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Event and Comment.

The Current Issue.

The November Journal covers a wider range than usual, and beside the working and field notes that are usually featured it contains some valuable information on current topics that will be welcomed readily by our readers. A notable contribution to the recent debate on the Primary Producers' Organisation and Marketing Bill, which has since become law, was made by the Minister in charge of the measure, the Hon. W. Forgan Smith, and his Second Reading Speech is presented. Some methods of countering the effects of dry seasons are discussed by Mr. Gibson and Mr. Clydesdale; the principles of Tomato Culture are set out by Mr. Benson; and Mr. Veitch has a note on an important Queensland insect pest. Departmental work in maize improvement is described by Mr. McKeon, while Mr. Clydesdale has added some useful working notes on wheat and pasture improvement. Mr. Shelton discusses among other matters the Poland-China pig, and Mr. Rumball contributes a note on the causes of distended abdomen in poultry. Mr. Mobsby has an interesting report on his work at the New Zealand and South Seas Exhibition. A new contributor, Mr. Davies, has a brief note on irrigation as practised on a farm near Miles. Entomological notes by Mr. Edmund Jarvis, and other sugar features are well supplied. Among selected matter is a striking article on the suitability of tropical Queensland for white habitation by Dr. Elkington, and a note on new cotton laws in California. Altogether this month's Journal is a very readable number.

Improving the Conditions of the Pastoral Industry.

At the instance of the Premier (Hon. W. McCormack) a committee of scientists and experts has been formed for the purpose of investigating thoroughly all phases of wool production, including land settlement, water conservation, land rentals, transport problems, fodder conservation, sheep-breeding, and pests, and carrying out all related research work. In its operations and inquiries, where common interests are concerned, the committee will work in conjunction with the Commonwealth Institute of Science and Industry. The activities of the committee should have an important influence in improving the general conditions of the pastoral industry.

Fat Lamb Raising.

At the recent Triennial Husbandry Conference in Sydney, consideration was given to many valuable suggestions for improving the conditions of the stock-raising industry. Fat lamb-raising was among the matters discussed, and the question was propounded as to why we cannot compete with New Zealand and Argentina in fat lamb export. It was pointed out that in New South Wales, and the contention applies with equal strength to Queensland, there is some of the finest fattening country in the world with a mild winter and, in normal seasons, good grazing conditions. It was contended that, provided we can produce early lambs, there is a period of two months in the markets of Great Britain when first lambs will command a ready sale. The success of the New Zealand farmer in this line of industry has been due to specialisation, and the need for specialisation is just as great here as for wool-growing. A hopeful sign is that small graziers and farmers are fully alive to the fact that quality in the product is an essential. The suitability of the wheat belt for lamb-raising below the Border has been demonstrated again and again, and the same applies to the grain lands of Queensland. At the last Parkes (New South Wales) Show there were some wonderfully fine pens of well-bred suckers suitable for export, fattened under natural conditions and brought direct to the pens from the paddock. In the class for the Border Leicester cross there were nine entries, and not one sucker would dress under 50 lb. Possibly most of them were too heavy for the export trade, but the weights—their ages were from four to five months—were so extraordinary that they have probably not been exceeded in Australasia. The test was severe, as the suckers had been off the grass for three days, and weights were averaged. Some individual weights are eloquent. One of Border Leicester-Comeback fusion dressed 61 lb. from a live weight of 107 lb. Another of the same cross scaled 58 lb. and 100 lb. respectively. A Border Leicester-Merino dressed 57 lb. Other weights were also unusually good considering the age of the lambs. At the Conference the policy of holding the increase of good seasons only to lose it in a dry time was declared to be unsound, and exports are not responsible for any serious flock reduction. In New Zealand sheep totals are kept on a safe level by exporting the yearly surplus. As the necessity of fostering the export market is recognised, organisation and continuity of supply must fitly follow. Taking a general view of things, and allowing for seasonal caprice, there seems to be no reason why Queensland should not add greatly to her wealth by developing further along sound lines—fodder-growing and conservation is naturally predicated—this branch of our live-stock business.

Herd Testing.

