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VOL. III. PARTS 1 TO 6.

GENERAL INDEX.

D.

E.

Page.

F.

G.

H.

I.

INDEX TO ILLUSTRATIONS.

QUEENSLAND AGRICULTURAL JOURNAL

VOL. III. JANUARY, 1915. PART 1.

THE PAST YEAR.

NOTWITHSTANDING the disastrous war in Europe and elsewhere and the destruction of peaceable merchant ships with the consequent dislocation of trade by raiding cruisers of Germany, a retrospect of the past year gives cause for congratulation on the results of agricultural and pastoral operations throughout the State. Ever since the memorable drought which—after operating disastrously on all rural industries for several consecutive seasons—terminated in 1903, Queensland has enjoyed, if not absolute immunity from droughts, at least a practical continuance of good seasons. At times when crops were on the verge of perishing for want of rain, and when sheep and cattle were on the eve of being removed to relief country, bountiful rains occurred just in time to avert any severe losses. Such has been the case during the latter half of the past year, when the early wheat and maize crops especially suffered in the early stages of growth owing to a dry spring and the lateness of the summer rains; but good rain fell in many districts in time to save the great bulk of the crops; whilst at the latter end of November bountiful rains were experienced over almost the whole of the State.

To show how wonderfully the Queensland soil responds to a good season, consider the last years before the termination of the great drought some twelve or thirteen years ago in 1903.

In 1902 the State exported 552,625 lb. of butter, valued at £24,610; in the following year these figures were exactly doubled; and in 1904 the increase of the butter export was phenomenal, as it amounted to 9,520,921 lb., of a value of £344,943. From that time forward the production and export of butter regularly increased until the dairying

industry has reached a position when the value of it can be referred to in millions, the value for the year 1913-1914 being estimated at £2,500,000. Yet the year did not open favourably for the production of dairy products, as almost every district suffered from a comparatively dry spring and the summer rains were later than usual.

As regards the progress of agriculture proper, there are to-day nearly 1,000,000 acres under actual cultivation, which is an increase of 48 per cent. on the area cultivated in 1903. Owing mainly to the expansion of the dairying industry, there was a smaller area under wheat during the past year than in 1904, when 150,958 acres produced 2,149,663 bushels of grain. For the 1913-1914 crop 132,665 acres were sown, which yielded 1,769,432 bushels.

The sugar industry, although labouring under some disabilities, which it is not our province to discuss in this Journal, has largely progressed during the year. We do not yet know the results of the crushing for 1914, but, owing in some cases to frosts and in others to the dry spring, the total yield will probably fall some 40,000 tons short of the State's requirements. The record sugar year was 1913, when 147,743 acres were under cane. Of this area, 102,803 acres were cut for crushing, returning 242,837 tons of 94 per cent. net titre sugar.

During the past year much more land has been placed under cane, especially in the North, where a large new mill has been erected at Inkerman, on the Lower Burdekin, and is already at work. A central mill is being erected at Babinda, which will be ready for the 1915 crop; and a third will be established at Durradgee, near Innisfail, which will probably be at work in 1916.

The present 47 sugar mills, 2 refineries, and 1 juice mill afford employment to nearly 5,000 hands; whilst the industry generally gives employment directly to some 50,000 employees of various grades, and indirectly, earning their living by sugar handling, the number may be reckoned by many thousands, including waterside workers, men engaged in transport of cane and sugar, seamen, and a host of others whose livelihood depends wholly or in part on the sugar industry after the raw sugar has left the mills. The number of plantations, excluding areas under 5 acres, is 3,982—an average to each planter of 37 acres, and an increase in number of 81 plantations above those of the previous year.

Taking the returns from all our industries as set forth in the Annual Report of the Department of Agriculture and Stock for the year 1913-1914, we see great cause for congratulation, and a great incentive to a stimulation of immigration from Great Britain, Canada, the United States, and possibly from countries now allied with the United Kingdom.

Agriculture.

EXTENSION OF AREA UNDER WHEAT FOR SEASON 1915—GOVERNMENT ASSISTANCE TO WHEAT-GROWERS.

In November last a letter was received by the Department of Agriculture and Stock, in which it was asked whether the Department intends to take any responsibility or risk with the result of the ploughing and sowing, and also if the Department has any views on the preparation of land for wheat. Deep ploughing, it was stated, has been a failure this year (1914) on the Downs, and the best crops have been grown on the drier areas, where the land was simply cultivated with a spring-tooth or disc cultivator.

In reply, it was assumed that the writer desired to know whether this Department will guarantee any price for wheat raised, and he was informed that the assistance offered by the Minister does not extend beyond the ploughing and preparation of the land and sowing of the crop.

With regard to the question raised as to deep *v.* shallow ploughing, and advice as to subsequent treatment of the land to ensure a crop, this is being dealt with direct by the different Agricultural Instructors, who have been engaged for some time past in tendering what assistance it is possible to give to wheat-growers.

One provision in connection with advances has relation to the ploughing up of the land by the 28th February next, this being done for the purpose of putting it into condition to trap the summer rains and admit of their percolation into the subsoil. Deep ploughing at this stage is not advocated for obvious reasons, and the advice tendered by the Department is strictly in the direction of the conservation of soil moisture by judicious cultivation on recognised dry-farming principles.

We wish to draw attention to the following conditions under which financial assistance will be given to farmers who may require it, and who are invited by the Minister for Agriculture to make application for it:—

"Each application will be subject to inquiry, and will be decided by the Minister upon the merits of the case.

"Financial assistance will be given for the following purposes:—

1. For increasing the area under wheat over and above the area planted by owner or occupier during 1914. Assistance in this respect will only be given where the land has been or can be ploughed by the 28th February, 1915.

2. For planting new land where wheat has not before been grown.
3. For the supply of seed for planting.
4. For the hire of horses or machinery.
5. For the payment of extra labour required.

"All farmers who desire assistance should be particular in furnishing the information concerning the assistance required, so that there may be no delay in making the necessary inquiries.

"Applications are to be addressed to the Under Secretary, Department of Agriculture and Stock, Brisbane, not later than the 10th December, 1914."

PICKLING WHEAT.

There are three methods of pickling wheat to destroy or prevent the germination of the spores of smut. The most commonly used pickles are:—(1) A solution of formalin; (2) Sulphate of copper (bluestone); (3) Plain hot water. The solutions are:—Bluestone at the rate of 1 lb. in 5 gallons of water, or formalin at the rate of 1 lb. in 40 gallons of water.

The seed, in either case, may be spread on a wooden floor and the solution sprinkled over it, turning the grain over and over either by shovelling or raking, so that all the grains become thoroughly wetted. The seed is then spread out to dry, and, if left in a thin layer over night, it is ready for sowing in the morning. Instead of sprinkling, which is wasteful, dipping may be resorted to. A bushel or so is placed in a bag and dipped in the solution, taking care that all the grains are thoroughly wetted by shaking the bag and plunging it in and out. In the case of bluestone only a minute or two is necessary for the dipping process, on account of its corrosive action; but in the case of formalin five minutes may be allowed, and it is less injurious to the grain, the cost being about the same as for the bluestone process. Both processes are equally effective in destroying the smut germs. The bluestone solution may be used again and again, but formalin is volatile, and it follows, therefore, that only the amount of formalin should be prepared that is required for immediate use, and sprinkling in this case should be preferred to dipping. Formalin is poisonous, and must be kept where there is no chance of children or others obtaining it in ignorance of its nature: 1 gallon of formalin solution is sufficient for 4 bushels of seed. For the hot-water treatment, two boilers are needed, containing water at 120 degrees Fahr. and 135 degrees Fahr. respectively. A smaller vessel containing boiling water and an abundant supply of cold water should be at hand. The seed to be treated may be placed in a gunny bag or in a perforated kerosene tin. Plunge the vessel containing the grain into the first boiler (120 degrees Fahr.), and move it about for a minute or two till the grain has all been warmed. Take care to keep up the temperature. Then plunge it into the second boiler (135 degrees Fahr.). Leave it there for ten minutes, moving it about and agitating the grain. Then take it out and plunge it into cold water, and then spread it out to dry, after which it is ready for sowing.

LIME WATER.

Mr. H. Ross, in an article on "The Treatment of Seed Wheat for the Prevention of Bunt or Stinking Smut," in the "Agricultural Gazette of New South Wales" (2nd March, 1914), advises:—

"The action of the bluestone during the process of pickling is that it kills the tiny spores or seed of the bunt which adhere to the outside of the grain. Now, while bluestone has the power to kill these spores it has also the power to impair the vitality of the grain, and even to kill the germ. To guard against this, the following measures should be observed. If there is no prospect of immediate germination—that is, if a 'dry' sowing is made, the bluestoned wheat should, after having been allowed to drain for from 10 to 15 minutes, be dipped into a solution of lime water, which is made by stirring ½ lb. of freshly burnt lime into 10 gallons of water. This mixture is allowed to settle; then the clear lime water is decanted, and into this the bluestone-treated seed is dipped for from 2 to 3 minutes. The lime neutralises the effects of the bluestone, and so preserves the full vitality of the wheat germ. If, on the other hand, a 'wet' sowing is made and an immediate germination of the seed is likely to follow, then there is little need to dip the bluestoned wheat into lime water.

When using lime water care should be taken to make a fresh mixture now and again, as the constant dipping of the bluestone-saturated butts of wheat into the lime water will change this eventually from an alkaline into an acid solution, in which case it would be useless; and for that very reason bluestone and lime should never be mixed together in a solution used for pickling wheat.

The chief advantages gained from using lime water, in addition to bluestone, are:—Firstly, that a farmer following this practice is in a position to pickle all his seed wheat, say, in March, ready for sowing in April and May, without running any risk of the germination being affected; secondly, that a better germination will be obtained if the sown seed should lie in the ground for some time before rain falls and germination takes place.

Little extra trouble is involved in the bluestone-lime treatment, and farmers are strongly advised to adopt this method in preference to the bluestone treatment only."

Should it be found impossible to obtain freshly burnt lime, it is recommended that ½ lb. of slacked lime be mixed with 10 gallons of water, thus making milk of lime, into which the butts of the bluestoned wheat should be dipped for a period of from 2 to 3 minutes.

Milk of lime differs from lime water in so far that in the former the particles of lime are not dissolved but held in suspension, whereas in the case of clear lime water the particles are dissolved.

[The above was published in the March (1914) issue of the Journal; but as many new subscribers are writing for information on the subject, in view of the wheat-sowing season of 1915, we republish it for the general benefit of intending wheat-growers.—Ed. "Q.A.J."]

A MARKET FOR SUNFLOWER SEED.

There is nothing more easy to grow as a farm crop than sunflowers, but, apart from their ornamental character, one never thinks of these plants as being of any use to the cultivator. Although the plant has never been cultivated on a commercial scale in Queensland—except, as far as we know, by Mrs. H. E. Waller on the Binjour Plateau, Gayndah, about five years ago—there is no reason, except, perhaps, prejudice, why it should not be a staple crop for Queensland. Why it has been so long neglected by Australian farmers it is difficult to say, considering that it is grown to an enormous extent in Germany, Hungary, and Russia, and the demand is always greater than the supply, notwithstanding the fact that each seed sown produces 1,000 or more, and the price ranges from £10 to £11 per ton. The most profitable sort to grow is the Giant Russian, of which each head contains from 1,000 to 2,000 seed, and even as many as 3,000 seeds per head have been harvested in Russia. The plant is admirably adapted to the soil and climate of Queensland. It thrives as well in the dry West as on the Darling Downs and on the Eastern coast lands. It is not particular as to soil, but succeeds best on deep well-drained loam, whether scrub or forest or plain. It does well on maize lands; and as the plant needs a lesser rainfall than maize, and is a much quicker grower, the crop requires less cleaning owing to its giving more shade, thereby lessening the growth of weeds, which means considerably less work to the farmer. From 4 lb. to 5 lb. of seed is sufficient to sow an acre at distances between the rows of about 3 ft. and in the rows about 12 in. to 18 in. from plant to plant. The return may be set down at about 50 bushels per acre. Sunflowers grow very rapidly, the crop being usually ready to harvest in three months.

The harvesting is a very simple matter. Mrs. Waller says that on ploughed ground a tip dray can be used provided with a frame covered with bag. The dray passes along the middle of the rows—one row on each side. The heads are cut and thrown into the dray. They are then driven to a convenient place in a paddock where there is a box, about 4 ft. high by 3 ft. square, with a wooden batten nailed on about 9 in. from the top inside on which the heads are "banged," when all the seed which is fully ripe and good falls into the box. The seed is then winnowed. Two men cutting into the dray can keep one man threshing.

Mr. Henry A. Tardent, in a paper on "The Sunflower," published in this Journal in October, 1899, said that "a very expeditious way to harvest it is to cut the stem close to the ground by means of a horse corn-cutter, and to cart home stems and heads together. The heads should be then dried as quickly as possible, and as soon as dry enough they can be threshed, winnowed, and bagged."

The seed is rich in oil, and yields 34 to 50 per cent.; whilst the oil cake forms an excellent food for stock. The best time to sow the seed is from September to February, inclusive.

As to a market for the seed, we are informed by Mrs. Waller that a payable market can be found for seed grown under contract for the firm of Messrs. Paten and Co., 60 Queen street, Melbourne, to whom she

consigned all her crop. This firm, writing to her, said: "If you know of anyone who has the necessary soil and climatic conditions for growing Black Sunflower seed, see if they will quote a price per ton for 10 to 50 tons f.o.b. Brisbane."

