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Event and Comment.

The Current Issue.

The Fiji disease of sugar-cane is the subject of a special warning note by the Bureau of Sugar Experiment Stations. Useful entomological hints to cane-growers are continued by Mr. Edmund Jarvis. Agriculture in Queensland is reviewed interestingly by Mr. Quodling; and recent departmental action in respect to the checking of the spread of Bunchy Top disease in bananas is described. Mr. White has a note on some recently described plants which is illustrated excellently by Mr. Helmsing. Awards for the more important agricultural exhibits at the recent Royal Show are fully listed. Mr. Rumball has a note on poultry feeding, while Mr. Shelton discusses the points of the Duroc-Jersey pig. Recent visitors' remarks on Queensland's magnetic north are also presented. Efficiency in dairy production and contagious mammitis in cattle are included among other seasonal subjects discussed. The Journal is, as usual, well illustrated.

A Bush Home—An Artist's Impression.

A well-known Southern artist, Mr. D. H. Soutter, in describing his impressions of a recent tour through Southern Queensland, remarks that the dilapidated shack is rapidly disappearing in Australia. In opening new country the pioneer possibly begins with a very humble shelter. A tent, maybe, later supplemented by a bark hut, but in time, as his means permit, he builds a home that, for comfort and suitability, is as near perfect as possible. In the south-west of Queensland he was struck with the high standard of the newer structures which are rapidly displacing the old. One he had in mind is most picturesquely situated on the serpentine bend of a creek in the Maranoa district. Just built by a new settler there and his wife, who have designed themselves a most artistic home in an ideal situation. Eighty or ninety miles, maybe a hundred, from a town; so they deserve comfort and æsthetic surroundings. The land slopes pleasantly to the creek, which carries many flowering plants on its placid surface. An inch of rain sets it running so the weeds (?) are no menace. Wild duck are plentiful. A novel feature in the house is the living-room, two walls of which are merely wire-gauze between six-inch posts. In winter, wooden shutters keep out the cold winds. In summer these are removed and the gauze keeps out the flies and lets in the fresh air. The old homestead, which has been raised bodily on piles and connected with a gangway to the back of the house, is now the kitchen and storerooms. A garden is being planned between the house and the river, and an irrigation system installed.

Dairy Production—The Need for Economy and Efficiency.

Speaking at the recent Animal Husbandry Conference in Sydney, Mr. L. T. McInnes (Dairy Expert, N.S.W.) contended that Australia is faced with an immediate and pressing need for a substantial increase in dairy production. On the present average herd production, he said, it required the product of one cow for every three units of production to keep on feeding the present annual increase in our population. An enormous increase in production would be necessary, amounting this year to the yield of 55,000 additional cows, based upon present average yields. Should the stream of immigrants to Australia be augmented the necessity for a rapid expansion in dairy production would be intensified. During the past twelve months 486,000,000 gallons of milk were required to supply Australian home requirements, representing the product of 1,700,000 cows, and leaving a surplus for export from only 600,000 cows. It was obvious that unless steps were taken either to increase our herds or to improve their yields Australia in a few years would not only have no exportable surplus, but would be faced with a production insufficient for home needs. Dairy farmers should remember that there was a sure home market in Australia for increased quantities of dairy produce, stabilised by their own organisations. It was a startling fact that during the past ten years the inefficient feeding of dairy cattle in New South Wales had been responsible for a loss sufficient to pay for the whole of the stock of the State twice over. Our present-day herds, if fed well, would average 150 lb. of butter-fat per cow per annum, whereas the average for the past ten years had been only 100 lb.

Sheep on the Farm

At the same conference the benefits of sheep as an ordinary farm animal were discussed. Wheat, as is well known, is a most useful crop for improving the pastoral value of land; and, it was pointed out, the carrying capacity of any stock farm is very largely increased by the growing of crops and by the fullest use of all available

feed. Even if, it was held, only one or two hundred sheep were kept the return from them would be an appreciable factor in farm revenue. Sheep should be regarded as more than merely a grass eater. Grass is often sour and insufficiently nutritive in the winter, and the economy of providing fodder crops in addition would be demonstrated easily in much improved returns.

Renovation of Paspalum Pastures.

Pasture renovation experiments which are being carried out by Mr. C. S. Clydesdale (Assistant Instructor in Agriculture), under the direction of Mr. Quodling, have resulted in the accumulation of much interesting data. Comparisons between ploughed and unploughed and fertilised and unfertilised plots respectively have been made, full particulars of which are being prepared for these pages. Results from ploughed and unploughed land are sufficiently interesting to command special mention. One plot unmanured and *unploughed* gave an aggregate green tonnage weight of 4.58 tons per acre, equal to a growth of 31 lb. of grass daily per acre over a period of 326 days, in the course of which seven cuttings were taken. Another plot, unmanured and *ploughed*, gave a corresponding return of 16.31 tons and 112 lb. of grass grown daily per acre. Eighty-one pound of grass daily, approximately a ratio in favour of four to one, was the gain effected by ploughing. The value of this method of reviving grass lands and increasing their stock capacity is, as a result of this and other tests, fairly convincing.

Maize Improvement.

The high yields obtained in the maize field trials carried out by Mr. C. McKeon (Assistant Instructor in Agriculture), and which have been extended over a considerable period, have demonstrated unmistakably the value of propagating high-yielding strains of seed. The departmental scheme of seed maize improvement, embracing maize breeding and seed selection work extending over a term of years, has already brought about a marked improvement in type and quality of the several varieties that find favour with Queensland growers.

The Journal.

In the Annual Report of the Department of Agriculture and Stock the following reference is made to the Journal:—"The 'Queensland Agricultural Journal' has maintained a high standard of agricultural journalism and as an official publication. That as a vehicle of current technical and practical information on farming problems and practice it is becoming more and more appreciated is evidenced by its widening circulation. It continues to be an active and useful educational medium. The aim of the Editor is to issue a publication of all-round value to the agricultural industry, and in this he has succeeded. Necessarily limited to the presentation of what may be termed educational matter, it cannot be regarded altogether as a journal of light agricultural literature, nor is it desired that it should be so. The Journal has, however, attained the position of a recognised authority on technical and scientific subjects in relation to the industry it serves. Officers of the Department engaged in scientific and technical work have been generous in regard to the number and value of their contributions. Their notes, observations, and findings as recorded have been quoted widely in the scientific Press of this and other countries; and through their efforts the Journal has acquired a high reputation which it continues to sustain."

Bureau of Sugar Experiment Stations.

FIJI DISEASE.

Fiji Disease is present in at least two Southern Queensland localities. To warn growers of its dangers, and to instruct them in the ways in which they can help to eradicate it, the subjoined note has been circulated among cane planters.

What is Fiji Disease?

Fiji Disease is one of the *really serious* diseases of sugar-cane.

Fiji Disease has wrought *immense damage* in Fiji and on the Tweed, Richmond, and Clarence Rivers of New South Wales.

Fiji Disease is capable at any time, on the poorer classes of soils, of causing the *severest losses* in susceptible varieties.

Fiji Disease is caused by a *dangerous microbe* which almost undoubtedly belongs to a group called the Virus, to which the Bunchy Top microbe of Bananas also probably belongs.

Fiji Disease is an *infectious disease*. It is *distributed in diseased sets* and can also travel from plant to plant or even from infected fields to healthy fields many chains distant, being probably carried by insects, so care and patience will be needed if it is to be got rid of.

Fiji Disease is present in the Beenleigh and Maryborough Districts.

Fiji Disease has lately been found in the Beenleigh and Maryborough districts of our great sugar tract.

It has not yet done great damage, so *now* is the time to attack this new enemy of the Queensland sugar-cane grower.

Success in an attempt to combat this or any other plant disease is very largely dependent on the *willing co-operation* of the growers in the affected districts. Growers are, therefore, asked to read this circular carefully, and to give their very necessary help by following the advice given should the disease be found on their farms.

What to Look For.

When the external signs of Fiji Disease become apparent this disease is one of the easiest to recognise of all Sugar Cane Diseases.

Watch out for stalks and stools which are stunted and have short blunt leaves forming a fan-like top. Run your fingers along the *under surface* of these short leaves. If the stunting has been caused by Fiji Disease you will feel and see *thin galls* or lumps on the leaf blade and/or on the mid rib. These are true galls and *not kinks* in the leaf, measure from $\frac{1}{8}$ in. to 1 in. or more, and lie in an up-and-down position along the veins of the leaf or any part of it.

What to Do.

(1) The moment Fiji Disease is found on your farm, by yourself or anyone else, you should notify the Director, Bureau of Sugar Experiment Stations, Brisbane, of the occurrence, stating plainly the variety affected, size of field, and locality of farm. An officer of the Pathological Staff will carry out a campaign against Fiji Disease during the summer months, and it is essential that he should have this information. If necessary we will mail you special advice on your case. All dealings of this nature will be confidential, and no lists of affected farms will be published without the consent of the growers themselves.

(2) Never cut seed from or from near infected fields, especially on rich soil, as there the symptoms are less obvious.

(3) D. 1135 and Malabar are liable to much damage from Fiji Disease and should be discarded altogether at the first sign of Fiji Disease in them. Q. 813 is, so far as is known, fairly resistant. Of standover canes N.G. 16 is resistant. N.G. 15 (Badila) is also resistant, but its susceptibility to gumming makes it unsafe for the Beenleigh district.

(4) All fields more than 5 per cent. infected should be ploughed out on harvesting and green manure planted, or the land rested for a season.

Remember.

The Bureau is here to help you, but without your support it can do but little. Your Associations will be duly notified as to when to expect our Pathological Officer, so go over your farms and get whatever information you can about your own case ready and available for him to work on the moment he arrives, so that no time will be wasted.

The above instructions are essentially of a general nature pending the results of detailed investigations, but should be followed as closely as possible.

Prohibition of Removal of Cane Plants to Other Districts.

Measures are now being taken to prohibit the removal of cane plants from districts, including Maryborough, to the New South Wales border, and against the introduction of plants from New South Wales in order that other cane districts may be protected.

CANE PESTS AND DISEASES.

The Director of the Bureau of Sugar Experiment Stations, Mr. H. T. Easterby, has received the following report (22nd September, 1926), from the Assistant to Pathologist, Mr. N. L. Kelly:—

There are two factors more or less connected with pathology which are deserving of wider publicity than they at present receive. They are—(1) Irrigation; (2) Effective control of planting.

To an observer travelling to North Queensland for the first time, there are many striking impressions. On leaving Proserpine a dry belt is entered which is seldom blessed with rain. No crops relieve the monotony of the outlook. Though steep hills rise on the left they are comparatively barren. But, about 3 miles to the south of Home Hill, the desert begins to blossom like the rose. The change is absolutely phenomenal, and is due solely to the efficient utilisation of the liberal underground water supply, with which the deltas of the Burdekin, and, to a lesser extent, of the Haughton, are endowed. Irrigation is destined to play an increasingly important part in the closer settlement of Queensland. At present the Burdekin—a half mile in width—is apparently dry, and the Haughton is merely a chain of waterholes, but for practically 30 miles the country is literally riddled with underground channels. The Inkerman Irrigation Scheme involves the sinking of wells or "spears," and the production and distribution of electric power; its cost being diminished by the growing demand. It is a great boon to the district, and there are signs that many owners of oil or steam-driven plants will eventually throw in their lot with the Government scheme. In the Haughton district there is an expansive lagoon which could easily supply twice the area it now does with water. In the season which these districts have just encountered, irrigation was submitted to a severe test, and came through it very successfully. Another district that must eventually irrigate is Rollingstone.

One cannot enter the Herbert River district without being favourably impressed by the control of the planting, which, by the farmers' own vote, was vested in the local (C.S.R.) mills, and which is being quietly and efficiently handled.

If other mills followed their lead our work in disease control would be considerably facilitated, and trained officers now employed on routine work, which is necessarily incomplete because of the wide areas traversed, would be set free to investigate the more important pathological problems—e.g., Disease transmission, varietal resistance, &c. The information on these points from outside sources is of insufficient value, because of the varied conditions under which it was obtained.

It would be a distinct advance if every mill had an officer—perhaps, the cane inspector—who would study the diseases prevalent in the district from the point of view of identification and control. In this way, especially in those areas where gumming is widespread, he could very materially assist both the farmer and the miller. Later, he could be depended on to pronounce fields safe or unsafe for seed purposes, and so, by preventing the planting of infected cane (which practice still prevails in many districts) he would be attacking the problem at its most vital point. Of course, notes would have to be kept dealing with every block of cane.

In the Herbert River district, in two years, gumming disease has been so reduced that there is every indication of the district being entirely freed from the disease within the next two years. At present, just following the dry spell, the only localities where gumming was to be seen, were Forest Home, Gairloch, and Halifax. This sound state of affairs, though aided by the drought, has been mainly brought about by the company's field officers seeing to it that susceptible and sensitive varieties, of which H.Q. 426 is the worst, be not planted. Penalties are

imposed if the prohibition is wilfully evaded. Compulsion, however distasteful it may be to some, is really the safest course for all concerned; and is apparently the only one whereby an organisation can obtain power; even if that power is desired for good purposes.

Haughton River District.

The incidence of disease at Giru is very similar to that obtaining at Ayr. B. 208 is highly infected with both Leaf Stripe and Mosaic. The diseased fields should be ploughed out, ploughed several times, and planted with another variety. There are several farms where B. 208 is apparently healthy. These could be used, cautiously at first, as sources of seed, though any stool showing the disease should immediately be eradicated.

The white section across the leaves is Sectional Chlorosis, so-called because it is a destruction of the Chlorophyll—green matter—of the leaf, in sections. It is comparatively harmless, and should not be confused with the leaf markings of Mosaic, which latter disease is best described as a mottling throughout the leaf; being more prominent on the young shielded leaves than on the older leaves whose markings are often due to minor diseases, such as Ring Spot, or to an unequal distribution of nourishment by the leaf veins.

It is remarkable the effect of good cultivation before planting in minimising the damage wrought by a succeeding drought. This was especially noted in the Herbert, where many farms into which the trash had been turned, followed later by green manure, showed an excellent strike and growth, though planted after four months dry weather, with two dry months succeeding. The rain now falling is a godsend to all 1926 plant cane, especially the autumn plant. Some fields at Toobanna vary so considerably in quality—sand and heavy loam—that it is strongly recommended to eliminate these inequalities by "scoping."

Tully River District.

It is unfortunate that in this new and rich district, Leaf Scald already has a strong foothold. About six farms scattered around Birkdalla, Midgenoo, and Upper Banyan Creek are infected, and there may be still more, the time at my disposal being insufficient for a complete survey. A factor making for uncertainty as to the extent of infection, is the abundance of Top Rot throughout the district. One distinguishing feature of this latter disease is that it rarely attacks every stem in a stool, and, secondly, the inside of the stem is sound except where the rotting is in progress near the growing point. In this district Top Rot seems to be characterised by the stem coming to a spindle top, which was probably caused by the prolonged dry season this year.

Leaf Scald.—This disease was described in the April issues of "Queensland Agricultural Journal" and "Australian Sugar Journal," &c., but a résumé of those remarks will not be out of place here.

Losses.—In susceptible varieties, H.Q. 426, N.G. 15, &c., 100 per cent. of infected stools are killed.

Symptoms.—The critical symptom is a long pure white streak, very narrow, running usually from the bottom of the leaf sheath along a vein to the margin of the leaf. The white streak soon becomes broader and the tissues adjoining it die. Very often there are to be found shoots along one or both sides, or from the base of the stem, and these usually show the pencil line. The top leaves are often very chlorotic—bleached—and are small and bunched. The dry weather has brought on the acute stage, wherein the canes wilt and die, and the pencil line is difficult to find.

Spread.—(1) By planting of infected sets; (2) By knives, in cutting a healthy after an infected field; (3) Probably by the agency of an insect or insects.

Cause.—The organism, abounding in the pencil lines, which causes the disease, is a bacterium species which is actively motile, and somewhat smaller than *B. vascularum* of Gumming.

Control.—(1) Eradicate infected fields after harvesting. The infection in a ratoon crop is always much larger than in the plant. (2) As the disease has been known to lie latent for considerable periods of time, the selection of sets from an infected locality is an undue risk which is not to be recommended. (The Midgenoo farmers should purchase their sets from the Lower Tully, which is apparently healthy.) (3) Resistant varieties; susceptible varieties are undesirable.

The H.Q. 426 in the district is probably all diseased. N.G. 15 is also susceptible but is difficult to replace. Infected farms could be replanted in part with Korpi or Q. 813 or H.Q. 409 or D. 1135. The farmers' secretary has a list of clean fields of these varieties.

Mr. R. W. Mungomery, Southern Assistant Entomologist, has submitted the following report (14th September) to the Director of Sugar Experiment Stations (Mr. H. T. Easterby):—

For the past month investigation work amongst cane pests has been followed out in the Bundaberg district, and, as was to be expected in the winter months, very little injury from these sources has taken place.

The Cane Moth Borer (*P. truncata*).

The most noticeable destruction has been that of the borer which has infested cane in some very "grassy" blocks adjacent to the Burnett River, and except for this the district could be said to be remarkably free from this pest. Two distinct phases of the attack of this insect can be seen in a field of H.Q. 285 which came under my notice this year. The first damage I noticed in March, when the bottoms of the cane sticks were bored and the larvæ at that time were on the point of pupating. When the insect attained its pupal and imaginal forms the cane had some chance of recuperating, and this is seen by a period of growth that ensued and is represented by the cane being quite sound and free from borer. At the present time caterpillars of the succeeding generation have established themselves in the top portion of the stick up as far as what is commonly termed the "cabbage," where they have evidently hibernated in this larval stage. Thus, one sees two centres of attack—the first at the base of the stick where the tunnels are old and black and often provide shelters for other insects, while the second is at the top of the cane stick, where the tunnels are fresh and quantities of frass are being ejected from them. Such goes to demonstrate the fact that some moths from the first generation have not gone far afield but have remained to reinfest the cane from which they emerged, and so one sees the difficulty of effectively getting rid of a pest like this when once it is given a footing in standing cane.

Cane Grubs (*P. furfuracea*).

A short time was spent in the Isis district for the purpose of carrying out observations on the cane grubs occurring there. It was found then, at the beginning of August when winter was at its height and light frosts were being experienced, grubs were actively feeding at the cane roots near the surface. These included both second and young third-stage grubs. Other and older third-stage grubs were encountered at depths from 15 to 21 inches, but these had their fatty products well developed and were in nicely fashioned pupal chambers, and there would most likely be a year's difference between their ages and those of the younger third-stage grubs.

Grubs of the second stage were found to be very erratic in their distribution, and were met with from 2 to 15 inches in depth, so that, although some authorities advocate fumigation in respect to certain trees, vines, &c., during the winter months when plant growth is checked and the cell sap not travelling freely, it could not be recommended for cane at this time, for many of the grubs would not come within its deadly influence and a low mortality would surely result.

Confirmation of the feeding of grubs during the winter months was established at the Southern Sugar Experiment Station, when second and third stage grubs were taken behind the plough in ploughing out an old block of cane immediately after the commencement of the crushing season. Though not to be had in large numbers these grubs were all within 10 inches of the surface, to which depth the disc was cutting, and they were usually found in amongst the old cane stools. So that from observations this year there appears to have been no true hibernating period in the case of the younger grubs, and the only semblance to such is a comparatively short quiescent period preceding the change from the second to the third instars, and this goes to show that there exist well-marked differences between the habits of the cockchafer grubs occurring in the Southern cane districts and those of the Northern fields.

Reverting once more to the Isis district, it will be of interest to note the condition of a farm there on which the above observations were made. One block of cane there was badly infested with grubs in January of this year, and at that time was carrying a crop of D. 1135 averaging about 10 tons per acre. This was left to stand over in the hopes of cutting a larger tonnage during this season, but now it is almost completely eaten out and only a few green sticks remain in isolated spots. Some grubs have been feeding there the whole time, and they have ultimately produced the same result as the well-known "greyback" grubs, though their devastation, unlike the "greybacks," has been one of "peaceful penetration" and the crop has gone down gradually, in marked contrast to the effect produced by the sudden onslaught of the Northern cane grub.

CANE PEST COMBAT AND CONTROL.

The Entomologist to the Bureau of Sugar Experiment Stations, Mr. Edmund Jarvis, has submitted the following report (21st September, 1926) to the Director, Mr. H. T. Easterby:—

Notes on the Tineid Moth-Borer.

An interesting occurrence of this small cane-pest, *Ephysteris chersaea* Meyr., was noticed at Redlynch, Freshwater, and Stratford on 26th August on four different selections, affecting collectively about 7 acres of young cane.

Most of the damage, as usual, was confined to shoots from 7 to 9 inches high, but in the present instance Mr. G. Bates, Assistant to Entomologist, noticed that cane 18 inches high had been destroyed. Infestation was observed both on alluvial sandy soils and high land of volcanic origin, the cane attacked being in all cases Badila.

This moth was first recorded by the writer as being injurious to cane in the year 1919 (see Bulletin No. 11 of this office), when it was observed to be causing "dead-hearts" in young ratoon crops at Pyramid, Gordonvale, Kamma, and Meringa. It usually bores second and third ratoon shoots, but up to the present has not been recorded from plant cane.

At Pyramid one could find large areas on which 30 to 50 per cent. of ratoons in affected stools had been killed by larvæ of *E. chersaea*. Outwardly, the damage corresponds in general appearance with that caused by our large noctuid borer *Phragmatiphila truncata* Walk., browning of the central or heart-leaves being a conspicuous and certain indication of such internal trouble.

The appearance of this pest in a locality so far removed from the Alooomba district seems worthy of special attention, since it affords evidence of the spread of an insect which may (as already stated in Bulletin No. 11, p. 7) prove of decided economic importance. Not being an indigenous species, but having, in the opinion of Dr. Guy A. K. Marshall, of the British Museum, "been probably introduced into Australia from Natal," it is quite possible that, in the absence of its own natural enemies and other controlling factors, this insect might, in a new country like Australia, increase abnormally and become troublesome in the near future.

Tenebrionid Larvæ in Cane Fields.

In almost any canefield the grower—if remaining perfectly still for two or three minutes, gazing intently at the soil between young cane rows or the surface of newly planted land—will usually become aware of the presence of a small, flattish, dusty-looking beetle about three-fourths of an inch in length, of elongate-oval form, crawling in an erratic, lively manner an inch or so, and then stopping a few moments and again scuttling about over the loose earth or lumps of soil. These beetles, two or more species of which are destructive at times to cane roots, belong to the genera *Opatrum* and *Gonocephalum*. The latter genus includes species of economic interest, *G. hoffmannseggii*, for instance, being destructive to potatoes and to roots of cereals in Mysore; while *Opatrum sabulosum* injures grape vines in the south of France by eating the buds on lower shoots and the terminal leaves.

Some years ago, at Pyramid, near Gordonvale, the writer noticed many small tenebrionid larvæ attacking roots of plant cane on a selection where beetles of *Opatrum* were very numerous.

Unfortunately, other work of more importance at the time prevented study of these larvæ or breeding them to the pupal and imago stages. At present, however, we are tracing the life-cycle of *Gonocephalum carpentariae*, and have already obtained eggs of this species laid in moist soil in breeding-cages.

Control measures recommended against adults of *G. hoffmannseggii* are the application of poison-baits consisting of freshly chopped grass dipped in a solution of 1 lb. sodium arsenite and 8 lb. molasses, dissolved in 10 gallons of water.

Fresh weeds pulled up by the roots and spread along the rows an hour or two before sunset have also been found effective. Such grass-traps should be visited soon after nightfall and the beetles collected and destroyed. Control work of this nature is of little use unless carried out systematically.

Cane Grubs from South Queensland.

During the last few months, several specimens of the larvæ of *Pseudoholophylla furfuracea* Burm. and those of another melolonthid beetle have been obtained by us

from the Bundaberg and Childers districts through the courtesy of Mr. R. W. Mungomery, Assistant Entomologist. These grubs are of exceptional interest, and will be a valuable addition to our office collection of the scarabæidæ affecting sugarcane.

Apparently, *furfuracea*, which was reported by Mr. Mungomery to have caused serious damage last February in the Isis district, occupies a position in South Queensland somewhat similar in economic importance to that held by *Lepidiota frenchi* in the Northern portion.

It should be mentioned here that a scarabæid beetle described in Bulletin No. 16 of our Division of Entomology as being *Lepidiota grata* Blackb. is evidently not that species, and still awaits identification. Curiously enough, the specific name of our *Lepidiota*, which up to the present has been known as *Lepidiota* No. 215, has recently been determined by Mr. G. J. Arrow, of the British Museum, as *Lepidiota grata* Blackb.

This beetle is of local occurrence at Gordonvale, and, although often collected in the early days from furrows in canefields, cannot at present be considered a very injurious species.

Cane-Beetles in Pupal Cells.

Examination of the pupal cells below some grub-infested stools on red volcanic high land soil at Meringa on 21st August revealed pupæ and greyback beetles in about equal proportions, some of the latter having effected transformation to the imago condition a week or so prior to our investigation, while others with softer elytra had probably not spent more than a couple of days in the beetle state. Pupation had taken place late in June at an average depth of 14 inches, indicating that the soil at that time contained less moisture than usual, the average depth of these pupal chambers in such land in normal seasons being about 12 inches.

During their strange subterranean existence, while the chitinous integument of the exoskeleton gradually attains rigidity, profound changes may possibly take place among various internal organs; until after a lapse of about three weeks, when fully endued at last with suppressed activity, these prisoners in the dark await with eagerness the call of the rain from above.

If pupation should chance to be followed by a dry spell lasting throughout November and December, such conditions will probably operate as a severe check to its increase, and millions of these expectant beetles will never see the light of day.

In the beetle season of 1923 the rainfall during the months of October, November, and December was 6.68 inches, as against 15.27 inches—which is the usual average for this period.

During the following season, 1924, however, the precipitation was 3 inches above this average, which gave the beetles a chance to make up for the setback of the preceding period.

Fortunately, in the season just over (1925) the rainfall during the above-mentioned three months happened again to fall to 6.09 inches, a decrease of 9.18 inches below the average, with the result that the numerical increase of our notorious cane-beetle once more received a decided check.

ENTOMOLOGICAL HINTS TO CANEGROWERS.

By EDMUND JARVIS, Entomologist.

Occurrence of Tineid Moth-Borer.

In view of its possible spread into other districts than those already recorded, we should be glad if canegrowers chancing to notice evidence of the presence of this insect amongst their ratoons would advise the Entomologist at Meringa Experiment Station.

Watch for Appearance of Greybacks.

Beetles may make an early emergence this season in localities where their grubs pupated towards the end of June or early in July.

During 1917 these cockchafer commenced flying on 29th October, and in 1918 a primary emergence was recorded on 15th October. Eminently favourable seasons for controlling cane grubs by means of soil fumigation are those in which emergence of the beetles takes place in October or the beginning of November, while much of the cane is still small and the ground free from excessive moisture.

To be on the safe side it is well to commence the work of injecting on cane land known from past experience to be invariably grub-infested, about three weeks after first observing greybacks on the wing. This advice applies more particularly to seasons in which emergence occurs during December; appearance of the beetles in October or early in November, allowing of course a longer period for carrying out fumigation work before commencement of the wet season.

How Growers can Fight the Beetle Borer.

1. Burn the trash in canefields where Tachinid flies have *not* been liberated.
2. Strip the trash on areas where the Tachinid parasite has been introduced or is working in affected sticks.
3. Lay bait-traps consisting of pieces of split cane about 18 inches long placed in heaps of from fifteen to twenty pieces in concavities about 5 inches deep excavated in headlands, and covered over lightly with trash or debris to prevent the cane from drying too quickly. Visit these traps every other day to collect and destroy weevil-borers attracted to same.
4. Select clean seed cane, free from indication of borer tunnels.
5. Obtain Tachinid fly parasites from the Sugar Bureau, by applying to the Entomologist, Meringa Experiment Station.

Entomological Canegrowers.

More interest could with advantage be shown by our growers in practical nature study relating to the economy of various insects occurring in canefields.

When unable to tell friends from foes in the insect world, many useful parasitic or predaceous enemies of cane grubs and other pests run a risk of being mistaken for injurious species and promptly destroyed.

When uncertain of the habits of any insects frequently seen in canefields the grower should drop same into a bottle containing methylated spirits and water (half and half) and send it to the Entomologist at Meringa for identification and advice.

Growers should also call at the Laboratory and have a look at our Museum which contains specimens of all insects known to attack cane in North Queensland, together with their principal enemies.

FIELD REPORTS.

The Northern Field Assistant, Mr. A. P. Gibson, reports (9th September, 1926):—

Unclouded skies to the 24th August, when heavy showers commenced to fall.

The year's rainfall to date is far below the usual. The Tully had recorded 65.87 points and Babinda 92.71 points.

Progress.

The growth of the Tully township continues. The town is lighted by electricity generated at the mill. Unfortunately the streets are narrow.

The Tully crop generally had improved since my last inspection, more especially that raised east of the mill. High and low tonnages are common in paddocks; such alternating conditions are due obviously to a poor strike and most erratic make-up of the soil. Early Tully and El Arish estimates may be exceeded, but that of Silkwood is likely to be reduced. A high percentage of the crop to cut is plant. Lengthy dry stretches had impeded the crop growth.

Harvesting.

The dry period since cutting commenced has permitted continuous working in field and mill; in consequence marvellous progress has been made in removing the 1926 crop. Exceptionally high ground cutting and much solid cane has been left on the top in parts at Tully. Weight of cane and sugar is lost, and subsequent ratoons are damaged, unless the highly cut cane is early removed. A sharp, heavy hoe, or, better still, an adze serves this purpose well.

The mill at Tully is working moderately well; it had not crushed its possible weekly tonnage.

Cultivation.

Comparatively few farmers at Tully have ploughable land; generally the soil is shallow. Great injury may be occasioned by ploughing too deep; this operation should be regulated by the depth of the surface soil. Soil washing may be arrested on abrupt hillside farms by leaving the trash after harvesting. Timber burning adjacent to maturing cane paddocks is often the origin of disastrous cane fires, and losses could be avoided by exercising more caution after burning off. Great stumpy areas are being cleared prior to ploughing. The use of explosives is assisting in lightening and cheapening this class of work. Horses are quickly changing to tractors, and feed to liquid fuel. The rotary cultivator is becoming popular, and is used on the more friable soils. When this is used prior to ploughing out the old crop, it should shatter and more finely divide the old stubble and permit its speedy disintegration, also ensuring its killing, thereby destroying the medium by which diseases are sometimes carried on to the subsequent crop. The average depth of ploughing in this district is about 9 inches.

Babinda.

The railroad from Bucklands to what is known as 67 Branch has been connected. This is a judicious move and one of double importance, for, should one of the two bridges now spanning the Babinda Creek be damaged or carried away whilst crushing is in progress, there would remain another avenue along which the crop could be removed to the factory.

The Crop.—The prevailing mid-year's dry weather, following on unusually low early rainfall, transformed what had every appearance of being a record district harvest to one of moderate degree.

In 1914 Babinda mill and its solid little town were not on the map. Its cane area extends all the way back on either side of the North Coast railroad from Fishery Creek to the southern bank of the picturesque Russell River. In the tributary district are mountains of great height and much land of high quality. The mill had treated nearly half of its very fine crop. Generally the cane had a fine colour; the semi-dry conditions had slowed down the growth and enabled it to fully mature. Never before have such excellent sugar contents been known in the area. The crop is cutting to expectations, although the yield per acre is likely to be less than that of former years. The recent rainfall, if backed by warmer conditions, should speed up the growth of the late-cut and backward paddocks and ensure their cutting.

Erosion of River Banks.—This is mainly brought about by the injudicious practice of removing the trees and undergrowth from the banks of speedy-running and winding streams. At Babinda the loss of soil is great on some of the creek farms.

Planting.—The following notes on scrub planting may be of use to new growers, some of whom appear to have hazy ideas regarding this highly important work, and in consequence have paid dearly for their experience:—

1. When logging, clear 9-foot tramway tracks every 2 chains.
2. Cane Holing.—Of the many implements used, the spade is about the best. Make cane drills 5 feet and cane holes from 2 feet 9 inches to 3 feet apart. Too close planting in virgin scrub land is not recommended.
3. Important. Use only disease-free and vigorously growing cane for plants. Keep knives sharp and avoid too much immature top.
4. One good set in a hole is enough. Cover plants with some 2 inches of pulverised soil, and do not entirely fill up the hole; this may be done later when the stool has become established. Given favourable conditions, the primary shoot should be bursting through the soil in about nine days.
5. Control the weeds on headlands and fields from the start. A poison solution sprayed on the early weed growth is cheap and effective, and is not harmful to the soil provided it is used in moderation.

Planters at Babinda expect a good price for 1927; in consequence much cane harvested this year has been ploughed out and immediately replanted. There is not much autumn plant. August is generally more seasonable; therefore most of the planting is done this month. Badila plant is not at its best under fourteen months old, therefore much August planting has the tendency of making the crop late.

Pests.—Cane grubs, weevil borer, wallabies, army worms, and white ants were noted. Grubs are sometimes credited with damaging cane when other causes have been responsible; however, grubs had occasioned much damage to cane growing on the Merriwinni rangeside friable decomposed granite areas. It is thought that beetles

are gifted with a certain amount of homing instinct, or that the soil frequently carries an odour which the beetles on flight detect, hence the probable reason why they return to similar places. The weevil borer is hardly noticeable at the Tully, but found working strongly on several Babinda farms. Beetles were picked up along the line soon after a cane train had passed; evidently this is one of the many ways by which they are conveyed to new areas. Although the Tully area is free from the pest at present, it is quite possible that beetles may be liberated from standing and affected cane in the mill yard and which has been transported from distant areas. Wallabies and army worms are retarding the growth of young cane in patches; the former is generally more troublesome in dry times. The latter may be controlled by clean headlands and the use of poison baits or sprays.

