye		

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1915.	1916.
Bowen ...	Bowen Pastoral, Agricultural and Mining Association	F. Sellars		
Brisbane ...	The Queensland Dairy Herd Book Society	Alfred Gorrie ...		
Brisbane ...	National Agricultural and Industrial Association of Queensland	J. Bain	9 to 14 Aug.	
Brisbane ...	Queensland Chamber of Agricultural Societies	J. Bain		
Brisbane ...	Horticultural Society of Queensland	F. W. Woodroffe ...		
Bucca, *viâ* Bundaberg	Bucca United Farmers' Association	W. D. Moore ...		
Buderim Mountain	Buderim Branch of the Queensland Farmers' Union	Capt. G. Burrows...		
Bundaberg ...	Bundaberg Agricultural, Pastoral, and Industrial Society	Redmond Bros. ...	9 and 10 Sept.	
Bundaberg ...	Canegrowers' Union of Australia (Woongarra Branch)	O. H. Klotz ...		
Bundaberg ...	Woongarra Canegrowers' Association (A.S.P.A. Branch)	G. O. Strathdee ...		
Bunerba, Deeford (*viâ* Westwood)	Bunerba Farmers' Progress Association	G. F. Barnes ...		
*Burrum ...	Burrum District Farmers' and Fruitgrowers' Association	S. E. Tooth ...		
Byrnestown...	Byrnestown Farmers and Dairymen's Progress Association	Patrick Gilmer ...		
Caboolture ...	Caboolture Pastoral, Agricultural, and Industrial Society	C. V. Hemming ...	29 and 30 April	
Cairns ...	Cairns Agricultural, Pastoral, and Mining Association	H. McMahon ...		
Cairns ...	Cairns Horticultural Society ..	R. Tweedie ...		
Cedar Pocket, Gympie	Cedar Pocket Farmers' Association...	W. A. Fraser ...		
Charleville ...	Central Warrego Pastoral and Agricultural Association	T. C. Fallis ...		
Charters Towers	Charters Towers Pastoral, Agricultural, and Mining Association	A. H. Pritchard ...	6 to 8 July	
Charters Towers	The Towers Horticultural Society ...	Jas. H. Chappel ...	25 and 26 August	
Chatsworth...	Chatsworth Combined Farmers' Association	F. W. Johns ...		
Childers ...	Childers Pastoral, Agricultural, and Industrial Society	J. R. Wrench ...	10 and 11 June	
Childers ...	Doolbi Canegrowers' Association ...	R. S. Rankin ...		
Chinchilla ...	Canaga Farmers' Progress Association	G. H. Rochester		
Chinchilla ...	Pelican Farmers and Settlers' Association	H. K. Nevell ...		
Chinchilla ...	Chinchilla Agricultural and Pastoral Association	B. Mackie	6 and 7 April	
Clermont ...	Peak Downs Pastoral, Agricultural, and Horticultural Society	A. S. Narracott ...		
Clifton ...	Darling Downs Pastoral, Agricultural, and Industrial Association	S. C. Mott... ...	22 and 23 Sept.	
Coochin ...	Coochin Farmers' Progress Association	W. Watson ...		
Cooktown ...	Cooktown District Pastoral, Agricultural, Mining, and Industrial Association	E. A. S. Olive ...		
Cooroy ...	Cooroy West Farmers' Progress Association	O. M. Proll ...		
Cooroy ...	Mount Cooroy Progress and Farmers' Association	L. H. Baldwin ...		
Coulsen ...	Coulsen Farmers' Progress Association	Gustav A. Lewald		
Coulstoun, *viâ* Biggenden	Coulston Lakes Branch of the Queensland Farmers' Union	P. E. Britnell ...		
Crow's Nest...	Crow's Nest Agricultural, Horticultural, and Industrial Society	James Gleeson ...	6 and 7 April	25 and 26 April
Dalby ...	Northern Downs Pastoral and Agricultural Association	W. R. Hunter ...	21 and 22 April	
Dallarnil ...	Dallarnil Farmers and Dairymen's Association	H. J. Piper ...		

* Monthly meetings held alternately at Burrum and Howard.