Under the present war conditions, when the seed probably cannot be obtained from Russia or Hungary or Germany, this might be a good opportunity to establish a new industry in Queensland.

CORN COBS AS FODDER.

The subject of ground corn cobs as a food for stock has given rise to much controversy, especially amongst the farming community in the United States of America, some farmers asserting that once the grain is removed the cobs are of no value, whilst others as positively assert that they possess high nutritive properties. As there are many tons of cobs annually thrown away or used instead of firewood in this State, it becomes a matter of very great importance to farmers to know whether they are thus destroying a valuable fodder material, or whether the cobs are, as supposed, absolutely useless as feed for stock. To decide this question, the Department of Agriculture, so far back as 1899, requested Mr. J. C. Brünnich, Agricultural Chemist to the Department, to furnish an analysis of the corn cob, and show its value and properties as a fodder. Mr. Brünnich, having made the analysis, furnished the following information, from which it will be seen that, taking the comparative food values, commencing with corn as 100, of certain food materials, lucerne hay come second and corn cobs third on the list, corn stalks fourth, and potatoes fifth, &c. In his report Mr. Brünnich remarks that corn cobs, as well as corn stalks, have a considerable value as food, as shown by the following analysis:—

—	Albuminoids per Cent.	Digest. Nutrients Carbo-Hydrates per Cent.	Fat per Cent.	Comparative Value.
Corn cobs ... ... from	·6	41·7	·2	37
Corn cobs ... ... to	1·1	43·2	·4	49
Corn stalks	1·1	37·0	·3	36
Corn	8·4	60·6	4·8	100
Potatoes	2·0	21·8	·2	26
Lucerne hay	9·4	28·3	1·0	65

Professor E. W. Stewart, in his "Feeding Animals," recommends strongly to pass the whole corn crop—stalks, ears, and all—through a large cutter and reduce it to a fine chaff.

Corn cobs may be ground by themselves to a fine bran-like mass; but the process is slow, and it is questionable if it would pay here.

That corn cobs, which in Queensland are universally a waste product, have a very considerable value as stock food has been demonstrated in the long-continued general experience of American farmers. The following table of analyses will serve to show how in chemical constituents the corn cob compares with corn and two common fodders:—

—	Water.	Ash.	Albuminoid.	Fibre.	Nitrogen (Free Extract).	Fat.
Corn	13·93	1·25	8·82	1·59	70·48	3·92
Corn cob	9·25	1·16	1·91	31·22	55·86	0·60
Oat straw	12·50	1·81	2·30	55·96	26·42	1·00
English hay	14·30	4·70	7·00	26·90	45·40	1·70

These figures do not show the whole value of the cobs as a feed. Cobs are never fed alone, but generally with the corn which grew on them. When fed thus, the cob seems to be admirably suited to act as a balance to the more concentrated grain. Moreover, three-fifths of the ash of the cob is potash—an element of undoubted value as an aid to digestion. As a result of experiments, made with 10 pigs and 20 bullocks, to test the question of the food value of cobs, it was found that 1 lb. of corn cob, when ground and fed with the corn which grew upon it, was worth more than 1 lb. of meal made from corn alone. In other words, both the pigs and bullocks gave better returns from corn and cob meal than was obtained from feeding clear corn meal. Considering the large proportion of ear corn that is cob (18 per cent.), this fact of the feeding value of cobs is a matter of no little importance where, as in Queensland, corn and hay in all its forms have a very high market value. This, however, should be borne in mind: That the cob must be ground fine—quite likely the finer the better; and to grind a given amount of whole ears of corn will require three times as much power, or its equivalent in time, as is needed in reducing the same amount of shelled corn.

THE FOOD SUPPLY QUESTION.

In war time, and especially during preparation for war, the intending belligerent countries pay particular attention to securing as large a supply of provisions as possible. As a writer in the "Pastoral Review" puts it:—"Without the agriculturist there could be no war—at least, no war of any duration. The life of an army depends mainly upon its supplies; and if those supplies can be brought forward with regularity and in sufficient quantities, the army so served possesses a very great advantage over opposing forces inadequately and irregularly supplied. The staple foods of armed forces (men and horses) are the products of the land—wheat, maize, fodder, and meat; and one of the first precautions taken by a nation at war is to ensure as large a supply as possible of these commodities."

Writing in the London "Daily Mail," the Paris correspondent of that paper gives interesting facts and figures with reference to Germany's food problem:—

"Already there come from Berlin stories of a hungry population seeking food in shops that have been emptied by the panic of well-to-do people. Already the shadow of famine is said to be darkening the summer sky in every German city. These tales must be received with doubt. Unless they had large stocks of food, the Germans would not have challenged Europe so boldly. Whenever it becomes necessary, the Government of the Kaiser, by virtue of martial law, will seize all food supplies and distribute them equally.

"Nevertheless, the situation of Germany is such that it will be hard for her to carry on a war for two months without starving her town populations, and impossible for her to fight on into the winter unless she can keep the sea open for her merchant ships.

"From being a country in which the people were mainly tillers of the soil, Germany has become a country of great cities and dwindling farmer population. Nearly half of Germany's 68,000,000 live in towns. Out of her own resources Germany can only provide 86 per cent. of her people's nourishment.

"She buys the bulk of her wheat from Russia; that market is closed. She is a good customer for Roumanian wheat; but even if Roumania remains neutral, and is willing to sell, how are cargoes to be shipped? All ships bound for German ports are fair game to the navies of Britain and France.

"To send wheat overland would raise the price, and there is danger of railway lines being cut. Germany's chances of getting supplies from her usual sources are poor. Equally small is the likelihood of drawing upon the United States.

"The only German frontiers that remain open are those parting her from Italy and Austria-Hungary. Hungary may send some cattle, and will continue, so long as Munich can pay for it, to supply barley for making beer. But neither she nor Austria has any great quantity of wheat to spare. Through Italy, Germany might receive a certain amount of food for her sharp-set millions, but it can be only a limited amount. Italy has not much to sell, and grain ships making for Italian ports will be suspects. Few owners will care to take the risk.

"In any case, even if Germany could find purveyors ready to supply her needs, the whole matter is governed by this question: Can she pay? Her war chest is known to be full at this moment, but her expenses are enormous. It is reckoned that the cost of the war can scarcely be less than £12,000,000 a day spread over Europe. Germany's share of this, I am told by competent authorities, is between £3,000,000 and £4,000,000; she is exporting nothing; she is unable to borrow. Suppose, for the sake of argument, that she could find merchants ready to sell to her, they would not sell except for gold paid immediately. How long will she have gold enough to pay?

"Her annual imports of food and drink cost £162,000,000. That is a surprising figure, when we recollect that ours cost us not so very much more. We are accustomed to think of ourselves as a nation entirely depending upon outside supplies, and of Germany as almost self-supporting. Among her imports, luxuries account for a good many millions; but the same is true of us. Allowing for foods and drinks which are in no way necessaries, the fact remains that Germany depends upon foreign markets for a large part of her people's daily bread.

"She needs at least £12,000,000 worth of food supplies a month. Admit that she can pay for them, the query still comes: Where can she buy them, and how bring them to hungry mouths?

"It must be plain to everybody that Germany could not agree to any proposal that the strength of fleets should be fixed to remain at their present ratio. She saw the impossibility of making war safely unless her navy were powerful enough to keep the seas open to her commerce.

"What decided her, then, to make war unsafely? The belief, it would seem, that she could by a series of knock-out blows sweep everyone out of her way. The alternative to that is famine."

How does the case stand with Great Britain and the Allies? It is said that the German women are competent farmers and can carry on the usual agricultural occupations without the male workers; but, for all that, if there are no men to grow the crops, drive machinery, and perform the necessary heavy labour connected with the production of agricultural and pastoral supplies, and if there are no means of importation, a country cannot hold out for any lengthened time. Here it is that the United Kingdom and her Allies possess such a tremendous advantage over Germany. To again quote the "Pastoral Review":—

"Every care is taken that all available stock in the Empire shall be at her [Great Britain's] service. Export of grain and meat, in our own case, to other countries is prohibited; and the Government possesses the power to supply her own needs as occasion arises. Thus, a country without the men to grow the crops, &c., and without the means of importation, would not be able to hold out for very long; and this is where Great Britain and her Allies possess such a tremendous advantage over Germany. Great Britain's numerous colonies can grow and export food for the armies without the slightest hindrance as long as the German fleet is kept off the seas; but, on the other hand, Germany is so situated that she can import very little. She can certainly—as long as the Allies are kept out of her country—grow crops, although, apparently, every available man has been called to the colours, because the German women are competent farmers, and quite capable of doing that part of the men's work."

But the British oversea dominions have it in their power to enormously increase the area under cereals and other food crops. In this State of Queensland, under present labour conditions, it is reasonable to argue that farmers may not be in a position to very largely extend the areas devoted to the raising of food crops; but the Government, being fully aware of the difficulties, has swept them away by coming to their assistance by making advances to enable them to put additional areas under crop, by arranging for supplies of seed wheat, and generally doing all in its power to aid them in the task of production of such crops as may be exported for the use of the armies in the field, and for general distribution amongst our kindred in the old country. It is satisfactory to know that this offer of the Government is meeting with considerable response, even to the extent of sowings of 600 acres by individual farmers.

WHITE MAIZE.

The question of the relative merits of white and yellow corn has been discussed in the American Agricultural Press and at innumerable farmers' meetings in that country at frequent intervals. From the chemical standpoint, the colour seems to have no special significance. Upon the question of relative productiveness, opinions have been rather evenly divided, and, although of the tests made at seven agricultural experiment stations, six report greater yields with white than yellow varieties, it does not, therefore, follow that all white varieties will yield more than all yellow ones. Numerous yellow varieties are fully as productive as many white ones. If the best varieties of white and yellow were compared, the relative difference would probably be slight. Yet all tests go to show that it is usually possible to secure greater yields from white than from yellow varieties.

As far back as the sixties, white maize was grown to some extent on the Brisbane River, Oxley Creek, and other farming districts in the neighbourhood of Brisbane; but this was mainly with a view to grinding it into maize meal, which was often mixed with flour for bread-making. The maize was ground at Messrs. Pettigrew's mill, at Brisbane. But this variety was not favoured by buyers owing to its susceptibility to the attacks of weevil, which did not admit of its storage for any length of time—in fact, the corn was frequently attacked by the weevil even before husking in the barn.

Another point as regards white maize is that it is very liable to cross-fertilisation by yellow varieties, and hence requires to be grown at some distance from yellow varieties; and where, as in the case of small farms, such segregation is impossible, a pure white maize is unlikely to be produced.

The Department of Agriculture instituted last year an inquiry into the White Maize question; and it was found that, in 1913, 472 bushels were ground in metropolitan mills into meal, yielding 47 tons valued at £423, and 109 tons of cornflour were manufactured valued at £3,435. These figures do not appear to point to any large demand for the white variety of maize, and offer no encouragement for increasing the cultivation.

We have mentioned the use of maize meal mixed with wheat flour for bread. According to Bowman and Crossley, "Flour so adulterated yields fewer loaves than an equal amount of pure wheat flour, and the bread produced is more moist than wheat bread and has a tendency to be sodden. An addition of 10 per cent. of maize flour is calculated to mean a reduction of five loaves on the sack." Another point is that, in the writer's experience, the admixture of maize meal with flour causes the bread to quickly become dry, if kept for any undue length of time, as is sometimes necessary in the bush.

Several articles are prepared from maize—notably cornflour, maizena, maize starch, maize oil, and, more largely, glucose, which is prepared from maize starch by conversion into grape sugar, and is used largely as an adulterant for cane sugar. In Melbourne a large glucose factory has been established, capable of treating 150,000 bushels of maize per annum.

The Department has imported some of the choicest varieties of white maize from America from time to time, and recently secured 2 bushels of seed of a standard type ("Boone County White") from Kansas, U.S.A., with the express object of raising seed grain for next season's planting, with a view to supplying farmers with reliable seed.

Amongst the white varieties, Hickory King is a very valuable and reliable field corn, having a large grain, and is the smallest cobbed pure white Dent in the world. The grain is so large and the cob so small that, by breaking the ear in half, one grain will cover the entire end of the cob. The ears grow 7 to 9 in. in length and 6¼ to 6½ in. in circumference, and are generally borne 3 to 6 on one stalk, thus making it enormously productive. It ripens early, maturing in 110 days from planting. It is particularly adapted to and will yield more in thin soils than any other variety of field corn, and, if planted on good soil, will bear much closer planting than other varieties, as the stalks are of medium growth. Wherever it has been grown it has given universal satisfaction.

FOOD VALUE OF MAIZE AS COMPARED WITH WHEAT.

[Compiled from Burtt-Davy's Recent Publication on Maize.]

Prepared in various ways, maize forms an important article of diet for the American people.

Considered as a food, maize is highly nutritious, digestible, and, when properly prepared, is wholesome. The total amount of digestible

nutrients is only excelled by wheat, the latter containing, approximately, 2 per cent. more than the former.

TABLE SHOWING DIGESTIBLE NUTRIENTS IN 100 LB. OF WHEAT AND MAIZE.

—	Protein.	Carbo-Hydrates.	Food.	Total.
Wheat	10·2	69·2	1·7	81·1 lb.
Maize	7·9	66·7	4·3	78·9 lb.

Two kinds of meal are usually prepared from maize—

(1) Whole meal, in which the embryo is ground up with the endosperm;

(2) The new process meal, in which the embryo as well as the hull is removed by special machinery.