White ants generally destroy a small percentage of sets, and have been known to completely demolish the stubble of ratoons. When this is so the patch should be replanted.

Diseases.—Leaf Scald is still increasing steadily at Tully and Babinda. The varieties mostly troubled are H.Q. 426 and Goru family. Wherever possible the farmers are shown this disease. Areas known to have been planted from diseased fields continue to die. Top Rot is very prevalent in parts at the Tully and Babinda.

El Arish reported a disease showing up on the leaves of big and small cane. The writer attributed such markings to the then cold weather conditions.

Our Feathery Friends.—The good old ibis is a protected bird; its beneficial work is not appreciated to the extent that it deserves.

The Babinda Mill.—Babinda mill had crushed 1,495,137 tons since its inception. Two hundred and fourteen growers supplied 164,238 tons of cane last year, as follows:—

Area harvested (1925), 8,769 acres; cane crushed, 164,238 tons; cane condemned, 694 tons; yield per acre, 18.7 tons; sugar per acre, 2.5 tons; sugar manufactured, 22,430 tons.

The variety percentage of crop harvested, together with its respective average c.e.s., is as follows:—

Variety.	Per cent. total crop.	Average c.e.s.
Badila (N.G. 15)	90.56	14.098
Goru	3.88	13.878
H.Q. 426	2.48	14.166
D. 1135	1.04	13.615
Q. 813	0.57	13.729
Other varieties	1.47	14.053

It will be seen that H.Q. 426 variety, like Mossman and Mulgrave, had yielded a higher c.e.s. This is hardly a fair criterion to go by, because of the fact that Badila variety is mainly grown, and in consequence is harvested early and late.

Unusual tops were observed on Badila, D. 1135, and the Goru family. Big leaves were absent; instead were many bunched, blade-grass-like leaves, which opened fan-shaped; such tops, examined, revealed a contorted, rather hard growing point. No insect injury could be found. The cause may be occasioned by climatic conditions or a check whilst arrowing.

Manuring.—Very little was being applied. At Tully 30 cwt. of lime had been broadcasted over an area. This should be lightly worked into the soil by plough or harrows.

The Central Field Assistant, Mr. E. H. Osborn, reports (17th September, 1926):—

Dry conditions had been experienced generally, the rainfall amounting to only 18.81 inches to date. However, steady soaking rain has now set in. Severe frosts also caused loss among the crops in low-lying and more exposed portions of the area.

In the town of Mackay many new and substantial business premises have been erected recently, and much needed attention has been paid to the local roads; telephonic installation is being extended considerably in the outside areas.

Homebush and Oakenden.

Very little cane had been cut from this area, except badly frosted and cane accidentally burnt, which was being sent to Marian, Pleystowe, Racecourse, and North Eton mills, as Farleigh mill was not then operating.

Accidental cane fires were responsible for serious losses to two Homebush growers, one grower having some 200 tons of standover condemned. In this area the writer was surprised to see how well the cane looked, large blocks of plant and ratoons comparing very favourably with any seen elsewhere. The depth of soil is mostly shallow. Luckily, however, it is blessed with a clayey subsoil which retains the moisture, quite distinct from the Oakenden soil, which, resting upon a shingly subsoil, requires far more moisture.

After at least three ploughings (generally many more), Bumper discs are used to make the 9-ft. beds with water furrow between each, and then machine-planted right away, or else the planter follows skeleton ploughing of the drill. In either case there are no open drills letting moisture away. When the results of this method of cultivation are seen, its success seems assured.

First ratoons of H.Q. 426, Malagache, Q. 813, 7 R. 428, and M. 1900 on several of the typical well-cultivated farms looked marvellously well. Fertilisers are in general use, and green manure in a suitable season, while trash is also ploughed in on many farms.

Oakenden.

This area was having a very bad time, with patches of cane drying right out. Young cane was only being kept alive by continuous cultivation, and it was wonderful to see how well some paddocks looked. Frost had done damage in places, which was accentuated by the late starting of Farleigh mill, and consequential delay in harvesting such crops.

Farleigh.

Cane was still keeping fairly green, blocks of M. 1900, Q. 813, N.G. 15, E.K. 28, E.K. 1, and Malagache all standing well up to it. Much work was being put into the young cane, and some planting was still in progress.

Much standover was noticed, a fair proportion of which had deteriorated badly. Among the standover was a very fine crop of Badilla (N.G. 15) on Mr. H. G. Matthews's farm.

Racecourse.

Practically similar conditions prevailed here, except that the local mill was in full swing and getting away with its crop in good style, the only delay being through the very poor quality of some of the S.O. cane coming in, causing trouble in manufacturing.

Flaggy Rock.

This busy little sub-district seems to have had more rain than others, and also to have been free from frost; consequently some very fair cane—mostly M. 1900 and Q. 813—was evident. The principal grower, Mr. Horace Hill, is harvesting some 60 odd acres this year, with probably another 20 for next season. Most of the farms are near the railway.

Carmila.

This place has had more than its share of frost, but the Plane Creek mill management is doing its best to minimise loss. Some really good Badilla was seen; third ratoons cutting up to 20 tons per acre were being taken off Mr. W. Staier's holding, showing that the land is all right.

Koumala.

This region has progressed rapidly during the past few years, and now possesses one of the prettiest railway stations in the North with its wealth of ferns and orchids. It also has three stores—butter, baker, and smith's shops. Cane is derricked at the railway for Plane Creek, after having been hauled over a 2-ft. tramline with two branches of about 2 and 6 miles respectively. In general, the cane here looked greener than elsewhere, and cattle and horses were in fair condition. Very little frost had been experienced. Some good cane was being cut, a crop of third ratoon M. 1900 from Mr. S. A. Lillendal's yielding about 20 tons per acre in this dry year, and this on only medium land, careful and thorough cultivation on a small area being responsible for this.

Varieties.—Q. 813 is probably the most popular cane for poor or medium land (except where grubs are prevalent), and stands up exceedingly well to dry conditions. E.K. 28 is also becoming more popular, and also stands up to dry conditions. E.K. 1,

in several isolated places, looked well. Malagache and D. 1135 are also fair dry-weather canes. M. 1900 and H.Q. 426, although growing well and carrying good c.c.s., won't stand up to either dry or frost conditions too well. H.Q. 285, although an early maturer and sweet cane, is not too good in a dry time. Innis is very patchy and is worth watching on account of disease. Badila (N.G. 15), with suitable soil conditions, is still a first-class cane. N.G. 103 has given good plant and first ratoons at Farleigh, and its second ratoons are still fair, carrying a good density in each crop. D. 1457 is credited with good tonnage and density for plant and first ratoon upon one Sarina farm, growing upon a medium alluvial soil.

Pests.—Grubs, helped by dry weather, are responsible for much damage this year. Mount Jukes suffered so heavily that several paddocks must be ploughed out. One paddock, abandoned several years ago from this cause, was planted two years ago. The plant crop showed many grubs, but not nearly as bad as this year's first ratoons. The nature of the soil, mostly friable chocolate, and the quantity of timber on the surrounding and close-by hills, makes it a place where grubs can do a lot of damage. D. 1135, E.K. 28, Uba, H.Q. 426, 7 R. 428, all had suffered, the first two varieties about the least.

Borers were also responsible for much damage to 7 R. 428 (Pompey) here, many sticks being absolutely riddled with them, the pest in its grub and beetle stage being found in most sticks.

Wallabies were also causing much damage in places, especially at Oakenden, wire-netting proving of little avail when there is no grass and the animals are desperately hungry.

Opossums.—Damage was caused by these in many blocks of cane where trees were near. At Koumala, H.Q. 285 and Q. 813 were growing side by side with several near-by dead trees; great damage was done to the first-named cane, with none to the Q. 813.

Wire worms did a little damage to early planted cane in low-lying parts.

Diseases.—Red Rot was showing up slightly in M. 1900, while Foot Rot in Innes was seen in the Farleigh area. Knife-cut in D. 1135 was fairly common in Oakenden. Mosaic was seen in a green cane at Koumala, and in E.K. 28 at Mount Jukes, but only in a few stools.

The Southern Field Assistant (Mr. J. C. Murray) reports (20th September, 1926):—

Maryborough.

Continued dry weather has seriously affected cane in this district, especially on the more elevated farms. The flats along the Mary are showing fair cane, no doubt due to greater capillary action. Capillarity is the water rising from the lower stratas of soil to the top soil, and can often be caused by deep cultivation and under drainage.

The red volcanic soils that occur in the Maryborough district should give better results. There are some very rich red soil areas between Maryborough and Magnolia, and if the farmers working them would give exclusive attention to 30 acres each they should do well. One man by himself cannot do justice to more than 20 acres of cultivation—that is, if he does it properly. In farming 30 acres, the grower could work on what might be called a 25 per cent. basis—that is, have 10 acres always undergoing rotation, fallowing, green manuring, or other treatment conducive to soil restoration. Ploughing and planting are the least exacting of operations involved, the subsequent cultivation requiring many months of careful and constant work. The lack of this is the great weakness in Queensland cane farming generally.

In the subsequent cultivation of young plant cane the plough should never be used, because it works from 6 to 8 inches deep, inverting the soil and disturbing ferments and processes in the soils and placing plant food beyond the reach of the young crop just where it wants it. A light cultivator which stirs to a shallow depth, but does not invert, is the correct implement to use. The disc cultivator should not be used after the cane is two months old.

Growers are recommended to discard Meerah, Striped Singapore, and Rappoe. The best varieties for this district are M. 1900 Seedling, H.Q. 285, E.K. 28, and Q. 813. The canes recommended to be discarded are very susceptible to disease, particularly gumming.

The following may be of interest, as showing the available plant foods in the red soil, soluble in 1 per cent. aspartic acid:—

	Per cent.	lb. per acre.
Phosphoric acid	.0006	18
Lime	.0946	2,838
Potash	.0233	699

It will be observed from this table that the phosphoric acid is very low.

A typical red volcanic soil taken from Woongarra, Bundaberg, contains 819 lb. of available potash per acre and 42 lb. of available phosphoric acid.

Yerra.

The cane on the whole appeared to be satisfactory, considering the long spell of dry weather that it has been through. Pasture is dry, although stock is in fair condition. Much land may still be farmed in this district. Farmers are requested to keep in touch with the Bureau in connection with matters relating to soil analysis and variety propagation. It is probable that this district will in future serve a twofold purpose of supplying fodder cane to the Burnett stock areas and sugar-cane to the mill.

Pialba.

There is some very fair cane to be seen, particularly the Q. 813, a variety gaining in popularity. Hambledon Seedling 285 is also being more accepted. The district generally is making good progress, and although the dry spell has hit the farmers this year, Pialba may become one of our more important rural regions, though cane will probably remain the staple product. A good road is badly wanted from Maryborough.

The tractor is coming more into use. The rotary cultivator is being used also, and it is the consensus of opinion among canegrowers that this is the best implement they have had for some time. Growers are unwise, though, to use this implement without a respirator of some kind, especially in the red soil, as the dust is always considerable.

Childers.

This district has suffered greatly from drought—the worst in the writer's experience. The prospect for next year, however, is not unpromising if rains occur within the next six weeks, as the young plant cane is showing fairly well. The great problem confronting the farmers here is how to maintain a continuous, if not large, supply of cane to their mill. The important thing for farmers to concentrate on is soil improvement by more intensive cultivation, combined with sub-surface drains. There are very few growers in the Isis that work on the system of methodically placing a definite percentage of their farms on the fallowing list, and also very few who have effective under drains—two most important factors in dry belts. Cane farmers of Southern Queensland, not only in Childers, are earnestly recommended to rest and renew their farms by throwing one-fourth of their holdings out of cane each year, otherwise the time is not far distant when the land will be so exhausted that only the poorest crops, very susceptible to disease and parasite attacks, will result.

Dallarnil.

Light rains have recently freshened up this district, but have done no good to the existing crop. Cutting is in full swing, and much depends on this year's returns how the farmers look at the industry. A good c.e.s. return and spring rains may place a different complexion on affairs.

QUEENSLAND SHOW DATES, 1926.

Nundah: 1st and 2nd October.

Balmoral: 16th October.

Kenilworth: 7th October.

Brookfield: 23rd October.

Southport: 9th October.

Mount Gravatt: 30th October.

Enoggera: 9th October.

AGRICULTURE IN QUEENSLAND.

By H. C. QUODLING, Director of Agriculture.*

The 1925-1926 Season.

Within the borders of such a vast State as Queensland it is only to be expected that marked differences would be noted in the class and character of the seasons experienced from year to year. Unfortunately, certain pastoral areas suffered for many months from the effects of insufficient rainfall. (Widespread beneficial rains, from one to over four inches, have since been recorded over practically the whole of Queensland.—Ed.) In some of the agricultural districts in the Southern portion of the State dry conditions also prevailed. A few provident farmers who conserved hay and ensilage maintained their stock satisfactorily, but many had to move every hoof to agistment country. The immediate North Coast district enjoyed a good season, while in the Mary Valley and parts of the Stanley and Upper Brisbane River districts fairly satisfactory rains were recorded. A rather prolonged dry spell, however, occurred in the Maranoa, Darling Downs, West Moreton, South Coast, and Kingaroy districts, and was the direct cause of a lessened production of dairy and agricultural produce of all kinds.

In Central Queensland beneficial rains in the winter of last year were followed by light but useful rains in the spring, which permitted of the preparation and planting of appreciable areas of maize and cotton. Summer rains, however, proved scanty.

North Queensland, particularly the Atherton Tableland, enjoyed a splendid summer season, and the maize crop promises to be a record one. Other districts, outside of the favoured tropical belt of country, particularly those west and south of Townsville, suffered through lack of sufficient rain.

Hay and Fodder Conservation.

Brief as the reference was under the previous heading to the spell of dry weather, which was felt in quite a number of important agricultural districts, its incidence and probable recurrence cannot very well be ignored. Although interest has latterly been shown in silo construction, the greater perhaps being in the Dawson Valley, where several reinforced concrete silos were recently built, it is only too evident that the Queensland stockowner will have to be more provident in the future, both in the matter of hay and ensilage conservation. Hay sheds, to avoid the extraordinary waste due to stacking hay in the open; and silos, to conserve the thousands of tons of maize plants rendered valueless, as they were this year, for grain production through spells of dry weather, require to be made more familiar land marks than they are to-day.

If it were possible for each stockowner to hold reserves of fodder on his property (and this is applicable also to the grazier, who in the generality of cases has superabundant supplies of natural grasses available in good seasons) a dry spell would be robbed of its disastrous aftermath, a safer living assured, and the live stock, a national asset, not only saved but kept in a state of production.

Although liberal provision has been made under the Agricultural Bank Act for the erection of hay sheds and silos and the purchase of plant for harvesting and conserving fodder, the would-be borrower is brought face to face with difficulties. Obviously, where the security is sound, he must have some easier means of getting money than at present. And if this latter object were more readily attainable, other matters, in the way of construction of suitable buildings and the use of portable plant, could be provided for on a much more advantageous basis.

A brief survey of some of the more important crops and of departmental activities in connection therewith is as follows:—

Wheat.

The 1925 crop, the marketing of which under the Wheat Pool Act is directly in the hands of the growers' representatives, gave an aggregate return, exclusive of seed and feed requirements on farms, of 1,799,263 bushels of grain, which was delivered to the Board. In certain districts, notably Maranoa and Inglewood, yields

* In the Annual Report of the Department of Agriculture and Stock, 1925-26.

were irregular; and in some instances, on the heavier soils of the Maranoa, seed failed to germinate, with the result that odd failures occurred. On the Darling Downs, where the major part of the wheat is produced, the average yield was reduced by two circumstances—insufficient rain, principally on a belt of country near Nobby and Clifton; and, secondly, by two late frosts in September, which affected the wheat belt generally and caught Florence and Pusa largely, two frost-susceptible but popular varieties, whose early-maturing characteristics had accounted for the crops being in a forward and rather susceptible condition (the flowering stage) when the frosts occurred. Wheats of later maturing habit more or less escaped, and it is reasonable to infer that in frost-labile situations the tendency will be to choose less susceptible varieties, or sow as late as possible consistent with local conditions.

Turning away from these disabilities and risks which the farmer is up against by the nature of his calling, the other and more pleasing prospect is presented. On hillside and slope of the picturesque Darling Downs the vista presented itself at harvest time of field after field of superb crops yielding in the main from seven to eight bags of grain to the acre, and on occasions ten and twelve and even up to fourteen and fifteen bags.

With anything like satisfactory conditions for production, the possibilities of expansion of the wheat industry are most encouraging. Expansion undoubtedly means much to the State.

How the Department is Assisting to Stabilise the Industry.

Experience has proved how important it is to produce varieties suitable to the conditions under which they are to be grown. To meet requirements here, the department has carried on wheat-breeding work consistently for a long term of years at the Roma State Farm. Wheats with improved field characteristics, including rust resistance, have been bred to meet special requirements in different districts, and the co-ordination of effort between the wheat-breeder and the Departmental Field Staff has been the means of bringing several promising varieties into general cultivation. With the object of making this work more fully effective and of the greatest possible benefit to the individual grower, a conference was held, before the 1926 planting season commenced, between officers of the Department and the Wheat Board, when a far-reaching scheme was brought forward by the Department and approved of by the Board. This included the raising each year, under agreement between the individual grower and the Board, of supplies of pure seed for delivery to the Board under the premium system and its cleaning and grading at suitable district centres, whence it would be distributed as required. Between thirty and forty growers were supplied with pure Departmental seed. Additionally, the Board is assisting the Department in its effort to eliminate smut (bunt) from Queensland-grown wheat in an endeavour to have all seed wheat pickled with copper carbonate before it is sown.

1926 Wheat Season.

This year it is expected that the area cropped will constitute a record, the price for last season's wheat (slightly over 6s. per bushel should be realised) acting as an inducement to growers to prepare as much land as possible. The Maranoa district had better rain than elsewhere throughout the main Darling Downs wheat belt. Generally speaking the rains over the latter stretch of country were light; the first fall, which was a few weeks late for the seasonable sowing of slow-maturing wheats like Currawa and Cleveland, came just in time for the general planting of mid-season varieties, and a second fall, a week or two later, permitted sowing generally. Those who had prepared land early and kept it in good tilth obtained a very satisfactory germination. In a few localities, particularly on heavy black-soil country that was at all late in being worked, the rain was barely in sufficient quantity to permit of the preparation of a good seed bed. Here the soil was inclined to remain in coarse nodules, and on this account some of the seed wheat malted and had to be resown.

In a number of localities on the Darling Downs sufficient rain fell to moisten both soil and subsoil, and here the crops are doing well and will carry on for some time. Elsewhere the rain only penetrated about six inches, and although the young wheat got away nicely (there was some damage on flat country by heavy frosts to embryo plants of low vitality) good soaking rains are urgently needed to thoroughly establish and carry on the young crops.

The Departmental wheat programme for the season is a continuation of tests in progress, with the object of evolving improved types of wheat for Queensland

conditions and for the propagation of special strains of seed. The wheat-breeding work at Roma State Farm has also been designed on an extensive scale this season.

Maize.

The high prices realised this year, with the certain prospect of an advance, were due in the first place to a reduction in the aggregate yield of the 1925-26 crop and concurrently to the extraordinary demand for grain as sheep food in the dry pastoral areas.

In the Southern division of the State, with the exception of the Mary Valley and the Upper Brisbane River districts, where more rain fell and good crops resulted, all the other big maize-growing centres in the Southern Burnett, South Coast, West Moreton, Lockyer, and Downs districts were not favoured with sufficient rain to ensure even a good average return. Generally speaking, the early and late planted areas yielded light crops, but the main planting more or less failed. In contrast to the partial failure in the Southern and Central divisions, the Northern maize-growing area on the Atherton Tableland enjoyed one of the most favourable seasons possible. Here the yield promises to exceed 20,000 tons, and on account of the nature of the season (freedom from an excess of drizzling rains) the quality of the grain will be good.

Seed Maize Improvement.

The type and quality of the stud seed maize produced this year by the efforts of the departmental officer (Mr. McKeon), who is specialising on seed maize improvement, is remarkable for its evenness and uniformity; and it is questionable whether better grain of the respective varieties undergoing improvement could be found. Such a result is only possible by years of careful technical work, which in such an important maize-growing country as this should have a far-reaching beneficial effect.

Establishment of a Stud Maize-Breeding and Research Farm.

The work of the Department has now been brought to a stage when very considerable assistance would be derived by the establishment of a specialised Stud Breeding and Research Farm, where problems intimately connected with the progress and development of the maize-growing industry could be investigated.

Additional work was designed and is in progress to evolve a type of grain to suit Atherton Tableland conditions, where difficulty has been experienced in past wet seasons with the locally-grown type of maize, which produces a rather soft grain, somewhat susceptible to moulds.

Maize Harvesting Machines.

Reference was made last year to the excellent work witnessed at a trial on the Downs of a Toowoomba manufactured maize reaper-thresher. The Northern Instructor in Agriculture in his annual report has referred to another machine designed for harvesting maize which was imported by Messrs. Faichney Bros., of Kairi. Obviously, the perfecting of a machine for harvesting and threshing maize is a matter of very great importance in the development of the industry.

Malting Barley.

Limited areas only were cropped last year on the Darling Downs, the market evidently being restricted by the capacity of the two Toowoomba malt houses to absorb the output; and to some extent also by the competition by Southern-grown barley. The crops generally were somewhat short, but the yields were fair and in some cases good.

Canary Seed.

Although a more co-ordinated system of handling and marketing was instituted under the existing Canary Seed Pool, the 1925 crop was not up to expectations, due to the fact that the belt of country in the Nobby and Clifton districts, which ordinarily produces the major part of the Queensland crop, suffered from the dry spell. Canary seed crops consequently did not stool out and develop satisfactorily, and light yields were all too common. The plant does much better in seasons when there are ample supplies of soil moisture.

Peanuts.

Interesting and important developments have taken place at Kingaroy in connection with the peanut growing industry. Here the peanut plant finds a congenial home on the rich red volcanic, friable loams of the district. Last year, with the assistance of the Department, a peanut-shelling machine was secured and installed by the Peanut Pool Board, whose centre of operations is at Kingaroy. Prior to this the marketing of the crop was done on the shell, and although the grower got a fair return, the profit went elsewhere. The installation of the machine was the "open sesame" to the Australian market, and full advantage is being taken by the enterprising secretary and members of the Board to popularise their shelled peanuts. In the season 1924-25 691 acres were cropped throughout the State. In the present season, 1925-26, it is estimated that 3,000 acres were cropped in the Kingaroy district alone, and present indications point to the probability of placing 10,000 acres under peanuts this season in the same locality. An electrically-driven cleaning, grading, and shelling plant has been put in at a cost of about £1,500, and the sheller will turn out a ton of shelled peanuts per hour.

The crop this season was reduced through the incidence of the dry weather, but owing to the deep-rooting nature of the plant it gave a return under weather conditions which proved disastrous to maize. Reference to seven years' statistics of the peanut crop shows the average return, in the shell, to be 1,141 lb. per acre.

Tobacco.

The industry is not progressing. As a matter of fact, this applies to both pipe and cigar leaf.

The centre of operations of the former class of tobacco is at Texas and the latter at Bowen. With few exceptions, pipe leaf is grown on the share system by Chinese.

Flue curing to produce the quality and colour required by manufacturers was given a trial on Texas Station, but the slightly increased price did not leave a sufficient margin of profit at the time between it and the ordinary air-dried leaf to warrant a continuation of the process.

The limited tonnage produced is still air-dried, and the tendency on the part of the Chinese is to grow heavy-yielding types in preference to varieties which may not in the generality of cases produce quite such heavy crops.

Another difficulty which militates against the progress of the industry is the lack of competition in buying, marketing having to be effected principally through the British-Australian Tobacco Company, which has a monopoly in manufacturing.

The cigar leaf growing industry is also in a parlous condition, growers also having had difficulty in obtaining payable prices through Melbourne brokers who deal direct with cigar manufacturers. Inquiries made by the Department on behalf of growers showed that the principal reason for this was attributable to faulty curing and marketing the leaf in an immature condition.

The Department makes a practice of regularly importing choice kinds of pipe and cigar leaf seed for use of growers. There appears to be a promising field for work by an instructor in tobacco culture with a knowledge of both growing and curing.

Renovation of Paspalum Pastures.

Four sets of experiments at Atherton, Cooroy, Maleny, and Runcorn are in progress—sixteen plots each at the three first-mentioned and forty plots at the latter centres. In all cases comparisons are being made between ploughed and unploughed, and fertilised and unfertilised plots respectively.

In the progress report submitted by the Assistant Instructor in Agriculture, Mr. C. S. Clydesdale, interesting data are given respecting the green tonnage weights cut from special areas enclosed for this purpose. Taking the lowest and the highest yielding plots merely as an example, it is shown that Plot 1A, unmanured and unploughed, gave an aggregate green tonnage weight of 4.58 tons per acre, equal to a growth of 31 lb. of grass daily per acre over a period of 326 days, 15th June, 1925, to 22nd April, 1926, in which seven cuttings were made. Plot 8B, unmanured and ploughed, with a corresponding return of 16.31 tons and 112 lb. of grass grown daily per acre, a gain effected by ploughing of 81 lb. of grass daily, approximately a ratio in favour of ploughing of four to one.

No more convincing proof could be had of the effectiveness of this method of resuscitating old *paspalum* lands, nor of improving their stock-carrying capacity. It also opens up great possibilities in the matter of renovating and improving the stock-carrying and milk-producing capacities of *paspalum* country, by the introduction of protein-yielding plants such as clovers and lucerne, which could more readily be established on inverted sod land before the renewed growth of *paspalum* is made.

The possibilities opened up by this experiment are very great indeed, and serve to illustrate that the rich tract of volcanic country of which Maleny is the centre may readily be brought back to its original stocking-carrying capacity, which was a beast to the acre.

Agricultural Instruction and Departmental Experimental Plot Work.

A fairly comprehensive scheme of crop and fertiliser experiments was designed and carried out in the Northern, Central, and Southern divisions of the State, details of which are furnished in the reports of Messrs. Pollock, Brooks, and Gibson, Instructors in Agriculture for the respective divisions.

Good work is being done by the whole of the members of the Field Staff. The duties of the instructors are of a varied nature. By coming into personal touch with the farmers the instructors are brought face to face with the problems confronting them. It affords an opportunity also of introducing and testing new varieties of crops of economic value and of imparting advice on cultivation and soil treatment; on methods of fodder conservation; how to recognise and treat the more common plant pests and diseases, and on agricultural matters generally, all of which exercise an important bearing on production.

Instructors in Pig and Poultry Raising.

The services of both these officers, Messrs. Shelton and Rumball, have been largely availed of by farmers interested in the respective callings, and a perusal of the reports submitted will indicate the character and scope of work each was actively engaged in, which is undoubtedly exercising a very important influence in the industries concerned.

Advertising the Agricultural Resources of the State.

A comprehensive exhibit was prepared and despatched to the New Zealand and South Seas Exhibition at Dunedin, where the Queensland exhibits excited much favourable comment. Nothing but good should result from such a splendid opportunity of advertising the resources of the State.

A very complete exhibit was also prepared and displayed at the Royal National Show in Brisbane.

The preparation of two complete exhibits of this character entailed a great deal of organisation and of resourceful work on the part of officers of my branch, to whom much credit is due.

State Clydesdale Stallions.

Four stallions—General Wallace, Bold Wyllie, Premier Again, and Glenalla—were allocated to the Laidley, Murgon, Cunningham, and Crow's Nest districts, where seventy-four, fifty-five, seventy, and fifty-seven mares were respectively served, making a total of 256 for the season.

In addition to mares previously examined and passed, a veterinary examination for soundness and for type and conformation was made in the undermentioned districts, but the number of mares brought forward proved insufficient to warrant the placing of a stallion in any locality. A comparison between the number respectively examined and passed will serve to indicate that the quality and type of animals in the neighbourhood of Mackay and Rockhampton did not conform to the desired standard:—

District.	Examined.	Inspections.	Passed.
Lowood	77	2	38
Clifton	38	2	25
Bundaberg	13	1	9
Mackay	8	1	0
Rockhampton	11	1	1

BUNCHY TOP—DEPARTMENTAL ACTION.

In order that the banana-growers of Queensland may fully realise the seriousness of the position of the banana industry created by the spread of Bunchy Top, which is now known to be present in several areas in Southern Coastal Queensland, extending to within about 3 miles of the Maroochy River on the North Coast, the Minister for Agriculture and Stock (Mr. W. Forgan Smith) has supplied the following information respecting the action that has already been taken and proposed to be taken, in order to give effect to the recommendations of the Bunchy Top Investigation Committee.

When Bunchy Top was found to be present in the Dayboro and Caboolture districts at the end of last December, an examination of the neighbouring plantations was made, with the result that the disease was found to have spread from the original area in which it was discovered and had become established in several parts of these districts, but not to as serious an extent as that met with in the plantations in which it was first discovered; and since then there has been no very serious extension of the disease in the district lying between the Brisbane and Caboolture Rivers. Unfortunately, prior to the discovery of Bunchy Top in the Dayboro and Caboolture districts, plants were sent from infected plantations to the Beerwah and Maroochy districts immediately to the north, but fortunately to only one property in each district; in both of which Bunchy Top has unfortunately made its appearance, and steps have been taken to destroy every stool that has shown a trace of the disease, so that it is believed that its further spread in a northerly direction has been stopped. In order, however, to prevent any chance of spreading the disease by means of infected plants, the transfer of plants in any part of the State was totally prohibited by a proclamation issued on the 28th April last. At the same time a careful examination of some 800 plantations—not counting back-yard gardens—has been made in the district extending from Gympie in the north to Eumundi in the south, of the Mary Valley as far as Kenilworth, and the area between Eumundi and the Maroochy River is now being inspected. So far no Bunchy Top has been discovered to the north of the Maroochy River in the southern part of the State, though there has been a slight outbreak in the Innisfail district of Northern Queensland as a result of infected plants having been sent there from the Dayboro district prior to the Department having any knowledge that the disease was present in that area.

The Northern outbreak is well in hand and, should there be no further indication of the trouble within the next few months, it may reasonably be assumed that the disease has been stamped out in that part of the State.

Every Precaution against Further Infestation Necessary.

Bunchy Top is, however, a disease of such an insidious nature that every precaution must be taken to prevent its spread in a northerly direction, and even though no trace of the disease has been found in the area inspected to the north of the Maroochy River, it is not deemed advisable to permit the transfer of plants from one part to another of this district until a second examination of the plantations in the district has been made, as there is a possibility that the disease may be present in a dormant or latent condition that will not show up until the spring growth takes place. At the same time, in order that the planting may not be unreasonably delayed, permission is being granted to growers who wish to extend their present plantations to plant a further area with plants that have been obtained from their present plantations, subject to their being examined and no trace of Bunchy Top being found.

Transfer of Plants.

Immediate steps will be taken to carry out a further inspection of this area, and it is hoped, should such inspection fail to reveal any trace of Bunchy Top, that permission to sell or transfer plants in that part of the district that is bounded on the south by the parishes of Maroochy and Maleny will be given about the end of October, subject to their first being inspected and found free of disease. No banana plants will be permitted to enter this part of the district from any part of Queensland, but plants may be sent out of this area to other parts of the State, subject to such conditions as may be deemed advisable, other than the area lying to the north of the Herbert River, into which no banana plants from any other place will be permitted entry.

In order to prevent the further spread of Bunchy Top from the area extending from New South Wales border to the Caboolture River, no banana plants will be permitted to be sent from any part of this area to any part of the area lying between

the Caboolture and Maroochy Rivers or from this latter area to the area extending from the Maroochy River to the northern boundaries of the parishes of Maroochy and Maleny. This will provide a threefold check—firstly, at the Caboolture River; secondly, at the Maroochy River; and thirdly, by the establishment of a buffer area—so far believed to be clean—between the Maroochy River and the northern boundaries of the abovenamed parishes.

In the area in which Bunchy Top exists—viz., from the New South Wales border to the Maroochy River—the transfer and sale of banana plants will only be permitted to take place within this area subject to the abovementioned restrictions, and then not until an examination of the plantations from which the sale or transfer of such plants has been made and no trace of Bunchy Top has been discovered, nor have any signs of the disease ever been seen in the plantation.

No plants will on any consideration be permitted to be transferred or sold from any plantation in which Bunchy Top is present or is known to have been present.

That part of the State lying to the north of Gympie and extending to the Herbert River has only been partially inspected, but an inspection will be made of all plantations in the banana-growing areas as soon as possible. No Bunchy Top has been discovered in this area so far, and should a further examination show that there is no Bunchy Top present the transfer of plants will be permitted on similar conditions to those applying to the area immediately to the south of Gympie.

BLACK-GROWN MAIZE.

The Minister for Agriculture (Hon. W. Forgan Smith) made the following announcement to the Press recently:—

“I notice in the Press a report from Grafton dealing with the views of Mr. H. Wenholz, a maize specialist attached to the New South Wales Department of Agriculture, on the proposed embargo on the importation of black-grown maize.