The Minister for Agriculture (Hon. W. Forgan Smith) has informed the Press that as a result of representations made by the Queensland Government and others the Federal Government had decided to give financial assistance to associations and State Governments which are carrying out the work of herd testing. In Queensland this work has been performed by and at the sole cost of the Department of Agriculture and Stock. Under the scheme proposed by the Federal Government this State will receive financial assistance for herd-testing services at a rate of 2s. per cow submitted to a butter-fat test. Continuing, the Minister expressed pleasure at being able to make this announcement, for it will enable this State to continue a beneficial service to dairy farmers. It is also gratifying to note, he added, that dairy

farmers generally are taking a keener interest in herd testing, and last year approximately 16,000 milch cows were submitted to a butter-fat test under the departmental herd-testing scheme. He felt confident that by a comparatively small personal effort on the part of the dairy farmer it would be practicable to double the production of the dairy herds in this State. Every dairy farmer should arrange to submit his herd to the butter-fat test and, where necessary, give increased attention to the mating of the cows with the right class of bull. Effort along these lines would result in placing the dairy industry in a much more satisfactory position than at present exists. Under the "Better Bull Scheme," inaugurated by the Queensland Government, provision is made to afford financial assistance to dairy farmers desirous of purchasing an approved dairy bull. The scheme provides that a subsidy will be given for this purpose on a £1 for £1 basis up to an amount not exceeding £50. The Minister added that to his mind the improvement of the productive capabilities of the dairy herd is a natural corollary to herd testing, and this can be effectively achieved by the infusion of improved strains into dairy herds. In this connection he hoped that the Commonwealth Government would be prepared to give consideration to the matter of granting a subsidy for the purpose of the purchase of approved stock for inclusion in dairy herds with a view to generally increasing milk and cream production.

What is Marketing?

Marketing is something more than mere barter, the mere offering of goods for sale. Used in its widest sense the term covers sales organisation, high standards of products and maintenance of quality, output control, utilisation of surpluses, manufacture of by-products, grading, and packing. To regard marketing as just bargaining, and to rely on a more or less inadequate organisation as a solution of the producer's present problem of securing a fair return for his energy and enterprise, is an unsound policy—unsound because it is incomplete. There must be organised effort to regulate the supply to the demand and to stimulate demand to the volume of the supply. The regulation of supplies is the more important factor of the two in the maintenance of price levels. The stimulation of demand is also necessary, of course, though a much slower process than the other. Queensland farmers have already awakened to the necessity of improved methods of organisation which are being followed, too gradually perhaps, by the elimination of waste in marketing and the promotion of orderly distribution. Large fluctuations in production are not in the interests of either the producer or the consumer, and farmers' organisations in this State are already at work towards reducing the risks of market gluts and minimising the losses that they entail. Though much has been done—little more than spade-work actually—there is yet much more to do, particularly in respect to market organisation. The aim should be to secure a steady flow of products in a measure sufficient to supply an increasing demand at prices that will return the farmer a decent wage and a fair margin besides. Consumers must be prepared to pay prices for farm products that cover the cost of economical production and allow a return fair enough to enable the efficient producer to maintain satisfactorily good living standards.

The Pooling of Brains.

A closer study of the economics of agriculture is becoming an urgent need. It is plain that the prosperity of the industry depends as much upon sound business methods as upon sound field practice and scientific animal husbandry. Accurate knowledge of the cost of production, farm organisation, land utilisation, and business co-operation has, it is clear, a most important bearing on the farming industry. In making any change in marketing methods keen opposition is bound to be encountered, and the importance of appointing men of ability and integrity to directive and administrative positions in farmers' marketing enterprises cannot be stressed too strongly. Competency, character, and driving force should be looked for as a matter of course in farmer leaders. In the market place ability must be matched with ability. If we are prepared to pool our interests in industry what is wrong with pooling our brains?

RURAL ORGANISATION.

MARKETING OF PRIMARY PRODUCTS.

MINISTER'S SECOND-READING SPEECH ON THE NEW AGRICULTURAL MEASURE.

The Bill now before the Legislative Assembly for the purpose of consolidating existing Acts of Parliament, which have been of advantage to the primary producers of Queensland, has aroused much interest among the farmers of this State. The principal Act of 1922 was a comprehensive measure intended to organise primary producers in Queensland, bestowing on them certain co-operative powers of organisation and marketing. At its inception that measure dealt with a somewhat difficult situation. Its objective was in the direction of securing a complete organisation throughout Queensland, culminating in the Council of Agriculture, which was given very definite functions. In addition to that, the Primary Products Pools Acts laid down a basis whereby agriculturists could co-operate with a view to securing control over the commodity which they produced, the object being to carry out certain functions which could be of benefit to them. These objects were not only designed to be of benefit to the producers of the commodity, but, by stabilising prices and securing control generally throughout those industries, it was hoped that waste would be eliminated and improved marketing conditions result.