Owing to the amount of oil it contains. the old-fashioned whole meal does not keep as well in hot weather as the new process maize meal, for the embryo holds 82 per cent. of the total oil-content of the grain, but the higher oil-content, on the other hand, adds greatly to the food value in cold weather.

Ordinary maize meal is classified into white and yellow, and graded into coarse, medium, and fine.

CONSUMPTION IN THE UNITED KINGDOM.

Of the maize meal exported from the United States of America in 1904, 21·32 per cent. was sent to the United Kingdom.

ARTICLES PREPARED FROM MAIZE.

Cornflour, maizena, &c., consist mainly of starch, much of the proteid and mineral matter having been removed by treatment with dilute alkaline solutions. These forms of maize starch are used largely in the preparation of puddings, blancmanges, &c.

Maize Starch.

The finer qualities are largely used as substitutes for arrowroot. Maize starch is used as an adulterant to wheat flour, and is sold at a correspondingly low figure; but the pure food laws of most countries require that the fact of the mixture is clearly defined. We have already stated that glucose is the largest single product prepared from maize starch, which is used as an adulterant for cane syrup, or is put up as corn syrup, when this latter has been sweetened with a small percentage (10 per cent.) of cane syrup.

The varieties of white maize now under cultivation in Queensland are all more or less adapted to coastal conditions.

Pastoral.

SPECIFICATION OF LABOUR AND MATERIAL REQUIRED IN THE CONSTRUCTION OF A SHOWER SPRAY FOR THE TREATMENT OF 250 SHEEP PER HOUR, AS RECOMMENDED BY THE DEPARTMENT OF AGRICULTURE AND STOCK.

The size of the tray shown on accompanying plan is 13 ft. 6 in. long by 6 ft. 6 in. wide, and this will regulate the position of the posts and fences accordingly.

Posts should be of sound hardwood (Ironbark preferred) 6 in. in diameter, 9 ft. long, set 3 ft. in the ground perfectly plumb every way, and filled in and well rammed.

Top plates may be of 6-in. round timber, checked, scarfed, and bolted into posts, or 5-in. by 4-in. sawn hardwood checked and bolted to posts, as may be most convenient.

Joists on top to be 6-in. by 2-in. sawn hardwood spaced 18-in. centre to centre, checked into top plates and well spiked.

Rails to be 4-in. round hardwood, or 4-in. by 2-in. sawn hardwood if preferred, to be 3 in number on each side, checked into and spiked to posts.

Provide and fix 4-in. joists under floor, embedded in the ground, about 18-in. centres for nailing iron flooring to.

Provide also a round hardwood rail to protect galvanised spouting for collecting liquid from floor.

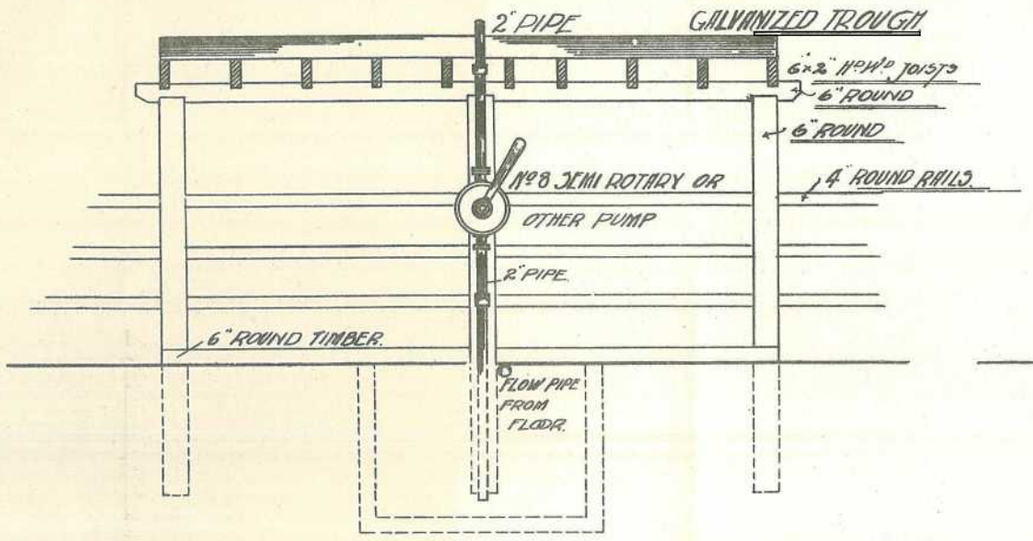
Frame the gates as shown with 3-in. by 1-in. hardwood double heads and heels and 3-in. bars and braces all bolted together and hung with light hooks and bands, and fitted with strong bar bolts as directed.

Build the yard fences as shown, or as required by the proprietor.

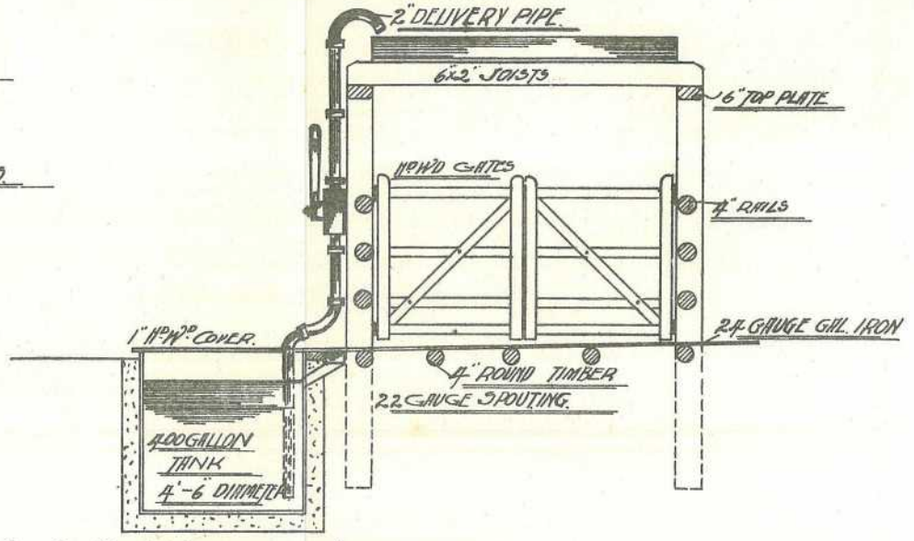
Provide 22-gauge galvanised-iron tray as shown on top, turned up 6 in. at sides and ends, finished with a strong bead at top edge perforated with No. 10 gauge holes every 3 in. apart at bottom, to be made in two or three sections as required and bolted together at joints with a piece of felting between; screw same to floor joists as directed.

Lay the floor with 22-gauge galvanised corrugated iron with a fall of 2 in. from the high side, to have 1½ corrugation lap, with felt in between, and fix to same a 4-in. by 3-in. 22-gauge galvanised iron spouting with a 2-in. waste pipe from same; provide all stop ends, &c., necessary.

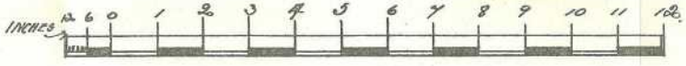
Provide and fix a No. 8 Semi-Rotary pump or other approved force and lift pump, with 2-in. suction and delivery pipes with a back-flow valve on bottom of suction pipe; provide all bends, sockets, and fittings necessary.



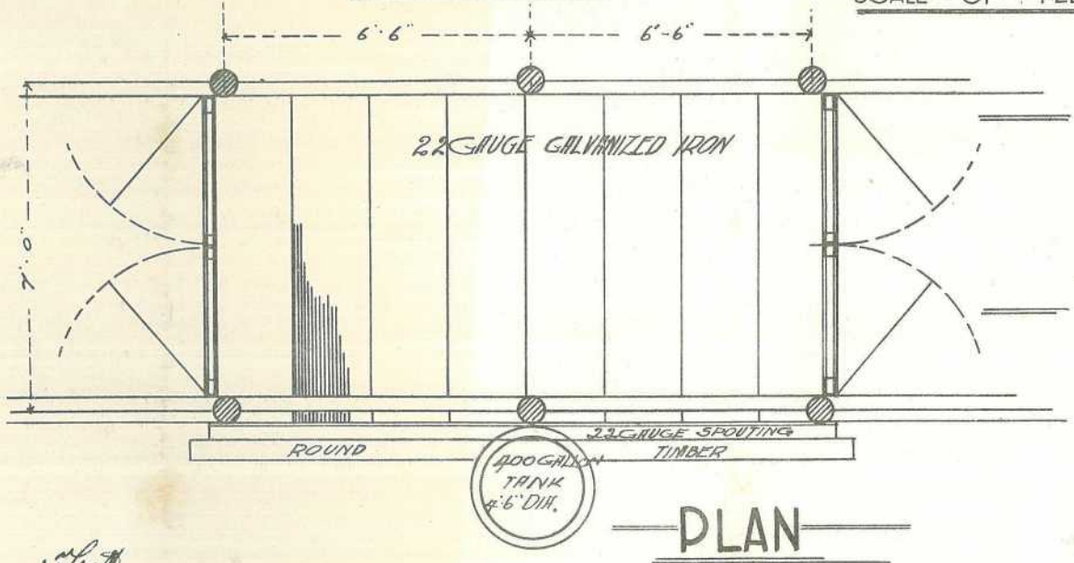
ELEVATION



SECTION



SCALE — OF — FEET



PLAN

PLAN OF SHEEP SPRAY FOR TREATING 250 SHEEP PER HOUR

ARTHUR MORRY
SURVEYOR

10th Dec. 1917.

Provide and fix in position shown a 400-gallon corrugated galvanised-iron tank let into the ground and encased in 4 in. of concrete. Provide a 1-in. hardwood cover for same, with strong ledges.

A 400-gallon ship's tank may be substituted for the above if preferred, when no cover will be required.

Leave all satisfactory at completion.

Double the number of sheep may be sprayed by simply doubling the length, and adding another pump.

THE SHEEP BLOW-FLY.

By A. H. CORY, M.R.C.V.S., Deputy Chief Inspector of Stock.

SOME RESULTS OF DIPPING EXPERIMENTS.

One of the experiments initiated by the Department of Agriculture and Stock at Gindie State Farm has reached a stage when some of its results may be indicated.

One fact has to be borne in mind, and that is—the season since April last to June has been exceedingly dry, and, in consequence, flies did not put in an appearance until later, either at Gindie State Farm or the district generally. It will be necessary, therefore, that this particular experiment be repeated in the coming year.

The experiments are designed to test the question whether dipping is beneficial in regard to the prevention of losses in sheep by blow-flies. To that end 645 sheep were purchased by the Department in April last.

These sheep were all ewes which had not been joined with the rams, were aged from 18 months to 3 years, and had about two months' wool on their backs at the time of purchase.

A shower dip on the Tandawanna principle was erected, and the sheep thoroughly saturated with the various makes of dip (ten in number) which were offered.

The sheep were drenched for worms on the 15th of April, and on the 17th of that month were dipped. Fifty animals were treated with each dip, and 145 were kept as controls—*i.e.*, not treated at all. That is, there were 500 dipped sheep and 145 untreated.

There were present at the operations Mr. W. G. Brown (State Sheep and Wool Expert) and Mr. Robert Jarrott (then manager of Gindie State Farm) and myself. After being dipped, rams were put with the ewes and left with them for seven weeks, the whole flock being watched daily by Mr. Jarrott or his assistants, and inspected thoroughly, weekly, by Mr. W. G. Brown. No flies were seen until rain fell in June (344 points), and then in only a few cases which quickly recovered, the flies dying off.

On 27th August the Acting Manager (Mr. E. Batts) reported that flies were beginning to work amongst the experimental sheep; and from the 1st September until 16th October the sheep were closely inspected once a week by Mr. Brown, besides being closely watched by Mr. Batts.

There was a fall of 432 points of rain on 8th, 9th, and 10th October; and, therefore, a big proportion of the sheep were seen to be blown.

Fearing that big losses would take place, and seeing that there was then about eight months' fleece on the sheep, Mr. Brown decided to crutch the sheep. On the 16th October, therefore, the sheep were crutched, and every sheep carefully examined, marks recorded, and the condition of each animal carefully noted. This latter in the case of blown sheep was recorded "badly blown, slightly blown, freshly blown on old infestation, and not blown at all in respective cases." The table containing the analysis of each lot of sheep will be seen below.

There were several deaths—5 to be exact—and these died during the six months from causes unconnected with flies; 9 were missing through breaking into neighbouring paddocks, leaving a balance of 631 sheep examined, whose condition was recorded.

It was found on inspection that the main attack of flies came after the 8th of October; and it is noteworthy that the flies attacked the sheep during the period when lambs were falling or about to fall.

The results so far as shown by the figures are:—

A total of 631 were examined.

A total of 167 were more or less seriously blown = 26·44 per cent.

A total of 92 were blown in 491 dipped sheep = 18·73 per cent.

A total of 75 were blown in 140 undipped sheep = 53·67 per cent.

On these figures, therefore, it seems as if dipping the sheep gives a certain amount of protection. True, the sheep do not escape being blown, but inspection of the blown animals shows that the undipped sheep suffer in a far greater measure than those dipped.

One other fact seems to have emerged, and that is—it was only when the ewes began to lamb that the flies began to work seriously. The sheep will be shorn in January, and another test made in the same manner as the first one. If the results approximate to those of this first experiment, then another palliative will positively be added to what we know.