“The resolution regarding the embargo was carried unanimously at the Conference of State Ministers of Agriculture held in Brisbane recently, and at which the New South Wales Government was represented by the permanent head of that State's Agricultural Department. The reasons for the carrying of the resolution were stated at the time and reported in the daily Press. Briefly, they were that, as Australia has adopted certain living standards, the product of Australian labour should not be subject to the competition of products grown by coloured labour in other countries where a much lower standard of living prevails. The granting of an embargo by the Commonwealth Government necessarily carries with it the right of the Minister for Trade and Customs to lift the embargo in the event of any shortage of production in Australia. It also carries with it a moral obligation on the part of the local producer to provide for Australian requirements at reasonable prices. Mr. Wenholz may be a specialist in the culture of maize, but I cannot accept him as an authority either on economics or on the fiscal policy that a country should adopt. Before proceeding to pass strictures on the recent Brisbane Conference of State Ministers of Agriculture, he would have been well advised to consult with the head of his own department, who was a party to the resolution, and with which Mr. Wenholz appears to be in conflict.”

SOME RECENTLY DESCRIBED PLANTS.

In continuance of the series of illustrated notes on recently described plants, two more species are illustrated in this issue. These were described by Mr. C. T. White, the Government Botanist, and Mr. W. D. Francis, Assistant Botanist, in the proceedings of the Royal Society of Queensland for 1925. The specimens shown on Plate 69 are from *Melicope stipitata*, a small tree with sparse foliage, slate-coloured bark and white flowers. The tree was originally found at Glenallyn, Malanda, North Queensland, by Mr. H. C. Hayes. On Plate 70, specimens of *Elviodendron microcarpum* are represented. This species is also a small tree. It was found at Mount Perry by Mr. James Keys and at Imbil by Mr. W. R. Petrie. Mr. Keys's specimens have been in the Queensland Herbarium for some years under the name of *Elviodendron australe* and were recognised recently as undescribed during the critical examination of Mr. W. R. Petrie's specimens.

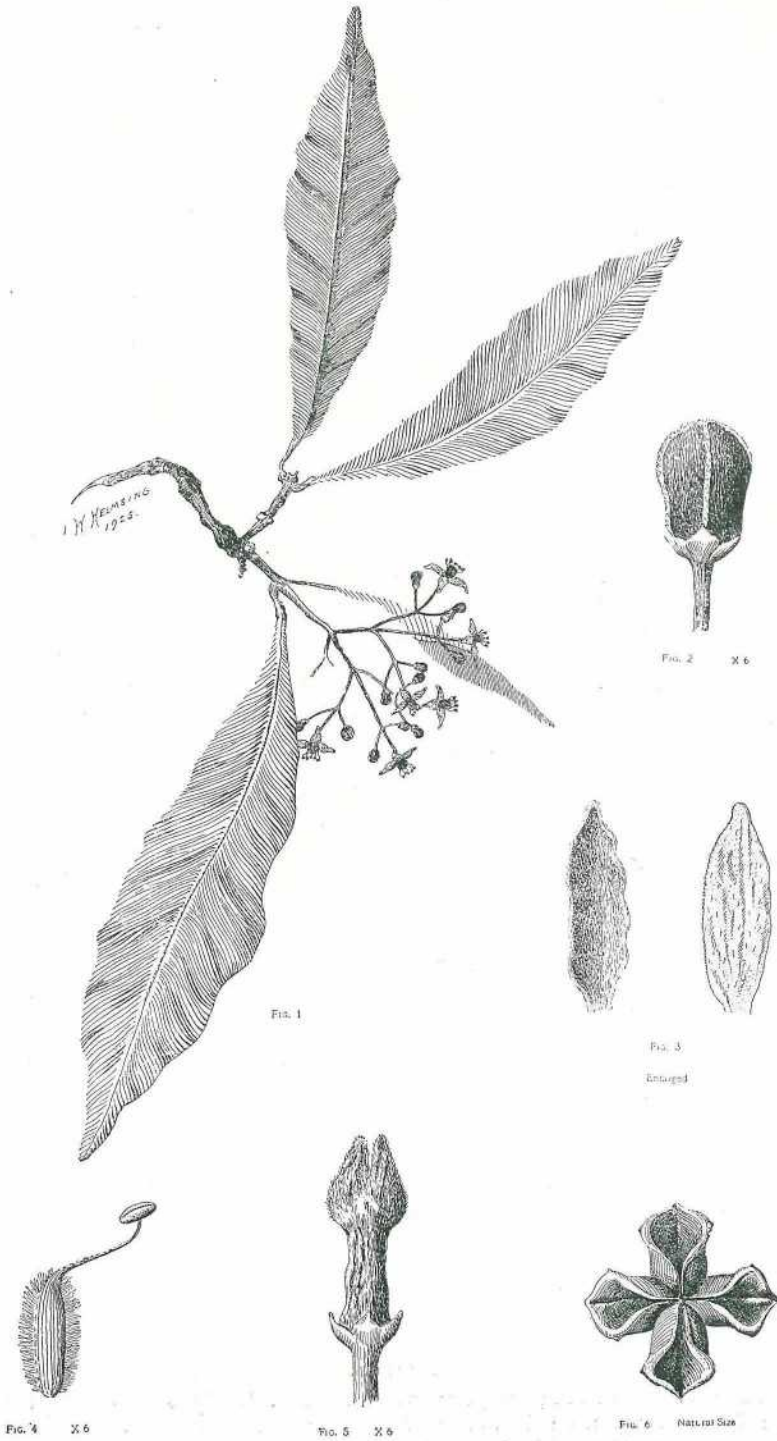


PLATE 69.

Melicope stipitata (new species), about one-half natural size. Fig. 2, bud $\times 6$; Fig. 3, petals enlarged; Fig. 4, stamen $\times 6$; Fig. 5, stipitate ovary $\times 6$; Fig. 6 cocci after dehiscence.

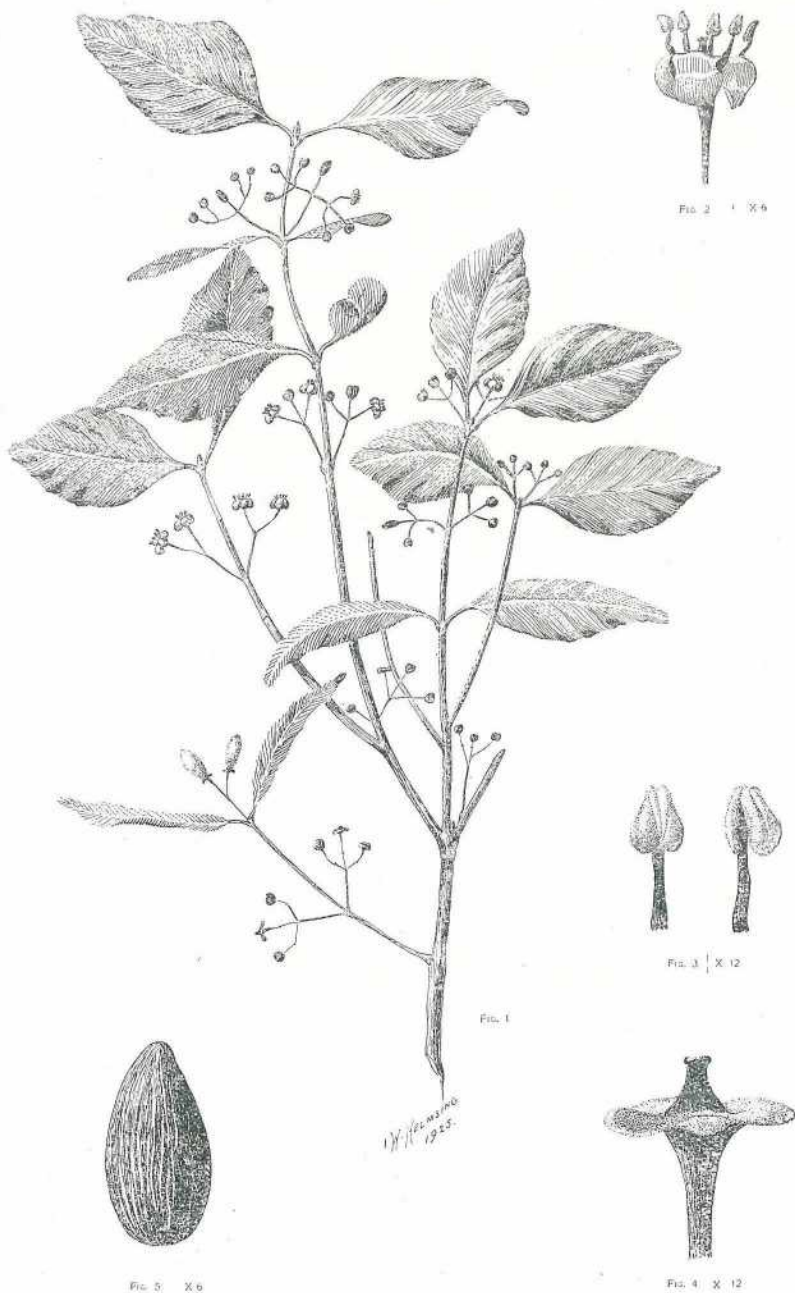


PLATE 70.

Elæodendron microcarpum (new species). Fig. 1, about one-half natural size; Fig. 2, flower $\times 6$; Fig. 3, stamens $\times 12$; Fig. 4, flower with petals and stamens removed $\times 12$; Fig. 5, seed $\times 6$.

ROYAL NATIONAL EXHIBITION.

THE AWARDS.

DISTRICT EXHIBITS.

An exceptionally fine display of products was arranged by the North Coast and Tableland of New South Wales, and this district is commended upon winning the Chelmsford Shield with 1,250 points. Wide Bay and Burnett was second, scoring 61½ points less, and the South Coast of Queensland secured 1,019½ points. In the respective sections, the North Coast and Tableland of New South Wales was first in dairy produce, in fruits, vegetables, and roots, &c., in grain, &c., first in hay, chaff, &c., in wool, in enlarged photographs, and in effective arrangement. It was also equal for first in wines and tobacco. Wide Bay and Burnett was first in manufactures and trades, in mineral and building materials, and equal for first with the winners in wines and tobaccos. Altogether it was a very fine contest, particularly between the first and second placed exhibits, but the fact that the New South Wales exhibit gained so many for effective arrangement—72 out of a possible 80—showed that those responsible know exactly how best to display the goods they produce. That is what the public desires, and it behoves Queensland exhibitors to profit by this year's experience, to heed the lesson that is to be obtained from the winning exhibit from the mother State, the directors of which are cordially congratulated on their success. Details:—

	Possible Points.	Northern Coast and Tablelands, N.S.W.	South Coast of Queensland.	Wide Bay and Burnett District.
DAIRY PRODUCE—				
Butter, 1 box, 56 lb.	90	82	80	81½
Milk (condensed, concentrated, or dried), and by-products	40	38	..	12
Cheese, not less than 1 cwt.	60	53	50	50
Eggs (suitable for domestic use), 1 doz. each variety	20	12	15	18
Totals	210	182	145	161½
FOODS—				
Hams and bacon	50	45	50	42
Rolled and smoked beef and mutton	20	15	18	14
Smallgoods and sausages, if smoked or pre- served	10	8	9	8
Fish—Smoked, preserved, or canned	10	4	6	8
Canned meats	25	18	23	18
Lard, tallow, and animal oils	20	16	18	15
All butchers' by-products not included in other parts of scale	10	8	8	6
Honey, and by-products thereof	20	15	10	17
Confectionery, factory made	10	10	10	10
Bread, biscuits, scones, and cakes, factory made	10	9	10	10
Totals	185	148	162	148

DISTRICT EXHIBITS—*continued.*

	Possible Points.	Northern Coast and Tablelands, N.S.W.	South Coast of Queensland.	Wide Bay and Burnett District.
FRUITS, VEGETABLES, AND ROOTS—				
Fresh fruit—all kinds	60	46	35	54
Preserved fruits, jams, jellies	30	29	20	22
Crystallised and dried fruits	20	20	..	15
Fresh vegetables—all kinds, including table pumpkins, but excluding potatoes ..	25	17	21	19
Preserved and dried vegetables, pickles, sauces	10	9	9	6
Potatoes, English and sweet	40	27	36	24
Roots (10 lb. of each), all kinds, and their products, including meals (1 lb. of each), arrowroot, cassava, &c.	14	9	8	11
Cocoanuts, peanuts, and other nuts ..	10	7	4	6
Totals	209	164	133	157
GRAIN—				
Wheat	50	47	15	32
Flour, bran, pollard, macaroni, and meals prepared therefrom	10	5	8	9
Maize	50	47	38	36
Maizena, meals, starch, glucose, and corn- flour	10	7	4	6
Oats, rye, rice, barley, malt, pearl barley, and their meals	30	28	20	22
Totals	150	134	85	105
MANUFACTURES AND TRADES—				
All woolwork	30	18	26	25
All metal and iron work	30	10	28	28
Leather, all leather work and tanning ..	20	18	19	16
Manufactured woollen and cotton fibre ..	30	25	..	20
All tinwork	10	8	7	9
Artificial manures	10	3	7	7
Brooms and brushes	10	5	6	4
Manufactures not enumerated	15	15	15	12
Totals	155	102	108	121
MINERALS AND BUILDING MATERIALS—				
Gold, silver, copper, and precious stones ..	25	16	4	18
Coal, iron, other minerals, and salt ..	30	18	10	20
Stone, bricks, cement, marble, terra-cotta ..	20	12	12	14
Woods—Dressed, undressed, and polished ..	25	21	23	21
Totals	100	67	49	73
TROPICAL PRODUCTS—				
Sugar-cane	60	54	45	48
Sugar (raw and refined)	20	15	10	16
Rum, other spirits, and by-products ..	10	..	7	10
Coffee (raw and manufactured), tea, and spices	10	8	6	10

DISTRICT EXHIBITS—*continued*.

	Possible Points.	Northern Coast and Tablelands, N.S.W.	South Coast of Queensland.	Wide Bay and Burnett District.
TROPICAL PRODUCTS—<i>continued</i>.				
Cotton (raw) and by-products	30	18	16	17
Rubber	10	..	..	10
Oils (vegetable)	10	10	..	10
Totals	150	105	84	121
WINES, ETC.—				
Aerated and mineral spa	15	10	5	6
Water, vinegar, and cordials	10	5	8	9
Totals	25	15	13	15
TOBACCO—				
Tobacco (cigar and pipe), in leaf	20	20	15	20
HAY, CHAFF, AND GRASSES—				
Hay—Oaten, wheaten, lucerne, and other varieties	30	29½	12	18
Grasses and their seeds	10	9½	7	8
Chaff—Oaten, wheaten, lucerne, and other varieties	50	40	22	35
Ensilage and other prepared cattle fodder ..	20	10	12	15
Sorghums and millets, in stalk	10	8	5	8
Commercial fibres (raw and manufactured)	10	8	9½	7
Pumpkins and other green fodder	10	9	9	6
Broom millet, ready for manufacture ..	10	6	8	9
Farm seeds, including canary seed	13	11	9	10
Totals	163	131	93½	116
WOOL—				
Scoured wool	40	39	37	35
Greasy wool	60	59	39	47
Mohair	10	8	..	9
Totals	110	106	76	91
ENLARGED PHOTOGRAPHS—				
Enlarged photographs of district scenery and locally-bred live stock	5	4	3	..
EFFECTIVE ARRANGEMENT—				
Comprehensiveness of view	20	18	14	15
Arrangement of sectional stands	25	22	18	17
Effective ticketing	10	10	4	9
General finish	25	22	17	18
Totals	80	72	53	59
Grand Totals	1,562	1,250	1,019½	1,188½



PLATE 71.—ILLUSTRATING THE DEPARTMENTAL CAMPAIGN FOR HERD IMPROVEMENT.



PLATE 72.—PITTSWORTH CHEESE HAS ALREADY WON FAME AT WEMBLEY, DUNEDIN, AND IN THE WORLD'S MARKETS. FINE EXHIBIT OF A PRODUCT OF THE DARLING DOWNS.



PLATE 73.—PRODUCTS OF THE QUEENSLAND STATE CANNERY.

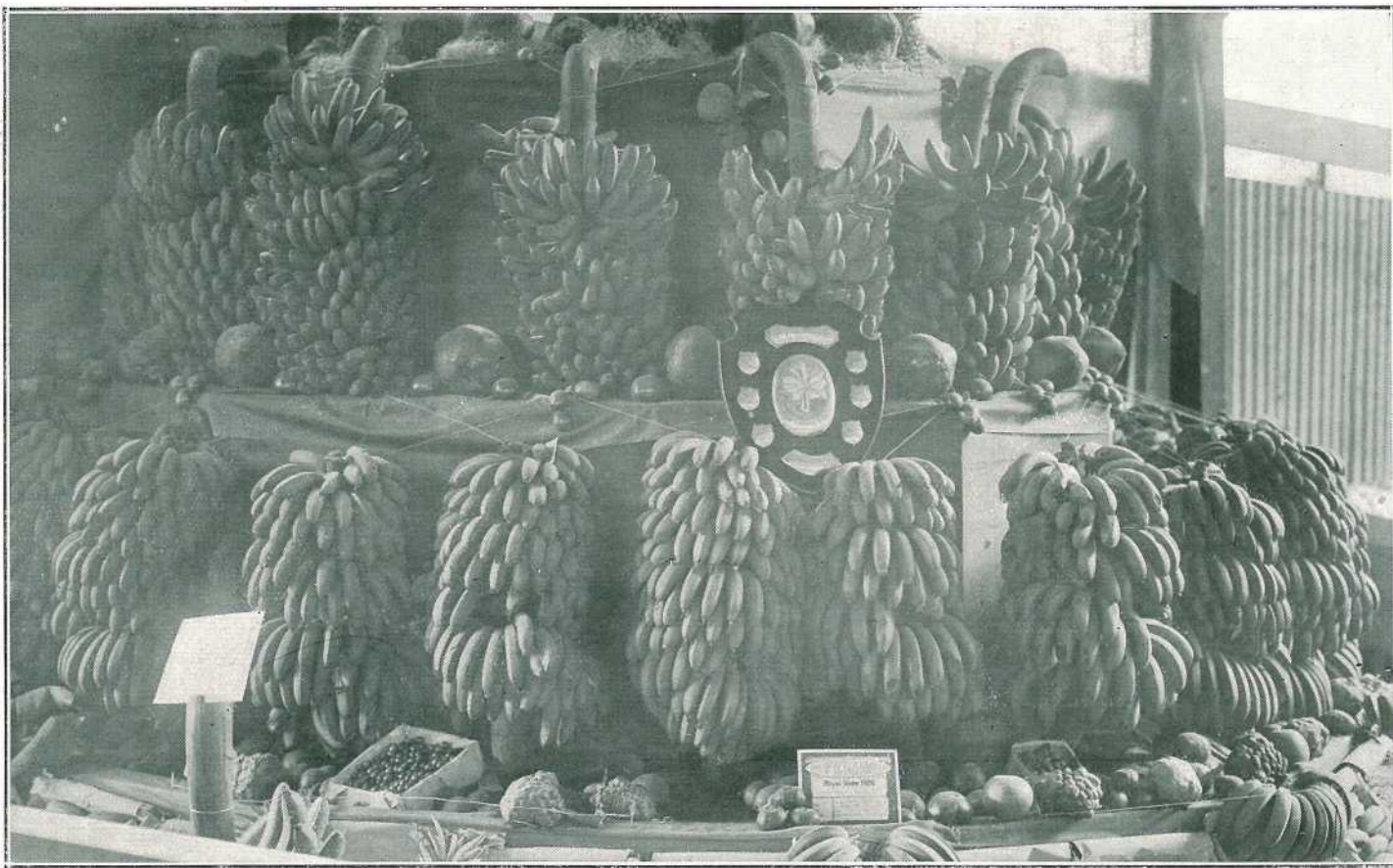


PLATE 74.—QUEENSLAND BANANAS.
Queensland can supply the whole of the Commonwealth with Fruit of Unequalled Quality.

PRIMARY PRODUCTS.

BRISBANE VALLEY WINS—NORTHERN DARLING DOWNS SECOND.

The winning exhibit secured an aggregate of 1,089½ points out of a possible 1,297, and 125½ points better than the Northern Darling Downs, which gained 964 points. An analysis of the detailed points will show where the contest was won and lost. The fact that all exhibits each secured over 800 points proves that each of the five was a worthy exhibit.

The result of the contest in the Primary Products Only was a meritorious win for Brisbane Valley, an offshoot really of the West Moreton district. Details:—

	Possible Points.	Woodford and Kilcoy.	Northern Darling Downs.	Nanango.	Brisbane Valley.	Kingaroy.
DAIRY PRODUCE—						
Butter, 1 box, 56 lb.	90	81½	80½	82	81½	81
Cheese, not less than 1 cwt. . . .	60	35	54	45	56	45
Eggs (suitable for domestic use) . .	20	14	12	16	18	12
Totals	170	130½	146½	143	155½	138
FOODS—						
Hams, bacon, rolled and smoked beef and mutton	50	40	39	38	46	42
Fish (smoked)	10	6	5	..	7	..
Lard, tallow, and animal oils . . .	20	15	15	15	20	15
Honey and by-products thereof . .	20	12	11	7	16	12
Confectionery (home-made)	10	3	2	1	6	1
Biscuits, bread, cakes, and scones (home-made)	10	7	8	7	7	2
Totals	120	83	80	68	102	72
FRUITS, VEGETABLES, AND ROOTS—						
Fresh fruits—all kinds	60	48	54	20	54	20
Preserved fruits, jams, jellies (home- made)	30	25	20	20	23	16
Crystallised and dried fruits (home- made or dried)	20	18	16	16	18	13
Fresh vegetables—all kinds, including table pumpkins, but excluding po- tatoes	25	18	20	13	19	16
Preserved and dried vegetables, pickles, sauces (home-made or dried) . . .	10	8	8	9	9	5
Potatoes, English and sweet	40	34	29	30	36	32
Roots (10 lb. of each), all kinds, and their products, including meals (1 lb. of each), arrowroot, cassava, &c. . .	14	12	7	6	12	10
Cocoanuts, peanuts, and other nuts . .	10	5	3	6	7	9
Vegetable seeds	10	8	7	6	7	7
Totals	219	176	164	126	185	128
GRAIN—						
Wheat	50	20	40	28	38	40
Flour, bran, pollard, macaroni, and meals prepared therefrom	10	3	9	6	..	8
Maize	50	46	34	32	48	46
Maizena, meals, starch, glucose, and cornflour	10	3	6	6	7	6
Oats, rye, rice, barley, malt, pearl bar- ley, and their meals	30	18	20	22	24	26
Totals	150	90	109	94	117	126

PRIMARY PRODUCTS—*continued.*

	Possible Points.	Woodford and Kiltroy.	Northern Darling Downs.	Nanango.	Brisbane Valley.	Kingaroy.
WOODS—						
Woods, dressed, undressed, and polished	25	22	24	22	24	23
Wattle bark	15	12	12	12	14	12
Totals	40	34	36	34	38	35
HIDES—						
Hides and home preserved skins for domestic use	15	15	13	14	15	12
TROPICAL PRODUCTS—						
Sugar-cane	60	20	5	5	35	22
Coffee, tea, and spices	10	4	8	..	7	7
Cotton (raw), and by-products	30	24	26	18	25	21
Totals	100	48	39	23	67	50
MINERALS—						
Gold, silver, copper, and precious stones	25	10	7	15	13	9
Coal, iron, and other minerals, and salt	30	13	18	14	16	9
Totals	55	23	25	29	29	18
TOBACCO—						
Tobacco (cigar and pipe), in leaf	20	16	20	12	20	17
HAY, CHAFF, AND GRASSES—						
Hay—Oaten, wheaten, lucerne, and other varieties	30	20	26	12	29	20
Grasses and their seeds	10	7	8	7	9	7
Chaff—Oaten, wheaten, lucerne, and other varieties	50	40	42	42	49	40
Ensilage and other prepared cattle fodder	20	13	10	12	18	16
Sorghums and millets, in stalk	10	7	8	8	9	9
Commercial fibres, hemp, and flax	15	7	10	8	11	10
Pumpkins, and other green fodder	10	9½	8	7	9	8
Broom millet, ready for manufacture	10	3	9½	9	8	8
Farm seeds, including canary seed	13	9	10	8	10	9
Totals	168	115½	131½	113	152	127
WOOL—						
Scoured wool	40	32	37	36	36	36
Greasy wool	60	40	59	35	51	46
Mohair	10	5	9	8	9	7
Totals	110	77	105	79	96	89

PRIMARY PRODUCTS—*continued.*

	Possibile Points.	Woodford and Kilcoy.	Northern Darling Downs.	Nanango.	Erissbane Valley.	Kingaroy.
ENLARGED PHOTOGRAPHS—						
Enlarged photographs of district scenery and locally-bred live stock	5	3	3	3	3	2
LADIES' AND SCHOOLS' WORK AND FINE ARTS—						
Needlework and knitting	25	22	15	14	20	15
School needlework	5	4	3	2	4	3
Fine arts	5	2	3	3	5	2
School work, maps, writing, &c. ..	10	7	3	7	8	8
Totals	45	35	24	26	37	28
EFFECTIVE ARRANGEMENT—						
Comprehensiveness of view	20	12	19	14	18	13
Arrangement of sectional stands ..	25	14	20	15	22	14
Effective ticketing	10	7	9	6	10	6
General finish	25	16	20	16	23	16
Totals	80	49	68	51	73	49
Grand Totals	1,297	895	964	815	1,089½	891

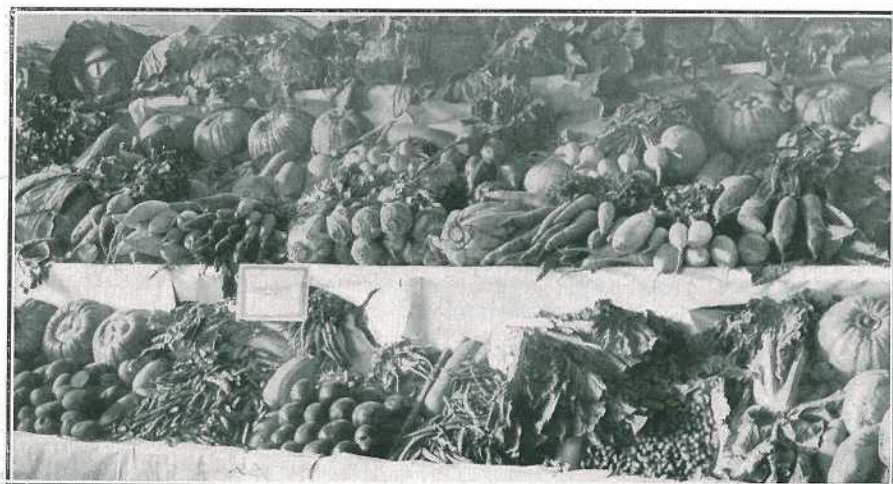


PLATE 75.—PRODUCTS OF THE MARKET GARDEN.



PLATE 76.—ENCOURAGING THE YOUNG IDEA.
A Practical Demonstration of the Efficiency of Queensland Scholars in the Orchardng Districts of the State.

TROPICAL PRODUCTS.

North Queensland, the only exhibit entered for the tropical products' trophy, secured 852 points out of the possible 1,352 points. The maximum points were awarded in raw and refined sugars. Cotton, hams, bacons, and cheese were items in which large percentages were obtained, but there was an absence of butter. To have obtained such high percentages in articles brought long distances must be gratifying to the promoters, and those who carried out the arrangements at the Exhibition. The full points are as follows:—

	Maximum Points.	North Queensland.
DAIRY PRODUCE—		
Butter, 1 box, 56 lb.	90	..
Milk (any form), cream	10	..
Cheese, 1 cwt.	60	53
Eggs (suitable for domestic use)	20	3
Totals	180	56
FOODS—		
Hams, bacon, rolled and smoked beef, and mutton ..	50	30
Smallgoods and sausages	5	2
Canned meats	25	25
Fish—Smoked, preserved or canned	10	..
Lard, tallow, and animal oils	20	15
All butchers' by-products not included in any other parts of scale	10	8
Honey and by-products thereof	20	12
Confectionery	10	2
Biscuits, bread, cakes, scones	10	7
Totals	160	101
FRUIT, VEGETABLES, AND ROOTS—		
Fresh fruits—all kinds	60	49
Preserved fruits, jams, and jellies	20	20
Crystallised and dried fruits	20	18
Fresh vegetables, all kinds, including table pumpkins, but excluding potatoes	25	18
Preserved and dried vegetables, pickles, and sauces ..	10	9
Potatoes, English and sweet	40	32
Roots (10 lb. of each), all kinds, and their products, including meals (1 lb. of each), arrowroot, cassava, &c. ..	14	12
Cocanuts, peanuts, and other nuts	10	8
Vegetable seeds	10	3
Totals	209	169
GRAIN—		
Maize, in cob (12 cobs of each variety)	25	18
Maize, shelled	25	18
Totals	50	36
MANUFACTURES AND TRADES—		
Wattle bark	15	11
Hides (1) and preserved skins	15	14
Totals	30	25
MINERALS AND BUILDING MATERIALS—		
Gold, silver, copper, and precious stones	25	11
Coal, iron, and other minerals, and salt	30	22
Stone, bricks, cement, marble, terra-cotta	20	12
Woods, dressed, undressed, and polished	25	23
Totals	100	68

TROPICAL PRODUCTS—*continued.*

	Maximum Points.	North Queensland.
TROPICAL PRODUCTS—		
Sugar-cane	60	58
Sugar (raw and refined)	20	20
Rum, other spirits, and by-products	10	5
Coffee (raw and manufactured), tea, spices	10	8
Cotton (raw) and by-products	30	20
Rubber	10	..
Oils (medical and machinery)	15	12
Totals	155	123
WINES—		
Wines	15	..
Vinegar, cordials, aerated, and mineral spa waters	10	8
Totals	25	8
TOBACCO—		
Cigars, cigarettes, and snuff	10	..
Tobacco (raw)	20	15
Total	30	15
HAY, CHAFF, AND GRASSES—		
Hay—Oaten, wheaten, lucerne, and other varieties	30	12
Grasses and their seeds	10	8
Chaff—Oaten, wheaten, lucerne, and other varieties	50	20
Ensilage and other prepared cattle fodder	20	5
Sorghums and millets in stalk	10	8
Commercial fibres, hemp, flax	15	..
Pumpkins and other green fodder	10	7
Broom millet (ready for manufacture)	10	5
Farm seeds, including canary seed	13	9
Totals	168	74
WOOL—		
Scoured wool	40	40
Greasy wool	60	55
Mohair	10	..
Totals	110	95
LADIES' AND SCHOOLS' WORK AND FINE ARTS—		
Needlework and knitting	25	20
Essay by pupil of school in district on "Value of Agriculture"	10	7
School work, maps, &c.	5	4
Fine Arts	5	2
School needlework	5	..
Totals	50	33
ENLARGED PHOTOGRAPHS—		
Enlarged photographs of district scenery and locally-bred stock	5	3
EFFECTIVE ARRANGEMENT—		
Comprehensiveness of view	20	15
Arrangement of sectional stands	25	12
Effective ticketing	10	3
General finish	25	16
Totals	80	46
Grand Totals	1,352	852

ONE-MAN FARM.

Mr. L. O. Christensen, the only exhibitor for the one-man farm competition, obtained 443 out of the possible 661 points. High places were gained in the hays and chaffs, wools, and dairy produce sections, but in tropical products the points awarded fell below the 50 per cent. mark. Against that, the possible points were given for tobacco, both in dried and in leaf. For effectiveness of display, the judges decided upon 25 out of 50 points. Detailed particulars of the decisions are as follows:—

	Possible Points.	L. O. Christensen. Crow's Nest.
DAIRY PRODUCE—		
Butter, 1 lb.	25	20
Cheese, 1 large (10 lb.), or 2 small (5 lb. each), home-made	20	17
Eggs (suitable for domestic use)	5	5
Totals	50	42
FOODS—		
Hams (15 lb.), bacon (15 lb.), home-cured	20	18
Corned, smoked, and spiced beef and mutton (10 lb.)	10	9
Honey, any variety, and by-products thereof	15	8
Beeswax, 6 lb.	5	2
Bread (2 loaves), scones (1 dozen)	5	3
Confectionery and sweets, 3 lb.	5	1
Home cookery, including cakes, biscuits, and other foods	7	..
Lard, tallow, and animal oils	5	4
Totals	72	45
FRUITS, VEGETABLES, AND ROOTS—FRESH AND PRESERVED—		
Fresh fruits—all kinds	25	15
Crystallised and dried fruits	10	6
Preserved fruits, jams, and jellies	15	8
Fresh vegetables	15	5
Pickles and sauces	15	7
Potatoes and roots	25	20
Table pumpkins, squashes, and marrows, 56 lb.	10	8
Cocoanuts and other nuts	7	3
Vegetable and garden seeds	5	3
Arrowroot, 10 lb.	5	5
Sugar beet, 3 lb.	5	4
Cassava, 3 lb.	5	..
Ginger, 3 lb.	5	3
Totals	147	87
GRAIN—		
Wheat	25	21
Maize	25	23
Barley, oats, rye, and rice	20	12
Home-made meals from above varieties of grain, 7 lb. of each variety	10	7
Totals	80	63
TROPICAL PRODUCTS—		
Sugar-cane, 24 stalks or one stool	30	9
Cotton, in seed	20	12
Coffee	5	5
Totals	55	26

ONE-MAN FARM—*continued.*

	Possible Points.	L. O. Christensen, Crow's Nest.
TOBACCO—		
Tobacco, in leaf, dried	10	10
HAY, CHAFF, AND GRASSES —		
Hay—Oaten, wheaten, lucerne, and other varieties ..	20	15
Grasses and their seeds, including canary ..	10	6
Chaff—Oaten, wheaten, lucerne, and other varieties ..	20	18
Ensilage (any form)	15	15
Cattle fodder (pumpkins and green fodder) ..	15	13
Sorghum and millet, in stalk	10	8
Broom millet, 10 lb.	10	6
Cowpea seed, 7 lb.	7	7
Flax, 3 lb., hemp, 5 lb.	5	5
Totals	112	93
WOOL—		
Greasy, 3 fleeces	20	18
Mohair	5	4
Totals	25	22
DRINKS—		
Temperance drinks, 6 bottles	10	6
WOMEN'S AND CHILDREN'S WORK—		
Needlework and knitting	10	8
Fine arts	5	3
Fancy work	15	3
School work, maps, writing, &c.	5	..
Totals	40	14
MISCELLANEOUS ARTICLES OF COMMERCIAL VALUE	5	3
PLANTS AND FLOWERS, IN POTS	5	2
TIME AND LABOUR SAVING USEFUL ARTICLES MADE ON THE FARM	10	5
EFFECTIVE ARRANGEMENT—		
Comprehensiveness of view	10	8
Arrangement of stands	10	5
Effective ticketing	5	3
General finish	15	9
Totals	40	25
Grand Totals	661	443

BUTTER CONTESTS.