The Government policy is to establish agriculture as a prosperous industry, so that the countryside, as a rural society, may enjoy the opportunities and amenities which are the moral right of a nation's citizens.

Subjoined is the full text, taken from "Hansard," of the second-reading speech of the Minister (Hon. W. Forgan Smith) on the new measure which is of particular interest to our readers.

The SECRETARY FOR AGRICULTURE (Hon. W. Forgan Smith): The problem before agricultural producers is chiefly one of marketing rather than of production, as the latter question has received and is still receiving considerable attention. A great deal has been accomplished in the matter of production, and that work is being pursued steadily by the several Departments of Agriculture throughout Australia, and by the several associations which bring to their work scientific organisation and research with a view to improving production on that side of the business.

It is not enough to produce a commodity. That is only one part of the problem. When it is produced it is necessary that it be marketed properly, having regard to the interests of those engaged in its production and to the interests of those who will finally use that product.

Advantages of Co-operation.

Farmers as a group prior to the passing of these measures were acting, for the most part, as individuals, and as independent units they could do little to bring about improvements in the process of marketing. It is only through concerted action that farmers can strengthen their position and stabilise their business. It is a recognition of those facts that has caused the Government to bring into being co-operative organisations in order that its policy can be given expression to. The doctrine of co-operation is not an untried theory. It is something which has been demonstrated as a practical policy, and one which can be extended in various ways with advantage to all concerned. In the primary producing side of industry in Queensland we have developed co-operation to a considerable extent, and in various primary industries co-operative production and marketing is now the established policy. One only needs to look into the records and experience of various co-operative companies in Queensland to realise the advantage of such organisation not only

to themselves but to the industry, and through the industry to the State as a whole. The Acts of which this Bill is a consolidating measure further extend the principle of co-operation and deal more particularly with marketing. Co-operation as a principle by itself does not accomplish anything. There is no means of laying down a principle and assuming that that principle accomplishes anything of itself. Co-operative effort, to be successful, must be carried on efficiently. Those engaged in co-operation must understand their aims and objects and must carry out their functions in a manner which will bring about better results than the conditions of industry which they seek to displace.

What Co-operation Is.

In that connection Mr. Lloyd S. Tenny, Chief of the Bureau of Agricultural Economics at Washington, has this to say—

“In organising a co-operative marketing association the farmer is not creating an agency that will automatically solve his marketing problems, nor one that is endowed with any supernatural powers. The organisation is nothing more than he and his neighbours working together to do those things which they can accomplish better collectively than as individuals. In moving a product from the farmer's field to the consumer's table certain services must be performed. Can the farmer perform those services more effectively through his organisation, or can they be performed better by private middlemen? Attention to this problem will enable students of co-operation to escape the error of thinking of co-operative organisation as an end in itself.

“The first essential of successful co-operation is that there must be a definite object in view; the organisation must perform a definite service or services. Furthermore, it seems to function more satisfactorily when based on a single commodity or a group of closely related agricultural commodities. Then it must have sufficient business; it must have good management, and finally, it must have a loyal and informed membership. There is no magic in co-operation. It is an attempt by the farmer to solve his own problems, and that means that it will succeed only to the extent that he exercises forethought and judgment. This does not mean that a farmers' organisation should not employ experts to handle the details of his business, but it does mean that in the long run the movement cannot advance any farther than the farmers themselves are able to carry out. For this reason we are all concerned with co-operation as an educational factor. If the farmers learn through the operation of their co-operative organisations something of the economic factors that directly affect them, if they gain in ability to analyse and to evaluate those factors, then much may be expected in the way of permanent improvement through co-operation. Co-operation means working together, profiting by mistakes, and becoming stronger through experience. The form of co-operation which will be of permanent value to the farmer is one which he himself controls and which enables him to learn better business methods and gain a better understanding of his problems.”