When the sheep are shorn in January, close attention will be paid to the results on the wool of the various lots of sheep treated by the dips used, as up to the present time there is some conflict of opinion in regard to the relative values of the dips used.

Name of Dip.	Number Dipped.	Total Number Blown.	Number on Back and Ear.	Marking on Body of Sheep.	Infested after 1st September.	Infested since 8th October.	Infested, but wholly Dried Out.	Infested, Dried Up, and Re-infested.	Badly Infested.	Rainfall since Dipping.	Remarks.
A	50	12	1	Red ring on back ..	None	5	6	1	1	June — 344 points	Recently blown sheep were in nearly every instance blown at root of tail, or the udder.
B	50	6	2	Red ring off rump ..	1	5	None	None	None		
C	50	11	3	Red ring back of head	None	4	3	None	4		
D	50	9	4	red ring near rump	5	6	None	4	3	..	"Badly infested" means that the whole breach is involved.
E	50	9	5	red ring forehead ..	None	9	None	None	4	October 8, 9, and 10— 432 points	
F	50	11	6	Red ring top of shoulder	2	10	1	None	1	..	The undipped sheep show very much more extended areas of damage than the dipped sheep.
Ga	50	81	7	Red stroke along back	1	8	1	2	3		
Gb	50	8	81	Stroke between ears	1	8	None	2	None		
Ha	50	8	9	Red ring top of rump	2	8	None	4	None		
Hb	50	8	10	Bar across back ..	3	6	None	7	4		
Controls undipped ..	145	75	End of book	No mark ..	42	70	3	9	34		

Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

MILKING RECORDS OF COWS FOR MONTH OF NOVEMBER, 1914.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Commercial Butter.	Remarks.
			Lb.	%	Lb.	
Miss Edition	Jersey	10 July, 1914	732	5·0	43·18	
Nellie ...	Shorthorn... ...	20 July ,,	992	3·6	41·76	
Glen ...	,, ...	26 Oct. ,,	841	4·2	41·45	
Madam Melba	Holstein	8 Sept. ,,	1,076	3·2	40·17	
Lark ...	Ayrshire	27 July ,,	802	4·0	37·61	
Honeycombe	Shorthorn... ...	23 Sept. ,,	870	3·6	36·63	
Rosebud ...	Ayrshire	20 Sept. ,,	960	3·2	35·80	
Bluebelle ...	Jersey	27 May ,,	612	4·6	33·17	
Miss Lark ...	Ayrshire	31 Oct. ,,	669	3·8	29·77	
Countess of Brunswick	Shorthorn... ...	26 July ,,	642	3·9	29·33	
Lady Spec ...	Ayrshire	24 Oct. ,,	641	3·9	29·28	
Pauline ...	Shorthorn ...	12 Oct. ,,	732	3·4	29·05	
Lady Lil ...	Jersey	22 Aug. ,,	467	5·2	28 67	
Silver Nell...	Shorthorn ...	5 Oct. ,,	680	3·6	28·63	
Sweet Meadows	Jersey	28 July ,,	478	5·0	28·20	
La Hurette Hope	,, ...	No records ...	451	5·2	27·69	
Lady Melba	Holstein	6 Mar., 1914	694	3·4	27·54	
Burton's Lady	Shorthorn ...	23 July ,,	638	3·5	26·08	
Miss Bell ...	Jersey	13 Aug. ,,	449	3·5	25 18	
Lady Margaret	Ayrshire	19 June ,,	609	3·5	24·90	
Auntie ...	,, ...	26 June ,,	554	3·8	24·64	
Lady Dorset	,, ...	20 Sept. ,,	594	3·5	24·29	
Lady Athol	Shorthorn... ...	10 July ,,	555	3·8	23·36	
Davidina ...	Ayrshire	17 July ,,	597	3·2	22·27	
Lowla II. ..	Shorth'rn-Ayrshire	23 Sept. ,,	643	3·0	22·43	
Cocoatina ...	Jersey	20 April ,,	370	5·0	21·83	
Lucinda ...	Ayrshire	20 Sept. ,,	602	3·1	21·73	
Gretchen ...	Holstein	6 May ,,	529	3·4	21·00	
Rosine ...	Ayrshire	29 Sept. ,,	489	3·6	20·58	

THE COMMONWEALTH STANDARD JERSEY HERD BOOK.

We are indebted to Mr. Alfred Gorrie (editor and publisher of a very valuable publication under the above title) for the first volume of a work which has occupied two years—years devoted to the inspection of animals and verifying pedigrees. Mr. Gorrie, who is well known in Queensland, has been for twenty-three years constantly associated with Jersey cattle, and during that time has collected and indexed particulars of pedigrees and performances of a very large number of Jersey cattle. His object has been to produce a herd book of this breed with a standard of admission so fixed as to exclude animals graded from the common herd. The necessity for such a book has long been felt, and the Commonwealth Standard Jersey Herd Book appears to supply that need as a reliable index to Jersey cattle in Australia of absolute and undoubted purity.

Many breeders of Jerseys take a pride in developing herds from pure foundations—others do not. The latter keep one or two pure animals and a large number which they have graded up from the common herd, and from these they rear as many bulls and heifers as it is possible for them to find buyers for; and they thus depend for their profits on the sales of stock instead of from the production of milk and butter from their herds.

The registration in Australian herd books of animals without pedigree and others bred from the common herd has had a most damaging effect on the Jersey breed. Most dairymen know that it is a very retrograde practice to use a grade bull; but many such are in use at present, because buyers have been led to believe that animals registered in herd books are pure, and, not being able to investigate the pedigrees of their purchases, have ruined their herds by the introduction of impure animals.

The Commonwealth Standard Jersey Herd Book is not only a reliable and faithful index of purebred Jersey cattle in Australia, but as a genealogical book of reference is probably the most complete herd book in the world. Pedigrees are fully tabulated back to the sixth generation, and all animals have been inspected and approved of by the editor, so that each animal registered is not only of pure descent but of choice individuality as well. The performances of animals as well as those of their ancestors have been investigated and are published with their pedigrees. These performances, indicating as they do the dairy prepotency of certain strains, will help dairymen considerably in the selection of stud animals. The data contained in the book concerning almost every good Jersey animal in Australia is such as gives it a rare value to Jersey cattle-breeders and all others who are taking up dairying as a means of livelihood and are determined to get the highest financial result which the Jersey breed returns.

As an illustration of the class of animal registered in the Commonwealth Standard Jersey Herd Book and the capacity of the pure Jersey cow for butter production, the test of Mr. Samuel Hordern's "Leda's Snowdrop" is valuable. She was tested by the New South Government for twelve months, during which time her official returns show that she produced 11,886 lb. of milk and 796½ lb. of butter. Her age at the commencement of the test was 10½ years. Such a return shows how splendidly adapted the purebred Jersey cow is for heavy and continuous milk and butter production, and should encourage all dairymen to secure absolutely pure animals of the producing strain, and thus place themselves in positions favourable for developing animals of the producing qualities of "Leda's Snowdrop."

The Commonwealth Standard Jersey Herd Book can be obtained from the publisher; price, £1 1s. per volume. The herd book under notice is well got up, well printed, and profusely illustrated, and contains entries of absolutely purebred Jersey cattle approved as typical animals, whose pedigrees trace in unbroken lines to foundations bred in Jersey herds recognised as pure prior to 1888.

The Horse.

HOW TO TREAT A FISTULA.

When a fistula on withers is forming, it is customary to apply a blister or hot fomentations. This on rare occasions appears to effect a cure, but in the majority of cases it hastens the swelling and brings it to a head. After it has broken, surgical treatment is required.

The next thing is to find out the direction and depth of the fistula. This is done by using a flexible probe, some 8 or 9 in. in length. Free drainage must now be given by opening along the full length of the probe, or, if thought advisable, an opening can be made at the lower part of probe, and a seton of tape or other material passed through and tied on the outside. A seton keeps the wound open and assists in draining the cavity, but the first method of opening up is generally found more satisfactory. Both sides of the withers should be opened, if necessary, and any necrosed (dead) tissue removed. The top of withers should not be opened crossways (from side to side), because there is a ligament which runs along the middle line of shoulders from the head—if cut, causes serious consequences.

The chief points to remember are:—Free drainage, the removal of all dead tissue, and the prevention of pockets where pus can accumulate.

The following lotion should be used every third day on the fistula after it has been opened up, until four applications have been applied:—

Corrosive sublimate	½ oz.
Methylated spirit	1 pint.

This is best applied by soaking some cotton wool or other absorbent material with the lotion, then packing the saturated cotton wool in the fistula. This treatment can be repeated, if necessary, after 10 or 14 days' interval. Knives, probes, &c., should be thoroughly disinfected before using by placing them in boiling water or some disinfectant such as carbolic acid, Condy's fluid, &c. Knives and other steel instruments should not be allowed to come in contact with the corrosive sublimate solution.

SHRINKAGE OF WOOL WEIGHTS IN STORE.

By an oversight, we omitted to state that the article on shrinkage of wool, published in the December issue of the Journal (1914), was supplied by Mr. W. G. Brown, Sheep and Wool Expert of the Department of Agriculture and Stock.

Poultry.

REPORT ON EGG-LAYING COMPETITION, QUEENSLAND AGRICULTURAL COLLEGE, NOVEMBER, 1914.

During the month 5,748 eggs were laid. Broodies have been very numerous. The weather, too, has been trying, a temperature of 107·5 degrees having been recorded on the 26th. Mr. Murchie lost a bird on the above date through heat appoplexy, but we managed to save the others by throwing water on the houses. Green food being now scarce, we shall have to commence to use lucerne chaff as a substitute. Loloma Poultry Farm's White Leghorns win the monthly prize with 169 eggs. The following are the individual records:—

Competitors.	Breed.	Nov.	Total.
A. T. Coomber	White Leghorns ...	154	1,045
T. Fanning	Do.	145	1,041
Loloma Poultry Farm, N.S.W.	Do.	169	995
Moritz Bros., S.A.	Do.	163	992
Kelvin Poultry Farm	Do.	123	965
Loloma Poultry Farm, N.S.W.	Rhode Island Reds ...	130	950
Geo. Tomlinson	White Leghorns ...	150	948
Cowan Bros., N.S.W.	Do.	150	938
R. Burns	Black Orpingtons (No. 1)	132	933
A. F. Camkin, N.S.W.	White Leghorns ...	158	909
E. Le Breton	Do.	137	902
A. H. Padman, S.A.	Do.	159	902
J. T. Coates	Black Orpingtons ...	129	897
Mrs. Munro	White Leghorns ...	165	893
R. Burns	S. L. Wyandottes ...	129	892
Mrs. Bieber	Brown Leghorns ...	148	890
T. Fanning	Black Orpingtons ...	157	884
J. R. Wilson	White Leghorns ...	145	884
Marville Poultry Farm, Victoria ...	Do.	161	884
R. Burns	Black Orpingtons (No. 2)	141	884
J. Franklin	White Leghorns ...	153	871
Derrylin Poultry Farm	Do.	150	868
J. T. Coates	Do.	147	861
F. McCauley	Do.	149	856
E. V. Bennett, S.A.	Do.	134	854
G. E. Austin	Do.	139	850
J. Gosley	Do.	136	852
R. Jobling, N.S.W.	Do.	136	854
J. Manson	Do. (No. 1)	141	840
J. Kilroe	Do. (No. 2)	151	832
J. D. Nicholson, N.S.W.	Do.	121	820
Range Poultry Farm	Do.	140	810
Mrs. Bradburne, N.S.W.	Do.	139	810
D. Moreton, N.S.W.	Do.	140	807
J. Zahl	Do.	147	801
J. Kilroe	Do. (No. 1)	125	789
C. M. Jones	Do.	147	787
J. N. Waugh, N.S.W.	Do.	133	767
J. Murchie	Brown Leghorns ...	140	753
J. M. Manson	White Leghorns (No. 2)	135	742
Totals	...	5,748	35,053

Owing to the transposition of two figures, an error was made in last month's grand total; it should be 29,304 instead of 23,904.

The Orchard.

DIE-BACK OF CITRUS TREES IN THE NORTHERN DISTRICTS.

BY G. WILLIAMS, F.R.H.S., Cairns.