Keen competition prevailed in the butter contests, and in the four export classes the Oakey Co-operative Butter Association had a triumphant day, winning three of the first prizes. The entries this year were more numerous than at the last Royal National Show. A falling-off was noticeable in the cheese section, owing to the adverse weather conditions. The Cooranga district scored a victory in the coloured pasteurised class, while in the white pasteurised the Oakey Company scored its fourth success. Details:—

BUTTER FOR EXPORT.

30 days' storage, salted. One box, not less than 56 lb., suitable for Export.

	Flavour.	Texture.	Colour.	Salting.	Packing. and Finish.	Total.
Possible points	65	20	7	4	4	100
Oakey District Co-operative Dairy Association, Ltd.	60	20	7	4	4	95
Southern Queensland Dairy Co., Ltd.	60	19½	7	4	4	94½
Downs Co-operative Dairy Association, Ltd., Dalby	59	20	7	4	4	94
Dayboro' Co-operative Dairy Association, Ltd.	59	20	6½	4	4	93½
Goombungee Dairy Co-operative Association, Ltd.	59	19½	7	4	4	93½
Queensland Farmers' Co-operative Association, Ltd., Laidley	59	20	7	3½	4	93½
Warwick Co-operative Dairy Association, Ltd., Millhill	58½	20	7	4	4	93½
Downs Co-operative Dairy Association, Ltd., Clifton.	59	19½	6½	4	4	93
Downs Co-operative Dairy Association, Ltd., Toowoomba	58	20	7	4	4	93
Maleny Co-operative Dairy Association, Ltd.,	58	20	7	4	4	93
Queensland Farmers' Co-operative Association, Ltd., Boonah	58	20	7	4	4	93
Wide Bay Co-operative Dairy Association, Ltd., Cooroy	58	19½	7	4	4	92½
Port Curtis Co-operative Dairy Association, Ltd.	57	19½	7	4	4	91½
Wide Bay Co-operative Dairy Association, Ltd., Gympie	57	19½	7	4	4	91½
Caboolture Dairy Association, Ltd., Caboolture	57	19½	6½	4	4	91
Caboolture Dairy Association, Ltd., Eumundi	56	20	7	4	4	91
Caboolture Dairy Association, Ltd., Pomona	57	19½	6½	4	4	91
Gayndah Co-operative Dairy Association, Ltd.	57	19½	6½	4	4	91
Maryborough Co-operative Dairy Association, Ltd., Maryborough	57	19½	6½	4	4	91
Maryborough Co-operative Dairy Association, Ltd., Kingaroy	56½	19½	6½	4	4	90½
Queensland Farmers' Co-operative, Co., Ltd., Booval	57	19½	6	4	4	90½
Warwick Co-operative Dairy Association, Ltd.	57	19½	6	4	4	90½
Downs Co-operative Dairy Co., Ltd., Crow's Nest	56	19½	6½	4	4	90
Maryborough Co-operative Dairy Association, Ltd., Biggenden	56½	19	6½	4	3½	89½
Maryborough Co-operative Dairy Association, Ltd., Mundubbera	56	19	6	4	4	89

BUTTER FOR EXPORT—continued.

8 weeks' storage, unsalted. One box, not less than 56 lb., suitable for Export.

	Flavour.	Texture.	Colour.	Salting.	Packing and Finish	Total.
Possible points	65	20	7	4	4	100
Goombungee Co-operative Dairy Association, Ltd.	59½	20	7	4	4	94½
Maleny Co-operative Dairy Association, Ltd.	59	20	7	4	4	94
Downs Co-operative Dairy Association, Ltd., Toowoomba	58½	20	7	4	4	93½
Warwick Co-operative Dairy Association, Ltd., Millhill	58	19½	7	4	4	92½
Caboolture Co-operative Dairy Association, Ltd., Caboolture	57	20	7	4	4	92
Southern Queensland Dairy Co., Ltd.	58	19½	6½	4	4	92
Queensland Farmers' Co-operative Association, Ltd., Laidley	57½	19½	6½	4	4	91½
Warwick Co-operative Dairy Association, Ltd., Allora	57	19½	7	4	4	91½
Oakey District Dairy Association, Ltd.	59	19	5	4	4	91
Queensland Co-operative Association, Ltd., Booval	56½	19½	7	4	4	91
Wide Bay Co-operative Dairy Association, Ltd., Gympie	57	19½	6½	4	4	91
Caboolture Co-operative Dairy Association, Ltd., Eumundi	56	19½	6½	4	4	90
Caboolture Dairy Association, Ltd., Pomona	56½	19½	6	4	4	90
Dayboro' Co-operative Dairy Association, Ltd.	57	19	6	4	4	90
Downs Co-operative Dairy Association, Ltd., Dalby	55½	10½	7	4	4	90
Maryborough Co-operative Dairy Association, Ltd., Biggenden	57	19	6½	4	3½	90
Queensland Co-operative Dairy Association, Ltd., Boonah	57	19	6	4	4	90
Wide Bay Co-operative Dairy Association, Ltd., Cooroy	56	19½	6½	4	4	90
Maryborough Co-operative Dairy Association, Ltd., Mundubbera	56	19½	6½	4	3½	89½
Downs Co-operative Dairy Association, Ltd., Crow's Nest	55	19½	6½	4	4	89
Maryborough Co-operative Dairy Association, Ltd., Kingaroy	55	19	6½	4	4	88½
Nanango Co-operative Dairy Association, Ltd.	54	19	6	4	4	87

8 weeks' storage, salted. One box not less than 56 lb., suitable for Export.

Oakey District Co-operative Dairy Association, Ltd.	60	20	7	4	4	95
Goombungee Co-operative Dairy Association, Ltd.	59	20	7	4	4	94
Maleny Co-operative Dairy Association, Ltd.	58½	20	6½	4	4	93
Caboolture Co-operative Dairy Association, Ltd., Pomona	57½	19½	7	4	4	92
Port Curtis Co-operative Dairy Association, Ltd.	57½	19½	7	4	4	92
Caboolture Co-operative Dairy Association, Ltd., Eumundi	57	19½	7	4	4	91½

BUTTER FOR EXPORT—*continued.*

8 weeks' storage, salted. One box not less than 56 lb., suitable for Export—*continued.*

	Flavour.	Texture.	Colour.	Salting.	Packing and Finish.	Total.
Possible points	65	20	7	4	4	100
Downs Co-operative Dairy Association, Ltd., Crow's Nest	57	19½	7	4	4	91½
Southern Queensland Dairy Association, Ltd.	58	19½	6	4	4	91½
Wide Bay Co-operative Dairy Association, Ltd., Gympie	57	19½	7	4	4	91½
Downs Co-operative Dairy Association, Ltd., Toowoomba	56	20	7	4	4	91
Maryborough Co-operative Dairy Association, Ltd., Biggenden	57	19½	6½	4	4	91
Maryborough Co-operative Dairy Association, Ltd., Mundubbera	57	19½	6½	4	4	91
Queensland Farmers' Co-operative Dairy Association, Ltd., Booval	57	19½	6½	4	4	91
Wide Bay Co-operative Dairy Association, Ltd., Cooroy	57	19½	6½	4	4	91
Downs Co-operative Dairy Association, Ltd., Dalby	56	19½	7	4	4	90½
Nanango Co-operative Dairy Association, Ltd.	56½	19½	6½	4	4	90½
Warwick Co-operative Dairy Association, Ltd., Millhill	56½	19½	7	4	3½	90½
Caboolture Co-operative Dairy Association, Ltd., Caboolture	56	19½	6½	4	4	90
Queensland Farmers' Co-operative Association, Ltd., Boonah	55½	19½	6½	4	4	89½
Maryborough Co-operative Dairy Association, Ltd., Kingaroy	55	19½	6½	4	4	89
Queensland Farmers' Co-operative Association, Ltd., Laidley	56	19	6½	3	4	88½
Dayboro' Co-operative Dairy Association, Ltd.	56½	18½	5½	3½	4	88

8 weeks' storage, salted. One box, not less than 56 lb., manufactured in Queensland from Pasteurised Cream, suitable for Table Use in Britain.

Oakey District Co-operative Dairy Association, Ltd.	60	20	7	4	4	95
Downs Co-operative Dairy Association, Ltd., Toowoomba	59	20	7	4	4	94
Caboolture Co-operative Dairy Association, Ltd., Eumundi	58½	20	7	4	4	93½
Southern Queensland Dairy Co., Ltd. ..	58½	19½	6½	4	4	92½
Warwick Co-operative Dairy Co., Ltd., Allora	57	19½	7	4	4	92½
Warwick Co-operative Dairy Association, Ltd., Millhill	58½	19½	7	3½	4	92½
Downs Co-operative Dairy Association, Ltd., Crow's Nest	57½	19½	7	4	4	92
Goombungee Co-operative Dairy Association, Ltd.	57	20	7	4	4	92
Queensland Farmers' Co-operative Association, Ltd., Laidley	57	19½	7	4	4	91½
Caboolture Co-operative Dairy Association, Ltd., Caboolture	57	19½	6½	4	4	91
Caboolture Co-operative Dairy Association, Ltd., Pomona	56½	19½	7	4	4	91

BUTTER FOR EXPORT—*continued*.

8 weeks' storage, salted. One box, not less than 56 lb., manufactured in Queensland from Pasturised Cream, suitable for Table Use in Britain—*continued*.

	Flavour.	Texture.	Colour.	Salting.	Packing and Finish.	Total.
Possible points	65	20	7	4	4	100
Maleny Co-operative Dairy Association, Ltd.	57	19½	6½	4	4	91
Maryborough Co-operative Dairy Association, Ltd., Mundubbera	57	19½	6½	4	4	91
Nanango Co-operative Dairy Association, Ltd.	56½	19½	7	4	4	91
Queensland Farmers' Co-operative Association, Ltd., Boonah	56½	19½	7	4	4	91
Downs Co-operative Dairy Association, Ltd., Dalby	56	19½	7	4	4	90½
Maryborough Co-operative Dairy Association, Ltd., Biggenden	57	19½	6½	4	3½	90½
Queensland Farmers' Co-operative Association, Ltd., Booval	56½	19½	6½	3½	4	90
Dayboro' Co-operative Dairy Association, Ltd.	56	19	6	4	4	89
Maryborough Co-operative Dairy Association, Ltd., Kingaroy	55	19½	6½	4	4	89
Wide Bay Co-operative Dairy Association, Ltd., Gympie	55	19½	6½	4	4	89
Wide Bay Co-operative Dairy Association, Ltd., Cooroy	55	19	6	4	4	88

CHEESE.

In the first contest the Oakey district Kelvinhaugh factory won with 93½ points, with Biddeston Co-operative Dairy Association, Limited, second with 92; Cooranga North Co-operative Cheese Association was third with 91½ points.

In the other class, export cheese, coloured pasteurised, two each 70-80 lb., Cooranga North Co-operative Cheese Association, Limited, had a good win with 94½ points. The runners-up were the Pittsworth Dairy Company "Y" factory with 93 points, and Biddeston Dairy Association, Limited, came third with 92½. Details:—

Export, white, pasteurised, suitable for English market; two, each 70 lb. to 80 lb.; six weeks' storage.

	Flavour.	Texture.	Colour.	Finish.	Total.
Possible points	50	25	15	10	100
Oakey District Co-operative Dairy Association, Kelvinhaugh	44	25	15	9½	93½
Biddeston Co-operative Dairy Association, Ltd. ..	43	24½	14½	9½	92
Cooranga North Co-operative Cheese Association, Ltd.	42½	24½	15	9½	91½
Pittsworth Dairy Co., Ltd. "P" Factory	43	24	14½	10	91½
Downs Co-operative Dairy Association, Ltd., Koondai	41½	24	14½	8	88
Woodleigh Cheese Factory	39	24½	14½	9	87

CHEESE—*continued.*

Export, coloured, pasteurised, suitable for English market ; two, each 70 lb. to 80 lb. ; six weeks' storage.

	Flavour.	Texture.	Colour.	Finish.	Total.
Possible points	50	25	15	10	100
Cooranga North Co-operative Cheese Association, Ltd.	45	25	14½	10	94½
Pittsworth Dairy Co., "P" Factory	44	24½	14½	10	93
Biddeston Co-operative Dairy Association, Ltd. ..	44	24½	14½	9½	92½
Downs Co-operative Dairy Association, Ltd., Koondai	43½	24½	14½	8	90½
Oakey District Co-operative Dairy Association, Ltd., Kelvinhaugh	42	24½	14½	9½	90
Pittsworth Dairy Co., Ltd., "Y" Factory	41½	24	14	9½	89½
Woodleigh Cheese Factory	39	24½	14½	9	87

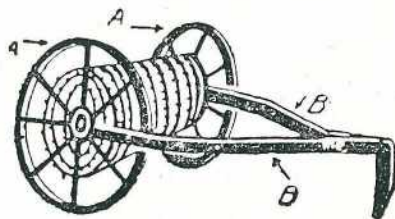
DISTRICT FRUIT EXHIBITS.

No better arranged displays or finer grades and classes of fruit have been staged at the Brisbane Exhibition. Every district and locality represented earned widespread popular appreciation for its distinctly creditable exhibit.

The noted fruitgrowing districts of Cooran, Kin Kin, Pinbarren, Montville, Palmwoods, and Woombye were well represented.

BARB WIRE REEL.

Barb wire is as pleasant to handle as the Scotch thistle, but this reel makes the job of building a fence a lot more pleasant. We need first a pair of light wheels 2 feet or more in diameter. A pair from an old wheel cultivator are about right, and light cart wheels or even bicycle wheels will do. These are shown at A in the drawing. For the axle a piece of 1-inch pipe will do. It will not be too large to allow the barb-wire spool to slip over it. One of the wheels can be fastened more or less permanently to the axle, but the other should be so fastened



A BARBED WIRE REEL.

as to come off easily to allow the wire spool to be slipped on the axle. Secure two pieces of light strap iron B or iron rod about half an inch in diameter. Bend one end of each so as to encircle the axle. Bend the free ends as shown, and fasten them together at the back. One of them should be about one foot longer than the other, and this is bent over at right angles and the end sharpened to a point. The right-angle piece acts as a handle for pulling or pushing the reel, and the point can be pushed into the ground to anchor it when desired.—"Country Gentleman."

POULTRY FEEDING.

By P. RUMBALL, Poultry Instructor.

Possibly there is no problem more important to the successful poultry raiser than that of feeding. For this reason and to assist in the economical utilisation of the various foods available, poultry raisers should have a thorough knowledge of the principals underlying feeding. Although it is possible for many to purchase mixed feeds suitable for either egg production or the growth of young stock, it is not always advisable for the commercial poultry raiser to rely solely upon these foods, as the distance from the manufacturer adds considerably to their cost, and it may also be possible for the poultry keeper to utilise cheaper foods produced locally.

Poultry, as with all animals, require food first for the maintenance of the bodily functions—that is, the supplying of heat and energy and repair of waste tissue, the surplus only being used for the production of the growth of the body, or in the case of moulting stock the growth of feather, and in laying stock the production of eggs. It is possible, and it frequently happens, by incorrect feeding to retard the growth of growing stock, and in adult stock to just maintain the birds in perfect health without procuring the desired production of eggs. It is, therefore, essential for the poultry raiser to realise at the outset that under-feeding is not conducive to good results, and that it is as equally wasteful as over-feeding; also that the production of eggs or the bodily growth of young stock can only be obtained by feeding quantities in excess of the bodily requirements of the bird.

In dealing with feeding, it is desirable to go into the question of the exact composition of the body of the bird, the egg, and the varieties of foods available, and it is as well to define the terms used.

Water—composed of hydrogen and oxygen. It is present in large quantities in the body and all foods to a varying degree.

Protein is a compound built up of nitrogen, hydrogen, and oxygen, and a few minor constituents.

Fats and carbohydrate are compounds of carbon, oxygen, and hydrogen.

Ash—Mineral matter and represents the residue of burnt material.

COMPOSITION OF HEN AND EGG.*

Composition.	White Leghorn Hen.			Eggs as Purchased.	
Water	..	..	56.8	..	65.6
Protein	..	..	21.6	..	11.8
Ash	..	..	3.8	..	.7†
Fat	..	..	17.8	..	10.8
Shell	..	..	—	..	11.1

*Col. Bulletin 164. † Other than shell.

TABLE OF FOODS.

Composition of some Poultry Foods—Digestible Nutrients.

—	True Protein.	Carbo-hydrate.	Fibre.	Fat.	Nutritious Ratio.
Barley, Green	1.2	9.0	2.9	0.4	1 to 10.7
Lucerne, Green	3.0	6.1	3.4	0.3	1 to 3.4
Pumpkins	1.1	7.0	2.6	0.7	1 to 10.2
Dry Lucerne Chaff or Meal ..	11.1	21.7	11.9	1.4	1 to 3.3
Barley	8.7	64.2	0.7	1.2	1 to 7.8
Maize	10.0	61.2	1.2	4.7	1 to 7.3
Cowpeas	17.3	52.0	1.1	0.8	1 to 3.2
Wheat	11.8	54.0	1.1	1.5	1 to 5.0
Feterita	10.1	65.4	..	2.4	1 to 7.0
Oats, Hulled	11.4	57.7	..	7.5	1 to 6.5
Bran	11.0	34.5	1.6	1.8	1 to 3.6
Pollard	13.9	47.0	1.7	4.8	1 to 4.3
Peanut Meal	33.8	11.6	0.6	7.2	1 to 9.0
Oil Cake (Sunlight)	15.6	38.6	4.0	10.4	1 to 4.3
Bone Meal, Fresh	18.3	..	..	24.5	1 to 3.0
Meat Meal	54.3	..	..	10.55	1 to 40½
Buttermilk	3.4	4.9	..	0.1	1 to 1.5
„ Dry	29.3	41.0	..	6.2	1 to 1.9
Milk, Skim	3.6	5.2	..	0.1	1 to 5.0
Blood, Dry	52.4	..	..	2.5	1 to 0.1

Use of Various Elements in the Body.

Water.—Since the fowl's body contains approximately 57 per cent. of water and eggs 65 per cent., the need of a good water supply should be evident. Although water is cheap, it is too frequently neglected. A good supply of clean, cool water is essential for best results. As will be seen in the table of the analyses of foods, water is present in a varying degree, and according to the quantity present so is the value of the food generally lessened.

Protein.—Protein is essentially a supply of building material, and is found in all muscular development. It is necessary for the repair of waste tissue, and poultry being of a very active nature, the demand is consequently heavy. It is also necessary for high egg production. Foods rich in protein are meat scrap or dried meat meals of all descriptions, fish meals, insect life, worms, milk, and other animal products. Vegetable proteins are rich in beans, peas, cotton seed meal, peanut meal, &c. Animal protein, however, has been found to be more suitable to poultry requirements, either by reason of the fact that they are more palatable or more readily digested.

Carbohydrate and Fats.—Carbohydrates are found in the form of starch and sugars, and together with fats are largely used by poultry. Their principle function is the production of heat and energy and the formation of the body fats. Hens, before the laying season, either during the growing stage or while moulting, store up certain quantities, which are used up after the bird commences to produce. In table birds, certain quantities of fat adds to the quantity of the stock, but it is always desirable to guard against large quantities of abdominal fats.

Ash.—This is the residue of burnt foods and represents the mineral matter drawn from the soil by plant life. As a general rule, stock that has free range and live on herbage obtain sufficient quantities of mineral matter, but with poultry, more especially those confined, the absence of mineral matter in their food is frequently noticed. This is due to the fact that the ash content of the grain is generally less than that of the whole plant. Liberal supplies of green feed, especially green lucerne, and, failing green lucerne, lucerne meal or lucerne dust, will largely make good this deficiency. Skim milk is an excellent food by which the mineral contents of food may be augmented, and bone meal, the larger part of which is calcium phosphate, mineral matter essential for the boney framework of the body, is practically essential where large numbers of stock are to be reared.

Fibre includes the least digestible of foods, such as the outer cells of grains and fibrous matter in plants. Excessive quantities of fibre are to be avoided, as they are not only indigestible by poultry but when extensively fed, especially in young stock, irritate the intestines.

Grit and Charcoal.—Grit hard and flinty should be supplied to poultry for the purpose of forming the teeth. Shell grit materially assists the mineral supply necessary for the formation of the shell, and charcoal is an excellent regulator for the bowels, fowls consuming it freely.

Digestibility of Foods.—The chemical composition of a food does not indicate its digestibility, and as regards poultry little is known on the subject. It is a question that can only be definitely ascertained by feeding experiments conducted with poultry.

Palatability of Food.—Results are not obtained by making up a ration with definite proportions of the constituents already referred to unless the fowls will eat it. If they become hungry enough they will consume a sufficient quantity of almost any food, but it will be at the cost of a very much reduced egg yield. Upon analysis, barley is found to be a food carrying almost the right quantities of protein and carbohydrate essential for egg production, but when put into practice we find that fowls do not relish the grain, and they have to be gradually accustomed to consume it. It may be as well here to mention that in making any change in the ration to laying stock, do so gradually, as sudden changes in the diet cause a reduced egg yield and frequently a false moult.

Nutritive Ratio.—It has been found by experiment that fowls should eat quantities of digestible protein and carbohydrate in fairly definite proportions. These proportions vary between 1 part of protein to 4.5 to 5 parts of carbohydrate. Experiments conducted in Victoria show the carbohydrates as being greater than these figures, but from the writer's experience a ration of 1 to 5 is sufficiently wide.

To enable readers to test for themselves the ratio of the foods they are using, those consumed by the birds during the last Mount Gravatt competition is given as an illustration. The first column shows the total weight in pounds of food, the second

the total protein content, the third the carbohydrates, and the fourth fats and oils. The costs of the various foods used is given also.

To obtain the content of the various constituents, the weight of the food is multiplied by the percentage shown in the table of analysis. The total protein content is then divided into the totals of the carbohydrates and fats, after the latter have been multiplied by 2.25 to show their carbohydrate equivalent, as a pound of fat will create as much energy as 2.25 lb. of carbohydrates.

Although the ration used in this test was slightly narrow or carried rather too much protein, good results were obtained, owing to the exercise promoted by feeding grain in litter. In the present test slightly more maize is being used, and is giving equal if not better results, and incidentally reducing the cost of feeding.

Table of Food Consumed by 270 Birds, Mount Gravatt Competition, 1924-25.

Kind of Food.				Weight in Lb.	Protein.	Carbo- hydrates.	Oils and Fats.	Cost.		
								£	s.	d.
Wheat	..	..	..	9,114	1,075.45	4,921.56	136.71	47	18	7
Maize	..	..	..	5,382	538.20	3,293.78	254.95	18	3	1
Bran	..	..	..	3,390	372.90	152.55	61.02	12	19	2
Pollard	..	..	..	8,760	1,217.00	4,117.20	420.48	36	14	11
Lucerne Meal	..	..	..	1,202	133.42	152.65	16.82	7	9	2
Linseed Meal	..	..	..	75	22.50	21.15	2.40	0	9	3
Meat Meal	..	..	..	900	342.00	..	72.00	9	19	3
Charcoal	..	..	..	7*	..	..	..	2	1	0
Shell Grit	..	..	..	1,680	..	..	..	6	13	2
Salt	..	..	..	20	..	..	..	0	4	2
					3,702.17	12,658.89	965.35	142	11	9

* Bags.

Ratio = $965 \text{ (fats)} \times 2.25 + 12658 \text{ (carbohydrates)} \div 3702 \text{ (protein)} = 1 \text{ to } 4$

Note.—The meat meal used was low in protein and contained salt, which accounts for the small quantity of salt used. Average cost of feed per bird, 10s. 6.7d. Average number of eggs laid, 204 per bird. It will also be observed that pound for pound the consumption of grain and meal is fairly equal.

Commercial Available Feeds and how they should be Used.

Barley.—Not a popular food among poultry keepers nor do fowls consume it readily. It has a fair feeding value, but in order to increase its palatability it should be soaked or sproated. When corn and wheat are high in price, barley could be used to the extent of 50 per cent. of the grain mixture, but, as previously pointed out, the change over should be gradual.

Beans and Peas.—When whole, stock do not take kindly to either of these grains, crushed they add to the protein content of the mash, and may be used to the extent of 20 per cent.

The Grain Sorghum.—In the drier areas this crop can be grown successfully when maize or wheat are failures. They are slightly higher in protein content than maize, but do not contain the fats. Feteriata and Milo are preferred, and are extensively used by some breeders with a good deal of success and economy in feeding. Some varieties of the grain, notably Kaffir corn, are credited with a binding nature on the bowels, but as an offset against this plentiful supplies of green feed can be used.

Maize.—This is one of Queensland's staple grain crops of which poultry are very fond. Large grain needs to be cracked, but the smaller varieties can be fed whole. When purchasing maize for grain feeding, it is as well to try and secure the small whole grain. The quality is then easily judged, and there is no waste. Cracked grain should always be sieved before being used, and the fine powder used in the mash. If the grain is fed extensively, it is inclined to lay on internal fat, but it can be used to the extent of at least 50 per cent. of the grain ration with safety. Yellow corn should be used in preference to the white on account of its content of vitamine A.

Oats.—In some places oats is one of the principal poultry foods. The majority of Queensland's supply is, however, imported, and it therefore cannot be economically used. It is, however, desirable to add variety to the ration of breeding stock by using a proportion of this grain.

Rice.—In the northern portion of Queensland, where this grain is grown, it may be possible to use quantities of this grain. It is a very starchy food of a fattening nature, but can be used to the extent of one-third of the grain ration. Crushed or ground rice needs to be used with care, owing to its habit of going rancid.

Wheat.—This grain provides the bulk of our poultry food supplied. It is readily consumed by poultry, and can be fed as a part of any grain ration or used by itself, the market price of various grain foods available being the guide as to the quantities used. Plump wheats of a hard nature are of better feeding value than pinched grain or full soft grains. It is a better feed for growing stock than maize, having more protein and ash, but for laying stock certain quantities of maize should be used in conjunction with this grain to give colour to the egg yolk.

Bran.—Bran is rich in protein and mineral matter, but carries a fair quantity of fibre. This fibre is useful in adding a certain quantity of bulk to the ration. It also assists in making a mash when fed wet of a nice consistency. Use at the rate of 25 to 30 per cent. of the mash.

Pollard.—Pollard has a greater proportion of carbohydrates than bran, but not so much ash and fibre. It forms the principal constituent of mashes, and may be used to the extent of 60 per cent. of the total mash supply.

Maize Meal.—This feed is especially of value in fattening poultry. Certain quantities may be used in all mashes, but owing to its low protein and ash content it is more suited to the use of adult than young stock.

Ground Oats and Rolled Oats and Hulled Oats.—Ground oats—that is, oats without the hulls—is an excellent food for both laying and growing stock, being rich in protein. Rolled oats may form the sole feed of baby chickens for the first two days, while hulled oats can be fed extensively as a grain. The use of these foods is largely governed by the price.

Linseed Meal.—Fairly rich in oils and proteins, but contains a good deal of fibre. It may be used to the extent of 5 per cent. in the laying mash, and increased slightly during the moulting periods to assist in the growth of feather.

Cotton Seed Meal.—Cotton seed meal, on analysis, would appear to be a splendid food for poultry, but in practice the extensive use has not given good results. A good grade may be used to the extent of 5 per cent., but never exceed this quantity.

Peanut Meal.—A very nitrogenous and easily digested meal. The keeping quality of the food is poor, being inclined to go rancid, but it may be used to assist in building up the protein content of mashes.

Meat Meals.—Meat meals vary considerably in their analysis. They are essential for high egg production. The quantities to be used would vary according to conditions under which poultry are kept. In closed runs where no other class of animal food is available, they may be used to the extent of 10 per cent., but with stock on free range during periods when animal food in the form of insect life is plentiful, the quantity should be considerably reduced.

Dry Crushed Bone and Bone Meal.—This class of food contains fair quantities of protein, but its principal value is its ash content. It is essential for the development of the boney structure of young growing stock and beneficial to laying birds. Amounts up to 5 per cent. may be used. Bone meal having a fairly high protein content, when it is being used other classes of animal food need to be considerably reduced. Poultry keepers who are a distance from markets could burn any bones about the place, which renders them easily crushed, and so have a supply of mineral matter suitable to the feeding to young growing stock.

Milk.—If all poultry keepers had a good supply of skim milk or butter milk there would not be such a large number of poorly developed stock on our farms. There is no better animal food for stock than milk or milk products. In a sour state it is recommended by some authorities as preventative of diarrhoea and coccidiosis. In feeding, however, vessels need to be kept clean, and although the milk is being fed in a sour state, putrefication needs to be avoided.

Dried Butter Milk.—This is an excellent food for those who have not the fresh product, and in a State such as Queensland, where the dairying industry is so extensive, poultry breeders should be assured of a continuity of supplies. Milk and milk products appear to be a tonic as well as a food, and highly suited for laying stock, growing stock, and breeding stock. When used for the latter purposes, it has been the writer's experience that the hatch-ability of the eggs have been increased. It may be used for the sole source of animal food supplied, or used in conjunction with other forms of animal foods. The price will govern its use, but there is apparently no advantage in feeding greater quantities than 10 per cent.

Green Feed.—Some sort of succulent green food is essential to maintain the health and vigour of stock, not so much by reason of its nutritive value, although certain quantities are supplied, but to act as a natural tonic on the fowl's system.

It has long been recognised as an important food for poultry, but it is only during recent years that scientists have found that green foods have been supplying an element known as "vitamine," which is essential to life. Green feed stimulates the liver and increases the secretion of digestive juices. The kinds of green feed most valuable and relished by fowls are the young, tender-growing portions of lucerne, lettuce, kale, rape, silver beet, barley, oats, maize, &c. In fact, all green foods are good, but it needs to be young or tender. The quantities used is dependent upon supplies and general conditions. When feeding by itself, say, at midday, give the birds as much as they will eat. If used in a wet mash, the quantity could be as high as 25 per cent. of the bulk, and during droughty periods, when poultry foods are costly, green feed can be used to the extent of 60 per cent. of the mash; but when fed in these quantities, two mashes, one at 7 a.m. and one about 1 p.m., should be fed daily, followed by a grain feed, say, at 5 p.m. Poultry have not a great holding capacity, hence the necessity of feeding two mashes to enable them to deal with the necessary bulk to obtain all the nutriment required.

When fresh green feed cannot be obtained, lucerne chaff, dust, or meal make an excellent substitute. This class of food, being dry, however, cannot be used to the same extent as if green. By weight, 12 per cent. should be the limit. If feeding on the wet mash, the dry lucerne can be soaked over-night with just enough water to mix the mash. This softens the lucerne, making it more easily digested.

Grits.—Shell and limestone, &c., for the purpose of supplying the necessary lime for bone and egg shell, material such as sea shell, crushed limestone, and ground bone are supplied. Good supplies of oyster shell or ground lime should always be available, while bone may be supplied either in the form of meal or grit.

Hard Flinty Grit.—Hard pieces of rock, crockery, sand, &c., are necessary to poultry for the grinding of their food supplies. The size naturally varies with the age and size of the birds. This should also be in free supply, particularly with stock confined to pens. Without grit it is impossible for stock to thoroughly digest their food, and any system of feeding where this is not supplied is wasteful.

Charcoal.—This can be fed either in the mash or be available to stock at all times. When it is desired to feed powdered charcoal in the mash it should be used at the rate of 2½ per cent. The principles for using charcoal are for its mineral content and its action as a bowel corrector.

In feeding all grit continuity of supply is essential, otherwise stock are liable to gorge themselves, with resulting troubles in the nature of distended crops, &c.

Salt.—With a good system of feeding—that is, variety and plenty of green feed—there is generally a sufficient supply of salt to meet the body requirements, but small quantities, 8 oz. to every 100 lb. of mash, makes the food more palatable, with the result of greater consumption and production. Salt, however, needs to be well mixed with the mash; when wet mash is fed it can be dissolved in the water, but when fed dry too much care cannot be exercised in thoroughly distributing it throughout the mash, owing to its poisonous nature when excessive quantities are consumed by poultry.

From the foregoing the nature and uses of food generally available in Queensland for poultry can be gathered, and it is now only necessary to deal with the methods of feeding.

Feeding of Laying Stock.