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1915.	1916.
Deeford (Dawson Valley)	Dundee Farmers and Settlers' Progress Association	Thomas Evans ...		
Degilbo ...	Emu Creek Farmers and Dairymen's Progress Association	J. E. Peterson ...		
Didcot ...	Didcot Farmers and Settlers' Association	Fred. Jones ...		
Dirran, *viâ* Malanda	Dirran Settlers' Progress Association	Percy G. R. Dutton		
Emerald ...	Emerald Pastoral and Agricultural Society	J. Esmond	26 and 27 May	
Esk (Toogoolowah)	Esk and Toogoolawah Pastoral, Agricultural, and Industrial Association	A. M. Hurworth ...	8 and 9 June	10 and 11 May (at Toogoolawah)
Eukey, *viâ* Stanthorpe	Eukey Branch of the Stanthorpe and District Fruitgrowers' Association	Tom Green... ...		
Evelyn ...	Millstream Farmers and Settlers' Association	H. R. Gardiner ...		
Fairford ...	Fairford Agricultural and Pastoral Association	H. E. Hollins ...		
Fordsdale, *viâ* Grantham	Fordsdale Farmers' Association ...	W. M. Ridley ...		
Forest Glen, *viâ* Palmwoods	Forest Glen Fruitgrowers' Progress Association	W. A. Fielding ...		
Forest Hill ...	Forest Hill Agricultural and Progress Association	J. Stoddart ...		
Gayndah ...	Pastoral, Industrial, Agricultural, and Horticultural Association	M. C. Stephensen...	22 and 23 June	
Gayndah ...	Gleneden Branch of the Queensland Farmers' Union	W. S. Morris ...		
Gayndah ...	Gurgeena Farmers' Progress Association	W. G. Leaver ...		
Gin Gin ...	Gin Gin Agricultural, Pastoral, and Industrial Society	C. M. Morris ...	17 and 18 June	7 and 8 June
		Ploughing Match		
Gladstone ...	Port Curtis Agricultural, Pastoral, and Mining Association	J. T. W. Brown ...	18 and 19 May	
Glen Aplin ...	Ballandean Fruitgrowers' Association	W. H. C. Laird ...		
Gooburrum ...	Gooburrum Farmers' and Canegrowers' Association	W. J. Lutin ...		
Goomboorian, *viâ* Gympie	Goomboorian Dairying and Horticultural Association	M. Webster ...		
Goomboorian road, *viâ* Gympie	Ross and Mullin's Creek Farmers' Progress Association	R. E. Kitchen ...		
Goombungee	Goombungee Agricultural, Horticultural and Pastoral Society	J. J. Morgan ...	24 March	
Goondiwindi	Comoron-Moorobie Farmers' Progress Association	J. Johnston ...		
Goondiwindi	MacIntyre Pastoral and Agricultural Society	E. T. Drake ...		
Gooroolba ..	Gooroolba Farmers and Settlers' Progress Association	Leslie L. Jackson...		
Grantham ...	Ma Ma Creek Farmers' Progress Association	A. McKenzie ...		
Gympie ...	Agricultural, Mining, and Pastoral Society	F. W. Shepherd ...	1 and 2 Sept.	13 and 14 Sept.
Gympie (Goomboorian road), *viâ* Gympie	The Veteran and Scrubby Creek Farmers' Progress Association	T. T. Ramskill ...		
Hambledon (Cairns)	Hambledon Cane Farmers' Association	F. C. P. Curlewis		
Hawthorn (Daymar Siding)	Weengallon Farmers and Settlers' Progress Association	Laurence A. Seeger		
Helidon ...	Flagstone Creek Branch of the Queensland Farmers' Union	Fred Tuffrey ...		
Herberton ...	Herberton Mining, Pastoral, and Agricultural Association	Richard Barton ...	5 and 6 April	
Hughenden...	North Western Queensland Pastoral and Agricultural Association	P. Blackall ...		