The characteristics of the above malady are, unfortunately, but too well known, and, with allied more or less obscure affections, have caused serious losses in citrus orchards. Investigations in respect of origin and remedial treatments suggested have not shown any appreciable results. From what has been published it would appear that principal attention had been given to affected trees, and but little bestowed upon those in infested districts as were almost or entirely free from external indications. From the latter, comparisons may be made and the effects of immediate environment with the influences exercised in the prevention of or in minimising the effect of disease. The establishment in diseased trees being effected before external indications are manifested, prevention will be preferable to subsequent treatment. Sprays of different formulas have been recommended from various sources; but, as the malady shows no sign of abatement, either the formulas are ineffective or indifferently applied, and better results will undoubtedly follow future plantings by avoidance of known favourable agencies for its progress. Amongst these are:—Primarily, soil of a heavy nature; a close, retentive, or impervious subsoil, giving rise to the effect of extremes of dry and moist conditions (an undue percentage of "clay" exercises similar influence) with insufficient drainage, lack of cultivation, over-manuring, excessive irrigation, and also working on unsuitable stock. Drainage is a most important feature, citrus being very deep rooted, and no artificial system is applicable to remedy a natural deficiency. In its absence an even state of moisture cannot be maintained. Where different classes of soil, particularly those of a widely different nature, are included in one orchard, and it is noted that trees planted in one class are healthy and vigorous, whilst in another they are badly attacked, the suggestion arises that to the unsuitability of such soil is almost, if not entirely, attributable the cause of the trouble. Wider observations and comparisons afford the fullest confirmation. Trees planted in light loam of good depth remain immune, and, even when cultivation is neglected, show but very slight indication of attack; but where a dense constituency prevails some of the known features favourable to the disease are an invariable accompaniment. Its presence is eventually manifested in a varying extent—even to killing the trees outright. In consideration of suitable soils, examination must go much below the surface. On alluvial flats with a surface of loose sandy soil, a subsoil of heavy nature is not infrequently met with, and in such situations trees flourish but for a limited time. The trees being evergreen and almost constantly active, sustaining uninterrupted evaporation from their leaf surfaces, they must always be provided with moisture or disease will result to tree or fruit. Without

excessive rainfall, the requisite supply of moisture can be retained in a suitable soil by cultivation; but where an unbroken surface, or grass or other weeds are permitted, a corresponding depression exists. The theory of maintaining moisture by surface cultivation has been frequently explained. Exact determination of moisture present during a dry month, at depths of the soil from 1 ft. to 6 ft., shows a gain of almost 50 per cent. where cultivation prevails. Moreover, in cultivated land the water in lower soil is held for the use of roots, and as fast as absorbed by them the supply is replaced through the firm soil below, which, evaporation being stopped, remains moist and permeable by the roots. In planting worked trees the influence of stock, though a most important one, is seldom considered. Experience further confirms the observations of Mr. H. Tryon—that oranges worked on rough lemon stock are the most susceptible to attack. The liability of the Lisbon lemon so worked is much more pronounced. Seedling trees have been quoted as comparatively immune, but this is erroneous. Young trees, both orange and mandarin, where planted in retentive scrub soil, are found to be very seriously affected at two and three years old. Planting trees in holes below the level of surrounding surface, or so that they will sink below that level, is very detrimental. The essentials to maintaining the trees healthy are:—A suitable soil of sufficient depth and drainage, with an even supply of moisture (mainly attainable by systematic cultivation) and reasonable attention in all details. Choice of varieties may have some influence according to vigour and constitution of the subject.

State Farms.

KAMERUNGA STATE NURSERY.

MANAGER'S REPORT FOR OCTOBER, 1914.

Rainfall for the month, 371 points.

Number of days on which rain fell, 16.

Weather during the last week has been hot and steamy.

Coffee is now bearing its second crop of flowers, and all the young trees look well, the foliage being a rich dark green; and, owing to the moist conditions, it is hard to distinguish between the manured and unmanured trees. The ground should be kept clean, and, where possible, mulch round the trees.

Vanilla.—The weather has been most favourable for the growth of vines. Those two years old are flowering freely, and the pods are setting well. All flowers are being pollinated. Thinning out of pods will be done later.

Gingers, turmeric, arrowroots, and yams should be planted now.

Animal Pathology.

CAN THE CATTLE TICK BE EXTERMINATED IN QUEENSLAND?

BY P. R. GORDON.

After a careful study of Mr. Pound's report on what has been accomplished in the way of exterminating the cattle tick in some of the American States, it has occurred to me that my extenisve practical experience in the successful extirpation of the sheep scap Acarus in Australia may supply some useful hints in an endeavour to carry out a similar work in respect to the cattle tick. I should premise that, up to 1866, New South Wales and South Australia were the only two colonies of the Australasian group that had effectually banished scab from their flocks. Victoria and Tasmania were not free from the disease until well on in the eighties, and New Zealand not until 1892. In the early fifties New South Wales stamped out the disease by the slaughter of all infected and contact sheep, compensating the owners from a fund formed by a levy on all sheep within that colony, and the flocks remained free from the disease until 1863, when some scabbed sheep on vessels trading between Melbourne and Newcastle had accumulated in a butcher's paddock at the latter port, and were sold to a dealer, who travelled them north towards the Queensland border, infecting all the flocks along their route; and, as South Australia had, a year or two prior to that date, cleared her pastures of the disease without the slaughter of the diseased sheep, the New South Wales Government hurriedly passed an Act similar to that in force in South Australia, appointed the late Mr. Alexander Bruce to be Chief Inspector under the Act, and I was appointed as his deputy—to act at headquarters during his tours of inspection, and to carry out country inspections when his presence was necessitated in the capital. The Act came into operation on 1st January, 1864, and the disease was completely exterminated in eighteen months, and the colony proclaimed clean in 1866. This feat was brought about solely and entirely by the Act having been administered by Mr. Bruce by a determined insistence on all its provisions being carried out in their integrity, the money penalties for laxity or neglect having been heavier than those under any other Act, the Customs Act alone excepted. There were several specifics reported to have been effective in killing the scab Acari; but the greatest difficulty hitherto had been to find one that would effectually kill the Acari, and at the same time act as a preventive of reinfection. The tobacco and sulphur dip—first brought into notice by Mr. John Rutherford, Victoria—was found to be the most reliable (up to that

date, at least), and was adopted as the Government dip; the use of all other specifics having been strictly prohibited. On the preventive measures depended the whole success of the treatment, as will be the case with the cattle tick. As already stated, the tobacco infusion was found most reliable in the destruction of the scab insect, but the sheep were liable to reinfection from trees, fencing posts, yards, &c., against which sheep had rubbed, so that the flowers of sulphur mixed with the tobacco infusion, and which was kept continually stirred up in the bath, so peppered the fleeces as to prevent reinfection for a period of six months, by which time all Acari on trees, fences, &c., had died off. But two dippings within an interval of from fourteen to twenty days were found to be necessary, because a study of the life history of the Acarus showed that when introduced on a sheep it, at once, burrowed under the exterior cuticle, reappearing in thirteen days with its numerous progeny attached to its legs, the lymph exuded causing pustules, which, breaking, formed scabs—whence its popular name, so that at the time of first dipping it almost invariably happened that many Acari were in a partial state of development under the surface of the skin, and could not be reached by the medicaments. Mr. Bruce resisted all applications of owners and agents of proprietary dips—and many such were made to the Government—to even submit their specific to a test for the reason not alone that the tobacco and sulphur dip, which was prepared under the surveillance of officers of the Department, but also because in the case of proprietary dips—many of which had failed to be effective—the ingredients of which they were composed were not made public; and the wisdom of this will be made plain by a circumstance that occurred some eighteen years later on. Now, in any attempt to stamp out the cattle tick in Queensland a means of preventing reinfestment for a certain time, to be ascertained, must, as with sheep scab, be of the very first importance. In America they have a natural means to that end in their meteorological conditions which are absent in Queensland, and, therefore, it will be necessary, as was our case with sheep scab, to set up an artificial means of prevention; and even if such is discovered, I strongly question whether extermination can be attained until all large grazing holdings have been subdivided into smaller properties and all cattle compulsorily kept within fences. From my experiences of sheep scab as related above, I would strongly recommend that the use of all proprietary dips for cattle tick be prohibited, and only the Government dip be allowed, unless the component parts of those dips be fully described to the Department's Analyst. My experience while in office of many of these proprietary dips was that most of them at least were merely the Departmental dip, with the addition of some ingredients which had no effect beyond increasing the cost of the dip. The extermination of the

ticks should be the one and only aim, and not to be side-tracked by any other consideration. I am, of course, aware that since the time when sheep scab was exterminated several effective sheep dips have been placed on the market; but, in strong support of Mr. Bruce's action in prohibiting the use of proprietary dips at the time, the following well-known circumstance occurred in 1884 or 1885:—It may be in the recollections of many sheepowners that about that date some sheep imported from America, which had passed through the Sydney quarantine and duly disinfected under the then Government Veterinary Surgeon (the late Mr. Willows) were sold to a well-known pastoralist, then of New South Wales, now of Queensland, and taken to his run, where soon afterwards they developed scab and were destroyed by order of the Government. The cost of destruction, the cleansing of the run, compensation to the owner, and legal expenses involved the Government in an outlay of over £80,000. The veterinary surgeon was dismissed the service. Mr. Bruce was suspended, and only reinstated on account of the many and valuable services to the pastoral industry that had been carried out on his initiative; and the dip the veterinary had used with the sheep, although then and still a valuable disinfecting fluid, and advertised as an efficient sheep dip, had "but scotched the snake, not killed it."

THE NATIVE TAMARIND.

Mr. F. Claussen, head teacher of the Brookfield State School, brought to this office a sample of a native fruit, locally known as the Native Tamarind (*Diploglottis Cunninghamii*). We submitted the fruit to Mr. C. Ross, Instructor in Fruit Culture, and he has furnished the following notes on it:—

"The fruits submitted are what are called 'The Native Tamarind'; botanically, *Diploglottis Cunninghamii*. I have seen the tree growing in the coastal scrubs and mountains further inland from North to South of Queensland. In some situations it grows to a fairly large tree. The young shoots, panicles, and leaf stalks are covered with soft, brownish hairs. The shape and size of the leaves vary on the same tree, ranging from 6 in. to over 12 in. in length. The fruit is borne in panicles, each fruit being enclosed in a round casing within which is a seed surrounded by an amber-coloured, juicy pulp of a brisk, pleasant, acid flavour. It is a useful dessert fruit, and excellent for conserves and jam."

Vegetable Pathology.

ONION WHITE BLAST.

By H. TRYON, Government Entomologist and Vegetable Pathologist.

The so-called blight affecting the onion crop in the Memerambi district, illustrated by the specimens transmitted, is a special injury due to the attacks of a small pale green, elongated insect belonging to the family Thysanoptera (fringe wing flies) whose members are spoken of as "Thrips."

This depredator concerned occurs in very large numbers at the bases of the leaves ensconced in the narrow interstices that exists between one and another.

The particular species of Thrips concerned cannot be as yet ascertained, since none of the winged adults occur in the sending, although the larval ones still attached to it are quite numerous. However, its identification is important, as this will throw light on the range of its food habits, and so possibly indicate sources whence it may have emanated, and to which, therefore, attention might be profitably given when devising repressive measures.

The injury is occasioned by the exercise of the biting habit of the Thrips, each bite originating a small gray spot and these spots becoming so numerous that the foliage, after first discharging its green colour, dies and becomes brown. Obviously, the oldest parts manifest the more severe injuries; thus the first-formed leaves succumb prior to the others, and the tips of the leaves die first, parts more and more back successively being implicated in the destructive damage.

Originally the insect is borne to the subsequently affected plant through the air on the wing, and so it becomes dispersed. Again, possibly, other truck plants might serve to originate the trouble, since many species of Thrips are general feeders.

A few insects, if overlooked, may soon, in the course of natural increase, give rise to a numerous host. The entire life from the egg upwards may be spent on the plant once adopted for a residence and feeding ground.

Once one sees the small whitish specks on the foliage of the onion, one may suspect the presence of Thrips, and, if it be present, the act of tearing the foliage apart will reveal the minute green elongated insects.

This "White Blast," as the disease may be designated, is evidently far worse than it would otherwise be owing to the prevalent drought; for dry conditions, whilst unfavourable to the onion plant, are conducive to the rapid multiplication of the onion Thrips, its enemy.

REMEDIES.

In dealing with the onion Thrips it must be remembered we have before us a very delicate hostplant. Therefore, the remedies that are most suitable for coping with insects of the class when occurring on fruit trees are not admissible in its case.

There are grounds, however, for concluding that even a slightly potent contact-insecticide will destroy it—for example, some application in which tobacco forms an essential ingredient; especially a soap containing nicotine.

Should the farmer have any tobacco growing (and everyone should have a little of this useful insecticide) he should roughly cure it, make a tea or decoction of it (1 lb. of tobacco in 2 gallons diluted to 4 gallons), and use this as a spray, adding a little soap or molasses to promote adhesion; or he might employ tobacco extract, and use this diluted.

Tobacco extract sometimes contains 40 per cent. of nicotine, and when of this strength should be blended with water in the proportion of 1 pint in 1,800. There is another form in which nicotine containing 60 per cent. may be used. Formerly a tobacco extract named "Rose Leaf," having a definite value in nicotine, was obtainable here. This, mixed with water in the proportion of 1 in 24, should be a very efficacious destroyer of the Onion Thrips.

The tobacco dust, if obtainable, is another form in which this nicotine-containing body may be used. It should be placed in a tin having its mouth covered with closely woven iron gauze, and simply dusted well into the hearts of the plants, care being taken lest the powder gets wet. Even at this late date, however, it appears that some good might attend its application.

I have dwelt upon the use of tobacco, since, especially when used as a basis in any spray wash, it will prove serviceable; but ones containing white oil soap and kerosene emulsion, too, might have been advocated. But both are liable to do injury, especially if not well made or applied when the light is strong.

Botany.

CONTRIBUTIONS TO THE FLORA OF QUEENSLAND AND BRITISH NEW GUINEA.

BY F. MANSON BAILEY, C.M.G., F.L.S., Colonial Botanist.

Order RUTACEÆ.

ATALANTIA, Corr.

A. glauca, *Hook. f.* var. **inermis,** *Bail. n. var.*

Dr. Lindley, the first botanist to describe the species, speaks of the plant as spinous (Mitch. Trop. Austr., p. 353). Bentham in the "Flora Australiensis," 1, p. 370, however, speaks of the plant as "often armed with straight or recurved spines," and subsequent writers have united the spinous and spineless varieties, but I have received specimens of the latter from the above two localities and consider it advisable to attach to the latter a distinctive name.