There are two methods of feeding in common use—wet mash and grain and dry mash and grain, good results being obtained by both. Liberal quantities of green feed are given in each method. It is a difficult matter to say which is the better of the two, but to the general poultry keeper, more especially the man with little

time, and the novice, the use of dry mash is recommended. By this system a considerable saving in labour is made and the birds get a full supply of what should be a well-balanced ration. It is impossible for the birds to swallow mash dry; therefore, it should stimulate the secretion of saliva and aid digestion. Wet mash feeding, however, has its advantages, in so far that large quantities of succulent green feed can be used, and, where available, the mash can be mixed with milk. The feeder needs to be particularly careful to see that his birds have full and plenty, but should not leave food lying around to become fouled and sour.

Suitable mash mixture: Bran, 25 per cent.; pollard, 55 per cent.; lucerne meal or dust, 12 per cent.; meat meal, 5 to 10 per cent.; salt, 12 oz. to every 100 lb. of dry feed.

This mixture is that which was used in the egg-laying competition at Mount Gravatt, and it gave good results with a mixture of wheat and maize at night. The feed used throughout the test of the whole twelve months had a nutritive ratio of 1 part protein to 4 parts carbohydrates. If dry mash is being fed, this mixture can be mixed in bulk and fed in gravitating hoppers to guard against waste. If it is desired to feed wet mash, the lucerne dust or meal may be replaced with green feed and may be increased to 25 per cent. of the bulk, or in droughty time when feed is dear more green stuff may be used. When liberal supplies of milk are available the addition of meat meal is not necessary.

This is not the only ration that can be used for laying birds, but under normal conditions it would be difficult to get one more convenient. Many feeding tests have been carried out by the Department of Agriculture in Victoria, and it is thought desirable to state what some of these rations were and the results obtained. These rations could be taken as a rough guide for Queensland conditions, and possibly some of the grains shown could be used by local poultry breeders at times with advantage.

Cereal Test.

In this test a wet mash was made up of equal parts by measure of bran, pollard, and green feed. The bran was moistened with soup made from boiled table scraps, sheep's heads and livers, or else meat meal, and dried off with pollard to a nice crumbly condition, when the green feed was added. This mash was fed to four different lots of hens, which were as alike as it is possible to get birds, in the morning. Each pen, however, was fed with a different grain at night. The grains used were Algerian feed oats (not clipped), wheat, barley, and a mixture of 2 parts wheat, 1 oats, and 1 barley.

SUMMARY OF TEST—EGG YIELD AND FEED COST.

	Average Per Bird.	Average Price per dozen when Eggs were Laid.	Return per Bird.	Cost of Feed.			Profit over cost of Feed.
				Mash.	Grain.	Total.	
	Eggs.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Pen 1 (Oats) . .	170	1 8	23 7½	3 1¾	3 9½	6 11	16 8
„ 2 (Wheat)	150	1 8	20 10½	2 8¾	6 7¾	9 4½	11 6½
„ 3 (Barley)	144	1 8½	20 9½	2 7½	3 3½	5 10½	14 10½
„ 4 (Mixed Grain)	157	1 7½	21 1¾	2 5¾	4 6¼	7 0½	14 1½

From the test it will be seen that the Algerian oats fed pen showed the greatest score and profit per bird, and that this grain is satisfactory as a food; also that barley, a food not popular among poultry keepers, gives fair results. The yield from barley feeding is not so high, but the reduced cost of feeding, by its utilisation, warrants consideration being given to this food during times of scarcity.

Maize Feeding Experiments.

Extensive feeding of maize has been roundly condemned, but the results from the experiment discounts to a large extent arguments against its use. In this test thirty-six birds equal to those in breeding of those in the cereal test were used. They were housed and treated under similar conditions with the exception of the ration. This test also was carried out over a period of twelve months. The birds were fed on a dry mash in hoppers consisting of:—Maize meal, 33 lb.; bran, 33 lb.; pollard, 33 lb.; meat, 10 lb.; powdered charcoal, 3 lb.

The grain ration which was fed in litter consisted of 3 parts crushed maize and 1 part wheat. Green feed was fed mid-day.

SUMMARY OF TEST—EGG YIELD AND FEED COST.

Average number of Eggs per Bird.	Return per Bird.	Cost of Feed.			Profit over Cost of Feed.
		Mash.	Grain.	Total.	
	£ s. d.	s. d.	s. d.	s. d.	s. d.
156	1 1 4	3 3·6	5 6·5	8 10·1	12 6

The result of the test compares more than favourably with the cereal test in connection with the number of eggs. In the test maize cost 6s. per bushel, maize meal being slightly higher. With maize at about 4s. per bushel, profit over cost would have been materially effected.

Another test of interest is meat meal *versus* dried butter milk. In the test 120 birds of equal breeding were divided into two pens. Both pens were fed with a dry mash, with this difference—that for one pen the animal food was dried meat meal, while dried butter milk was used for the other.

SUMMARY.

Pen.	Average Number of Eggs per Bird.	Return per Bird.	Food Cost per Bird.	Profit over Cost of Feed.
		£ s. d.	s. d.	£ s. d.
60 Brds (Dried Buttermilk)	211·46	1 9 7½	7 11½	1 1 8
60 Birds (Dried Meat Meal)	174·73	1 4 0	7 0½	0 16 11½

It was noted that the pen fed on butter milk powder consumed more food. This naturally was responsible for an increased egg production. The reason advanced for the increased consumption of mash was that the milk added to the palatability of the ration. The extra cost of feeding amounted to £2 15s. 1d., but as the milk-fed pen returned £16 14s. 6d. more in the form of eggs the expense was well warranted.

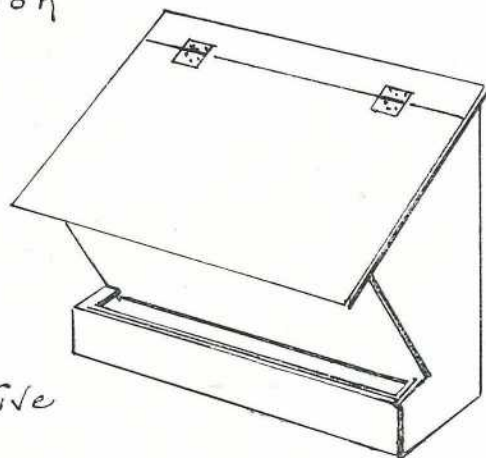
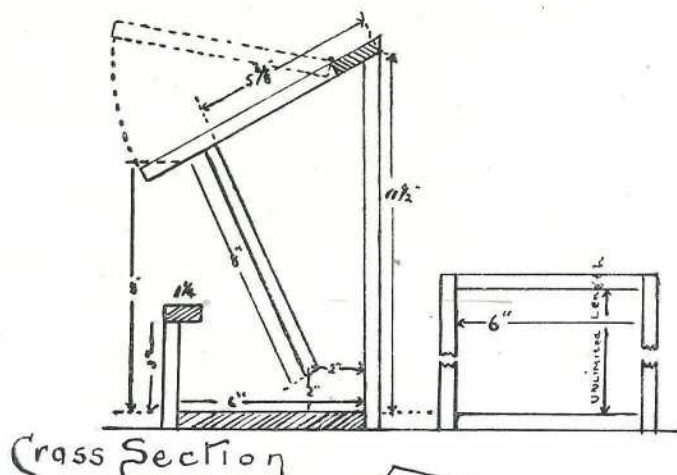
The rations being used in some of the California egg-laying contests for the year 1922 should also be of interest to the feeder for egg production.

Grain.	Santa Cruz.	Petalumia.	Pomona.
	Per cent.	Per cent.	Per cent.
Barley	40·0	35·3	30·0
Wheat	22·5	33·3	20·0
Milo	..	..	20·0
Cracked Corn	37·5	32·3	30·0
	100·0	100·0	100·0
Mash.			
Bran	30·0	29·7	35·0
Middlings	20·0	16·7	..
Red Dog Flour	..	..	20·0
Ground Barley	..	11·2	..
Ground Oats	12·5	..	..
Corn Meal	12·5	24·0	20·0
Soybean Meal	5·0	..	..
Linseed Meal	5·0	..	10·0
Meat Scrap	7·5	9·2	7·5
Fish Scrap	7·5	9·2	7·5
	100·0	100·0	100·0

In these tests grain and mash are fed as nearly as possible in equal quantities.

DRY MASH HOPPER.

The accompanying sketch and cross section of a wall hopper—that is, a hopper to be hung or placed against the walls of poultry houses—will enable breeders to manufacture hoppers suitable for their requirements. As will be seen, the hopper can be made to any length, likewise it is possible to increase its height. The dimensions could be governed by the timber available and numbers of birds to be fed.



If it is desired to build hoppers to be placed out in the runs, the cross section can be taken as half of the hopper, and provision, therefore, made for the stock to feed from either side. Protection from the weather can be provided for by having a sheet of iron of suitable length bent to fit the top of the hopper. This iron cover should also have sufficient overhang to shed the water clear of the feeding trough. Many types of hoppers can be manufactured both from wood or iron, the kerosene-tin being particularly adaptable to the purpose, but hoppers built upon the above lines are, perhaps, the easiest of manufacture.

QUEENSLAND'S MAGNETIC NORTH.

The visit of the Empire Parliamentary Delegation to Queensland was one of the big events of the month. The visiting Parliamentarians, representative of almost every Assembly in the British Commonwealth, have expressed themselves as profoundly impressed with the agricultural conditions and prospects in this State, particularly in respect to the wonderful wealth, both latent and the process of winning, of our Northern tropical province. The leader of the delegation, the Marquis of Salisbury, made this clear in the course of an address at a public function at Yungaburra on the Atherton Tableland. The delegates, he said, had not formed very clear ideas as yet on all the problems of Australia, which was a bewildering place, and he had been warmly impressed with the wonderful resources of this great country of Queensland. Travelling from the temperate climate of New South Wales to the highly tropical vegetation of Cairns, one rose up 2,000 ft. and found himself once more in a temperate climate. He was deeply interested in the resources of this wonderful country. A great responsibility rested upon Australians, who had been given by Providence a country second to none. They had been given a wonderful opportunity. The British were the most wonderful colonising race that the earth had ever seen. It was for the Australians to make good. They had done extremely well, but there was a great deal yet left to be done. He sincerely hoped that if nothing less resulted from the present journey there would be this—that henceforth there would be a better understanding between the peoples of Great Britain and the people of Australia. The delegation would take away the news that North Queensland was a wonderfully fertile land, and that all it required was population. The speaker did not require to be convinced of the value of the climate at Atherton, and he was sure that it would produce a healthy, vigorous race.

The Great Future of the North.

"I am convinced that this district has a very great future," said the Rt. Hon. J. Ian McPherson, another member of the delegation, when speaking of the richness of Cairns and its environs. It was wholly distinctive, he said, from anything else they had seen in Australia, and the land could, he felt, grow practically anything. What was important also was that the people who lived here knew the possibilities of the place, and he could say that he had been very impressed with it.

Another notable visitor to Queensland in the course of the month was the Hon. W. G. Gibson, Postmaster-General of the Commonwealth, who was greatly impressed with Queensland and its scenic loveliness.

"The rising generation in towns like Mackay, Rockhampton, Cairns, and Townsville compare very favourably with any children in the South," Mr. Gibson said to the Brisbane Press. "The type of man who has spent his lifetime in Western Queensland is really an outstanding type, seen seldom anywhere except in a country of vast spaces like Queensland."

Outstanding Manhood.

"There is some of the finest scenery between Cairns and Kuranda that I have seen anywhere in the world. There is an impression among a lot of people in the Southern States that North Queensland is not a white man's country, but one could not form any impression other than that the rising generation in towns like Mackay, Rockhampton, Cairns, and Townsville compare very favourably with any children in the South, and older men who have lived their lifetime in the North seem so tied up in the country that, even if they were to retire, they would not spend their latter days in the climate of the South, but somewhere in the north of Queensland. I had the advantage of seeing many men at the Townsville Show from out Western Queensland, and the type of man who has spent his lifetime in that country is really an outstanding type, seen seldom anywhere excepting in a country of vast spaces like Queensland." These men were going through abnormally trying times on account of a season of scanty rainfall, but they had so much confidence in their own territory that nothing would induce them to leave a country that had its periodical dry periods, because it had its compensations in so many good years. He was sure that, if Southern people knew of the climate and scenery of North Queensland and its tableland, there would be streams of tourists coming in the winter months from the Southern States to enjoy the mild climate and conditions that applied to a tropical area such as obtained in the coastal country of the North.

Wonderful Productivity.

Mr. Gibson explained that one of his principal missions to Queensland had been to speak on the referendum proposals, and at the various towns from Bundaberg north he had had very good receptions and audiences. His tours also had given him,

as a Southerner, a better grasp of the sugar position, and what it meant to the State of Queensland. "I was astounded," said Mr. Gibson, "at the productivity of the country, with its very fine rainfall and beautiful alluvial flats and volcanic soils. Should such a disaster as the failure of the sugar embargo take place, one can hardly imagine the desolation it would create in these areas, where such fine cities have been built solely on the sugar industry."

Conservative Farming Notions.

Mr. Gibson observed that a striking feature associated with sugar cultivation was that the whole of the sugar farmers confined themselves solely to the production of sugar, and made no effort whatever to add to their farming any second industry, but were content to purchase the actual feed for their horses from other areas, rather than grow corn to supply their own needs. "Surely," Mr. Gibson queried, "dairying and the growing of corn and perhaps the pig industry might very profitably be added to the sugar industry as we now know it."

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF AUGUST, IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING AUGUST 1926 AND 1925, FOR COMPARISON.

Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.		Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.	
	Aug.	No. of Years' Records.	Aug., 1926.	Aug., 1925.		Aug.	No. of Years' Records.	Aug., 1926.	Aug., 1925.
<i>North Coast.</i>	In.		In.	In.	<i>South Coast—continued:</i>	In.		In.	In.
Atherton ...	0·87	25	0·64	1·73	Nambour ...	2·03	30	0·10	4·22
Cairns ...	1·80	44	1·65	1·92	Namago ...	1·43	44	0·26	2·44
Cardwell ...	1·32	52	1·37	0·85	Rockhampton ...	1·03	39	0·08	1·41
Cooktown ...	1·35	50	0·50	1·73	Woodford ...	1·85	39	0·18	3·18
Herberton ...	0·68	39	0·31	0·70					
Ingham ...	1·56	34	1·80	1·96	<i>Darling Downs.</i>				
Innisfail ...	5·23	45	5·40	4·98	Dalby ...	1·27	56	0·29	3·32
Mossman ...	1·50	13	0·90	0·58	Emu Vale ...	1·27	30	0·33	2·98
Townsville ...	0·56	55	0·02	1·98	Jimbou ...	1·30	38	0·13	0·93
					Miles ...	1·24	41	0·44	3·66
<i>Central Coast.</i>					Stanthorpe ...	1·89	53	1·45	4·98
Ayr ...	0·65	39	0	0·85	Toowoomba ...	1·76	54	0·35	3·08
Bowen ...	0·71	55	0·07	0·83	Warwick ...	1·59	61	0·42	3·79
Charters Towers ...	0·63	44	0	1·06					
Mackay ...	1·12	55	0·18	4·66	<i>Maranoa.</i>				
Proserpine ...	1·52	23	0·46	2·93	Roma ...	1·02	52	0·18	2·05
St. Lawrence ...	0·90	55	0	1·46					
<i>South Coast.</i>					<i>State Farms, &c.</i>				
Biggenden ...	1·15	27	0·12	1·48	Bungewongorai ...	1·11	12	0·01	1·38
Bundaberg ...	1·35	43	0	1·42	Gatton College ...	1·27	27	0·49	0
Brisbane ...	2·10	75	0·41	3·14	Gindie ...	0·79	27	0	0
Childers ...	1·30	31	0	1·21	Hermitage ...	1·48	20	0·28	3·26
Crohamhurst ...	2·32	30	0·14	5·54	Kabi ...	1·05	12	0·59	1·18
Esk ...	1·61	39	0·93	3·15	Sugar Experiment	1·04	29	0·28	3·93
Gayndah ...	1·23	55	0·06	1·21	Station, Mackay	0·99	12	0	1·46
Gympie ...	1·82	56	0	1·63	Warren ...				
Caboolture ...	1·63	39	0·72	3·19					
Kilkivan ...	1·53	47	0·10	1·34					
Maryborough ...	1·75	54	0·04	1·60					

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for August this year, and for the same period of 1925, having been compiled from telegraphic reports, are subject to revision.

GEORGE G. BOND, Divisional Meteorologist.

EFFICIENCY IN DAIRY PRODUCTION.

WHAT THE DEPARTMENT IS DOING.

The Minister for Agriculture (Hon. W. Forgan Smith), referring in the course of a recent Press announcement to the conclusions of the Imperial Economic Committee, which urged Empire dependents on the dairying industry to adopt more efficient methods in production, said that the Committee in its report indicated several directions in which improvement in existing conditions might be effected. Generally, the recommendations of the Committee are in harmony with the policy that had been adopted by his department. Fodder conservation was mentioned, and in this connection Mr. Smith stated that the growing of crops suitable for dairying purposes had been, and was, receiving attention, and much had been done to encourage dairy farmers to give attention to the important matter of fodder conservation. Instruction in all matters relative to the growing of the crop and the conservation of fodder was being given by officers of the department, and, through the Agricultural Bank, assistance was afforded to farmers desiring to construct silos or sheds for the storage of fodder. Practical assistance in the improvement of dairy herds had been provided in the form of a subsidy which was paid to approved dairy farmers desirous of purchasing a pure-bred bull—*i.e.*, the progeny of an approved sire and officially tested dam. The systematic testing of milch cows by officers of the department had been carried out over a number of years. This branch of departmental activities was growing in favour among dairy farmers, and in the course of the last five years about 80,000 cows had been submitted to test. This work was carried out free of cost to dairy farmers.

Pasture Improvement.

Pasture improvement had been carefully considered, and experimental plots had been established in various districts, and the increased tonnage of pasture that had followed in the wake of ploughing, or an addition of fertilisers to the soil, had been carefully recorded and published, with a view of encouraging dairy farmers to give greater attention to pasture renovation.

Market Regulation.

These activities he especially referred to because they were matters emphasised by the Imperial Economic Committee as being worthy of consideration by dairymen throughout the British Dominions. The Committee also mentioned the matter of regulation of supplies in order that much of the "peak" difficulties might be removed in the marketing of dairy products abroad. The Committee had suggested, he continued, that marketing of dairy produce should be more scientifically regulated, and it recommended the holding in cold storage of produce at the seasons of highest production, thereby obviating the simultaneous arrival on the London market of excessively large quantities of dairy foodstuffs. Here again the Government, by the erection of a cold stores at Hamilton, had rendered practicable this recommendation of the Committee. Ample cold storage accommodation for primary products had been arranged at Hamilton, on the Brisbane River, and the facilities they are afforded for the loading of chilled products from the cold store to the ship's hold are the means of avoiding fluctuation of temperatures.

Attached to the department was a staff of instructors and inspectors who worked for the betterment of the industry, and had the support and assistance of the Agricultural Chemist to carry out necessary analytical work, while the bacteriological investigations had the attention of the Government Bacteriologist.

CONTAGIOUS MAMMITIS IN CATTLE.

Several inquiries for information on vaccine treatment for contagious mammitis which has proved very successful in Queensland have recently been received. The vaccine is prepared by the Government Bacteriologist, Stock Experiment Station, Yeerongpilly, and is supplied to stockowners at 5s. for sufficient vaccine to treat one animal. The Government Bacteriologist, Mr. C. Pound, has supplied the subjoined note on contagious mammitis, which is of general interest to dairymen.

This serious disease is continually being brought under notice through outbreaks occurring on dairy farms. The spread of the disease may be attributed partly to the carelessness of the dairy farmer, and to the want of proper hygienic methods of controlling it.

The disease is caused by a tiny chain-forming micro-organism, or streptococcus, which attacks the mucous membrane, and, through the development of its poisonous products or toxins, causes the rapid destruction of tissue cells and leucocytes or

white blood corpuscles which are attracted to the spot. These dead cells produce that peculiar feature of the disease—a yellowish purulent discharge or pus which can be withdrawn from the affected quarter.

Symptoms.

In the acute form the first symptoms are the diminution of the milk yield, usually in but one quarter of the udder, a definite acidity of the milk, and a tendency for it to become rapidly coagulated. Gradually the milk assumes a dirty, brownish colour, and becomes more curdly, the amount of secretion from the affected quarter diminishing owing to the thickening of the ducts, which finally becomes impervious, and the whole quarter is rendered useless. The lesions develop slowly, and one quarter after another of the udder becomes involved, and later the milk secretion is liable to stop entirely.

It will be observed in some cases that the symptoms are so slight that the milk does not appear to be curdled, and, on settling, the deposit is so small as to be overlooked.

In all cases where slight affection is suspected, a sample of cream as well as of the first drawn milk should be submitted for bacteriological examination.

Undoubtedly the transmission of the infection from one cow to another is through the agency of the milker's hands or the cups of the milking machine. This appliance, which was designed to enable the farmer to produce cleaner milk than by any other method, must be kept scrupulously clean and be sterilised after each milking, and this advice is applicable also to the milker's hands; moreover, all cows that are considered in any way suspicious should be milked last.

Once the disease has occurred in a herd the owner should personally examine minutely every cow's udder before milking and carefully note the character of the first small quantity of milk drawn. This precaution is especially necessary where a milking machine is in use, and any cow showing the slightest suspicion of the disease should be held over to the last for milking, and on no account should the machine be used on her.

Milk from an affected cow must be considered dangerous. The cow should be milked into a vessel kept for the purpose, and the milk scalded so as to destroy the mammitis germs. When the milk is cooled down it may be fed to the pigs.

Treatment.

Both preventive and curative treatment have been carried out successfully by means of vaccine prepared at the Stock Experiment Station, Yeerongpilly.

The full dose of vaccine is two cubic centimetres, and an interval of forty-eight hours must elapse between the injections. Two injections will usually effect a cure, but in cases of long standing it is sometimes found necessary to continue the treatment. The skin of the animal should be treated with a disinfectant solution for ten minutes at the proposed seat of injection with Hycol, Kerol, or Cyllin, diluted in the proportion of one teaspoonful of disinfectant to one quart of water. The syringe, after loosening the parts of the needle, should be sterilised by boiling in water for ten minutes before use.

The vaccine is injected into the subcutaneous tissue behind the shoulder in the same manner as tick fever inoculation is performed, and the ordinary tick fever syringe and needle are necessary to perform the work.

Mammitis Vaccine—Scale of Charges.

Animals.						Cost.	
						£	s. d.
1	..	..	..	..	..	0	5 0
4	..	..	..	..	..	0	15 0
10	..	..	..	..	..	1	10 0
20	..	..	..	..	..	2	10 0
30	..	..	..	..	..	3	0 0
40	..	..	..	..	..	3	10 0
50	..	..	..	..	..	4	0 0
60	..	..	..	..	..	4	10 0
70	..	..	..	..	..	5	0 0
80	..	..	..	..	..	5	10 0
90	..	..	..	..	..	6	10 0
100	..	..	..	..	..	7	10 0

THE DUROC-JERSEY PIG.

By E. J. SHELTON, H.D.A., Instructor in Pig Raising.

In recent years three new breeds of pigs have been introduced into Australia, two of them, at any rate, entirely new to our conditions; the other practically a new breed, judging by its improved quality and up-to-date type. We refer in the first instance to the most recent American introduction, the red hog of America, the Duroc-Jersey, and also to the Gloucester Old Spot breed, a black and white spotted type, a British breed with a good reputation and coming from a country where they have been handled for a century or more in the partly improved and improved form. The other breed to which reference is made is the type originally known as the British Large Black, or, as it is sometimes referred to by the old hands, the Devon breed, but now popularly and more frequently spoken of as the Large Black, a breed emanating from county Devonshire, in the British Isles.

Of these three new breeds the Duroc-Jersey certainly appears to be making the most rapid headway here in Queensland, while the Gloucester Old Spot and Large Black have forged ahead in Victoria, a State in which as yet the Duroc-Jersey is not well known. With us the Duroc (as it is frequently referred to) certainly has had the advantage of a year or two's publicity ahead of either of the other types, though it must be said in their favour that even under these conditions they have established themselves fairly well even in face of the rather severe competition of the older and more widely distributed breeds. The Large Black was very popular here some years ago, but, as was also the case in the other States, it failed as a breed to make headway, and now one would scarcely find a pure-bred Large Black in the whole of this vast expanse of country, though, doubtless, they will become popular again in due course.

The principal qualifications of the Duroc-Jersey as we have them here are their early maturity and their adaptability, they being suited either in the pure or cross bred state to the requirements of both pork and bacon producer. Whether, from the factory and from the consumer's point of view, they will be able permanently to justify their overseas reputation remains to be seen. They appear to the inexperienced eye to be somewhat heavy boned and coarse, some strains particularly appearing much less refined than others; they are also variable in colour, some being a light-yellowish red, other quite a dark-brown shade; some have comparatively straight soft and silky hair, while others have what appears to be coarse curly hair. All these imperfections, however, are commonly associated with new breeds that have been developed under American conditions, where the general demand is for a much heavier animal and for an animal carrying a much larger proportion of fat than is popular here in Queensland. These are largely faults which could be overcome or improved upon by careful selection, efficient housing and management, and possibly by a system of breeding aiming at earlier maturity and at refinement in the general character both of the flesh, bone, and external covering. Those breeders here who have given the Duroc-Jersey a thorough "test out" have a good deal to say in their favour, though so far experiments have not been extensive or continuous enough to be able to definitely acclaim from the data available that the Duroc-Jersey or its crosses are superior to the Tamworth-Berkshire, or even the Tamworth-Poland-China or Yorkshire-Berkshire crosses.

Certain it is that splendid opportunity offers for fanciers of the Duroc to come forward in carcass contests—if these can be arranged—and at live stock exhibitions generally with exhibits of the most popular strains, for after all more can be done to advertise a new breed by actual demonstration at the pig pens on the farm and in the show-ring than by newspaper publicity. The bacon factory folks also have a say in these matters, and their reports will be eagerly looked forward to as time goes on.

If the breed can in this way as well as on the farm prove their superiority over other breeds, it will need no better advertisement in the bid for popularity among those engaged in pig production. Meantime we strongly recommend breeders who are interested to carefully study the breed and its varied qualifications, and to take

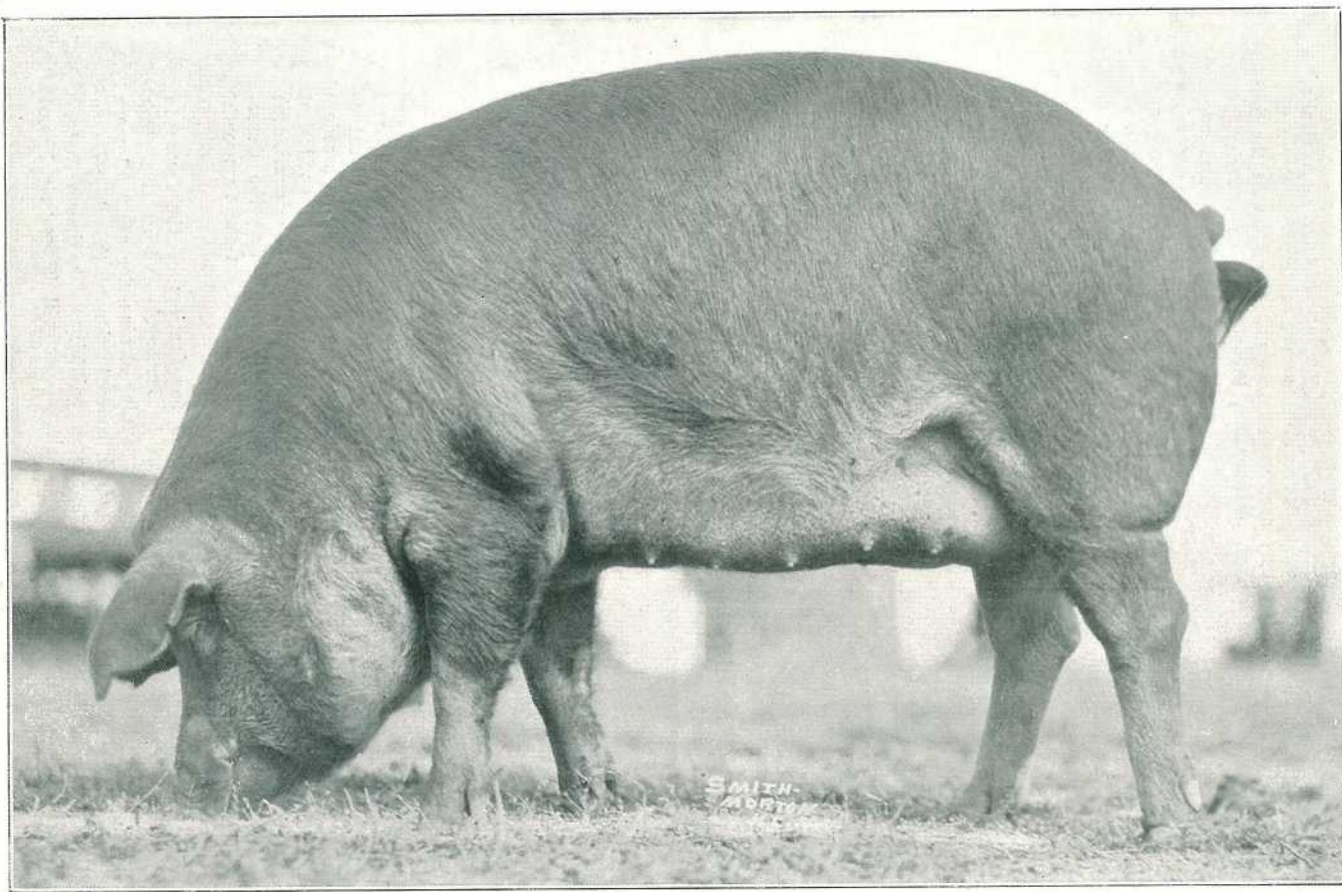


PLATE 77 (Fig. No. 2).—DUROC-JERSEY SOW, "MISS SPECIAL SENSATION."

Junior Championship Winner at Kansas and Oklahoma State Fairs, U.S.A. This picture was taken when the sow was one year old. She is, according to the American idea of the type, practically perfect, well balanced, high-backed, straight in legs; in general, up to the highest standards of the breed. The type of sow that should be productive of good results as a stud and as brood sow.

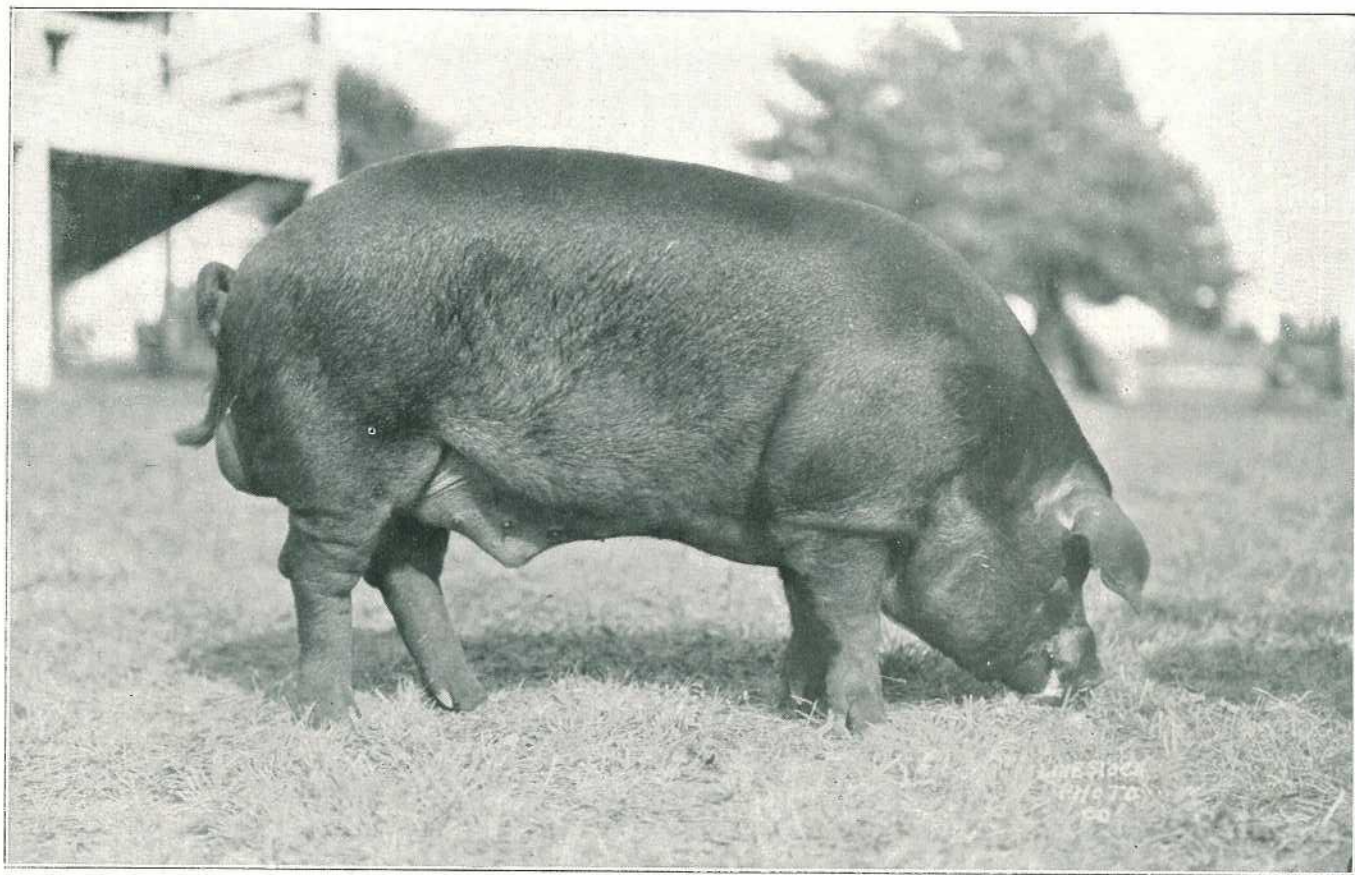


PLATE 78 (Fig. No. 1).—DUROC-JERSEY BOAR, "BERRYTON'S SENSATION."
Grand Champion Duroc-Jersey Boar, Kansas State Fair, U.S.A., 1924. An attractive upstanding sire of good type and quality.

every opportunity of getting in touch with those who have actually given the breed a fair trial. The breeders advertising Duroc-Jerseys for sale in the several agricultural newspapers and journals, and in the Australian Stud Pig Breeders' illustrated pamphlet, "Better Pigs on Every Farm," will be only too pleased to supply quotations and to give any information in connection with their experience of the Duroc. By the way, copies of the publication, "Better Pigs on Every Farm," may be obtained gratis on application to the Secretary of the Queensland Branch of the Australian Stud Pig Breeders' Society (Mr. R. G. Watson, Inns of Court, Adelaide street, Brisbane), while the series of illustrated pamphlets on matters pertaining to pig raising generally may be obtained on application to the Department of Agriculture and Stock, Brisbane.