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1915.	1916.
Ingham ...	Herbert River Pastoral and Agricultural Association	R. L. Jones ...	17 and 18 Sept.	
Inglewood ...	Inglewood Agricultural, Pastoral, and Horticultural Society	J. F. Cheshire ...	24 and 25 March	
Inkerman (Lower Burdekin)	Inkerman Farmers and Graziers' Association	L. M. Osborne ...		
Innisfail ...	Johnstone River Canegrowers and Manufacturers' Association	Ralph Reid ...		
Innisfail ...	Johnstone River Agricultural Society	T. Nesbet		
Ipswich ...	The Queensland Pastoral and Agricultural Society	G. W. Allen ...	26 and 27 May	25 and 26 May
Ipswich ...	Ipswich Horticultural Society ...	Hugh Parkinson ...		
Jackson (Western Line)	Parish Woleebee Settlers' Association	S. C. Griffin ...		
Jardine ...	Jardine Farmers' and Fruitgrowers' Association	H. M. Scheibe ...		
Juandah ...	Juandah Dairy and Progress Association	R. Bowie		
Kamma (Cairns)	The Cairns Canegrowers' Association	C. V. Hives ...		
Kenmore ...	Brookfield, Pullen Vale, and Moggill Farmers' Association	F. B. Howard ...		
Kilcoy ...	Kilcoy Pastoral, Agricultural, and Industrial Society	Arthur Sinclair ...	6 and 7 May	18 and 19 May
Kilkivan ...	Kilkivan Pastoral, Agricultural, and Industrial Association	F. E. Hopkins ...	9 and 10 June	
Killarney ...	Killarney Agricultural Society ...	L. W. Wilkinson ...	24 and 25 Feb.	23 and 24 Feb.
Kingaroy ...	Agricultural, Pastoral, and Industrial Society	R. A. Pearce ...	24 and 25 March	
Kin Kin, *vid* Cooran	Kin Kin and District Farmers' Progressive Association	A. C. Stewart ...		
Kooroongarra, *vid* Inglewood	Kooroongarra Farmers' Progress Association	J. French		
Laidley ...	Farmers' Progress Association ...			
Laidley ...	Lockyer Agricultural and Industrial Society	F. Roberts	21 and 22 July	
Lake Clarendon (*vid* Gatton)	Lake Clarendon Branch of the Queensland Farmers' Union	W. J. Walton ...		
Landsborough	Ratepayers and Fruitgrowers' Progress Association	R. E. Swan ...		
Lockrose ...	Lockrose and District Farmers' Progress Association	R. W. L. Raymont		
Longreach ...	Longreach Pastoral and Agricultural Society	A. Petersen ...		
Lowood ...	Lowood and Tarampa Pastoral and Agricultural Association	W. E. Michel ...	11 and 12 May	
Mackay ...	Pioneer River Farmers and Graziers' Association	T. J. Leonard ...		
Mackay ..	The Pioneer River Farmers and Graziers' Show Association	T. J. Leonard ...	22 and 23 June	
Macnade, *vid* Lucinda	Macnade Farmers' Association	E. S. Waller ...		
Millaa Millaa, *vid* Cairns	Millaa Millaa Settlers' Progress Association	Sydney S. Buckley		
Mapleton ...	Mapleton Fruitgrowers and Farmers' Progress Association	J. G. Smith ...		
Marburg ...	Marburg and District Agricultural and Industrial Association	A. H. Bielefeld ...	2 and 3 June	2 and 3 June
Mareeba ...	Mareeba District Mining, Pastoral, Agricultural, and Industrial Association	W. A. Ferguson ...		
Maryborough	Wide Bay and Burnett Pastoral and Agricultural Society	H. A. Jones ...	1, 2, and 3 June	
Miles ...	Miles District Agricultural and Pastoral Society	T. P. Goonan ...	21 April	