Hab.: Near Dalby, *Dr. T. L. Bancroft* (September, 1913); Chinchilla, *R. C. Beasley* (December, 1914).

Order RUBIACEÆ.

GALIUM, Linn.

G. tricorne, *With.* Annual, glabrous, stems simple or slightly branched at the base, ascending, very scabrous. Leaves 6-8-verticillate, lanceolate-linear, mucronate, scabrous. Peduncles shorter than the leaves with 1, 2, or 3 flowers, the pedicels of which are rolled back and thickened after flowering. Fruit covered with small tubercles.

Hab.: A native of Europe. I have recently received specimens naturalised near Brisbane from *Mr. Jas. Keys.*

Order PRIMULACEÆ.

ANAGALLIS, Linn.

A. parviflora, *Hoffm.*, gg, and *Link.* Very similar to the common Pimpernel (*A. arvensis*). Annual, glabrous, slightly branched, stems ascending. Leaves opposite, sub-rotund, enlarged and embrassing the stem at the base, obscurely nerved. Flowers blue or pink on peduncles 2-3 times longer than the leaves. Calyx lobes lanceolate acuminate; corolla small, equalling or slightly exceeding the calyx, lobes oval. Capsule globose, not exceeding the calyx.

Hab.: A native of the Mediterranean region, naturalised near Brisbane, *Colonel C. F. Plant.*

Order SCROPHULARINEÆ.

HERPESTIS, Gaertn. f.

H. chamædryoides, *Kunth.* (Plate 1.) A procumbent branching glabrous herb. Branches slender, diffuse, tetragonous, often rooting. Leaves opposite, shortly petiolate, ovate or obovate-oblong, obtuse, crenate, base cuneate, entire, 3-9 lines long, 2-6 lines broad. Pedicels

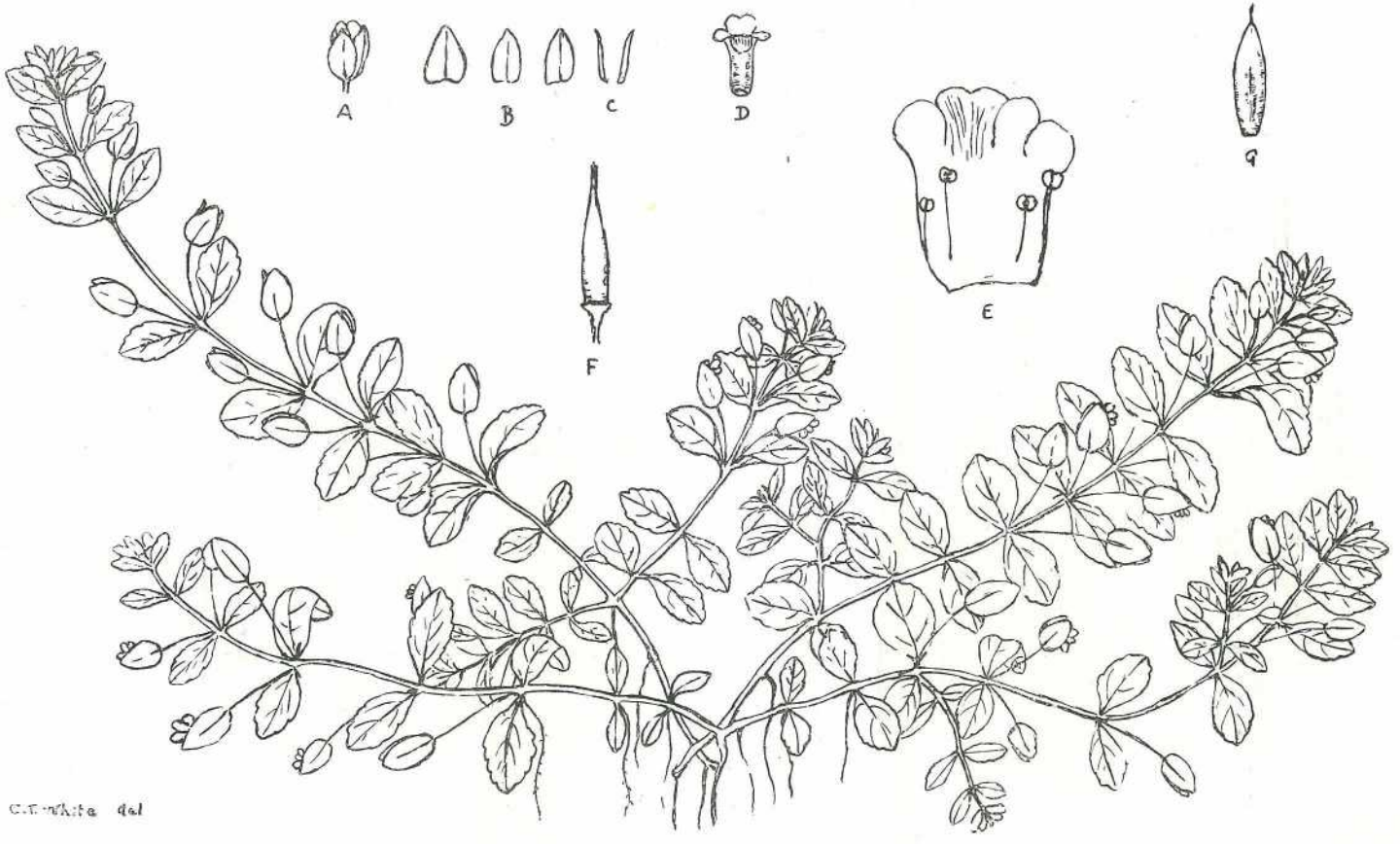


PLATE 1.—HERPESTIS CHAMÆDRYOIDES, *Kunth.*

A—Flower. B—Outer calyx lobes. C—Inner calyx lobes. D—Corolla E—Corolla laid open. F—Pistil. G—Fruit
A D—Natural size. E G—Enlarged.

axillary, solitary, often opposite, erecto-patent, filiform, ebracteate. Calyx 5-partite, 3 outer segments ovate oblong, the 2 inner ones linear lanceolate. 3-5 lines long. Corolla yellow, very slightly longer than the calyx, upper lip emarginate, lower trifid. Stamens short, included. Style short. Capsule, ovate, acute. Seeds numerous, very minute.

Hab.: A native of Tropical America. Specimens have been received as naturalised near Cairns from *Mr. C. E. Wood.*

This plant is met with as a naturalised weed in the ricefields of Java; it is also said to be a not uncommon weed in the West Indian canefields.

Order PLANTAGINEÆ.

PLANTAGO, Linn.

P. major, *Linn.* var. **Cornuti,** *Gouan.* (as a species). This differs from the common form in its much larger size. A perennial one to over 2 ft. high. Leaves oval or elliptic, 7-9 nerved, attenuated at the base into a very long petiole. Scapes much longer than the leaves.

Hab.: A native of the Mediterranean region; now a naturalised weed on some of the farms in the Pine River district. Specimens received from *E. W. Bick.*

Order URTICACEÆ.

FICUS, Linn.

F. scandens, *Roxb.* I have just recently received specimens of this from Samarai, British New Guinea, from Mr. Thos. J. A. Thomson, who states: "I have seen two remarkable cures of big sores on boys' feet with this after trying all our medicines; the natives simply break the fruit off, then drop on the sore the white milk that exudes from the fruit." The specimens forwarded seem to agree better with the normal form than with the Australian variety.

Order FUNGI.

Boletus portentosus, *Berk. et Br.*

Hab.: At the base of a tree, Goodna, *C. T. White.*

Ustilago utriculosa, *Tul.*

Hab.: On inflorescence of *Polygonum attenuatum,* Ithaca Creek, *C. T. White.*

A MARKET FOR MAIDEN-HAIR FRONDS.

The Colonial Botanist has recently received the following letter from Messrs. Gordon and Gotch, 15 St. Bride street, London, E.C., England:—

"Dear Sir,—A friend of ours is of the opinion that there should be an opening for considerable business in the shipment of dried Maiden-hair Ferns from Australia to London.

"We have failed to secure any information on the matter over here, so venture to think that you in your official capacity may be able to assist us by passing this enquiry into likely hands. Our friends would doubtless be able to purchase in large quantities, and we would suggest for preliminary purposes that quotation be sent per 1,000 leaves made up in fifties, the quotation being for say 5,000, 10,000, and 20,000.—Yours faithfully, "(Sgd.) GORDON AND GOTCH."

I should think that *Adiantum formosum* is the one that would prove the most suitable for the purpose; this is the common large Maiden-hair of our Southern and Northern scrubs and the quantities referred to could often soon be gathered.

Entomology.

BEETLE BORERS OF SUGAR-CANE.

By E. JARVIS, Assistant Government Entomologist.

The following article upon "Beetle-borers of Sugar-cane from New Guinea" has been received by the General Superintendent of the Bureau of Sugar Experiment Stations:—

It is thought that the following notes may prove serviceable to those interested in the welfare of our sugar industry, and more particularly to entomologists who are endeavouring to minimise financial losses occasioned by the injurious action of various insect pests of cane.

The beetle-borers in question were found by the writer last September at Macnade in two varieties of sugar-cane:—

CRYPTORHYNCHUS Sp.

Injuries due to this weevil are somewhat similar in general appearance to those caused by our common beetle-borer (*Rhabdocnemis obscurus*), but the tunnels seldom exceed 4 in. in length, are very irregular in width, and may entirely encompass an affected internode, thus destroying most of the internal portion. The larva does not construct a cocoon, but pupates at the end of its tunnel in an egg-shaped chamber, one end of which consists of débris tightly compacted, the whole interior being neatly smoothed and rounded.

LARVA.—The larva is a light-yellow, wrinkled, soft-bodied grub about a quarter of an inch long with bright chestnut-red head, and black mandibles.

PUPA.—Pale creamy-yellow, with dark brown eyes and two reddish black-pointed spines at the extremity of the abdomen. Length, about $\frac{5}{16}$ of an inch.

ADULT.—The perfect insect is a somewhat narrow-bodied weevil, scarcely a quarter of an inch long and of a general dark yellowish-brown colour, with a small orange-yellow blotch on each side close to the legs, which is brighter in some specimens, but fades after death to dull brownish-yellow.

Freshly emerged adults are often reddish at first, but gradually darken to the normal colour upon continued exposure to light.

Like other species of the genus, this bettle cannot fly, though able to walk quickly, and has the curious habit of feigning death when alarmed. At such times it lies motionless on its side with legs bunched together in a shapeless mass, and if chancing to fall upon ploughed ground or among weeds, its extraordinary resemblance to surrounding particles of soil, &c., enable it to easily elude observation.

Cryptorhynchus weevils are noted for possessing remarkable tenacity of life, and it may be of interest to mention that I subjected this species to strong fumes of cyanide of potassium for twenty-four hours in a tightly corked bottle, and next day found the bettle alive and able to move its legs. It did not fully recover from the effects, however, and died a few days later.

RHABDOCNEMIS Sp.

This weevil might at first sight pass for an abnormally small specimen of our common beetle-borer, but is a more slender insect, and when looked at closely the thorax and base of beak appear velvety and of a dark olive-brown tint, while the wing-covers instead of being black are deep brown, more or less reddish on the basal portion. Length, scarcely $\frac{3}{8}$ of an inch.

It was found boring cane, the damage inflicted being very similar to that caused by *R. obscurus*. No larvæ or pupæ were observed, and only one adult (a female).

NOTE.—Scientific descriptions of these beetle-borers are reserved for publication elsewhere.

Statistics.

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF NOVEMBER IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING NOVEMBER, 1913 AND 1914, FOR COMPARISON.

Divisions and Stations.	Average Rainfall.		Total Rainfall.		Divisions and Stations.	Average Rainfall.		Total Rainfall.	
	Nov.	No. of Years' Records.	Nov., 1914.	Nov., 1913.		Nov.	No. of Years' Records.	Nov., 1914.	Nov., 1913.
North Coast.	In.		In.	In.	*South Coast*—continued:	In.		In.	In.
Atherton	2·01	13	0·75	1·21	Mount Larcom ...	...	...	0·54	2·82
Cairns	4·06	27	3·48	Nil	Nanango	2·35	27	0·48	0·48
Cardwell	4·65	27	2·17	Nil	Rockhampton ...	2·12	27	0·68	0·70
Cooktown	3·13	27	2·81	Nil	Woodford	2·98	27	1·52	1·03
Herberton	2·59	27	0·61	2·04	Yandina	3·50	21	1·67	1·17
Ingham	4·09	22	1·62	Nil					
Innisfail	6·98	27	4·24	Nil	*Darling Downs.*				
Mossman	6·12	5	5·30	0·25					
Townsville	1·89	30	0·13	0·01	Dalby	2·47	27	0·65	0·47
					Emu Vale	2·72	17	0·56	0·81
Central Coast.					Jimbour	2·47	24	0·54	Nil
					Miles	2·35	27	1·31	Nil
Ayr	1·45	27	Nil	Nil	Stanthorpe ...	2·75	27	2·13	0·61
Bowen	1·29	27	1·06	0·01	Toowoomba ...	3·06	27	0·75	0·90
Charters Towers ...	1·57	27	Nil	0·02	Warwick	2·61	27	1·05	0·65
Mackay	2·45	27	1·10	0·07					
Proserpine	3·47	11	1·36	0·06					
St. Lawrence ...	2·12	27	0·27	2·25	*Maranoa.*				
South Coast.					Roma	2·13	25	1·36	0·54
Crohamhurst ...	4·47	20	3·30	0·31	*State Farms, &c.*				
Biggenden	2·45	14	1·31	1·06					
Bundaberg	2·39	27	0·53	1·83	Gatton College ...	2·71	14	0·88	0·42
Brisbane	3·57	63	0·59	1·64	Gindie	2·06	13	Nil	1·12
Childers	2·75	19	0·53	3·75	Kamerunga Nurs'y	3·22	23	2·68	0·01
Esk	3·02	27	0·75	1·28	Kairi	...	..	0·17	1·55
Gayndah	2·54	27	0·96	0·93	Sugar Experiment Station, Mackay	2·50	16	...	0·06
Gympie	2·88	27	1·68	0·71					
Glasshouse M'tains	3·97	6	1·95	1·67	Bungeworgorai ...	...	...	...	0·03
Kilkivan	2·50	27	0·12	0·68	Warren	...	...	Nil	0·70
Maryborough ...	2·80	27	0·54	2·82	Hermitage ...	2·81	7	1·20	0·64

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for November this year and for the same period of 1913, having been compiled from telegraphic reports, are subject to revision.