It is worth at this stage mentioning the experience of a number of breeders interested in the Duroc. In the other States, for instance, Mr. W. H. Bruce, of South Australia, probably the largest pig-raiser in that State, has during the past two years "switched over" on to the Duroc-Jersey as undoubtedly the most prolific and most profitable pork and bacon pig, this especially so where Duroc boars are crossed on to Tamworth and Tamworth-Berkshire sows. Mr. Bruce refers to quite a number of instances in which Tamworth sows have farrowed from twelve to fifteen pigs in the litters sired by Duroc-Jersey boars. These are red and black spotted pigs of good type. He is of opinion, as also are many other breeders, that in the pure-bred state the Duroc is inclined to be heavy boned and coarse, but this does not appear pronounced in the cross-bred types referred to. Mr. Bruce was speaking of the product of 150 breeding sows, 90 per cent. of whom were crossed with boars of the Duroc breed—boars, by the way, which he considered were the finest he had ever had on his property. As Mr. Bruce has 500 acres pig fenced, with an additional area of 200 acres in preparation for pig paddocks, his experience must count. He is principally interested in the production of porkers.

In New South Wales Messrs. Whittaker Brothers, of Denison street, Botany, suburban pig farmers carrying 500 head of pigs or more, have recently introduced Duroc-Jersey boars for crossing with sows of various crosses—Tamworth-Berkshire, Berkshire-Yorkshire, &c. Mr. R. Whittaker writing a few days ago, says that the litters that his sows are producing by the Duroc-Jersey boar are easily holding their own with other breeds, though he recognised it would take a long time to thoroughly test out this red hog. Other breeders in New South Wales also have proved the Duroc to be a good pig for cross-breeding purposes for the production of bacon pigs.

In Queensland Messrs. Brown Brothers, of Mooroombin, Toogoolawah, have also had fairly wide experience of the type. It was as a result of a close personal investigation into the merits of the breed while on a visit to America and Canada four or five years ago that Mr. Fred G. Brown, the senior member of the firm of Brown Brothers and an enthusiastic Friesian cattle breeder, decided on the introduction into Australia of some of the famous red hogs of which he heard so much and inspected so many during the trip. He eventually succeeded in introducing the type and, apart from W. H. Bruce, of South Australia, is the only breeder who has thus far made any further introduction.

From their stud Durocs have been forwarded to many parts of Australia.

Another enthusiastic breeder and exhibitor of Durocs is Mr. Percy V. Campbell, of Lawn Hill, Lamington, via Beaudesert. In writing recently in regard to his experience Mr. Campbell states that so popular have the Durocs become that he has effected sales of selected boars and sows to breeders both here in Queensland, in New South Wales, and also in Victoria.

Mr. Campbell's sales include deliveries to Balfe's Creek, via Charters Towers, Queensland, in the Northern Division, to many breeders in the Central Division, including quite a number to the Central and South Burnett, and in Southern Queensland to many centres both on the South Coast and the Fassifern and Brisbane Valley Line, as well as on the main Southern and South-Western Lines and the Darling Downs. He says it is his intention as opportunity offers to dispose of all his other breeding sows and to specialise in the production both of purebred Durocs and of Duroc crosses, for sales of purebred stock have become more numerous and the inquiry is still keen, though during unsatisfactory seasons like the present the demand falls off. Mr. Campbell's experience prior to taking on the Duroc-Jersey was that the Berkshire breed had been, and in many places still is, practically the only breed represented; he realises as many other breeders do also that the Berkshire is a "safe" breed, but he has noted since other breeders have purchased Duroc-Jerseys that many farmers are waking up to the fact that their pigs are not as good as they ought to be, and the introduction of the Duroc-Jersey crosses seems to be acting as it were as a saviour of the position. Never yet, remarked Mr. Campbell, have

I found one farmer who has tried the Duroc who regrets his choice. Many of them report that under the new conditions they are marketing their baconers at an earlier age than they did with the older type Berkshire. He says the factories seem to be well pleased with the pigs as they usually class them as prime. One feature he has found specially noticeable and that is that the Duroc is a good doer, they eat and thrive well and grow fast. As breeding sows Mr. Campbell's experience has been that the Duroc sows are good milkers, rearing good pigs, and as for numbers they

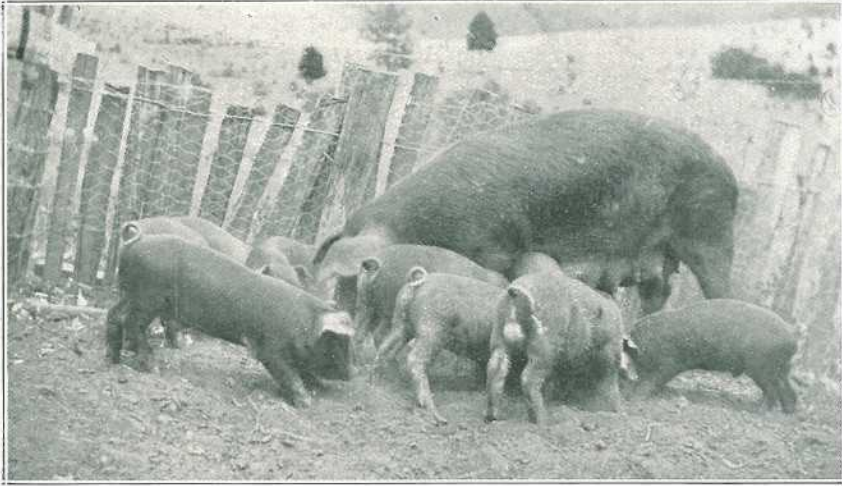


PLATE 79 (Fig. 3).



PLATE 80 (Fig. 4).

Duroc-Jersey Sows with litters, the property of Mr. Percy V. Campbell, of Lawn Hill, Lamington, Q. The photographs indicate the prolific sturdy nature of the breed, a breed new to Queensland conditions, but apparently well suited to the requirements of pig raisers for the production of store, bacon market, and stud pigs.

easily hold their own, some of his sows farrowing ten to twelve good strong pigs. Sows have farrowed up to sixteen pigs in their second litters and they usually rear eight to ten pigs or more each time.

Mr. Campbell submitted a few figures in proof of his assertion that the Duroc is worth a trial. His purchases included—

	£	s.	d.
January, 1924—Duroc Sow, "Mooroombin Miss." Bred to imported			
Boar, "Mooroombin Sensation"	21	0	0
May, 1924—Duroc-Jersey Boar and Freight	14	10	8
March, 1926—Boar "Taldra Imperial"	15	15	0
March, 1926—Sow "Taldra Regina," in pig to a boar of unrelated strain	21	0	0
Shipping Expenses, Freight, &c., ex Adelaide	10	11	10
	£82	17	6

Pigs on hand ex above and others as at 30th June, 1926, totalled fifty-two head.

He estimated his cost of feed, &c., to 30th June, 1926, at £30 2s. 5d., the balance of feed grown on property; there were other incidental expenses also covering registration, &c.

From these foundation stud animals he has effected the following sales:—

	£	s.	d.
Sales from May, 1924, to 30th June, 1925	51	0	0
Sales from 1st July, 1925, to 31st December, 1925	193	7	4
Sales from 1st January, 1926, to 30th June, 1926	65	15	1
	£310	2	5

These Mr. Campbell states represent the stud sales and some of the bacon and pork sales, and as indicated above there were on hand as at 30th June, 1926, no fewer than fifty-two head, many of them being prepared for exhibition. Since that date there have been added sales, and the imported "Taldra Regina" has farrowed a dozen fine sturdy youngsters.

Breeders in the Beaudesert district and in the South Burnett have also given the Duroc a very fair test out, a few of those interested being Mr. H. Bruxner, Jelbyn, Beaudesert, Mr. Leo Delroy, Murgon, Messrs. H. Shelton and Sons, Merlwood, Mr. T. A. Bellotti, Ashfield Farm, Murgon, Mr. Hardiker, of Murgon, and many others.

Overseas Experience.

It is noted in the current issue of the English publication "Pigs" that Messrs. Campion Brothers, who own one of the largest hog ranches in Argentina, in giving a report of their experience with various breeds—and they carry upwards of 3,000 breeding sows on their ranch—had this to say: "That the improved type of Duroc-Jersey had come to stay, and to-day they considered them undoubtedly the best pig for the purposes of their ranch. They found from their weighings (and the average of the progeny of 3,000 or more sows provided a good deal of reliable evidence) that the Duroc-Jersey is a much quicker grower when young than the older type of Poland-China, and since they have no desire to hold their market pigs on the ranch one day longer than necessary they found it to their advantage to change over gradually from Poland-China to Duroc-Jersey though they realised the change would cost them a lot of money. They aim at marketing prime baconers at around five months of age and as "Pigs" remarks, judging by the extraordinary uniformity of type and size of pigs illustrated in a number of photographs produced, it would seem that there could not be very much difference between the best and the majority of their pigs. They feed principally on lucerne and maize, barley and wheat products also being used. The lucerne crop, says Mr. Campion, is the basis of the pig industry in the Argentine; it provides practically the whole of the grazing and a fairly large proportion of the food consumed.

Future Prospects.

It would seem therefore that we have in the Duroc-Jersey a type of pig destined to play an important part in the pig industry. Their future is in the hands of the breeders interested, whether they win out or whether they will fail to "fill the bill" remains to be seen. They are well worth a trial, and the more experience and knowledge breeders have of the breed before trying them the better.

Historical Record.

In several interesting and attractively prepared publications issued recently by the National Duroc-Jersey Record Association at Illinois, United States of America, it is stated that more than 40 per cent of the pedigreed pigs in the United States of America are of the Duroc-Jersey breed. The type appears to have been developed from a strain of pig introduced into the United States of America from Spain as far back as the year 1820. These were red or sandy coloured hogs that had the reputation of growing to an enormous size with a good quality flesh. Doubtless during the days of American slavery when ships traded freely with different countries carrying slaves and food supplies, &c., some of the more interested "chiefs" carried with them as "booty" some of these red hogs, for we have authentic record of their having been introduced both from Guinea and New Jersey as well as from Spain. It is presumed that they were introduced by or for breeders who had a fancy for a red hog, for hogs of this colour were well known "way down in Tennessee" and in Saratoga, New York, and were considered to be far superior to the types common in most States, though they were smaller and less profitable than the Spanish type appeared to be. It is possible, too, that descendants of the Old English Berkshire, which were introduced later to improve and develop the Poland-China, may have reverted to a reddish coloured hog, for these old English types were all inclined that way; even at the present day we find the Berkshire has the tendency when their breeding is neglected, though we look upon this as a sign of degeneracy more than as a result of neglect. Historical records further prove that the Berkshires of olden times were of a reddish hue (they have a "red" Berkshire breed in America to-day). So it was that between the several types fanciers of the red hog made their choice and by continued effort in the direction named they eventually produced a permanently red pig of great value.

Then came the christening of the breed. The Spanish type had come to be known as the Jersey Reds, and those found so numerous in Saratoga were styled the Durocs. The blending of the two types proved so profitable that it was decided to combine the two names, using the American type as the standard, hence they have from that date been known under the title of the Duroc-Jersey. Other names by which the breed had previously been known were the Jerseys, the Red Rocks, the Clay Rocks, the Dewrocks, Red Graziers, Red Berkshires, and Red Guineas. In 1883 the American Duroc-Jersey Swine Breeders' Association was formed in Chicago and the name was then formally adopted.

Nowadays the breed is largely sponsored in the United States by the National Duroc-Jersey Record Association, Fayette, at Monroe street, Peoria, Illinois.

Herd Book Standard.

The standard of excellence of the Duroc-Jersey breed, as adopted by the Australian Stud Pig Breeders' Society, and published in the current volume of the Herd Book, in which numerous registrations appear, is as follows:—

Head and Face.—Head of medium size, wide between eyes and ears; face slightly dished, neat and attractive.

Eyes.—Bright and prominent.

Ears.—Medium size, not coarse and heavy, pointing forward and slightly outwards, well under the control of animal.

Neck.—Short, thick, deep, slightly arched.

Jowl.—Broad, full, yet not coarse and heavy.

Shoulders.—Very deep and full, not too heavy on top. In boars, the shield should not be too heavy.

Chest.—Wide, deep, roomy, well filled behind shoulder, breast-bone prominent.

Back and Loin.—Back medium width and length, slightly arched, carrying even width from shoulder to ham, surface even and smooth.

Sides and Ribs.—Sides very deep, medium length, level top-line. Ribs long, strong, and well sprung.

Belly and Flank.—Full-fleshed, roomy, flanks well let down. Teats evenly placed, twelve to fourteen in number. In males, sheath to be free from abscesses or enlargements.

Hams and Rump.—Broad, full, and well let down to the hocks; rump should have round slope from loin to root of tail, same width as back and well filled out around tail.

Legs and Feet.—Medium size, strong, wide apart, yet well set under body, pasterns short, strong, feet short, not splayed.

Tail.—Medium thickness, well curled, rather bushy flag.

Coat.—Fine, moderately thick and straight, covering body well.

Colour.—Cherry red, without any other admixtures.

Size.—Large for age and condition. Medium weights desired.

Action and Style.—Action animated and vigorous; style free and easy.

Condition.—Healthy, skin free from scurf, &c.; flesh mellow, skin soft, hair silky.

Disposition.—Very quiet and gentle, easily driven or handled.

MOTOR TRANSPORT OF PIGS TO MARKET.

A good deal has been heard during recent months in regard to the successful and rapid transport of sheep per motor lorry from one district to another in Queensland. The experiments that have already been carried out have demonstrated the possibility of this scheme being put into action over wide areas of country with results that should mean the saving of thousands of sheep and indirectly benefiting both those engaged in the industry and the industry and State generally.

It is interesting in this connection to note that equally successful and equally rapid transport of pigs to market is possible and commercially profitable.

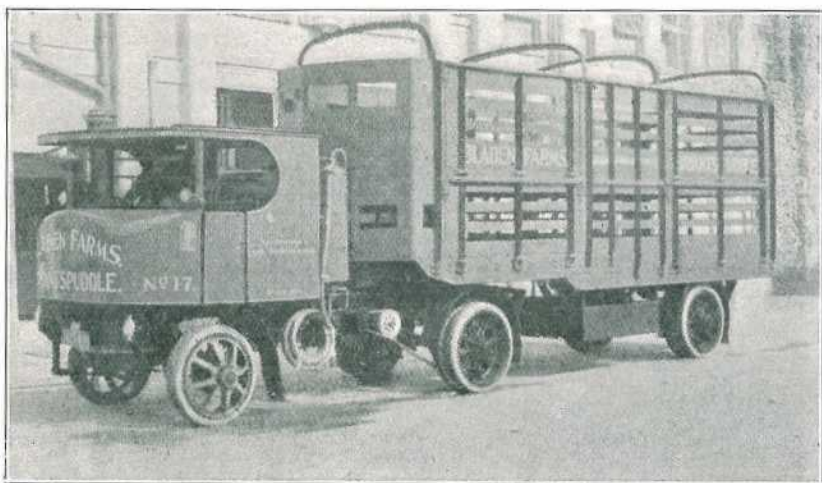


PLATE 81.—A SUPER SENTINEL PIG LORRY.

Double-decked and, when fully loaded, carrying seventy-two full sized bacon pigs or a larger number of porkers or store pigs. It is the property of Mr. E. R. Debenham, Bladen Farms, Briantspuddle, England.

The modern conveyance (See Plate 81), built to the order of Mr. E. R. Debenham, of Bladen Farms, Briantspuddle, England, for this purpose is double-decked, and carries when fully loaded seventy-two prime bacon pigs. It is used to transport bacon pigs from the Bladen Farms to Calne Bacon Factory. It then picks up a load of goods for Bristol, from whence it departs with a load of foodstuffs on the return trip to Briantspuddle where the home farms are situated.

There are many districts in Queensland where such a conveyance would prove a godsend and where pig raising would be carried on much more extensively than at present with our comparatively slow and oftentimes burdensome means of transport. Motor transport certainly appears to be the order of the day.—E. J. SHELTON, Instructor in Pig Raising.

STERILITY IN BREEDING SOWS.

We have received many inquiries on the subject of sterility or barrenness in sows, of which the following is typical:—

"I have two Berkshire sows and one boar which have been specially selected from a leading stud as foundation stock for my Berkshire herd. These pigs are now nearly eighteen months old but up till the present the sows have had no litters and they have not shown any inclination to breed. They are running in a 2-acre paddock, sometimes with the boar and sometimes apart, but the boar does not seem to have any inclination to breed either. I think the pigs have been handled correctly though for some months during the summer both boar and sows were rather fat, but during recent months they have been out grazing and are not over-fat now. What I should like to know is, is there any way of inducing activity, and is it any use carrying these animals on any longer?"

The following answer was supplied by the Instructor in Pig Raising, Mr. E. J. Shelton:—

A great many of the cases of sterility and barrenness in pigs are due to the animals being over-fat and lazy. There are many instances also in which the boar is too fat and lacking vigour. It is unfortunate that many strains of pigs, particularly purebred pigs, have been practically ruined through being kept in very fat show condition for exhibition purposes over lengthy periods; it is equally unfortunate that many of their progeny suffer as a result and fail to breed satisfactorily if they breed at all. These conditions can very largely be overcome by reducing the condition, first by a lessened diet, by the use of green foods and also by compulsory and regular exercise. Frequent doses of Epsom salts should be given, using from two to four ounce packets per dose in half a pint of warm water, preferably as a drench first thing in the morning or in the food. The pigs should be compelled to hunt for part of their living by grazing over reasonably large, well-grassed pig paddocks (an acre or more in area). Green foods—lucerne, burseem (Egyptian clover), sorghums, pumpkins, rape, and barley—root crops—sweet potatoes and artichokes, &c.—are suggested. Some cases of barrenness are due to septic inflammation of the womb the result of germ infection due to stock being kept in unclean sties, and to boars serving clean sows after having bred to sows suffering from infectious diseases of the womb. In these cases, and in all cases where the sows will not hold to the service of the boar, it is advised to syringe the uterus with a solution of one teaspoonful of table salt in one pint of sterile water—i.e., water which has been boiled and allowed to cool down to blood heat. If this does not give satisfactory results try 20 grains of permanganate of potash in one pint of sterile water at blood heat and follow up with the salt solution every day for three days before service. During treatment also give Epsom salts as recommended. It is advisable also if at all possible to change the boar, using a young vigorous animal. The sows should be kept away from the boar until they are ready for service, and after being stinted they should be immediately placed in a clean dry sty away from all other pigs, and should be kept very quiet for several hours. If they still seem restless mate them again the following evening and follow the same practice. Sterility and barrenness are also often induced through the animals being improperly nourished and through their lacking stamina and vitality.

Many sows commence stud duties too young, many boars also are ruined in this way; neither should be used for stud purposes before ten or twelve months old.

Hereditary influence is also a factor, the progeny of shy breeders often failing to breed at all. Injuries to the genital organs of the male are also a frequent cause of the sows failing to breed. The boar may have become weakened through frequent unsuccessful attempts at service, this especially so where a young boar is running with a lot of full grown sows. The boar in this case is often punished severely by the sows and kept away from the food trough. It frequently happens that a young boar so injured becomes so "cowed" that he is ever afterwards afraid and becomes quite effeminate. There are many other causes, too, such as the use of improperly balanced rations, disease of the genital organs of the boar, hot, dry seasons, and so on.

The remedy lies in the removal of the cause wherever that is possible and in culling out unsatisfactory breeders. Satisfactory specifics for the treatment of pigs that are unsatisfactory breeders are well advertised. In a general way, however, we do not recommend the use of medicinal agents for the purpose indicated.

THE COTTON BOARD AND B.A.C.A.

The Deputy Premier and Minister for Agriculture (Hon. W. Forgan Smith), stated in the course of a recent Press announcement that he had received a deputation from the Cotton Pool Board, with whom matters relating to the ginning and marketing of cotton for the ensuing season were discussed. The deputation explained to him that the Cotton Pool Board for some time had been in negotiation with the British-Australian Cotton Association with regard to the price to be paid for ginning and other services which that Association can render, and informed the Minister that, in the opinion of the Board, the price for services quoted by the British-Australian Cotton Association was too high and that it involved a charge on the industry which would seriously limit its development. The deputation was advised by Mr. Forgan Smith to continue negotiations with the British-Australian Cotton Association and endeavour to secure a more equitable arrangement. This the deputation agreed to do. The British-Australian Cotton Association has established six ginneries and one oil-mill in Queensland at a considerable capital cost. For the ensuing year one, or not more than two, ginneries would be required, and consequently it is contended, the price for ginning should be based on the capital necessary or employed for the reasonable requirements of the industry, and should not be based on the capital that is unnecessary and not required.

WHEAT CROP PROSPECTS IN THE MARANOA.

Subsoil moisture as a result of good soaking rains aggregating about 4½ inches, which fell in the Maranoa district last May, helped to establish and carry on the young wheat crops, and in this respect the district was more favoured than the chief wheat-growing centres on the Darling Downs.

Since then, however, the crops have had a fairly hard struggle to carry on. Generally speaking, the growth made was short; the plants have stooled lightly, and the ears for the most part are dry-weather tipped; but notwithstanding all the drawbacks the wheat is of good colour, and even if no more rain falls between now and harvest time, the yield should run from 8 to 10 bushels per acre in the Maranoa district for crops which are being allowed to mature. Immediate rain would still do good, as the major part of the crops will not ripen normally for another three or four weeks.

Evidence of droughty conditions may be gathered from the fact that only about 20 points of rain were recorded in the last ten weeks, and the aggregate fall from the beginning of June to date was from 80 to 110 points. One outstanding feature is the remarkable capacity of the Western district soils to withstand dry conditions, and another equally remarkable thing is the drought-resistant quality of the wheat plant.

A proportion of the district crops has already been used for feeding off by working horses, dairy cattle, and sheep, as latterly pastures had given out. One fact calculated to effect a gradual improvement in the position of the wheatgrower as a settler is the effort being made to extend his holding, generally all too small, and acquire a living area to permit of a combination of sheep and wheat. Those who are in a position to develop along these lines will undoubtedly come through successfully in the long run.

The best grown crops seen were at Bindango, and the best individual crop was Cedric wheat, where there was only a dividing fence between the fields of wheat and the Mount Abundance land now being designed for settlement.

In the neighbourhood of Hodgson and Wallumbilla there are also some fairly good crops, the better being those grown on early prepared and well-worked fallowed land. Generally speaking, the most promising varieties were those raised in the first place at the Roma State Farm. Splendid work is being carried out at this institution in the way of breeding and the evolving of types of wheat to suit Queensland conditions.

This year the stud wheats at this Farm, although short in the straw, look particularly well, and it will be possible in such a season as the present to determine the behaviour of a number of new varieties when grown under drought conditions. So far, the wheats of particular note are those with a short growing season.

For some years special attention has been given by the Wheat Breeder, Mr. R. E. Soutter, to the segregation and development of quick maturing strains of wheat, and it is satisfactory to note that one very promising variety, "Watchman"—a cross between Soutter's Early and Warren—promises to be the quickest maturing variety amongst Queensland-grown wheats; one field at the Roma State Farm is just about ready to harvest, being about three weeks in advance of the ordinary varieties grown in the district.—H. C. QUOBLING, Director of Agriculture.

Answers to Correspondents.

Information to Farmers.

W.R. (Kawl Kawl)—

There is absolutely no charge for information to farmers conveyed through the Journal. The Journal is supplied free to all engaged in land occupation on the prepayment of 1s. to cover the annual cost of postage. Inquiries should be addressed to the Under Secretary, Department of Agriculture and Stock, Brisbane. Many thousands of letters are received in the course of the year, and replies are addressed to correspondents directly. It is, of course, impossible to answer every inquiry through the Journal, and only replies judged to be of general interest can be inserted in these pages.

BOTANY.

In the course of the month the Government Botanist, Mr. C. T. White, F.L.S., addressed the following replies to correspondents, and which are of general interest.

Umbrella Tree (*Brassia actinophylla*)—Jacaranda.

F. (Darra)—

The plants are—(1) the plant with glossy leaves and long red flowering or fruiting sprays—*Brassia actinophylla*, the Umbrella tree—a native of North Queensland; it is not known to possess any harmful properties. It is very largely grown as an ornamental tree. (2) The tree with feathery leaves—the Jacaranda (*Jacaranda mimosifolia*), a native of South America, widely cultivated through the tropics and subtropics as a flowering tree. Many people in Queensland claim that when in flower it causes "hay-fever," and also the flowers falling in roof guttering make the water unfit for drinking, if drunk causing gastric troubles; these suspicions, however, have never been definitely proved.

"Wild Lime," or "Desert Lime" (*Eremocitrus glauca*).

W.L. (Toowoomba)—

The specimen is *Eremocitrus glauca*, the "Wild Lime" or "Desert Lime." It produces a small, pleasant, acidulous fruit. In the "Queensland Flora," and other works, this tree is referred to as *Atlantia glauca*, but Dr. Swingle, of the United States Department of Agriculture, a keen worker on all citrus matters, has taken it as the type of a new genus *Eremocitrus*, and I am inclined to agree with him. The Americans have taken a great interest in this plant as the possible source of a drought-resistant stock for citrus culture.

Wild Gooseberry—Native Bryony—"Poison Peach."

Johnstone River A.S.—

The three specimens proved to be:—(a) Known as Wild Gooseberry. This is *Rubus Hillii*, the Native Raspberry. It is not known to be harmful in any way. (b) *Bryonia laciniosa*. Native Bryony or Striped Melon—very poisonous. See leaflet. (c) *Trema aspera*. Poison Peach or Wild Peach. At times the leaves of this shrub develop a prussic acid yielding glucoside, and are then poisonous if eaten in quantity. I have, however, often seen the plant eaten extensively by stock without ill-effects following. See leaflet.

Darnel Grass (*Lolium temulentum*).

T.W.L. (Stanthorpe)—

The seedling grass has now flowered and proves to be *Lolium temulentum*, the Darnel. The grass is widely distributed over the temperate regions of the world, mostly as a weed in cultivation. It has a bad reputation, the seeds being poisonous, though fatal results are rare. Before seeding the grass is a palatable and nutritious feed for stock. The grass is not uncommon in Queensland, but I have never heard of any harmful effects caused by it here.

Red Currant Bush—Milky Vine—Wild Peach—Water Vine.

R.A.M. (Innisfail)—

Specimens forwarded proved to be—Red Currant Bush—*Breynia cernua*. Very common in parts of North Queensland, sometimes called "Coffee Bush." It extends to the East Indies and Philippine Islands; is not known to possess any poisonous properties. The family it belongs to, however (the Euphorbiaceæ), possesses several poisonous plants.

Milky Vine—*Faradaya splendida*. This is one of the vines used by the North Queensland aborigines as a fish poison. In experimental work dilute infusions of it were found to be potent. The active principle is a saponin. Its effect on stock is not known, but it probably would prove poisonous.

Wild Peach—*Vitex trifolia*. This is not the shrub usually known as "Wild Peach" or "Peach Poison." It is very common along the coast, and is not known to be harmful in any way.

Water Vine—*Vitis* sp. Not known to be poisonous or harmful in any way.

It is often difficult in scrub areas to pick any one plant as the cause of losses among stock, as many species among the secondary growth are somewhat poisonous and are not eaten by stock. During dry times stock may take to these plants with fatal results. A vine to look for on your place is the Tape Vine (*Stephania hernandifolia*); this has a round, somewhat heart-shaped leaf, glossy above and dull and paler beneath. Cattle mortality has occurred at various times through eating it.

"Galvanized Burr"—(*Bassia Eirchii*).

"INQUIRER" (Ipswich)—

The plant most commonly known as Galvanised Burr, and that has been gazetted a noxious plant, is *Bassia Eirchii*. The popular name is derived from the dull greyish colour of the plant and its hard woody nature. It is a very common inland weed, but is rarely seen on the coast. The neighbourhood of Laidley and Gatton is the nearest place to Ipswich where it has been observed.

"Medick Burr" or "Burr Trefoil" (*Medicago laciniata*).

A.P. (Gayndah)—

The specimen proved to be *Medicago laciniata*, a species of "Medick Burr" or "Burr Trefoil." It is a native of the Mediterranean region and is naturalised in Australia. It is fairly common in New South Wales, but I have never before received specimens from Queensland. It is a valuable nutritious fodder; even after the plant dies down the dry burrs or pods are readily eaten by stock. The species is said to stand dry weather better than most of the trefoils, the only objection being that the burrs, which are borne in great abundance, are troublesome in sheep country.

"Ooline" (*Cadellia pentastylis*).

"INQUIRER" (Brisbane)—

The specimen of leaves and wood from Tambo is *Cadellia pentastylis*, "Ooline." Ooline is the commonest name by which it is known in Western Queensland, though it also goes under the names of Solidwood (Taroom) and Mahogany (Tambo).

The Kurrajong Tree.

J.C.P. (Warwick)—

Kurrajong trees are best raised from seeds, and are fairly easily transplanted. They can be raised in special beds and transplanted when large enough. Experience has shown that trees 3 feet and over move fairly well—in fact, better than smaller plants. Kurrajong trees are used a great deal in the Southern States for street planting; for this purpose the seed is generally sown in flat wooden boxes or trays; kerosene tins cut in halves lengthwise are useful: they are then placed in plots or tins and moved with a good ball of earth. You should be able to obtain seed locally from trees growing at Warwick or neighbourhood; if not, local seedsmen should be able to supply. If local seedsmen do not carry stocks, most of the Southern people do. The Southern price is 1s. 6d. each plant.

Phalaris Grass—Trefoil.

F.R.D. (Pittsworth)—

The grass is *Phalaris* sp., a stunted specimen of one of the *Phalaris* or canary grasses, not known to be harmful in any way. The trefoil is *Medicago minima*, one of the Medick Burrs or Burr Trefoils. These plants are common in New South Wales and Southern Queensland, and are generally regarded as good fodders; they are not known to possess any poisonous properties, but if eaten by hungry stock, often cause bloat. If the trouble is really due to weeds, the cause must be looked for among plants other than those sent.

White Bauhinia.

J.C. (Westwood)—

The specimen forwarded with your letter of the 31st ultimo proved to be *Bauhinia candida*, the White Bauhinia. It is a native of India, but is cultivated extensively as an ornamental tree over the warmer regions of the world. The generic name commemorates the brothers Bauhin, two early well-known botanists. If you look at the "twin" leaf you will see the appropriateness of the name. We have several species of *Bauhinia* native to Queensland and among our most beautiful trees.

"Tie Bush" (*Wikstroemia indica*).

J.F.H. (Dundas)—

The specimen is *Wikstroemia indica*, often called "Tie Bush" on account of the bark being very pliable and fibrous. The plant has been suspected at various times of poisoning stock, but feeding tests carried out at the Stock Experiment Station gave the following results:—Fourth day—Scours. Fifth day—Scours with traces of blood. Seventh day—Slight improvement, and condition then remained the same till the eleventh day, when the feeding tests were stopped. As the plant is one generally avoided by stock, the animals ate a great deal more than they would under ordinary conditions, and it appears to have had no other effect on them than to cause severe scouring. Had the feeding been continued, the animals would quite likely have died from scours and malnutrition, but stock would hardly ever eat sufficient of the plant for this to occur under natural conditions.

From the foregoing you will see that the plant is an undesirable one and should be eradicated, but if you are losing stock every year I would be inclined to look elsewhere for the cause of the trouble. If after the eradication of the Tie Bush you are still losing stock, send specimens for report of any weeds or undergrowth growing on your property. If this is not satisfactory, perhaps a visit to your property could be arranged, and the paddock or paddocks examined for poisonous plants.

Hoya Vine.

"INQUIRER" (Nanango)—

The plant is Hoya Vine (*Hoya australis*), a fairly common climber in the scrubs of Coastal Queensland, both over trees and rocks. The plant is poisonous, so far as known, at all stages of its growth. The following treatment of affected animals has been recommended by Mr. A. McGown, M.R.C.V.S., Government Veterinary Surgeon:—"1 lb. Epsom salts and 1 lb. treacle should be given as soon as the animal is noticed to be sick, which should be followed daily with 2 dr. potassium iodide in half a pint of water."

Reputed Stock Poisoning Plant—Native Fuchsia (*Eremophila maculata*).