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1915.	1916.
Minehan's Siding, *vid* Townsville	Houghton River Farmers' Association	James Griffith ...		
Mitchell ...	Maranoa Pastoral, Agricultural, and Industrial Association	Neil Hammond ...	11 and 12 May	
Mondure, *vid* Wondai	Mondure Farmers and Dairymen's Association	G. E. Compagnoni		
Montville ...	Montville Fruitgrowers and Farmers' Progress Association	F. W. Thompson ...		
Mooloolah ...	Mooloolah and Glenview Farmers' Progress Association	William Ellison ...		
Mount Gravatt	Mount Gravatt and District Agricultural, Horticultural, and Industrial Society	J. H. Rackley ...	23 Oct.	
Mount Larcom (Gladstone)	Wilmott Farmers' Progress Association	J. J. Kelly... ...		
Mount Larcom	Mount Larcom Farmers' and Canegrowers' Association	Thomas Fraser ...		
Mt. Marshall, *vid* Allora	Mount Marshall Farmers' Progress Association	J. Rooney		
Mullet Creek	Mullet Creek Farmers' Association...	G. Lee		
Mundowran	Mundowran Pocket Farmers' Association	E. Canty		
Mundubbera	Mundubbera Farmers and Settlers' Progress Association	W. G. Parker ...		
Murgon ...	Murgon Branch of the Queensland Farmers' Union	W. D. Davidson ...		
Murray's Creek	Murray and Baffle Creek Progress and Farmers' Association	J. T. Dawson, junr.		
Nambour ...	Maroochy Pastoral, Agricultural, Horticultural, and Industrial Society	A. H. Bushnell ...	21 and 22 July	
Nambour ...	Bli Bli Farmers and Fruitgrowers' Progress Association	F. Pashen		
Nanango ...	Nanango Agricultural, Pastoral, and Mining Society	W. Selby	*	
Nerang ...	Southern Queensland and Border Agricultural and Pastoral Association	E. Fass	30 Sept.	
North Arm, N. C. Railway	North Arm Farmers' Progress Association	J. F. Fountain ...		
North Pine ...	The Pine Rivers Agricultural, Horticultural, and Industrial Association	G. W. Armstrong...	25 and 26 June	
Oakey ...	Oakey Agricultural and Pastoral Society	Alan B. Stanley ...		
Oakey Creek, *vid* Eumundi	Kenilworth Farmers' Association ...	Harry Pickering ...		
Okeden, *vid* Wondai	Proston, Okeden, and Wigtoun Settlers' Association	R. McNamara ...		
Oman-ama ...	Redbank Farmers' Progress Association	W. K. Ison ...		
Palmwoods ...	Queensland Farmers' Union (Palmwoods Branch)	W. Browne ...		
Palmwoods ...	Palmwoods Progress and Fruitgrowers' Association	Robt. Gregory ...		
Philpott Creek	Philpott Farmers' Society	R. H. Roe-Russell		
Pickanjennie	Pickanjennie Farmers' Progress Association	J. Proud		
Pittsworth ...	Pittsworth Pastoral, Agricultural, and Horticultural Association	W. O. Hare ...	27 Jan.	
Pomona ...	Noosa Agricultural, Horticultural, and Industrial Society	A. H. Shears ...	17 and 18 Nov.	
Proserpine ...	Proserpine Farmers and Canegrowers' Association	W. B. Caswell ...		
Ravenshoe ...	Ravenshoe Farmers and Graziers' Progress Association	W. R. Soilleux ...		
Roche Creek, *vid* Miles	Roche Creek Farmers' Progress Association	G. F. Smith ...		
Rockhampton	Alton Downs Farmers' Association...	G. T. Crook ...		

* Show abandoned.