That quotation from this Professor of Economics at Washington sums up very succinctly the whole position as it affects us in Queensland. Here we have laid down what may be defined as an agricultural code, having for its purpose the building up of agriculture in this State on an efficient basis with a view to giving the best results to those engaged in primary production. Thought along these lines has pursued various channels in different countries, yet it is becoming more and more impressed upon the legislatures of civilised communities that the conditions of producing the essentials of life necessary for human well-being demand further consideration than has been the case in the past.

“Any Parliament or any individual seeking to deal with society as a whole, having regard to the economic evils that exist at the present time, must have as a starting point a sound agricultural policy that will not only provide for the needs of the people but will provide also that those engaged in the production of the essentials of life shall have a decent standard of living in order to maintain themselves and their dependents.”—Hon. W. Forgan Smith.

Country Life must be Made more Attractive.

The SECRETARY FOR AGRICULTURE: The farmer produces in many cases without any foreknowledge of his marketing conditions. When products are plentiful, when nature has been kind, we often find glutted markets, resulting in losses to those engaged in production, and it would seem that on occasion, due to faulty methods of organisation within a State, the general public are denied the advantages of bounteous Nature. I think everyone in Queensland will agree as to the principle that life for the man engaged in production must be made more attractive than it has been in the past, and that a man upon the land engaged in producing the essentials of life, assuming that he is reasonably industrious and efficient, is entitled to a decent standard of living for himself and his dependents. All social organisation must therefore have its starting point in laying down a sound agricultural policy.

Any Parliament or any individual seeking to deal with society as a whole, having regard to the economic evils that exist at the present time, must have as a starting point a sound agricultural policy that will not only provide for the needs of the people but will provide also that those engaged in the production of the essentials of life shall have a decent standard of living in order to maintain themselves and their dependents.

Problems of Marketing.

The immediate problems in marketing organisation can be summed up, I submit, in the following ten points:—

1. Standardising and improving production;
2. Standardising and improving grade and pack;
3. Stabilising production;
4. Controlling flow to market;
5. Improving distribution between markets.
6. Advertising and the developing of new markets;
7. Collective bargaining;
8. Financing of marketing operations;
9. Making marketing more efficient;
10. Maintaining favourable public relations.

Those ten points sum up the problem confronting not only the Government but organisations called into being by this and other Acts that we from time to time place upon the statute-book. No Parliament, no Government, can do these things of their own volition. They can only be accomplished by the intelligent co-operation of the individuals engaged in these industries, and the application of trained minds to these problems and the calling into being of organisations whose duty it will be to solve and deal with these problems.

In Queensland we have a Primary Producers' Organisation, with the Council of Agriculture as the chief mouthpiece of that organisation. It may be said that that organisation as constituted at the present time leaves much to be desired. It has been criticised from various standpoints by individuals not altogether interested in seeing that agricultural organisation is a success.

Organisation on a Commodity Basis.

The SECRETARY FOR AGRICULTURE: It has also been criticised by people who desire to see agricultural organisation placed on a proper footing. Last year we introduced an amendment of two Acts. That legislation laid down the basis of organisation on a commodity basis. The Council of Agriculture as then constituted was fairly divided on the question, and, as a result, having regard to the principle that men have a right to a voice in the conduct of their own affairs, a compromise was effected by constituting the Council of Agriculture from representatives of commodity boards and representatives of district councils.

When that reorganisation took place my original intentions were the only ones which appealed to me as being sound. An organisation composed of different units such as I have described has proved in operation to be lopsided. You have the position of growers of two-thirds of the products of Queensland being represented by commodity boards and one-third being represented by members of district councils.

In addition to that, bearing in mind that the chief function is successful marketing, I hold that the commodity boards, which are composed of men many of whom are engaged in marketing already and are directly responsible for the successful conduct of their businesses, are the proper bodies to have the supreme control of this organisation. However, be that as it may, this organisation had to be established. We had no experience to guide us as to the lines we should take, and I am satisfied that the Government proceeded along the lines which were best at the time, and that, as a result of what has been done since the inception of the first measure in Parliament, we are able to-day to lay down a basis which will be of a permanent character, and