"INQUIRER" (Lake's Creek)—

From the symptoms given Mr. White suspects the Native Fuchsia (*Eremophila maculata*). He does not know the country around Capella personally, but Native Fuchsia is fairly common in the Central district around Emerald and other parts. There is much controversy among stockmen concerning this plant, many looking on it as a good fodder. Stock certainly at times eat large quantities without ill effects following, but sometimes the plant develops a prussic acid yielding glucoside (like young sorghum) in abundance, and is then poisonous. What controls the formation of these glucosides in plants is at the present time unknown.

Ringbarking.

R.S.M. (Surat)—

There has always been controversy in Australia regarding the proper times of ringbarking different trees, but the weight of evidence seems to favour the mid or late summer months—February and March—as the best times of the year to carry the work out—that is, when the sap is well “up” and the tree in full growth. These months apply to the Sandalwood.

Suitable Trees for Planting.

M.H.G. (Cecil Plains)—Here is a short list of trees suitable for planting about Cecil Plains:—

Native trees—

- Pittosporum undulatum*).
- Lagunaria (Lagunaria Patersonii)*.
- Kurrajong (*Sterculia diversifolia*).
- Bottle Tree (*Sterculia rupestris*).
- Crow's Ash (*Flindersia australis*).—One of the best of the native shade trees, but frost may get it in the young stage at Cecil Plains.
- Queensland Nut (*Macadamia ternifolia*).
- Wattles (*Acacia* spp.).
- Gums (*Encalyptus* spp.).
- Silky Oak (*Grevillea robusta*).
- Figs (*Ficus* spp.).
- Cypress Pine (*Callistris* sp.).
- Hoop Pine (*Araucaria Cunninghamii*).

Exotic trees—

- Pepper Tree (*Schinus molle*).
- Broad-leaved Pepper Tree (*Schinus terebinthifolius*).
- Plane Tree (*Platanus* sp.).
- Phytolacca Tree (*Phytolacca dioica*).—A valuable fodder.
- Portuguese Elm (*Celtis*).—A valuable fodder.
- Carob Bean (*Gleditschia*).
- Privet (*Ligustrum*).
- Camphor Tree (*Cinnamomum camphora*).—May be cut back by frost at Cecil Plains.
- Oaks (*Quercus* spp.).
- Pines (*Pinus* spp.).—The best, I think, are *Pinus insignis* and *P. longifolia*.
- Cypress Pines (*Cupressus* sp.).
- Junipers (*Juniperus* spp.).
- Palms.—The Wine palm (*Cocos yatay*), the Cotton Palm (*Brachea filamentosa*), and some of the *Phoenix* are worth trying; all these do well at Toowoomba. The Cotton Palm, at least, should grow at Cecil Plains.

Native Grasses—Bush Hay—Forage Trees.

We have not made analyses of Mitchell grass at different stages of growth, but I have no doubt that the correspondent is right when he states “Mitchell grass, after six months' dry weather, possesses very poor feeding qualities and stock will fall away and die.” The question of bush hay or Mitchell grass hay, however, is a totally different matter; the value of this after a number of years depends very largely on the stage at which the grass is cut. It is useless to cut Mitchell grass at the end of the summer or early winter when the seed is being shed or during a long, dry spell; the best time is after the early summer rains, when the seed heads are nearly, but not quite, ripe. Mitchell grass cut at this stage and carefully stored should last for years and retain a good proportion of its nutritive value.

I do not think anybody will question the fact that a great deal could be done in Queensland to minimise the effects of droughts which occur periodically. The subdivision of larger properties and the periodical spelling of some of the paddocks should help; it is marvellous the length of time many native grasses and herbage will keep green if left untouched by stock. No grass can stand its green shoots being constantly picked off as fresh ones appear. The value of bush hay has already been referred to.

The planting of forage trees should be part and parcel of the routine of every Western property. There are a number of valuable native trees well known to every stockowner; most of these are, unfortunately, of comparatively slow growth, and their extensive use will consist more in conservation than in planting—this cannot be said of all, however—e.g., the Kurrajong. Some exotic trees are also worthy of trial in this respect—e.g., the *Phytolacca* tree and *Celtis sinensis* (the latter in Queensland commonly miscalled "Portugese Elm") are worthy of note.

SELECTION OF NATIVE FODDER TREES.

Mulga (*Acacia aneura*).—One of the very best of the inland fodder trees. Would likely be of very slow growth under cultivation.

Kurrajong (*Sterculia diversifolia* or *Brachychiton populneum*).—One of the best of the native trees for extensive planting, easily raised from seed and of fairly quick growth.

Bottle Tree (*Brachychiton rupestris*).—Can be raised from seed and of fair growth; can be readily transplanted from local scrubs where it is growing.

Whitewood (*Atalaya hemiglauca*).—Liked by stock; the young shoots are said to kill working horses, but otherwise an excellent fodder.

Olane or Emu Apple (*Owenia acidula*).—A beautiful tree and a useful fodder, but rather difficult of propagation and of fairly slow growth.

Wilga (*Geijera parviflora*) has rather a mixed reputation; a useful standby.

Apple Trees (*Angophora subvelutina* and *Angophora intermedia*) are useful as roughage, but are not very nutritious.

Oaks (*Casuarina species*) are used extensively; the commonest in Western Queensland is the Belar. The one with best reputation as a fodder in Australia is the Drooping Oak (*Casuarina stricta*). It is not found in Queensland.

Supple Jack (*Ventilago viminalis*) is usually regarded as excellent.

Leopard Wood (*Flindersia maculosa*) is common in parts of Western Queensland and New South Wales. It is relished by stock; the seed is very light, and the tree would probably be of very slow growth in cultivation.

Red Ash (*Alphitonia exulosa*) is a tree worth extensive planting. It can be raised fairly easily from seed, and is of comparatively quick growth.

Sideroxylon Pohlmanianum var. *vestitum* is a tree common in parts of North Queensland from Townsville to the Gulf. The leaves are relished by all classes of stock. Others of the same family are eaten readily and are fairly nutritious. Most of these have no common names.

Figs (*Ficus species*) are trees, the leaves of which would provide large quantities of forage.

The *Phytolacca* Tree (*Phytolacca dioica*) is a native of South America; is a very rapid grower; is easily raised from seeds. Analysis shows the leaves to be highly nutritious. It is a very heavily foliaged tree and yields a high amount of forage. My attention was first drawn to the use of this tree as a forage by Mr. Robert Dick, of Purga.

Celtis sinensis is a native of China—misalled in Queensland "Portugese Elm." It is a deciduous tree and does well in Central Queensland; for colder parts *Celtis australis* (the true Portugese Elm) is the better species.

The Algaroba or Mesquite Bean (*Prosopis juliflora*) is suitable for the coast and warmer parts of the State. Though a great deal has been heard of this tree as a fodder, its value, in my opinion, is small in comparison with some of our native trees or of the other exotics mentioned here.

The Carob Bean (*Ceratonia siliqua*) is useful for the cooler parts of the State only. The trees are dioecious—that is, the male and the female trees are distinct; the females, of course, are the only pod-bearers.

The Honey Bean or Honey Locust (*Gleditschia triacanthus*) is another exotic, the pods of which are eaten by stock. This tree also does well in the cooler parts of the State.

PIG RAISING.

Following are selected replies to correspondents by the Instructor in Pig Raising (Mr. E. J. Shelton, H.D.A.) in the course of the month, and which are of general interest:—

Pig Feeds and Feeding.

C.B. (Dideot)—

If you cultivate a larger area of sweet potatoes and even only a small area of lucerne, in addition to an area of improved cow-cane or some other variety of sugar-cane, or of saccaline or other variety of sorghum, plus pumpkins and melons, these crops would provide a rotation of green foods for use during dry periods and periods of shortage. Mangel wurzel is one of the most satisfactory root crops, particularly for feeding to breeding sows. Apparently the pigs you lost consumed too much barley grain, and after drinking freely the stomach became over-full, and this in turn caused rupture of the tissues.

It is not usual for pigs to suffer from hoven, though this is a common trouble with cattle, but it is very risky allowing animals to consume too much dry grain and then to have free access to unlimited supplies of water. Careful feeding and management, and the provision of good fences and suitable accommodation, are all points to which attention should be given if success is to be assured.

Berkshire-Tamworth Cross.

R.C. (Colosseum)—

We consider the class of sow to which you refer (*viz.*, sows first cross by Berkshire boar from Tamworth sows) as quite suitable for breeding purposes for the production of bacon pigs, but would prefer to recommend that these sows be mated back to an unrelated Berkshire or Poland-China boar in preference to a Tamworth boar. We advocate the paddock (or colony) system of feeding in preference to a continuous system of sty feeding, though we also recommend reducing the range as the pigs approach the final marketing stage. It is at this stage also that the pigs require topping up on a proportion of grain, though care must be taken to see that they do not become over-fat, for there is no demand for very fat bacon nowadays. The self-feeder system is quite all right, provided the pigs have a limited grain allowance, and an abundance of green food and plenty of good drinking water. Some experience is, of course, necessary to know just when to top a bacon pig off and to know when he is in prime condition. The matter of weight, &c., is referred to fully in the pamphlets. Cowpeas are an excellent grain and protein (flesh-forming) food, while Dwarf Essex rape (preferably sown in conjunction with skinless barley) makes ideal grazing during the latter months of winter and during spring and early summer. Just at present we have no plans available for self-feeders, but hope to have these available shortly, when a copy will be forwarded on to you.

Pig Management.

W.J.S. (Marrai, N.S.W.)—

The young pigs have apparently suffered from severe frost bite. Frost bite would cause the skin peeling off the pig's ears. This would be probably helped by hog lice and possibly the small lice, which causes mange. Have affected animals carefully washed with warm water and soft soap; oil them freely with some vegetable oil or crude castor oil to which a small quantity of kerosene is added (you could utilise pig fat or even mutton fat for this purpose, being careful to see that each portion of the pig is treated). Careful feeding and soft, succulent food are necessary. Give the animals a course of Epsom salts, using from teaspoonful to desertspoonful doses daily for three or four days, according to size and the age of animals. The trouble, of course, may have been exaggerated by weed growth in the pig runs, as some weeds like stinging nettle and similar weeds are liable to affect the skin of the pigs.

R.H.P. (Oatlands, Tasmania)—

Queensland is favourably situated geographically for expansion in all lines of agriculture. Successful pig-raising must be essentially a crop-growing and a crop-marketing proposition, for there is little profit in depending for a food supply on the purchase of comparatively high-priced concentrates.

Pig Feeding.

G.W.C. (Birkdale)—

Malt culmings are not a very satisfactory food for pigs, though they can be used in with other foods in making up a suitable mash. It is preferable to grow lucerne and to spend the money on cultivating and fertilising the lucerne, for in this way you would secure a greater bulk of food of a very much higher feeding value than the somewhat tough and fibrous barley germ. Malt culmings and bran are very much more satisfactory when used as a food for cows than as food for pigs. Cattle require fairly large quantities of succulent food; pigs have a comparatively small stomach and cannot handle the extra bulk to advantage.

Trouble with Breeding Sows.

G.S. (Pinbarren Creek)—

It is noted that on p.m. examination a quantity of hair had accumulated in the stomach in the form of a ball, and that this and other complications resulted in stoppage of the bowels and in death. If you still have the hair ball, dry it in the sun, and enclose in a small box of sawdust, and forward it to this Office, as we are anxious to have further specimens of this description. These hair balls are described technically as "Trichobezoars," and that they vary considerably in size. Have dead calves and other stock carefully skinned and cooked before feeding to pigs, otherwise the carcasses should be burnt, and not be used as a pig food at all. There is also considerable risk in feeding carcasses to pigs before the meat has been thoroughly cooked, while, from your own standpoint, it pays very much better to cook the meat mixed with some meal, grain, or root crop, and a liberal quantity of water. Feed as a mash, particularly to growing pigs and to pigs in the early stages of fattening. In this way there is practically no waste and no evil smell resulting, whereas where carcasses are thrown into the pigsties in a raw condition they become a hotbed of disease and a breeding-ground for blowflies, &c. The skins, if carefully removed and cared for, are also of value at most seasons of the year.

Pleurisy in Pigs.

T.S. (Kandanga)—

The young pigs, apparently, are suffering from pleurisy. There may be an affection of the ear also, the result of the formation of abscesses in the inner ear similar to the trouble referred to in the pamphlet forwarded dealing with a peculiar disease of the ear. Probably accommodation is not suitable, for cold, draughty sties and dry dusty yards are prolific sources of trouble among young and growing pigs. Pigs that wander about among wet grass and crops and that are not properly housed at night suffer great inconvenience, as also do pigs fed on comparatively dry fibrous foods, which are frequently indigestible, and the animal suffers severe pain as a result of indigestion and bowel disorders. Animals that are exposed to the frost during cold, wintry nights suffer severely from frost-bitten ears; an animal so affected on rising will walk about as if in great pain.

FIRST GRADE CREAM PRODUCTION—SIX ESSENTIALS.

1. The general provision of overhead water supply by means of tanks, windmills, and pumps.
2. The general provision of ample facilities for boiling water, such as a set-in-copper or chip heater connected with the general water supply.
3. General use—first, of cold water; second, of warm water and washing soda for first washing; third, of boiling water for proper scalding; finally, drying of all dairy tinware and the cleaning of the milking plant.
4. More general knowledge of milking plants, especially in regard to their cleaning and handling.
5. The general adoption of the cooling of cream to as low a temperature as possible; keeping it in cool, clean, well-ventilated surroundings, stirring frequently and mixing when cool.
6. Daily delivery of all cream from farm to factory.

General Notes.

Stock Crossings on Southern Border.

Relative to the closure of the Habnarey crossing-place on the Queensland-New South Wales border, further advice has been received from the New South Wales authorities that, although the gate is closed to cattle, sheep may still be admitted into New South Wales through that crossing-place.

Staff Changes and Appointments.

The following persons have been appointed Officers under and for the purposes of the Animals and Birds Acts as from the 18th September, 1926:—

Messrs. F. S. Hodel, J. J. C. Hamilton, C. J. F. Miller, L. A. G. Boyce, and Neil Macdonald.

Bird Sanctuaries Proclaimed.

1. R. 125, parish of Mia Mia, county of Carlisle.
2. The Gorge and properties of F. E. Rudder and E. Bilbrough, Springbrook, county of Ward, parish of Numinbah, being land comprised in portions 25, 30, 79, 80, 88, 149, and 150, R. 465 (timber reserve), and R. 494 (recreation reserve).
3. Green Island, near Cairns.

State Wheat Board Levies.

A vote on the question of State Wheat Board levies, in connection with a General Reserve Fund and a Hail Insurance Reserve Fund, was conducted recently at the Department of Agriculture and Stock with the following results:—

General Reserve Fund—

For the levy	..	..	..	..	..	834 votes
Against the levy	..	..	..	..	..	1,284 „
Informal	..	..	..	..	..	17 „

Hail Insurance Reserve Fund—

For the levy	..	..	..	..	..	1,346 votes
Against the levy	..	..	..	..	..	768 „
Informal	..	..	..	..	..	17 „

Farm Planning.

The adoption of a sound plan for the farm buildings is an essential to the satisfactory working of the farm. This includes the selection of the site and the location of the various buildings in relation to each other.

A number of points need to be considered in fixing the site, among which are accessibility to the nearest public road, the position of the permanent water supply, the position of the farming area, and the suitability of the soil for gardening purposes.

The last is a point to which, as a rule, very little thought is given. Often in the early days of a farm the farmer has no time to beautify his home or to attempt to grow vegetables, fruit, &c., and the home site is chosen without thought in this direction. Ultimately, when attempts are made to establish a garden or orchard, they result in failure and considerable loss to the farmer owing to the unsuitability of the soil.

A garden can only be successfully established near the home, where a little time can be devoted to it frequently, and where it will be protected from birds, &c. Not so much attention has been given by many farmers to the advantages to be gained by growing much of their own food on the farm, but, with mounting costs and the difficulties in securing profitable returns for the products that are sold off the farm, farmers are endeavouring to make their farms more self-supporting. Furthermore, the pioneer stages of farming are passing in most districts, and farmers and their wives are acquiring greater knowledge and thriftiness, and both these things are making the farm garden and vegetable plot of increasing importance.

Co-operation—What it Means.

Co-operation is not something to be adopted and accepted, but rather something to be learned and acted.

Co-operation can only succeed when every member is willing to make some sacrifice and to do his part in making his organisation a success.

It is far easier to sit back and complain and find fault with those attempting to bring about improvement than it is to become an informed and active worker in securing the desired results.

Be yourself the leader, not the trailer. Set the standard as conscience dictates, then you will mould instead of being moulded.

Colouring Citrus Fruits—A Trade Practice.

To make it more saleable a considerable proportion of certain varieties of Florida oranges and grape fruit is coloured by a gas formed by the incomplete combustion of kerosene or similar petroleum product. This practice, which is regarded as a legitimate one, was begun in California a number of years ago (states the "New York Journal of Commerce"), and nearly all packing houses there are now equipped for colouring.

In response to requests the United States Department of Agriculture undertook experiments with a view to adapting the process of colouring citrus fruits to conditions in Florida. The best results were obtained by having the stove outside the colouring room, the gas being piped in, thus preventing damage by excessive heat.

In the course of the experiments it was found that grape fruit and oranges can readily be coloured by the exhaust from a gasoline engine, by ethylene, as well as by the gas formed by the incomplete combustion of kerosene or other similar petroleum product. Grape fruit colours more readily than oranges, and early oranges assume the characteristic golden yellow colour more quickly than doth the spring-maturing Valencia. Oranges begin to show the desired colour within forty-eight to seventy-two hours after treatment is begun.

Cutworm Control.

The Entomological Branch of the Department of Agriculture and Stock has received numerous inquiries relating to the control of cutworms, and it seems desirable to give further publicity to the details of the control measure generally adopted against these serious pests. Poisoned baits are the standard remedy for cutworms, but, to be thoroughly effective, they should be used as soon as the attack is noticed. The bait may be made as follows:—

Bran, 50 lb.; Paris green, 2 lb.; molasses, 2 quarts; oranges, 3 fruits; water, 4 (approximately) gallons.

The Paris green and bran should be thoroughly mixed together, dry; the juice of the oranges, the finely chopped up fruit, and the molasses should then be added to some of the water. The latter mixture should now be combined with the Paris green and bran and should be thoroughly stirred, enough water being added to produce the right consistency. The right consistency must be determined by the user, but only sufficient water should be added to leave the mixture in a crumbly condition and thus dry enough to permit of being scattered broadcast on the ground; at the same time the quantity of water added must be such as to ensure that each flake of bran has been moistened by the molasses sufficiently to make it attractive and also to enable it to carry a small quantity of Paris green. It is better to have a barely moist bran mash than a thoroughly wet one because an unduly wet one becomes baked by the sun and rendered unattractive.

The baits should be distributed towards evening so that they will not lose their attractiveness to the cutworms when they come out to feed at night. Do not use these baits where fowls or other animals have access to the ground treated, and remember that Paris green is very poisonous and must be handled with corresponding care. The quantity mentioned above is sufficient for several acres; smaller quantities can be, of course, made up if smaller areas are to be treated. Where only garden plots or very small areas are to be dealt with broadcasting may be abandoned in favour of distribution by placing a teaspoonful of the mixture near the base of each plant likely to be attacked. If no fruit is available the bran mash can still be used, but it is always desirable to have it sweetened.

Noxious Plants.

Bathurst Burr (*Xanthium Spinosum*), Galvanised Burr (*Bassia Birchii*), and Noogoora Burr (*Xanthium Strumarium*) have been declared to be noxious plants for the purposes of "The Land Acts, 1910 to 1925." These are in addition to Prickly-pear, Zamia, and Desert Poison Bush, already defined as noxious plants by "The Land Act of 1910."

The End of the Milk Can.

"The knell of the milk can is sounding, and in five years or even less every consumer in London and probably throughout the country, will receive his milk in a machine-filled bottle." This prediction was made by Mr. P. B. Tustin, the technical adviser to United Dairies, Limited, at a meeting of the Royal Sanitary Institute at Weston-super-Mare (England). "The whole organisation of the milk trade," he added, "is being revolutionised to meet the new standards set by the leaders of the dairy industry and the Ministry of Health. The plants now being erected for pasteurisation and bottling, which eliminate all human contamination, can almost be described as machinery with a brain."

Fruit Trees and their Bearing Habits.

When the bearing habits of the different kinds of fruit trees are understood, it is possible to regulate the bearing of each individual tree. Fruit buds are easily distinguished by their larger and plumper appearance (writes Mr. G. W. Marshall, in the "Rhodesia Agricultural Journal"). With a moderate amount of experience it is possible to forecast the next fruit crop from the previous season's fruit bud formation. Pruning is done to regulate the fruit crops, especially when too much fruiting wood has been formed.

The fruit is produced in the different kinds of trees as follows:—

Apple and Pear.—On spurs chiefly, also from terminal and lateral buds, always on wood of the previous season's growth.

Quince.—From co-terminal buds, or wood of the current season's growth.

Peach and Nectarine.—On wood of the previous season's growth.

Apricots and Plums.—Generally fruit twigs, shoots and spurs from shoots produced during the previous season's growth.

Figs.—First crop previous season's wood. Second crop on current season's wood.

Citrus.—On current season's growth. Main crop of fruit on spring growth.

Vines.—On new rods of the season's growth.

Milk Maxims.

If the precautions necessary for the protection of dairy products from bacterial infection were observed as religiously as they are brought before the notice of the farmer, the need for the admonitions would have long since disappeared. Following are some rules enumerated by a writer in the "Journal of Agriculture of South Australia" as essential in the handling of milk:—

Strain all milk through a fine mesh strainer to remove small particles of dust and hair.

See that all utensils, cowyards, &c., are in a thoroughly clean condition.

Use lukewarm, then scalding, water for all utensils, milking machines, &c., and occasionally washing soda, then drain on a rack in a clean atmosphere.

Discard milk from diseased cows or those with injured quarters.

Milk from newly-calved cows, or those nearly dry and forward, should not be included with the rest. Always allow at least one week to elapse before using milk from the former.

Examine the water supply to see that it comes from a good source, free from harmful drainage.

During warm weather it is advisable to cool all milk in order to keep it in as sweet a condition as possible. Occasional stirring will help in this respect.

When holding milk, cover with gauze and keep in a cool, clean atmosphere, with free access of fresh air. Do not close up cans until immediately before delivery.

Avoid, as far as possible, carting whey in cans used for milk, because not only is it difficult to remove all traces of the whey, but the acid it contains will shorten the life of the cans. Avoid the use of can cloths or other absorbent material.

Animal Parasites—Combative Methods.

There are many varieties of parasites—some attack the skin, others the nasal chambers, liver, kidneys, lungs, &c.—but the most important are those of the digestive tract. The problems that face the farmer are, firstly, of course, diagnosis (a correct diagnosis is obviously all-important); and, secondly, curative and prophylactic (preventive) treatment. In determining the best measures of eradication (writes an officer of the Stock Branch of the N.S.W. Department of Agriculture), a knowledge of the life-history of the parasite is essential. Such a knowledge often bares the weakest point in the parasites' defence. The liver fluke of the sheep, for example, must in one of its larval forms inhabit the water snail, and it is by eliminating the snail that we effectively prevent fluke infestation. Other parasites, the life-histories of which we know quite well, are well-nigh impregnable once they have reached a certain stage. An instance of this is an intestinal worm of the horse, which parasite in its asexual stage finds lodgment in the walls of the main artery supplying the bowels. Once it has reached that location treatment is of no avail. This parasite is a frequent cause of colic in horses and ultimately causes their death. Other parasites, again, readily respond to curative treatment (for example, large round worms).

Treatment of parasitic conditions must be of a rational and practicable nature. In sick stock treatment comes first and prophylaxis second, but with apparently healthy stock prophylaxis takes first place. Whatever the procedure to be followed, the veterinarian is the adviser and the farmer the man of action, and unless the latter carries out his part faithfully the work of the veterinarian goes for nought. Often prophylaxis to be of use must be periodical—to control parasitic infestation of stomach worms in sheep, for instance, it is necessary to drench them with a vermicide once monthly. It is failure to recognise the necessity for constantly treating apparently healthy stock that in this relation constitutes the average farmer's most serious disability, and it is the general inadequacy of such treatment that in our chain of defence against parasitic invasion constitutes perhaps the weakest link.

Prophylaxis, like medicinal treatment—which itself is prophylactic, of course—varies with varying geographical and climatic conditions. It is of little use, again, to try to control parasites by medicaments that do not in passing through the body come in contact with them—such, for instance, as kidney worms in the perirenal fat of pigs and worm nodules in the submucosa of the intestines of sheep.

As far as we know at present, the only parasites that are accessible to medicaments are those in the digestive tract of horses, in the stomach and small intestines of pigs and ruminants, and certain blood-sucking parasites, such as liver fluke. Our present knowledge suggests, too, that certain organs are not accessible to treatment, and among these are the sublining (submucosa) of the digestive tract, connective tissue, except that under the skin (subcutaneous), liver substance, kidneys, perirenal fat, and musculature. Then there are parasitic conditions in locations that are apparently accessible, but that do not respond satisfactorily to treatment. Such locations are the lungs and air passages.

In applying preventive measures we often surmise too much; we often waste time, energy, and money, believing that two somewhat similar parasites have similar life-histories—there are men on the land who are of opinion certain preventive measures are applicable to all endo-parasites of all animals at all periods of the year. Then, finally, of course, there is the question of economy—not mere expenditure.

Even when the life-history is known, the application of rational prevention would sometimes result in a greater financial loss than the parasite itself, the cure being more costly than the disease. Such is the case with the tapeworm (*Taenia crassicolis*) of the cat, the parasite having its habitat in rats and mice as intermediate hosts.

Since the majority of worm eggs find a carrier in the pasturage, the farmer must make a determined effort to supervise the food supply; an uncontaminated food supply is every bit as important to live stock as it is to the human race. The farmer must be educated and advised to extend as far as is practicable those prophylactic measures generally applied in relation to human needs to those of domestic animals. Housing, receiving yards, and disposal of body wastes should receive special attention. With regard to most parasites of the digestive tract, the following general preventive measures are suggested:—

Do not overstock.

Remove stock frequently to fresh pastures.

Minimise the use of permanent pastures.

Cultivate, fallow, or dress with quicklime and salt paddocks recently depastured by parasitised stock.

Fully utilise paddocks containing stubble and fodder crops when not required for other uses.

Fence off low-lying, swampy ground and drain it.

Burn off pastures periodically to destroy worm eggs and larvæ.

When practicable use water from troughs in preference to still water, such as that in dams.

If the pasturage is lacking in chemical constituents, supply a lick of suitable ingredients.

Do not pasture parasitised animals with apparently sound ones.

Practise stock rotation. The parasites of horses, pigs, and ruminants are, generally speaking, peculiar to each species, and these stock can follow each other with little danger from pathogenic results.

Practise pasture rotation, though where land is limited this means constant thought, constant changes, and a considerable amount of expense in fencing, &c. It should be remembered that many larvæ worms reach the infective stage in from fourteen to twenty-one days following expulsion of the ova; and consequently pasture rotation must be as frequent as possible—the more frequent it is the more efficacious.

Let it be remembered, in conclusion, that eradication is preceded by control, and that control is preceded by knowledge, and that it is the farmer who makes a point of adding as much as possible to his knowledge, who aims at a high standard and works conscientiously to attain it, who is successful in the combat of parasitic pests and in the pursuit of animal husbandry generally.

Better Horses—The Menace of Mongrel Sires.

In the course of a paper on horse improvement at the recent State Conference of the Agricultural Bureau of New South Wales, Mr. M. L. Kingdon called attention to the menace constituted by the uncontrolled mongrel stallion, and the need for legislation in this relation.

To encourage and promote horse-breeding on proper lines, said the speaker, Government supervision of stallions was necessary. All stallions should undergo strict veterinary examination, and those successful in passing the test should be registered. Victoria, which had had compulsory registration of stallions for some years, furnished a good example of the benefit of such a measure. In recent years rapid strides had been made in that State in the improvement of draught horses, and a large number of undesirable stallions had been weeded out. Many of the rejects had probably found their way into New South Wales.

In the past horse-breeding had been of an indiscriminate nature, mostly from nondescript stallions, and the price was now being paid for past neglect. Every farmer should breed sufficient horses to replace his old worn-out animals. If he bred and kept his teams young by selling geldings at 5 or 6 years old, breeding would pay handsomely. In the event of a clearing sale his horses would realise big money.

Mechanical power on the farm, necessary and remunerative though it might be, was not going to displace the horse. The tractor was but an auxiliary to horses on a farm. Tractor depreciation costs were heavy, the fuel had to be imported, and no tractor yet manufactured had the power of reproducing its kind.

By not breeding horses of a better standard for city use, farmers were losing both horse and fodder sales.

One of the methods in vogue in America for encouraging horse-breeding was by boys' colt clubs, a scheme which could, perhaps, be adopted here. Show associations could render valuable assistance by giving prizes for the best colt or filly shown by a boy under 16 years of age, the idea, of course, being to encourage an interest in horses. But the best method of encouraging breeding and improving the standard was to adopt the plan introduced last year into New South Wales by the Coolamon A. and P. Association—a community scheme of stallion hiring.

Years ago Ruskin had given the assurance that the more sentimental of economists need not fear the too wide spread of the formalities of a mechanical agriculture. To-day, however, there were grounds for such a fear. The presence of a wise population implied the search for felicity as well as for wealth, and, to get the utmost satisfaction from their calling, farmers should have other interests besides that of securing the maximum financial return from their holdings. They would find that high-class live stock, particularly horses, would give them much pride and satisfaction, and if they were to adopt a proper system of horse-breeding their monetary returns would also be increased.

Sugar-Cane Technologists—Triennial Convention.

Arrangements have been made with the Cuban Government to hold the next convention of the International Society of Sugar Cane Technologists (an organisation to promote by means of triennial conventions the discussion of problems connected with sugar production in both field and factory) in Havana. The meetings will open on 14th March, 1927, and continue for about a week, with side trips in and about Havana. Following this, an excursion will be made to other parts of Cuba either in small groups or by the convention in a body, as may be decided.

The meeting that was held in Honolulu in August, 1924, was of great interest and value to all who attended. The Havana meeting, with the larger attendance that is expected, promises to be a most exceptional convention for those interested in the technical problems of sugar production.

Thirteen sugar-producing regions were represented at Honolulu—namely, Australia, Fiji, Formosa, Japan, Philippine Islands, India, Java, Chile, Mexico, Porto Rico, Cuba, Continental United States, and the Hawaiian Islands.

In all probability a much wider representation will be had at the Havana meeting, as the membership of the society now includes all the important cane sugar sections of the world.

Among the subjects to be discussed are—

Insect pests of sugar-cane.

Diseases of the sugar-cane plant.

Sugar-cane varieties and related problems of seed selection and seedling propagation.

Protective quarantine measures.

Field practices such as cultivation, fertilisation, tillage, &c.

The operation and chemical control of the cane sugar factory.

Technical papers presented at the meetings will be limited to approximate brevity, so as to allow adequate opportunity for an exchange of views by the representatives of the various sugar-producing sections. The plan followed so successfully at Honolulu, of having the topics discussed under the leadership of a qualified specialist, is thought to be a desirable one to use again.

All inquiries regarding hotel accommodation or similar matters may be addressed to Mr. E. L. Anderson, Secretary of the Cuba Sugar Club, Apartado 1973, Havana, Cuba. Mr. Anderson has kindly offered to assist in particulars of this kind.

Advantages of Milk Recording.

The advantages to be derived from milk recording are many. A writer in the "Rhodesian Agricultural Journal" includes the following in his list:—

Milk records indicate to us the poorest cows and those which do not pay for their feed.

They prevent our best cows from being sold or slaughtered.

They help us to discover great differences in cows as regards persistency in milk flow.

They help us to notice variations in yield and urge us to seek for the cause of these variations.

They enable us to bring in larger returns from fewer cows.

They help us to build up a profitable herd quickly, because heifers from the best cows only are kept as the basis.

They allow us to exercise more discrimination in apportioning feed according to yield.

A great stimulus to excel is received when records are compared with those of other farmers.

Employees take a great interest in records. Consequently the cows under their charge get better attention.

They increase the pleasure and interest in farming.

Financially the keeping of milk records is of great benefit. Young bulls are frequently sold at much higher prices if milk records of their dams are available than they otherwise would have been.

The Record of a Great Office.

The balance-sheet of the Public Curator of Queensland for the year ended 30th June, 1926, shows a net profit of £4,697. The Office has been in existence just ten years, and the accumulated profits amount to £40,000. This is, indeed, a splendid record of a great Office. Owing to the democratic constitution of the Public Curator Office, these profits do not pass or belong to the Government, but are invested by the Public Curator for the benefit of beneficiaries, whose interests are in his hands. It is, therefore, a mistake to assume that the Government makes a profit out of the administration of the Public Curator. All that the Government expects him to do is to make his Office pay its way without being a charge on the State and its taxpayers.

During the last decade, the Public Curator Office has not only not cost the Government one penny in salaries, equipment, and general expenses, but it has so reduced the cost of the administration of estates that all beneficiaries entitled to share in their distribution receive the benefit of the reduced charges.

The remarkable growth of the Office is its own commendation. More and more individuals are refusing to serve as Executors or Administrators for the reason that here is a Public Official guaranteed by the State for his integrity and just administration, whose duty and business it is to be the people's Executor, Administrator, or Trustee. In days gone by, to be named an executor by a friend was considered a compliment—an expression of his confidence in that friend's ability and integrity. But to-day, such duties are being handed over to the Corporate Executor, who has continuity of office, who never dies, and to whom beneficiaries can look with confidence and safety, knowing full well that when the time arrives for them to receive payment of their shares in estates, the money will be instantly forthcoming. It may be interesting to look into the matter of Estate Administration through the Corporate Executor's eyes.