General Notes.

BANANAS AS FOOD.

There are many methods of preparing the banana as food besides the usual way of eating it as a ripe fruit. W. Fowcett, B.Sc., late director of public gardens and plantations in Jamaica, in his valuable book on "The Banana—its Cultivation, Distribution, and Commercial Uses," gives much information on the methods of utilising the fruit and on the by-products obtainable from it. He first mentions the roasting of bananas on the grill, stewing them as is done with pears, making banana fritters, &c. Then the processes of preserving the fruit in the same manner as figs, raisins, and other dried fruits are produced are described. Banana flour from the fully-grown unripe banana, he mentions as a regular article of consumption in and export from the West Indies. It is shown that in all the banana-exporting countries put together there are probably as many as 8,000,000 bunches which fail to come up to the standard demanded by shippers and the trade. Then it was found that the small unsaleable fruit could be utilised in making alcohol, and, to some extent, this has been turned to some account.

Mr. A. F. Spawn, of Tampa, Florida, who resided for some years in Queensland and Victoria, manufactured banana figs and banana flour in 1887. He did not make either wine or spirits from the fruit, but a very much better product in the shape of banana coffee. This is a product which, considering the high opinion held of it both in America, Great Britain, and Australia, we are surprised has not been more largely exploited. The Mortimer Pure Food Company, Chicago, considered Mr. Spawn's banana coffee to be an article of the higher order of food, and destined to do more good for the coffee-drinking nations than any other food, it being a pure article and a most delicious beverage. The "Home Journal," New York, wrote:—"The transformation of the most nutritious of fruits in the world into a coffee is a great triumph. It is a perfect drink, and solves the coffee question . . . it is a satisfying beverage, supplying an aroma and taste heretofore lacking in all coffee substitutes."

In 1913, Mr. Spawn sent to the Department of Agriculture and Stock some tubers of the "Dasheen" from which he also prepares a good food. These were distributed to the Botanic Gardens and the Kamerunga State Nursery, where they were acclimatised. Under the name of "Tania," we described the tuber in the November issue of the Journal for 1906.

But, to return to the products of the banana, practically only a small proportion of the world's banana production can be utilised for the manufacture of flour and banana figs, and it remains to consider the use of the fruit in manufacturing an alcoholic spirit. Ligon, in his

"History of Barbados" (1657), says that the bananas for this purpose are gathered when fully ripe, then peeled, and washed in water well boiled. The mash is left overnight, when it is strained and the liquor bottled. In a week it is ready for use. It is a very strong and pleasant drink, but must be used sparingly, for it is much stronger than "sack" (sherry), and is apt to mount to the head.

The possibility of utilising the banana fruit in the production of alcohol has been more than once under the consideration of the Academy of Sciences of France, and Mr. Fawcett takes the following information from a paper read before the Academy by M. B. Corenwinder ("Comptes Readers," vol. 88, 293, 1879) :—"It had already been shown by Buignet that during the whole growth of this fruit the saccharine matter is constituted entirely of cane sugar, but the proportion varies considerably. From results of analyses by Corenwinder himself, it appears that a sound ripe banana fruit contains as much as 22 per cent. of its weight of sugar, 16 per cent. being crystallisable, and the remainder uncrystallisable. In the mature sugar-cane, the proportion of cane sugar present is, according to Payen, 18 per cent."

In 1894 experiments on a large scale were carried out by Herr Kahlke, at his manufactory of yeast and alcohol at Königsberg, on the use of banana meal in brewing. Herr Kahlke wrote in the weekly paper "Alcohol" as follows:—

"Banana flour, without doubt, from its richness in starch and its good flavour, is particularly suitable for the manufacture of yeast. This flour is easily rendered saccharine. It has all the requisite properties of an excellent class of yeast, and, moreover, keeps well. The alcohol obtained from it leaves nothing to be desired. . . . Satisfactory experiments have also been made in some breweries, where 20 per cent. of malt has been replaced by the flakes and flour of bananas. The flavour of beer was not altered, and the quantity of liquid was increased, and the malt was replaced by a less expensive substance."

We have already, in previous issues of the Journal, given several recipes for the various methods of utilising bananas in the home, and have shown that a valuable fibre can be obtained from the banana, known as *Musa textilis*.

TO FIND THE CONTENTS OF STACKS.

A knowledge of the weight of hay in a stack is useful in several ways to a farmer—for fire insurance, for instance. It is no uncommon occurrence for one or more stacks to be destroyed by fire either accidentally or wilfully caused. For a very small premium stacks may be insured against fire; and to get at the weight of the contents as nearly as possible is important, in order that the value may neither be over nor under estimated.

Various modes may be adopted, but the only accurate one is by the use of platform scales. The number of tons may be nearly determined

by ascertaining the number of cubic feet or yards in the rick, and obtaining the weight per cubic foot by actual weighing.

Weight per Foot.		Yards to a Ton.	Weight per Foot.		Yards to a Ton.
Lb. Oz.			Lb. Oz.		
5 3	=	16	7 8	=	11
5 8½	=	15	8 4	=	10
6 0	=	14	9 3	=	9
6 6	=	13	10 5	=	8
6 14	=	12			

The number of yards per ton will depend on the solidity of settlement of the stack. If a good-sized stack has well settled, about 12 cubic yards to a ton will be fair.

The following rule will give the weight approximately by measurement:—

With a tape measure, measure the length and breadth of the stack, then the height to the eaves, and lastly the perpendicular height from the eaves to the top.

To calculate the quantity proceed thus—

To the height from the ground to the eaves, add one-third of the height from the eaves to the top; multiply this sum by the breadth and that product by the length. This will give the content in cubic feet, which divided by 27 (the number of cubic feet in a yard) the quotient will be in yards. Divide this by 10 to bring it into tons.

EXAMPLE.

Suppose a stack of hay, 30 ft. in length; 20 ft. in breadth; the height from ground to eaves, 14 ft.; and height from the eaves to the top, 9 ft.—

14 feet = height to the eaves
3 = ⅓ of height to top } add

17
20 = breadth

340
30 = length

10,200 = cubic feet

27)10,200(377·7 cubic yards.
10)377·7(37·7 tons, or 14 cwt.

As the sides of stacks are generally bevelled inwards, in measuring for length and breadth take the *mean* rule—that is, measure at half-way up from ground to eaves; and for heights measure perpendicularly.

If the hay is not well settled, divide by 9.

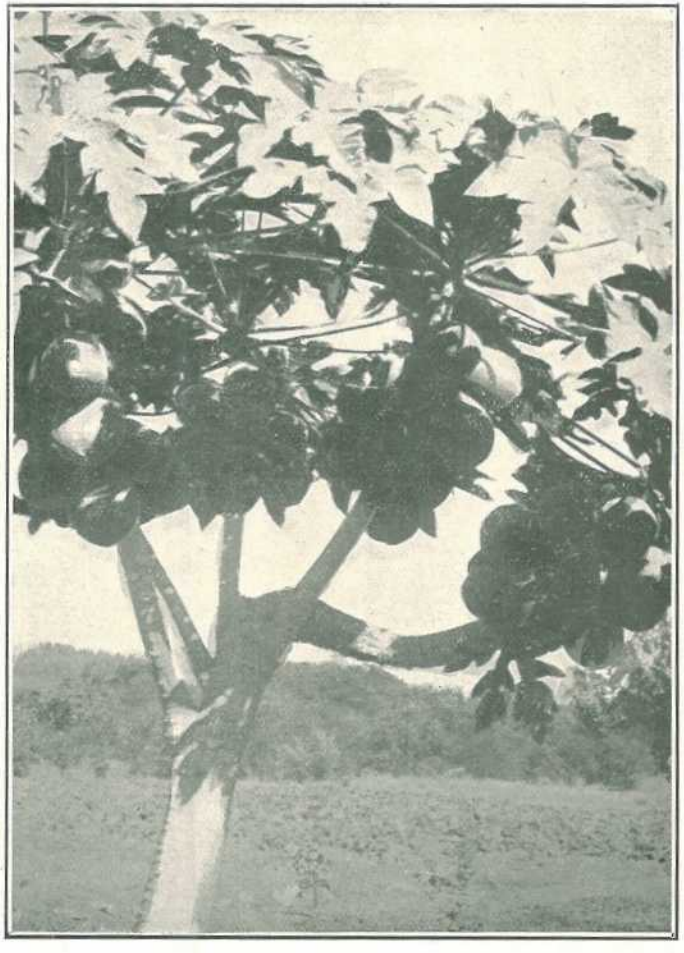
If well settled, divide by 7.

If very compact, divide by 6.

ERRATUM.

In the December issue of the Journal an error occurred in the quantity of methylated spirit in making up a blister for the removal of a splint from a horse. Instead of 1 drachm, the quantity should have been given as 1 oz.

PLATE 2 (FIG. 1).—Large Papayas developed after thinning out the remainder.



(FIG. 2).—Papaya Tree artificially caused to branch.

Answers to Correspondents.

MANURE FOR CITRUS TREES.

E.M., Auckland, N.Z.

A standard manure for citrus trees should contain not less than 80 lb. nitrogen, 40 lb. phosphoric acid, and 80 lb. potash per acre.

The 80 lb. nitrogen can be obtained approximately from 600 lb. dried blood, or 400 lb. sulphate of ammonia, or can be supplied by green manuring.

The 40 lb. phosphoric acid can be obtained approximately from 235 lb. of 37 per cent. soluble superphosphate, or Thomas' phosphate, 200 lb. of meatworks fertiliser without blood, or 165 lb. good bonedust.

The 80 lb. of potash is obtained from 160 lb. of 96 per cent. sulphate of potash.

This combination gives a complete manure, containing 8 per cent. nitrogen, 4 per cent. phosphoric acid, and 8 per cent. potash. For young trees not in bearing, a smaller quantity should be used. Trees 5 years old require from 4 to 6 lb. of the complete manure per tree. Old trees in full bearing require as much as 20 lb. per tree. The manure should be given in two applications—the first in July or August, and the second in December or January.

AREA OF CLEARED LAND.

G.C.P., Bunerba—

The correct area of clearing a block in triangular form, with sides 14, 15, and 19 chains respectively, is 10·40 acres, as calculated by the following rule:—

Add the three sides together, and take half that sum, then multiply the half sum and the three remainders together; and the square root of the last product will give the area.

Example.—$19 + 15 + 14 = \frac{48}{2} = 24$

$24 - 19 = 5$

$24 - 15 = 9$

$24 - 14 = 10$

$24 \times 5 = 120 \times 9 = 1080 \times 10 = 10800$, the square root of which is 10·40 acres.

TIMES OF SUNRISE AND SUNSET AT BRISBANE—1915.

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

PHASES OF THE MOON, 1915.

On or about the 150th Meridian, East Long.

			H.	M.	
1 Jan.	○	Full Moon	10	20	p.m.
9 „	☽	Last Quarter	7	12	a.m.
16 „	●	New Moon	12	41	„
23 „	☾	First Quarter	3	32	p.m.
31 „	○	Full Moon	2	41	„

The moon will be brightest, under favourable atmospheric conditions, when in the last quarter, as it will then be nearer to the earth.

7 Feb.	☽	Last Quarter	3	11	p.m.
14 „	●	New Moon	2	31	„
22 „	☾	First Quarter	12	58	„

There will be no actual Full Phase this month, two having occurred in January. The moon will be nearest to earth on 7th February at 11·18 p.m.

2 Mar.	○	Full Moon	4	32	a.m.
8 „	☽	Last Quarter	10	27	p.m.
16 „	●	New Moon	5	42	a.m.
24 „	☾	First Quarter	8	48	„
31 „	○	Full Moon	3	38	p.m.

The moon will be nearest the earth on the 5th at 1 p.m., and farthest from the earth on the 21st at 11·12 a.m. The moon's distance from the earth at these times will be about 225,000 miles, and about 252,000 miles, respectively.

7 Apr.	☽	Last Quarter	6	12	a.m.
14 „	●	New Moon	9	36	p.m.
23 „	☾	First Quarter	1	39	a.m.
30 „	○	Full Moon	12	19	„

The moon will be in perigee, or nearest to the earth, on the 2nd at 9·36 a.m., and on the 30th at 5·12 p.m. It will be in apogee, or farthest from the earth, on the 18th at 1 36 a.m.

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 will rise and set about 4 minutes later than at Brisbane, and at Oontoo (longitude 141 degrees E.) about 48 minutes later.