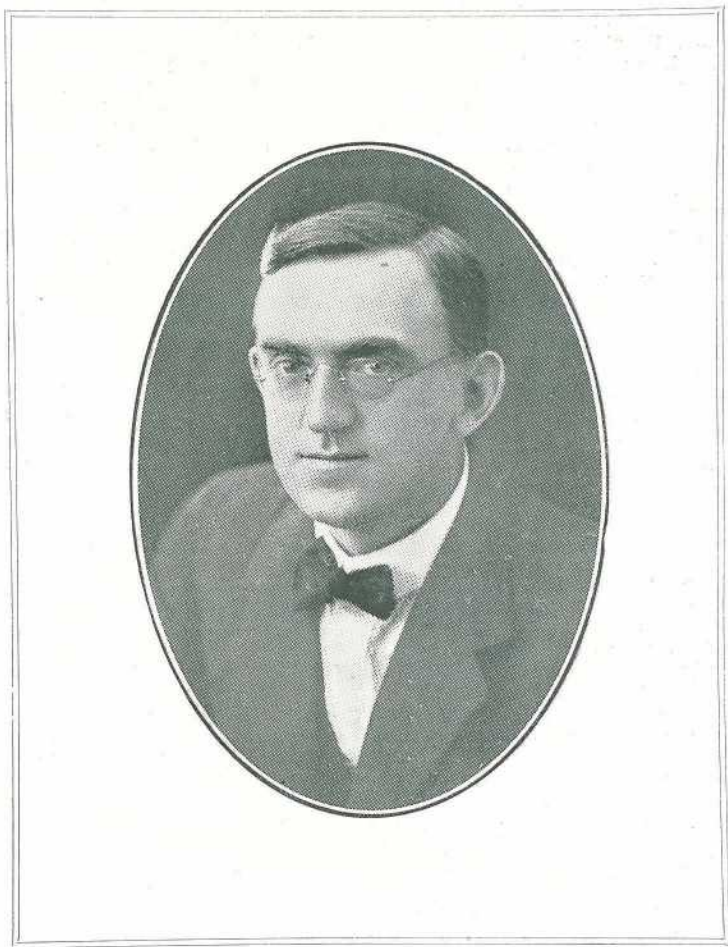


PLATE 82.—HON. W. FORGAN SMITH, MINISTER FOR AGRICULTURE.

which, if used properly and effectively by the organisation itself, will do much to permanently stabilise and improve the conditions of the people in this industry. Agricultural organisation, I repeat, is something that should be encouraged by any Government. We know that these are days of organisation, when every interest in the community is organised to the hilt and able to protect its own interests. It is unfortunate that in the direction of organisation much leeway has to be made up by agriculturists in Australia.

The Lessons of Denmark.

Sir H. Rider Haggard, in dealing with this problem in his very interesting book, "Rural Denmark and its Lessons," has this to say—

"Now let us pass to the indirect but equally tangible results of co-operation. First of these I should be inclined to put the development of mind and character among those by whom it is practised. The peasant or little farmer who is a member of one or more of these societies, who helps to build up their success and enjoys their benefits, acquires a new outlook. His moral horizon enlarges itself, the jealousies and suspicions which are in most countries so common among those who live by the land fall from him. Feeling that he has a voice in the direction of great affairs, he acquires an added value and a healthy importance in his own eyes. He knows also that in his degree and according to his output, he is on an equal footing with the largest producer and proportionately is doing as well. There is no longer any fear that because he is a little man he will be browbeaten or forced to accept a worse price for what he has to sell than does his rich and powerful neighbour. The skilled minds which direct his business work as zealously for him as for that important neighbour. Again, being relieved from all the worry and risk of marketing, he is free to devote himself altogether to the actual business of his life. Lastly, by means of its elimination of expense and by its large dealings, co-operation makes enterprises which are often enough unprofitable individually very profitable collectively. Once more it exemplifies the truth of the Greek fable of the single stick and the fagot, or of the motto of the old South African Republic, 'Union is Strength.' The farmer who standing alone can be broken across the knee of tyranny, extortion or competition, if bound up with a hundred others by the bond of common interest, is able to mock them all. This advantage, too, remains to him: as co-operative societies guarantee the quality of their produce, his market is always sure. In short, co-operation is the real solution of the difficulty so often experienced of making properly farmed but unprotected land pay a living profit and something over for rent or interest on loans invested, with a margin for sinking fund or savings."

I think that quotation sums up the situation very effectively, and contains a lesson which all those engaged in these industries in Queensland should take seriously to heart.

The Farmers' First Line.