AGRICULTURAL AND HORTICULTURAL SOCIETIES—*continued.*

Postal Address.	Name of Society.	Name of Secretary.	Show Dates.	
			1915*	1916.
Rockhampton	Rockhampton Agricultural Society...	H. Hill	27, 28, and 29 May	
Rockhampton	Jardine Farmers and Fruitgrowers' Progress Association	H. M. Scheibe ...		
Rockhampton	Fitzroy Farmers' Progress Association	T. Ritchie		
Roma ...	Western Pastoral and Agricultural Association of Queensland	H. M. Campbell ...	20 and 21 July	
Roma ...	Euthulla and Upper Bungil Farmers and Settlers' Association	John J. Maun ...		
Rosewood ...	Rosewood Agricultural and Horticultural Association	A. J. Loveday ...	28 and 29 July	26 and 27 July
Sexton ...	Sexton Farmers and Settlers' Progress Association	W. K. Harvey ...		
Speedwell, *viâ* Stalworth	Speedwell Farmers' Progress Association	Aubray U. Potter		
Springsure ...	Springsure Pastoral and Agricultural Society	W. Fisher	12 and 13 May	
St. George ...	Balonne Pastoral and Agricultural Association	Mark Roberts ..		
Stanthorpe ...	Stanthorpe Agricultural Society ...	A. E. Bateman ...	2, 3, and, 4 Feb.	
Tabragalba ...	Tabragalba and Canungra Farmers' Progress Association	A R. Ludwig ...	1916	
Takura, *viâ* Maryboro'	Takura Farmers' Union	S. E. Tooth ...		
Teutoberg ...	Teutoberg Farmers' Progress Association	E. H. Ochmichen...		
The Caves, *viâ* Rockhampton	Mount Etna Farmers and Selectors' Progress Association	Geo. Smith ...		
The Gums, *viâ* Tara	The Gums and Horse Creek Pastoral and Agricultural Association	S. E. Love... ...		
Tolga ...	Tolga Forest Farmers' Union ...	H. Northey ...		
Toowoomba...	Royal Agricultural Society of Queensland	G. Noble	13, 14, and 15 April	2, 3, and 4 May
Toowoomba...	Toowoomba White Growers' Association	A. C. Salmon ...		
Townsville ...	Townsville Pastoral, Agricultural, and Industrial Association	J. N. Parkes ..	29 and 30 June	
Wallumbilla	Wallumbilla Farmers' Association ...	H. A. Watson ...		
Warwick ..	Eastern Downs Horticultural and Agricultural Association	F. H. Selke ..	9, 10, 11, & 12 Feb.	8, 9, and 10 Feb.
Wellington Point	Wellington Point Agricultural, Horticultural, and Industrial Association	E. Ziegenfusz ...		
Wondai ...	Wondai Agricultural, Pastoral, and Industrial Society	H. J. Compagnoni	26 and 27 May	
Wondalli, *viâ* Goondiwindi	Wondalli-Yelarbon Farmers' Progress Association	L. C. G. Cameron		
Woodend ...	Warren-Woodend Farmers' Club ...	W. Lehfeld ...		
Woodford ...	Woodford Agricultural, Pastoral, and Industrial Society	G. H. Osmond ...	22 and 23 April	
Woombye ...	North Coast Agricultural and Horticultural Society	E. E. McNall ...	23 and 24 June	
Woombye ...	Woombye Fruitgrowers' and Progress Association	J. Howe		
Woongarra ...	Woongarra Canegrowers and Farmers' Union	R. A. Cattermull...		
Woowoonga Scrub	Woowoonga Farmers and Canegrowers' Association	Thos. Wilkins ...		
Yandina ...	Cooloolalin Farmers and Fruitgrowers' Association	A. Drummond ...		
Yandina ...	Maroochy River Farmers' Union and Progress Association	D. G. Martin ...		
Yandina Creek *viâ* North Arm, N.C. Line	Yandina Creek Farmers and Settlers' Progress Association	J. D. Benfer ...		
Yingerbay ...	Yingerbay Dairymen and Farmers' Association	R. Frederick ...		
Zillmere ...	Zillmere Agricultural, Horticultural, and Industrial Society	Arthur B. Marquis	18 Sept.	

Departmental Announcements

The Editor will be glad to receive any papers of special merit which may be read at meetings of Agricultural and Pastoral Associations in Queensland, reserving, however, the right to decide whether their value and importance will justify their publication.

Secretaries of Associations are requested to be good enough to forward to the Editor, as early as possible, the dates of forthcoming Shows, as it is important in the interests of the Associations that these dates should be published.

It is equally necessary that prompt notice be given to the Editor of changes in the Secretaryship of any Society or Association, a matter which is much neglected. Furthermore, information concerning dates on which shows are to be held must be forwarded to the Editor at least six weeks before the Show date. If these suggestions are not complied with, the Society whose Secretary neglects to supply the required information will be liable to be struck oc the list of Societies published monthly in the Journal.

To enable recipients of the *Queensland Agricultural Journal* to have the half-yearly volume bound, Covers in Boards and Cloth will be supplied from this Office on application to the Under Secretary for Agriculture. Applications must be accompanied by a remittance to cover cost. Covers will be supplied at ONE SHILLING and ONE SHILLING AND NINEPENCE each.

In order to avoid disappointment, correspondents who wish for replies to questions in the Journal are requested to note that it is imperative that all matter for publication on the first day of any month should reach the Editor by the 15th of the previous month.

Persons desiring to communicate with the Queensland Agricultural College and State Farms are requested to address their correspondence to the Principal of the College, Gatton, and to the Managers of the State Farms. The State Farms are: Hermitage (Warwick), Gindie (*viâ* Springsure), Warren (Stanwell), Bungeworgorai (Roma), Kairi (Tolga), Kamerunga State Nursery (Cairns).

We would ask our Subscribers to note that, when their Subscription has run out, a RED CROSS is placed against the Order Form. It often happens that this intimation is disregarded, with the result that the JOURNAL is NOT POSTED to the Subscriber. The Department cannot guarantee to supply back numbers in such cases.

It is notified, for the information of intending Visitors to the Queensland Agricultural College, that the Second Wednesday in each month has been set apart for the reception of Parties of Farmers and others desirous of inspecting the Institution. Supplies of hot water and milk can be obtained at the College, if desired.

The Department has now prepared a booklet on "Flower Gardening for Amateurs," which may be obtained on application to the Under Secretary for Agriculture and Stock. Price, TWO SHILLINGS.