At St. George, Cunnamulla, and Thargomindah the times of sunrise and sunset will be about 18 m., 30 m., and 38 minutes respectively, later than at Brisbane.

The moonlight nights 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 it 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 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 with regard to the ecliptic.

The Markets.

PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR DECEMBER, 1914.

Article.		DECEMBER. Prices.
Bacon	lb.	8d. to 10d.
Bran	ton	£9
Butter	cwt.	110s.
Chaff, Mixed	ton	£5
Chaff, Oaten	,,	£4 to £7 10s.
Chaff, Lucerne	,,	£3 to £4 10s.
Chaff, Wheaten	,,	£4 to £5
Cheese	lb.	5d. to 7d.
Flour	ton	...
Hams	lb.	1s. 2d. to 1s. 3d.
Hay, Oaten	ton	£2 15s. to £3
Hay, Lucerne (Prime)	,,	£3 15s.
Honey	lb.	2d. to 3d.
Maize	bush.	3s. 4d.
Oats	,,	3s. 8d.
Onions	ton	£6 15s. to £8
Peanuts	lb.	3½d.
Pollard	ton	£8 10s.
Potatoes	,,	£4 to £7 10s.
Potatoes (Sweet)	cwt.	2s. 3d.
Pumpkins	ton	£2 to £3 10s.
Wheat, Milling	bush.	5s. 4d.
Eggs	doz.	9d. to 1s. 3½d.
Fowls	pair	3s. to 5s.
Geese	,,	4s. 9d. to 5s. 9d.
Ducks, English	,,	3s. 6d. to 4s.
Ducks, Muscovy	,,	4s. to 5s. 6d.
Turkeys (Hens)	,,	8s. 6d. to 12s. 6d.
Turkeys (Gobblers)	,,	14s. to 19s.

SOUTHERN FRUIT MARKETS.

Article.	DECEMBER. Prices.
Bananas (Queensland), per case	12s. to 14s.
Bananas (Queensland), per bunch	...
Bananas (Fiji), per case	24s. to 24s. 6d.
Bananas (Fiji), per bunch	...
Mandarins (Queensland), per case	...
Mangoes, per case	8s. to 11s.
Oranges (Navel), per case	12s. to 16s.
Oranges (Seville), per case	6s. to 7s.
Oranges (Valencias), per case	12s. to 20s.
Oranges (other), per case	...
Passion Fruit (Queensland), per half-case	5s. to 9s.
Papaw Apples, per half-case	7s. to 12s.
Pineapples (Queens), per case	9s. to 11s.
Pineapples (Ripleys), per case	6s. to 14s.
Pineapples (Common), per case	8s. to 12s.
Tomatoes, per quarter-case	3s. to 5s.
Rockmelons, per double case	8s. to 10s.

PRICES OF FRUIT—TURBOT STREET MARKETS.

Article.	DECEMBER. Prices.
Apples (American), Eating, per case	20s. to 21s.
Apples (Tasmanian), per case	12s. to 14s.
Apples Cooking, per case	10s. to 12s.
Apricots, per quarter-case	5s. to 6s. 6d.
Bananas (Cavendish), per dozen	2d. to 4d.
Bananas (Sugar), per dozen	1½d. to 2½d.
Cape Gooseberries, per quarter-case	4s. to 7s.
Cherries, per quarter-case	4s. to 9s.
Cocoanuts, per sack	12s. to 15s.
Cumquats, per case	...
Custard Apples, per quarter-case	...
Lemons, per case	10s. to 12s. 6d.
Lemons (Italian), per case	12s. to 15s.
Limes, per case	...
Mandarins, per case	6s. to 8s. 6d.
Mangoes, per case	4s. to 6s.
Oranges (Navel), per case	8s. to 12s.
Oranges (other), per case	2s. to 4s.
Papaw Apples, per quarter-case	1s. 6d. to 4s.
Passion Fruit, per quarter-case	3s. to 5s.
Peaches, per quarter-case	1s. to 3s. 6d.
Peanuts, per pound	3d.
Pears, per quarter-case	...
Persimmons, per quarter-case	...
Pineapples (Ripley), per dozen	5s. to 8s.
Pineapples (Rough), per dozen	3s. 6d. to 5s. 6d.
Pineapples (Smooth), per dozen	6s. to 8s. 6d.
Plums, per quarter-case	2s. to 3s. 6d.
Rockmelons, per dozen	2s. 6d. to 6s. 6d.
Rosellas, per sugar bag	...
Strawberries, per tray	...
Strawberries, per dozen boxes	2s. to 3s.
Tomatoes, per quarter-case	1s. to 4s.
Watermelons, per dozen	4s. to 14s.

TOP PRICES, ENOGGERA YARDS, NOVEMBER, 1914.

Animal.	NOVEMBER. Prices.
Bullocks	£15 10s. to £17
Cows	£10 2s. 6d. to £12 15s.
Merino Wethers	20s.
Crossbred Wethers	17s. 9d.
Merino Ewes	16s.
Crossbred Ewes	18s. 6d.
Lambs	18s. 9d.
Pigs (Porkers)	35s.

Farm and Garden Notes for February.

FIELD.—The land intended for potatoes should now be ready for planting. Plant sound small potatoes, well shot, without cutting them. If large potatoes are cut into setts, there is a risk of their rotting, as the usual wet weather may be expected, with a hot, muggy atmosphere. Weeds will be very troublesome, and for that reason the sowing of lucerne should be deferred till later. Sow lucerne in deep rich soil, thoroughly worked and deeply ploughed. Cape barley, panicum, kafir corn, imphee, sorghum, and vetches may be sown; but it is risky to plant maize for a late crop, as early frosts would destroy the ripening grain. For an early winter crop, sow swede turnips and mangelwurtzels.

KITCHEN GARDEN.—Make preparations for good crops of vegetables for the early winter by ploughing or digging all unoccupied land, supplying well-rotted manure if needed. Chicken guano is also an excellent fertiliser, if prepared as follows:—

Spread a layer of black soil on the ground. Dump the fowl manure on to this, and pound it fine with the back of a spade; add hardwood ashes, so that the compound shall contain—Soil, 3 bushels; fowl manure, 2 bushels; ashes, 1 bushel. Mix thoroughly, and a little before planting moisten the heap with water, or, better still, with urine; cover with old mats, and let it lie till needed.

Most market gardeners will have cabbages and cauliflowers ready for transplanting. Do this during the month. In the pamphlet on "Market Gardening" issued by the Department, it is recommended to sow the seed from the middle of January to the middle of March, arranging the time, however, to suit early and late districts. For winter crops, the Drumhead type, of which Flat Dutch and Queensland or Florida Headen are good examples, and are the most profitable. The Savoy cabbage does well here. The best cauliflowers to grow are the Large Asiatic, Eclipse, Early Dwarf, and Le Normand. If the aphis appears, spray with tobacco solution.

Sow French beans, butter beans, beet, carrot, turnip, radish, cabbage, cauliflower, cress, peas. Should the weather prove dry after the January rains, give the plants a good soaking with water. Gather all fruit of cucumbers, melons, French and other beans, and tomatoes as they ripen, to ensure the continued production of the vines and plants.

FLOWER GARDEN.—Thin out and tie up dahlias. Keep the weeds down, and never allow them to seed. Sow hardy annuals. This is the best month for sowing, as you will be able to keep up a succession of bloom during the succeeding months of autumn and winter. To ensure this, sow phlox, pansy, daisy, stocks, aster, nasturtium, hollyhock, candytuft, mignonette, sweet peas, dianthus, carnations, cornflower, summer

chrysanthemum, verbenas, petunias, pentstamons, &c. Dianthus, sown now and planted out in March, will bloom during the whole year, if the dead stalks and blooms are regularly cut away.

Do not sow flower seeds too deep, as on the depth will depend greatly what results you will have as regards the seed germinating. It is easy to remember that seeds should be covered with fine soil to a depth equal to their own size; for instance, a pea is about one-eighth of an inch in diameter, therefore, cover it with one-eighth of an inch of soil.

Orchard Notes for February.

In order that the series of monthly notes that have appeared for some years past in the "Agricultural Journal" might be rendered of more value to our fruit-growers, I took advantage of the commencement of the new year to revise them and bring them up to date. At the same time, the notes have been somewhat altered, as, instead of making them of a general nature, applicable to the whole of the State, they are, to a certain extent, localised, as, although the general principles of cultivation, manuring, pruning, treatment of fruit pests, as well as of the handling and marketing of the fruit are applicable to the State as a whole, there are many matters that are of interest to individual parts of the State rather than to the whole State; and, further, notes that are applicable to the Southern part of the State for one month are not always applicable to the North for the same month.

In order to carry out this idea the State has been divided as follows:—

1. The Southern Coast Districts, south of the Tropic of Capricorn;
2. The Tropical Coast Districts;
3. The Southern and Central Tablelands.

This plan has met with such general approval during the past year that the notes will henceforth be published in accordance therewith.

THE SOUTHERN COAST DISTRICTS.

The earlier summer fruits, including grapes, will be pretty well over, but pineapples, mangoes, and bananas are in full fruit. The bulk of the main summer crop of pines ripens during the month, and growers are in consequence kept very busy sending them to both our local markets and canneries, and to the Southern States. The planting of all kinds of tropical fruits can be continued where necessary, though earlier planting

of both pines and bananas is to be recommended. Still, if the land is thoroughly prepared—viz., well and deeply worked—they can be planted with safety, and will become well established before winter. The month is usually a wet one, and both tree and weed growth is excessive. If unable to get on the land with horses to keep down weed growth, use the scythe freely in the orchard before weeds seed, as by doing so you will form a good mulch that will tend to prevent the soil washing, and that when ploughed in later on will add a considerable quantity of organic matter to the soil, thus tending to improve its mechanical condition, its power of absorbing and retaining moisture, as well as to increase its nitrogen contents.

This is the best month of the year in which to bud mangoes in the Brisbane district. The bark of the stock to be budded must run very freely, and the scion, when placed in position, must be tied very firmly. The bark of the scion should be slightly thicker than the bark of the stock, so that the material used to tie it keeps it firmly in its place. As soon as the bud is tied ringbark the stock just above the bud, so as to force the sap of the stock into scion so that a union will take place quickly.

Where cyaniding of citrus and other trees has not been concluded it may be continued during the month, as fruit treated now will probably keep clean and free from scale insects till gathered. If the trees have been treated with Bordeaux mixture, do not cyanide, as cyaniding should always be done previous to spraying with Bordeaux mixture.

If Maori is showing, spray with the sulphide of soda wash. Look out for Black Brand and also for theYellow Peach Moth towards the end of the month in the earlier districts. Spraying with Bordeaux mixture is advisable in the case of both of these pests.

Get land ready for strawberry planting, so as to be ready to set out runners next month. Some growers set out plants as early as the end of February, but March is to be preferred. Citrus and deciduous trees can still be budded during the month. Young trees in nursery should be kept clean and attended to; ties should be cut where necessary, and the young trees trained to a straight single stem.

THE TROPICAL COAST DISTRICTS.

As the month is usually a very wet one in this part of the State, very little work can be done in the orchard other than keeping down excessive weed growth by means of a scythe. When citrus trees are making excessive growth and throwing out large numbers of water-shoots, the latter should be cut away, otherwise they are apt to rob the rest of the tree, and thus injure it considerably. Many of the citrus trees will come into a second blossoming during the month, and this will produce a crop of fruit ripening towards the end of winter and during the following spring. The main crop, where same has set in spring, will be ripening towards the end of the month, but as a rule insect life of all kinds is so

prevalent at this time of year that the bulk of the fruit is destroyed. Where there is sound fruit, however, it will pay to look after. If the weather is wet it should be artificially dried before packing, but if there are periods of sunshine, then the fruit can be cut and laid out on boards or slabs in the sun, so that the extra moisture of the skin can be dried out. Care will have to be taken not to sun-scald the fruit, or to dry it too much; all that is required is to evaporate the surplus moisture from the skin, so that the fruit will not speck when packed.

Tropical fruits of all sorts can be planted during the month. Budding of mangoes and other fruits can be continued. Bananas must be kept netted, as fly is always bad at this time of year.

THE SOUTHERN AND CENTRAL TABLELANDS.

The marketing of later varieties of apples, pears, plums, peaches, and nectarines will occupy the attention of the Stanthorpe growers. The grape harvest will also extend right through the month. Every care should be taken to see that the fruit fly and codling moth are not allowed to spread, although the best work in fighting these pests has to be done during the months of December and January, as on the action then taken, if carried out systematically, the freedom of the later fruits from infestation mainly depends.

Handle the fruit carefully, and see that no fly or codling moth infested fruit leaves the district. The grapes, ripening as they do when this fruit is over in the earlier parts of the State, should be sent not only to Brisbane but to all other parts of the State. For long shipment nothing can beat crates holding 6-lb. baskets. The fruit should be gathered some hours before packing, and be placed in the sun, so as to become thoroughly dry, and to allow the stems to become wilted, as this causes the fruit to hang on the bunch much better, and consequently to reach its destination in better order.

If parrots and flying foxes are troublesome, organised shooting parties or poisoning with strychnine are the best means of dealing with those pests.

The crop of grapes will be about over in the Roma and other inland districts. Citrus trees, when infested by Red Scale, should be cyanided. The orchard should be kept well cultivated after every rain, and when there is no rain, but water is available for irrigation, if the soil requires it, the trees should get a good soaking, which, if followed by thorough cultivation, will carry the trees on till the fruit is ripe.