I have mentioned that this Bill deals with organisation purely on a commodity basis. The local producers' associations will form the first line of organisation of the farmer. He can form his local organisation to carry out work in his interests. Commodity boards under this Bill may be established either for marketing purposes or without marketing functions. They will be elected directly by those engaged in the production of the commodity concerned. That is to say, the dairyman will be the elector of the butter board, the sugar-grower will be the elector of the sugar board, and so on; so that you will have organisations based on mutual interests representative of and elected by those engaged in the production of the commodities concerned, and those boards in turn will each elect one of their number to be a member of the Council of Agriculture.

Hon. members will see, therefore, that under the new organisation the Council of Agriculture will be an executive comprising the commodity boards concerned. No Government nominees will be on the Council, as at present, and the Secretary for Agriculture will not of necessity be president. In other words, the Council of Agriculture will be composed, as I have said, entirely of representatives of commodity boards, with the Director of Marketing acting as a liaison officer between the commodity boards, the Council of Agriculture, and the Government.

In that connection, I wish to draw the attention of hon. members to the fact that certain persons are endeavouring to serve party interests by making reference to Government nominees on the Council of Agriculture as constituted at present. Everyone who has an intimate knowledge of the work of the Council of Agriculture recognises that the Government nominees have been of incalculable value in the building-up of this organisation.

The Secretary for Agriculture: They are men of wide experience in their various fields of activity, and their efforts have been highly prized by the men who comprise the Council of Agriculture itself, and the council and a conference of commodity boards have both affirmed, not only the principle of Government nominees, but also the desirability of the Secretary for Agriculture being their president. That is a

complete reply to those individuals who have endeavoured to depreciate some of the advantages and undermine the authority of the Council of Agriculture by seeking to create dissension in this respect. It is no longer necessary to have members of my staff on the Council of Agriculture. Under the new organisation the council will be comprised of men who have certain duties to perform and certain responsibilities. They will have access to the Minister as at present. I am pleased to say that my relations with the commodity boards have always been of the most cordial character, and I have no doubt that will continue, and that interviews of mutual advantage will continue to take place. The services of officers of the department who have expert knowledge in various spheres of activity will be availed of in a consultative capacity in any direction desired.

Abolition of District Councils.

The Bill abolishes district councils. With the building up of commodity boards and the extension of marketing functions, I have come to the conclusion that district councils are no longer necessary. In the early stages of development they carried on much organisation work and performed a great deal of good service to the people they represented; but they, in turn, must give way to a better and more progressive organisation. They have served their purpose. We can discontinue them, and save the expense that is now entailed by their maintenance.

The Power of Commodity Boards.

The commodity boards under the new legislation may be constituted on practically the same basis as pool boards are now constituted under the Primary Products Pools Act. The commodity boards will have power to levy for the following purposes:—

1. For administrative expenses.
2. Paying the precept to the Council of Agriculture.
3. In establishing an insurance fund.

The power that the Council of Agriculture now has to levy on produce will be abolished. The commodity boards will have the same power to levy on their produce; they, in turn, supplying their quota by means of precepts for the maintenance of the Council of Agriculture. I consider that a very desirable method of financing their operations, because it provides for greater control than any indirect system. Where the commodity board is directly responsible to its own members for the levying of sums of money for carrying on its organisation and for the manner in which the funds are expended, there will be provided administrative control of finance, which will be to the interest of all concerned. A levy for an insurance fund or any special purpose will be subject to a poll of those concerned. That is to say, for administrative expenses and for paying precepts to the Council of Agriculture the commodity board will have power to make a levy; but with respect to any levy for a special purpose, such as a provision for insurance against various contingencies or for any purpose that may be considered advisable by the board, the growers concerned will have the right to demand a poll before that levy can be made.

The establishment of a pool and the conferring of marketing functions will be decided by a two-thirds majority. The existing pool boards will continue to function as at present.

The Functions of the Council of Agriculture.

There will be some alteration necessary in the functions of the Council of Agriculture. Its duty will be to co-operate with the Department of Agriculture, the local producers' associations, and other bodies in—

1. Developing the rural industries.
2. Advising upon matters to the interest of primary producers.
3. Advising the Minister upon matters he may refer to the council.
4. Advising upon matters brought before the council by associations or boards.

Finance.