PAMPHLETS on different subjects relating to Agriculture, Horticulture, and Stock are issued by the Department, and may be obtained gratis, on application to the Under Secretary.

NOTICE OF SHOW DATES.

We wish to draw the attention of Secretaries of Agricultural and Pastoral Societies and Associations to the importance of promptly notifying the Editor of any change in the dates on which shows are to be held.

QUEENSLAND AGRICULTURAL COLLEGE.

FOR SALE.

GRASS ROOTS.—Paspalum and Rhodes Grass roots. Price, 2s. 6d. per sack, f.o.b., Gatton.

POULTRY.

The following breeds are available:—Brown Leghorn, White Leghorn, Silver-Grey Dorking, Indian Game, Plymouth Rock, Black Orpington, Buff Orpington, Silver-Laced Wyandotte, White Wyandotte.

Prices:

Cockerels—10s., 15s., and 21s.
Pairs—Cockerel and Pullet, 30s. and 42s. } f.o.b. Gatton.
Trios—Cockerel and two Pullets, 42s. and 63s.

Prices vary according to quality. Unless crates are returned promptly, an extra charge of 2s. for a single bird and 1s. for each additional bird will be incurred.

Settings of eggs of the above breeds are available from 1st July up to 30th November. Price, 10s. per setting, f.o.b., Gatton. Nine eggs in each setting guaranteed fertile. Should less than nine prove to be fertile, the infertiles will be replaced, if returned, carriage paid and unbroken.

(N.B.—An infertile egg is uniformly translucent when held up to a strong light. Settings should be allowed to settle twenty-four hours before being placed under the hen.)

AYRSHIRE BULLS, For Sale—

No. 112. Sire, Netherton King George (imp.) Dam, Miss Lark. Calved, 31st October, 1914.

No. 137. Sire, Netherton King George (imp.) Dam, Lady May. Calved, 7th March, 1915.

No. 126. Sire, Stewart of Wanora. Dam, Lady Loch II. Calved, 8th February, 1915.

All cattle sold accompanied by pedigree.

Price: £10 10s. each, f.o.b., Gatton.

YORKSHIRE AND BERKSHIRE PIGS—

Orders will be received for Boars and Sows of the above breeds. Price: From eight to twelve weeks old—£2 10s. each, f.o.b., Gatton. All pigs sold accompanied by pedigree.

FOR SERVICE—

CLYDESDALE STALLION, *Lord Cellus* (Imported).
Service fee, £3 3s. per mare and 1s. 6d. per week agistment.

AYRSHIRE BULLS—*Netherton King George* (Imported).
Stewart of Wanora.

SHORTHORN BULL—*Bloomer of Darbalara.*

HOLSTEIN BULL—*Froxfield Dairyman* (Imported).

JERSEY BULLS—*Star Turn* (Imported).
Reuben.

Service fee, 10s. per cow; agistment, 1s. per week.

IMPORTED BERKSHIRE and LARGE BRITISH BLACK and YORKSHIRE BOARS.

Service fee, 5s. per sow. An extra charge of two shillings and six pence is made if sow required to remain three weeks for second service.

All orders must be accompanied by remittance of the amount due.

All service charges must be settled before removing the animals from the College property.

CUTHBERT POTTS, Principal.

QUEENSLAND AGRICULTURAL COLLEGE.

The College, which is situated within 4 miles of Gatton and 1 mile from the College Railway Siding, comprises 1,692 acres, and the buildings can accommodate 60 Students.

TERMS.

Twenty-seven Pounds per annum, paid half-yearly in advance. Students are also charged One Pound per annum each for medical attendance, the sports fund, and for guarantee fee.

The course of instruction includes **Practical Agriculture** in all its branches, **Dairying, Gardening, Stock-Breeding, and Mechanical Arts.** Classes are also held daily for **Theoretical Instruction** in these branches, as well as in **Surveying, Chemistry,** &c.

The College Calendar, giving full particulars, may be obtained on application to the Principal at the College, or to the Under Secretary for Agriculture and Stock, Brisbane.

BURSARIES.

Four bursaries are given annually. An examination for these is held in December of each year. Bursaries will be awarded upon the following conditions:—Candidates (males) to be from fifteen to eighteen years of age, of sound constitution, and in good health; they must have resided in the State for the two years immediately preceding the time of their examination for such bursary; or their parents must have resided in the State three years immediately preceding such examination. The bursar is entitled—subject to good behaviour and the pleasure of Parliament—to free board and instruction as a resident student for a period of three years. He is required to take up his residence at the College within one month of the publication of the results of the examination; otherwise he forfeits his right to a bursary.