People think of an estate as a lot of stocks, bonds, deeds, and other papers lying in a safe-deposit box with the owner's will on top. But to a corporate director like the Public Curator, an estate is a good deal like a fire alarm. When a man dies, he stops, but his estate does not stop. So promptness is one of the Executor's cardinal virtues. No time must be lost in getting to the estate, learning its nature, and taking steps to keep it going or to wind it up. As a corporation sole, the Public Curator has certain advantages over an individual executor or administrator. He has, for one thing, greater financial responsibility, which enables him to pay all duties without immediately sacrificing the assets to enable these compulsory Government duties to be paid. All estates entrusted to him are handled by an organisation instead of by a person, with obvious advantages in experience and judgment.

But because the Public Curator is a corporation sole, people may feel that his handling of estates and trusts will be coldly impersonal. Such, however, is not the case, because his officers are trained and encouraged to consult with interested persons in all matters of administration on the principle that, after all, it is their estate and the Public Curator is but their trustee, eager and anxious to carry out at all times, when advisable, their wishes in regard thereto.

Moreover, the Public Curator, having no personal or pecuniary interest in an estate, is not in any way influenced by personal animosities or family quarrels or prejudices. It is his duty to administer justly and impartially and *according to law*.

In reality, he is a liquidator. He takes charge of the property in an estate for the purpose of turning it into money, paying debts, taxes, duties, and other expenses, and distributing what is left according to the will or to the Statutes of Distribution. The law demands that he attend to his business diligently, and, though not required to make a profit, get as large a yield as possible out of the estate for the benefit of those interested in it.

The Royal Society of Queensland.

At the last ordinary monthly meeting of the Society the President, Dr. J. V. Duhig, M.B., was in chair. Dr. W. H. Tilling and Mr. S. Stephenson, M.A., were unanimously elected as ordinary members.

Dr. L. S. Bagster exhibited samples of leather tanned with syntan, mangrove bark extract, mixtures of syntan and mangrove bark extract, and leather tanned with mangrove bark extract and bleached by treatment with syntan. It was stated that the syntans or synthetic tanning materials were discovered by Stiasny, and several of them were patented in Austria and Germany. They are prepared by reaction between various coal tar products, such as cresol, and sulphuric acid and formaldehyde. When the syntans are used alone a white leather is produced. A further important property of the syntans is their power of dissolving the dark

colouring matters associated with vegetable tanning extracts such as those of mangrove barks. In consequence of this property, the syntans, when used in conjunction with mangrove extract, produce a much lighter coloured leather than that made with mangrove extract alone.

Professor H. C. Richards exhibited samples of material from the bore which was put down by the Great Barrier Reef Committee at Oyster Cay near Cairns. The bore attained a depth of 600 feet. The great majority of the material down to 400 feet consisted of broken coralline detritus. Some solid coral core was encountered between 10 and 17 feet from the surface. From 400 to 600 feet the material was non-coralline and composed to a great degree of rounded grains of quartz sand. The exhibitor stated that a cursory survey of the material from the bore seemed to indicate decisive evidence of subsidence which would substantiate Darwin's hypothesis of the origin of coral islands.

Dr. E. O. Marks exhibited a geode containing zeolites and lined internally with chalcedony. The specimen was obtained from Nanango.

Mr. H. A. Longman exhibited a juvenile specimen of the "Luth" or "Leathery Turtle," *Dermochelys coriacea*, from the Solomon Islands, which had been presented to the Queensland Museum. He also showed a sketch of a large specimen of this turtle which had been captured by some of the islanders off Anchor Bay in the Torres Strait. The sketch was forwarded by the Rev. W. H. MacFarlane, of Thursday Island, through Mr. Chas. Hedley. The sketch and the description accompanying it left no doubt as to the identity of this giant turtle, which was said to be about 8 feet 6 inches in length and was known to the natives by the name of "Zignaipu."

Messrs. Longman, C. T. White, B. Dunstan, and Drs. E. O. Marks and L. S. Bagster commented upon the exhibits.

Mr. C. T. White communicated a paper by the late J. H. Maiden and Mr. W. F. Blakely entitled "Descriptions of Seven New Queensland Acacias and One New Variety." The following new species are described and illustrated: *Acacia angusta*, *A. semirigida*, *A. pustula*, *A. attenuata*, *A. semilunata*, *A. jucunda*, *A. glaucocarpa*. *Acacia stipuligera* F. v. M. var. *glabrifolia* is described as a new variety.

A paper by Mr. G. H. Hardy entitled "Notes on Tasmanian Flies of the Genus *Atherimorpha*" was taken as read. The paper deals with a genus of the Leptidæ originally described from Tasmania, of which two species are now known, and three forms of one of these species are recognisable by slight structural and colour characters.

The President and Messrs. D. A. Herbert and H. A. Longman commented upon the paper by the late J. H. Maiden and Mr. W. F. Blakely.

Succouring Sheep—4,000 Fed on £1 a Day.

It remained for Mr. J. C. Rome, of Longford Downs, in the Julia Creek district, to solve the problem of keeping his flock of 4,000 sheep alive at a minimum cost of 18s. 10d. a day, as against £30 a 1,000 paid by some selectors and stations for agistment, with an attendant risk of losing a great proportion of the flock and the trouble and expense of reaching the agistment country (says the "Flinders Chronicle"). His idea is a simple one, and consists of a motor-truck which contains a pumping apparatus, the whole outfit costing £450, and when not pumping can be used in transport work. The pump is placed in the bore drains with hose attached, and the water is sprayed for a distance of 200 feet on each side of the drain, and when the ground has been given sufficient moisture it is removed further along the drain and a similar process followed. The soils respond immediately, and in about a week after there is a splendid crop of natural grass, several inches high, on which the sheep are depastured. By this means Mr. Rome has kept his sheep in excellent fettle, and can even turn off fat wethers if he desires. We understand that since Mr. Rome has demonstrated the success of this method, several other selectors, who at first laughed at the contrivance, are now adopting a similar procedure with equal results. Mr. Rome's property is situated only 6 miles from Julia Creek.

The foregoing news item is of more than ordinary interest, and on its being placed under the notice of the Agricultural Chemist, Mr. J. C. Brünnich, he made the following observations:—

"On turning over my records I find that, about the middle of April of the present year, Mr. J. C. Rome submitted a sample of water for analysis, to be tested with regard to suitability for irrigation purposes, and it was found that this water was of such purity as to be eminently suitable for such purposes.

"Mr. Rome's success is such as would justify other pastoralists who have a plentiful supply of water in submitting samples for analysis, in order to ascertain the value of such water for irrigation purposes."

Alleged Discovery of Remedy for Bunchy Top.

The Minister for Agriculture and Stock (Hon. W. Forgan Smith), in commenting upon a statement regarding the alleged discovery of the cause of bunchy top and its remedy that appeared in the Press recently, pointed out that it had been demonstrated beyond doubt that bunchy top is a disease due to the presence of an ultra-microscopic germ which is transmitted from affected plants to other plants by means of the dark banana aphid, *Pentalonia nigronervosa*, and once the disease has made its appearance in any stool nothing can remove the disease from that stool or from the affected stool. It cannot be over-emphasised that there is likewise proof to the effect that there is no connection whatsoever between any fungus and bunchy top.

It is regrettable that a banana-grower should be so carried away by his enthusiasm as to forget that before anyone can state that a fungus is the cause of a disease, it is necessary he should be equipped with the knowledge and apparatus which will enable him to isolate the fungus, cultivate it, and obtain pure cultures therefrom, and finally inoculate plants grown under specially protected conditions with the pure culture and so produce the disease.

The statement recently published to the effect that a fungus produced the disease may mislead many growers. The scientific world to-day accepts the verdict that bunchy top is a disease due to a microscopic germ transmitted as already indicated, and no growers who have heard any one of the numerous lectures given in clear language by Professor Goddard, recounting the methods by which this has been proved, have ever failed to recognise that the evidence is 100 per cent. efficient. If anyone who at all doubts the truth of the above will visit the University at Brisbane, they will have the opportunity of having demonstrated to them the production of bunchy top by treatment of healthy plants with aphides transferred from bunchy top plants, and at the same time have the opportunity of seeing all parts of bunchy top plants, from which aphides have been removed, placed on healthy plants or mixed up with the soil in which healthy plants are growing, and having demonstrated to them that in the absence of the aphides the healthy plant will not develop the disease.

Those who are engaged in attempting to protect the banana industry at the present time feel that it is their duty to warn growers against taking notice of some of the wild statements that have recently appeared in the Press.

Work of an elaborate nature is being prosecuted at the present time by Professor Goddard at the University of Queensland in connection with other aspects of the bunchy top problem and at the same time this work is being followed up by experiments in the field.

In conclusion, the Minister earnestly urges all banana-growers to follow out the recommendations made by the Bunchy Top Investigation Committee.

Co-operative Marketing—Standardised Products.

Many persons, when considering the possibilities of co-operative marketing (writes Mr. H. E. Erdman, in a circular of the College of Agriculture of the University of California), are inclined to think in glittering generalities of things a long way off, little realising that some of the most likely fields for activity on the part of their marketing organisations are close at hand. Among those closest at hand are the possibilities arising from standardisation of varieties and from improvement in production.

Members of a co-operative association often resent having the management discuss production. The management, in their opinion, has been hired to sell. It must be remembered, however, that the management is in a position to know what varieties and qualities the market demands, and it should be expected to point out the facts to the membership. Producers do too much experimenting with varieties. Co-operative organisations can do much to bring about standardisation along this line by discouraging the production of the less desirable, and by bringing about the general adoption of a few of the best breeds and varieties.

Co-operative organisations can promote the adoption of those practices which tend to make for standard quality of product in the community. The general adoption of what have been shown to be the best methods of spraying and pruning orchards, for example, should make for uniformity of colour and appearance in the fruit. Already in certain sections of California the spraying and pruning of citrus fruits is done by the co-operative packing associations—largely, it is true, on account of the greater efficiency thus obtained, but also because of the greater uniformity of the product. For similar reasons many of these associations have also undertaken the co-operative picking of the fruit.

In many instances the financial gains from the better standardisation of the product are greater than any possible saving in costs of marketing. One of the outstanding advantages gained by the Danish co-operative creameries in selling their butter on the English market arose from this line of action. Danish bacon offers even a more striking example of planned production. In this case it was discovered that the English trade demanded bacon from a peculiar type of pig. Thereupon the Danes set about by organised effort to produce that particular type.

Another outstanding possibility for co-operative marketing organisations consists in improving and standardising grade and pack. The greater the control of the central organisation over the product, the greater the possibility that a high degree of perfection may be reached along this line. Improving and standardising grade and pack should make marketing more efficient by (a) raising the level of quality of the product; (b) improving its carrying quality; and (c) permitting readier agreement between buyer and seller.

Painting Farm Buildings.

The pigments generally used for the preparation of the colours commonly used in the painting of buildings are as follows:—

Stone colour: Burnt Turkey umber, raw Turkey umber, yellow ochre.

Drabs: Burnt umber and yellow ochre.

Bufs: Yellow ochre and Venetian red.

Greys: Lamp black, Indian red, ultra-marine blue, vermillion.

Brown: Burnt sienna, Prussian blue, yellow ochre.

Greens: Brunswick greens, dark and light, with blue and chrome yellow.

The white lead is ground to a paste in oil, ready to mix with more oil, &c. (as stated in last week's notes), to prepare it for use. The colouring matter is mixed in a similar way and added to the white lead and oil until the required tint is obtained. The whole is then strained, either through a piece of canvas (usually a piece of chaff bag tied over the mouth of an oil drum), or a fine-mesh wire strainer, the paint being worked through with an old brush. If found to be too thick for immediate use, a little oil and turps may be added. The strainer when finished with should be placed under water to keep it soft and fit for future use. If mixed paint has to be laid aside for a few days, it should be covered with a little water to prevent a skin forming on the surface.

The most useful brushes for ordinary work are the flat type, in sizes from 1½ to 5 inches wide. They may be used for all work, including cutting in around sashes, mouldings, &c., or for painting of broad surfaces, such as weatherboards. New brushes should be set for a few hours in clean water or raw oil before being used. At no time when out of use should they be exposed to the air, but set into clean water, say, 2 inches deep, sufficient to keep the ends of the bristles soft. To clean a dark colour out of a brush so that it can be used in a lighter colour, work it briskly in a little raw oil, which can afterwards be used in other paints. To clean a brush that has been neglected, soak it in hot turps, kerosene, or a strong solution of washing-soda.

See that the surface to be painted is cleaned down—that is, all dust brushed off and anything that requires rubbing down is attended to, either with pumice-stone or glass-paper.

Start at the top and work downwards, so that if any paint falls off the brush it will not injure the finished work. Apply quickly and evenly, leaving no brush marks, and finish with the grain of the wood. If the paint seems to run, it is either too thin or the surface is not clean—probably greasy, if you are painting old work. This should be given a coat of hot lime-wash, and allowed to dry before paint is applied. Always allow one coat to be thoroughly hard and set dry before applying the next.

If doing outside work, select fine weather when neither dust nor flies are about, as nothing makes the painter more annoyed than to have a dust-storm rise when he is applying the finishing coat.

It is a general idea that the first coat should have only a small proportion of white lead in it. It should really be just the opposite, and have rather more than the next coat, because white lead clings to the wood with far more tenacity than any other of the ingredients in paint. The best lead will keep its hold after the oil with which it has been mixed has disappeared, forming the "chalky" surface so familiar on old buildings, fences, or gates.

The following mixture may be used on rough timber, brickwork, or corrugated iron, and will reduce the temperature of houses when applied to the roof equally

as well as the best refrigerating paint sold:—10 lb. of fresh unslaked stone lime; 1 lb. glue; 1 lb. powdered alum.

Slake the lime with hot water, keeping it well covered over during slaking. Dissolve the glue, also the alum, in boiling water, and add to the already slaked lime, taking care not to make too thin. Strain the whole as for paint, and cover over for two days or more, when it is ready for use. Apply with an ordinary two-knot whitewash brush, giving the work two coats, the first to be thoroughly set before the next is applied; and if on roofs or tanks, apply in cool weather. Colouring matter (ochres) may be added if necessary. A little blue improves at all times.

Manuring Grass Land—Phosphatic Fertilisers.

Farming is a business, and the justification for any farming practice is in the financial results, writes Mr. A. B. Adams, in the "Journal of the Department of Agriculture," Western Australia. The farmer who grows wheat uses superphosphate when putting in his crop, as he realises that, except on particularly good soils, all the previous labour—the clearing, cultivating, &c., of the land—would go for little or nothing without a few pounds of superphosphate per acre. It is necessary for the farmer to realise that grass is also a crop, and a crop even more dependent on the addition of substances which are unavailable or deficient in the soil.

In the case of the latter the working and consequent aeration of the soil tends to render unavailable plant-food more available. In the case of permanent grass land the soil becomes for a period more dense and consolidated, and at this stage, which is a critical period in the history of a pasture, there are few, if any, forces at work to make unavailable plant-food available. After a period land under grass improves in texture, as the soil is opened up by the fine plant roots, and when these roots die channels are left in the soil admitting air. With the increased amount of humus and decaying vegetation carbon di-oxide is given off, which in solution in water has a solvent action on some of the otherwise unavailable mineral reserves in the soil.

GREATLY INCREASED CARRYING CAPACITY.

There are no exact figures available of the cash results of top-dressing grass lands in Western Australia, but observation and experiment show that in the areas of heavy rainfall 1 acre of top-dressed land grows from twice to eight or more times as much feed as an acre of similar land not top-dressed. Though the apparent increase is so great, the actual stock-carrying capacity will usually be increased to an even greater extent, as the feeding value of a plant is governed by the soil on which it grows. If the soil is deficient the plant will also be deficient.

In addition to the direct physical and chemical changes in the soil due to the application of phosphoric acid in a form available to plants, it is considered by Dr. Robertson that there is a change in the soil bacteria. Bacteria being a low form of plant life, they are dependent, in common with other plants, on phosphoric acid, and an increase in the amount of this substance present in the soil will tend to cause an increase in the numbers of the soil bacteria, with consequent improved fertility, as a dead soil is an infertile soil.

A further physical effect that has been noted as a result of the top-dressing of grass land is that the soil was kept cooler and clay soil tended to crack less, these effects being due to the increased herbage shading the soil. Over a period these effects can be expected to increase, as the accumulation of humus in the soil will help to retain moisture and also improve the texture of a clay soil.

THE FINANCIAL ASPECT.

The cost of superphosphate as an annual application frightens many from top-dressing more than a limited area each year, but in a great many cases the amount required to purchase manure will be less per acre annually than the interest charge on the cost of clearing, previous cultivation, &c.; therefore, if it was good business to outlay capital in clearing, it is much better business to spend an annual amount which will probably amount to less rather than more than the interest on first cost, when by so doing such a much greater return is to be obtained. Further, if the land is regularly top-dressed, not only will an immediate return be obtained in increased stock-carrying capacity, which will probably pay some (if not all) the interest charge on previous capital expenditure, as well as the cost of the manure, but there will also be a resultant steady improvement in the quantity and quality of feed on the area. Failure to fertilise will just as surely lead sooner or later to a run-down pasture, unthrifty, poorly grown stock, and unsatisfactory financial returns.

Increasing interest is being taken in the subject of pasture improvement in Queensland, where experience has amply supported the argument in the foregoing paragraphs—that manuring of pastures pays.

Farm and Garden Notes for November.

FIELD.—Farmers are commencing to realise that quick-maturing wheats which possess a degree of rust resistance are more dependable than the slow-growing and often rust-susceptible kinds, which are gradually giving place to these and mid-season varieties.

Growers are advised to make every preparation to work up the surface of the ground immediately after the removal of their crops, so that the soil may be put into good condition to receive any rain which falls, the conservation of which is the best guarantee for the success of the next succeeding crop. Such initial preparation also encourages the early growth of all foreign and weed seeds, and permits of their eradication by the implements used to produce the desired soil mulch. In such manner paddocks are kept clean and the purity of crops is maintained. The careful preparation of areas intended for maize-planting cannot be too strongly impressed upon growers. Deep and thorough ploughing, followed by cross-ploughing and subsequent cultivation of the soil, must precede sowing if success would be attained; and all efforts must be concentrated to obtain a good surface mulch. Failure to follow up the subsequent sowings by harrowing prior to the appearance of the young plant conduces to weed growths and very often entails, by neglect of this operation, subsequent hand-hoeing between the plants in the drills. Harrowing should be discontinued before the plant breaks through the surface, otherwise damage will accrue to the tender shoots of the young plants. When the young maize plant has hardened up it may, with advantage, be lightly harrowed in the direction of the drills, but such practice must discontinue once the plant has attained a height of 6 inches. Close cultivation by inter-row cultivation implements is necessary after every shower to conserve moisture and to prevent weed growth, care being taken to ensure each cultivation being shallower than the preceding one, and so prevent damage to the root system of the plant, which is extensive. Inter-row cultivation should cease with the advent of the cob on the plant; and, if proper attention has been given to the crop, it should, at this period, be unnecessary. Where crops are planted on the check-row principle, inter-row cultivation is facilitated, and more even crops result.

The French millets (red and white), owing to their rapid maturing qualities, form excellent intermediate or supplementary crops, and are suitable for present sowing. Their value for fodder and seed purposes is worthy of more general recognition at the hands of the average farmer.

Past dry periods have impressed upon us the necessity of providing during good seasons against the return of less favourable ones, and in this connection the cultivation of quick-growth fodder plants appeals to us. Many varieties of useful classes of fodder can be cultivated over a large portion of this State; chief of which, perhaps, are the sorghum family for grain and fodder purposes. Of the latter, Sudan grass has much to commend it, and is fast becoming one of the most favoured by stockowners. Grain sorghums, of which Feterita, Red Kafir, and the various Milos are examples, should occupy a more prominent position for purposes of horse and pig feeding, and are particularly suited to those localities which are unsuitable for maize production. Some varieties of sorghum have strong frost-resisting qualities, and lend themselves to those localities where provision for some form of succulent fodder is necessary during the winter months.

Orchard Notes for November.

THE COASTAL DISTRICTS.

November is somewhat of a slack month for fruit in the coastal districts, as the citrus crop, excepting a few Valencia Late oranges, off-season lemons, and a few limes, is over. Pineapples are also scarce, as the late spring crop is finished, and there are only comparatively few off-season fruits ripening. The main summer crop of fruit in the principal producing districts is only in the flowering stage, though that in the more tropical parts is ready for marketing. It is also a slack month for

bananas, as the summer fruit is not yet fully developed, and the bunches that make their appearance are usually poor. They have been slow in developing on account of the comparatively cool weather of winter and early spring, when the suckers were more or less at a standstill. Young suckers should, however, be making vigorous growth now, and the plantation will require constant attention to prevent the stools being overcrowded with too many suckers. Keep the land well worked and free from weeds of all kinds, as good growth now means good bunches in the autumn and early winter. Where there is a danger of the soil washing badly with heavy rain, rows of Mauritius, velvet, or other suitable beans should be planted at right angles to the fall of the land, as the growth they make will tend to hold the soil and thus save any from being washed away. When planting beans of any kind, either to prevent washing or for green manuring, don't forget to manure them, as thereby you will get a much greater yield, and as none of the manure is removed from the soil, as the crop is allowed to lie and rot on the ground, it is all made use of eventually by the permanent crop.

A good all-round manure for a bean crop is a mixture of 1 cwt. of sulphate of potash and 4 cwt. of basic superphosphate or finely-ground phosphatic rock to the acre, and, if the soil is deficient in lime, a dressing of not less than half a ton to the acre will be found very beneficial, as all leguminous plants require lime to yield their maximum return both of haulm and pulse. The pineapple plantations require to be kept in a state of thorough tilth, and no weeds must on any account be allowed to grow. If blady grass makes its appearance it must be stamped out, as once it gets established in the rows it is only a short time before it takes control, and the plantation is ruined, so that it can only be brought back into profit by taking out the pines, killing the blady grass, and, after thoroughly and deeply working the land, manuring it and replanting.

The planting of pineapples and bananas can be continued throughout the month, taking care to see that the land is properly prepared and that the advice given in previous monthly notes is followed. Young pawpaw plants that have been raised in the seed bed can be set out now, as also can young passion fruit. Citrus orchards require to be well looked after; the ground must be kept in a state of thorough tilth, and if the trees show the slightest sign of distress, owing to lack of moisture in the soil, they must be given a thorough irrigation if water is available for this purpose. The trees should be carefully examined from time to time so as to note when young scale insects of any kind are hatching out, and when this is noted they should be sprayed with a weak emulsion of a miscible oil consisting of one part of oil in forty parts of emulsion, as this is quite strong enough to kill any young scales before they develop their protective covering. As stated in these notes previously, no oil sprays should be used when the trees are suffering from lack of moisture, as they are then likely to do more damage than good to citrus trees. If scale insects are very bad, and it is important that the trees are sprayed, a weak lime-sulphur spray, or even a soap and tobacco or weak resin wash, will kill the young scales as they hatch out. In the earlier districts a keen lookout must be kept for the first appearance of the mites, which are the direct cause of the darkening of the skin of the fruit known as "Maori." The first indication of the trouble is that when the sun is shining on the young fruit, it appears to be covered with a grey dust, and if the fruit is examined with a good lens it will be seen to be covered with large numbers of small yellowish slug-like insects which are living on the skin. Spraying with sodium or potassium sulphide washes, as recommended by the Department, or with a weak solution of lime sulphur, will destroy these insects and prevent the fruit from turning black. Borers of all kinds should be looked for and destroyed wherever found. Water sprouts, if not already removed, should be cut away. Vines will require careful attention, and the vineyard should be kept in a state of thorough cultivation. Spraying for downy mildew and black spot should be continued, if necessary, as well as sulphuring to prevent oidium.

Fruit fly must be systematically fought whenever seen, and special care must be taken to gather and destroy any early ripening peaches or other fruit that may be infested. If this is done systematically by all growers, as provided by the Diseases in Plants Act, there will be many less flies to attack the later crops of mangoes and other fruits.

Leaf-eating insects of all kinds should be systematically fought wherever seen, by spraying with arsenate of lead, and potatoes and tomatoes should be sprayed with a combined spray consisting of Bordeaux or Burgundy mixture and arsenate of lead, so that diseases such as early blight and Irish blight may be prevented and leaf-eating insects, which frequently cause very heavy losses to these crops, be destroyed.

THE GRANITE BELT, SOUTHERN AND CENTRAL TABLELANDS.

Keep the orchards and vineyards in a thorough state of cultivation, so as to keep down all weed growth and conserve moisture in the soil. This is important, as, if a long spell of dry weather sets in, the crop of summer fruit will suffer severely from the lack of moisture. Citrus trees should be irrigated where necessary, and the land kept in a state of perfect tilth. Spraying for codlin moth should be continued, and all pip fruit trees must be bandaged the beginning of the month; further, the bandages must be examined at frequent intervals and all larvæ contained in them destroyed. The neglect to spray thoroughly and to attend to the bandages properly is responsible for the increase in this serious pest in the Granite Belt, and growers are warned that they must pay more attention to the destruction of this pest if they wish to grow pip fruit profitably. Fruit fly may make its appearance in the cherry crop; if so, every effort should be made to stamp out the infestation at once, as, unless this is done, and if the fly is allowed to breed unchecked, the later ripening crops of plums, peaches, apples, pears, apricots, and Japanese plums are bound to become more or less badly infested. Combined action must be taken to combat this, the most serious pest of the Granite Belt, and growers must realise that, unless they take this action and see that careless growers do not breed the fly wholesale, they will never keep it in check, and it will always be a very heavy tax on their industry. Rutherglen bug is another serious pest in this district, and is propagated by the million by careless orchardists. The best remedy for this pest is to keep the orchard clean and free from weeds. Brown rot in fruit should be watched for carefully, and, on its first appearance in a district, all ripening fruit should be sprayed with the sodium sulphide wash.

All kinds of leaf-eating insects should be kept in check by spraying with arsenate of lead, and all grape vines, potatoes, and tomatoes should be kept sprayed with Bordeaux or Burgundy mixture, the former for black spot and downy mildew, and the latter for early and late (Irish) blight.

PEANUT GROWING—PREPARATION AND PLANTING.

Peanut seed for planting may consist of—(a) unshelled nuts, (b) nuts broken in half, (c) shelled nuts (kernels). Of these three, the last is the most desirable, for although it is not essential to plant shelled seed, the practice of sowing in the shell cannot be recommended for the following reasons:—

1. Planting whole peanuts will result in a slow and irregular germination, particularly if conditions are dry at seeding time. This will mean later maturity, which is undesirable.
2. With varieties such as Valencia, which contain three to four kernels, the seeding would be far too heavy.
3. Immature, diseased, damaged, and poorly developed kernels cannot be discarded.
4. There is uncertainty of obtaining a good stand.
5. There is greater expenditure of seed.

If a planter is used for sowing, it is essential to use only shelled nuts.

In the case of the small-podded varieties, such as White Spanish, shelling is not so necessary, for if good seed is selected the pods will invariably be found to contain sound, well-developed kernels. There is little danger of overcrowding, as this variety requires much thicker seeding than some of the later and more vigorous types. Sometimes pods containing only one kernel are graded out and reserved for sowing. Another method is to break in half the pods containing two kernels. This method is quick and effective, and has the advantage of saving considerable time, although it will not give results equal to the shelled seed. When unshelled nuts are used they may be soaked for a few hours previous to planting, so as to encourage a more rapid germination, provided they are to be planted in a moist seed-bed. This practice must not be adopted when kernels are planted, as there is a danger of considerably damaging the seed.

Shelling should be delayed until as late as possible before planting (two or three weeks), since less damage is likely to be done to the kernels and a better germination will be obtained. If reasonable care is taken in preparing the seed for planting there will be no difficulty in obtaining a good germination. Hand-shelled seed, although the operation is a somewhat slow and tedious one, is superior to machine-shelled seed. Machines have a tendency to damage or bruise the kernels, causing rotting in the ground of kernels otherwise sound.—A. and P. Notes, N.S.W. Department of Agriculture.

ASTRONOMICAL DATA FOR QUEENSLAND.

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

TIMES OF SUNRISE, SUNSET, AND MOONRISE.

AT WARWICK.

MOONRISE.						
1926.	SEPTEMBER.		OCTOBER.		SEPT.	OCT.
Date.	Rises.	Sets.	Rises.	Sets.	Rises.	Rises.
1	6.8	5.36	5.34	5.50	a.m. 1.39	a.m. 2.9
2	6.7	5.36	5.33	5.51	2.35	2.53
3	6.6	5.37	5.32	5.52	3.24	3.31
4	6.5	5.37	5.31	5.52	4.9	4.7
5	6.4	5.38	5.29	5.53	4.53	4.40
6	6.2	5.38	5.28	5.53	5.31	5.9
7	6.1	5.39	5.27	5.54	6.6	5.44
8	6.0	5.40	5.25	5.54	6.39	6.16
9	5.59	5.40	5.24	5.55	7.9	6.44
10	5.58	5.41	5.23	5.55	7.43	7.24
11	5.57	5.41	5.22	5.55	8.14	8.4
12	5.56	5.42	5.22	5.56	8.47	8.46
13	5.54	5.43	5.21	5.56	9.23	9.36
14	5.53	5.43	5.20	5.57	10.4	10.30
15	5.52	5.44	5.19	5.57	10.50	11.28
16	5.51	5.44	5.18	5.58	11.41	p.m. 12.26
17	5.50	5.45	5.17	5.59	p.m. 12.39	1.39
18	5.48	5.45	5.16	5.59	1.43	2.45
19	5.47	5.46	5.14	6.0	2.49	3.52
20	5.46	5.46	5.13	6.1	3.58	4.57
21	5.45	5.46	5.12	6.1	5.7	6.13
22	5.44	5.47	5.11	6.2	6.15	7.9
23	5.43	5.47	5.10	6.2	7.20	8.13
24	5.42	5.47	5.9	6.3	8.26	9.13
25	5.41	5.47	5.8	6.4	9.30	10.16
26	5.40	5.48	5.8	6.4	10.32	11.9
27	5.38	5.48	5.7	6.5	11.32	nil
28	5.37	5.48	5.6	6.6	nil	a.m. 12.5
29	5.36	5.49	5.5	6.6	12.28	12.50
30	5.35	5.49	5.4	6.7	1.21	1.30
31	...	...	5.4	6.8	...	2.8

Phases of the Moon, Occultations, &c.

The times stated are for Queensland, New South Wales, Victoria, and Tasmania.

7 September	● New Moon	3 44 p.m.
15 "	○ First Quarter	2 26 p.m.
22 "	○ Full Moon	6 19 a.m.
29 "	☾ Last Quarter	3 47 p.m.

Apogee, 7th September, 6 24 a.m.

Perigee, 21st September, 4 18 p.m.

On the 19th of September a conjunction of the Moon and Jupiter will take place about a quarter of an hour before the Moon rises at Warwick. It will, however, afford an interesting daylight spectacle soon after 3 o'clock in the afternoon when the planet should be seen to the left of the Moon, apparently at a distance of less than four times the diameter of the latter from the planet, although many millions of miles will actually separate the two objects.

Delta Capricorni will be occulted by the Moon on the 19th in Southern Queensland. About 9.30 p.m. the star will appear a little to the right of the Moon, which will obtrude itself between the star and the earth, a few minutes later. About 10.10 the star will again be seen on the opposite side of the Moon, low down to the left. The Moon being nearly full, binoculars or a telescope will be necessary to observe this occultation.

The beautiful planet Venus will no longer be such a brilliant object in the morning sky, as it will not rise until a few minutes after 5 each morning during the month, and the Sun will be rising only half an hour later at the end of the month, and it will be practically lost in the approaching daylight.

7 October	● New Moon	8 13 a.m.
15 "	○ First Quarter	12 27 a.m.
21 "	○ Full Moon	3 15 a.m.
28 "	☾ Last Quarter	8 57 p.m.

Apogee, 4th October, 11 12 a.m.

Perigee, 20th October, 1 0 a.m.

October.—Mercury will rise 28 minutes before the Sun on 1st October, on the 15th at 1.18 before the Sun, and on the 31st at 1.49 before the Sun.

Venus will rise at 5.9 minutes before the Sun on 1st October, on the 15th at 7.53 p.m., and on the 31st at 6.26 p.m.

Jupiter sets at 3.12 a.m. on 1st October, on the 15th at 2.15 a.m., and on the 31st at 1.21 a.m.

Saturn sets at 9.13 p.m. on 1st October, on the 15th at 8.27 p.m., and on the 31st at 7.32 p.m.

An interesting spectacle may be seen on the evening of the 22nd when the Moon, rising soon after 7 o'clock, will appear to be attended by the planet Mars, which will seem to be about five or six times the diameter of the Moon to the north of it. Both objects will be in parts of their orbits, which bring them nearer than usual to the earth. The Moon will be at a distance of something like 230,000 miles, and the planet at the much greater distance of about 235 millions of miles.

No occultation of any popular importance will occur during this month, and most of the other phenomena either occur in the daytime, when unobservable, or are of little popular interest.

For places west of Warwick and nearly in the same latitude, 28 degrees 12 minutes S., add 4 minutes for each degree of longitude. For example, at Inglewood, add 4 minutes to the times given above for Warwick; at Goondiwindi, add 8 minutes; at St. George, 14 minutes; at Cunnamulla, 25 minutes; at Thargomindah, 33 minutes; and at Oontoo, 43 minutes.

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

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

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