The **Age of Candidates** for Admission to the College as Students is Fourteen Years.

Full particulars and conditions on application to

The Under Secretary,
Department of Agriculture and Stock, Brisbane.

STATE FARM - - WARREN.

Stock for Sale.

YOUNG **AYRSHIRE BULLS.** Prices and particulars on application. Young **BERKSHIRE BOARS** and **SOWS.** Prices: Boars, £2 2s.; Sows, £1 1s. F.O.B., Warren. Crates returned.

Roots of the following Grasses for sale at 2s. 6d. per sack. F.O.B., Warren:— **Rhodes, Paspalum, Giant Couch.**

FOR SERVICE.—The Imported **Clydesdale Stallion, "Sir George."** Fee: £2 2s per mare; and 1s. per week agistment. **Ayrshire Dairy Bull, "Naomi's Arthur."** Fee: 5s. per cow; and 6d. per week agistment. **Two Imported Berkshire Boars**— "Peterkin W." and "Flockmaster." Fee: 5s. per sow; and 1s. per week agistment.

THOS. JONES, Manager.

Department of Agriculture and Stock, Queensland.

"The Fruit Cases Act of 1912."

Attention is drawn to the Regulations under this Act which come into force on the 1st June, 1915, and it is notified that on and after that date fruit that is sold in cases or is exported to any place within the Commonwealth must be in cases of the dimensions mentioned below. Bananas are excepted from the operations of the Queensland Act.

The sizes of the fruit cases required in New South Wales are of the same dimensions as those in the Queensland Act. The New South Wales Regulations are already in force.

Any case must be of one of the following **inside** measurements, **clear of any divisions.**

	LENGTH. inches.	DEPTH. inches.	WIDTH. inches.
(1) 1 bushel	18	$14\frac{1}{4}$	$8\frac{2}{3}$
(2) do.	26	$14\frac{1}{4}$	6
(3) do.	20	10	$11\frac{1}{8}$
(4) $\frac{1}{2}$ bushel	18	$7\frac{1}{8}$	$8\frac{2}{3}$
(5) do.	26	$7\frac{1}{8}$	6
(6) do.	18	$5\frac{1}{4}$	$11\frac{3}{4}$
(7) $\frac{1}{4}$ bushel	$13\frac{3}{4}$	4	$10\frac{1}{8}$
(8) Tropical Fruit Case (for Pineapples, etc.)	$24\frac{3}{4}$	12	12

New or Clean Cases.

1. All cases for the Queensland trade must be new or clean and free from insect or fungus diseases.

2. New cases only must be used for fruit exported to any of the other Australian States.

3. New cases only must be used (under any circumstances) in the fruit districts of Stanthorpe and Bowen.

Case to show Maker's Name, Address, and Guarantee.

Every case, whether the fruit is for sale in Queensland or in another Australian State, must have legibly and durably on one end of the outside of the case:—

1. The name and address of the packer of the case.
2. The words "guaranteed by packer to contain 1 Imperial bushel" or as the size of the case may warrant.

In the case of the Tropical Fruit Case the guarantee should be—"Guaranteed by maker to contain not less than 3,564 cubic inches."

The above name, address, and guarantee should be at least 5 inches long and 2 inches wide; but stamps 3 inches by 1½ inches and upwards will be accepted.

Exception.

The Act will not apply to the sale of fruit sold in trays, baskets, casks, or buckets, or to crates which contain trays of fruit. Fruit so packed, however, must have marked on the package the weight or number of its contents.

Contraventions.

Penalties are provided for persons who—

1. Pack fruit for the Queensland trade in disease-affected cases.
2. Export fruit to another Australian State in second-hand cases.
3. Obstruct or refuse to give information to an Inspector who is carrying out the Act.
4. Place an incorrect guarantee on a case.
5. Export fruit in a case carrying an incorrect guarantee.
6. Alter the size of a case bearing the packer's name, address, and guarantee.
7. Interfere with the packer's name, address, or guarantee on the case.

ERNEST G. E. SCRIVEN,
Under Secretary.

19th April, 1915.

By Authority: ANTHONY JAMES CUMMING, Government Printer, Brisbane.