The Council of Agriculture will be financed by the issue of precepts upon the Commodity Boards, and will meet annually and on such other occasions as the importance of the business may demand. A grant of £15,000 is made in this Bill as a final grant to this organisation by the Government. After this year no further payment will be made by the Government, and the organisation will be made entirely

self-supporting. In that connection it is interesting to note that since the inception of the organisation up to 30th June, 1926, the Government have assisted the Council of Agriculture to the extent of £95,981. The amounts available to the Council during that period are:—

	£
Grants by the Government	95,981
Levies raised by the Council, 1924-25	20,884
Levies raised by the Council, 1925-26	25,259

The total sum raised by means of levies was £46,143, which, added to the subsidy granted by the Government, gives a total of £142,124. With the £15,000 that I have referred to as being provided under this Bill, and on the basis that a levy collected during the present financial year will approximate the amount raised last year in this way—namely, £25,259—by the end of June, 1927, the Government will have subsidised the Council of Agriculture to the extent of £110,981 against £71,402 raised by levies.

The Sugar Industry.

The Bill also provides for the maintenance of the existing organisation in the sugar industry. It will be remembered, Mr. Speaker, that for some time there have been various forms of organisation in the sugar industry. That is one industry which is in a highly organised condition and can deal with its problems effectively by means of the organisation that has been built up. The Bill provides for the carrying on of that organisation, which is based as follows:—

1. A mill suppliers' committee for each individual sugar mill;
2. District cane growers' executives to deal with the business of each sugar district;
3. A Cane Growers' Council elected by the whole of the sugar industry of Queensland.

Provision is made whereby any primary industry may adopt a similar system of organisation, with, of course, such modifications as may be deemed necessary or desirable to meet its peculiar circumstances.

"I look to the producers of this State to study carefully the problems which affect their own interests and act accordingly. There is no Messiah in the agricultural industry or in the Department of Agriculture who can bring about reform and bring about permanent benefits to this industry. Producers must develop those powers of organisation and the successful marketing of their produce for themselves. In proportion to the intelligence with which they build up this organisation, and in proportion to the loyalty with which they support their own organisation, so will benefit accrue to themselves and the agricultural industry of Queensland be advantaged."—Hon. W. Forgan Smith.

A Director of Marketing.

The Bill provides for a Director of Marketing. He will be a Government officer. He will co-operate with the various Commodity Boards in securing effective marketing conditions, and will act as a liaison officer between the Government and these Commodity Boards.

The Commodity Boards under the scheme will have far-reaching powers. The boards will have control and authority in various directions, but that control and authority is subject to approval by regulation of the Governor in Council. It is desirable for that and many other reasons which are apparent to have this liaison officer, who will conduct business as between the boards and the department, and at the same time give the value of highly specialised services to the Commodity Boards of which ex officio he shall be a member. His salary will be paid by the Government. It will be a charge on consolidated revenue, although the boards will be called upon to pay him the same fee as is prescribed to members of Commodity Boards generally. That fee will be payable from the funds of the Commodity Board, and will be used towards the payment for his services. That briefly describes and defines the organisation on its new basis.

Other Legislation Affected.

The Bill also deals to some extent with other Acts that affect rural organisation. It deletes from the Fruit Marketing Organisation Act, the Stallions Registration Act, and the Agricultural Bank Act, the mandatory clauses which make it necessary for the Governor in Council first to secure the approval of the Council of Agriculture on certain matters of administrative detail. That method has been found in actual practice to be cumbersome and quite unnecessary. Any Commodity Board which desires regulations can easily approach the Minister for them; but, on the other hand, the Minister should not be in the position of having to approach such an organisation for a recommendation to carry out the functions of his office or the functions which properly belong to the executive government of the State.

Also, in connection with the Committee of Direction of Fruit Marketing, the Bill makes it clear that the referendum to decide whether or not the Committee of Direction shall continue is to be decided by a majority of the fruitgrowers actually affected. There is some obscurity about the matter, and this Bill makes it clear that, in the event of a vote being taken for the continuance of the fruit marketing organisations, all fruitgrowers shall be entitled to a vote, and the matter shall be decided on a vote pro or con of those participating in that ballot. That is a fair and reasonable proposition.

Provision is also made that other ballots shall be carried out by the Department of Agriculture. That is the desire of the Commodity Boards themselves, and is a policy of which I heartily approve. If a vote is being taken, say, for the continuation of a pool, it is much better that those connected with its operations should not be liable to the charge that they control the vote for their own continuance. In their interests and in the interests of the public, it is desirable that a body not affected by the vote should control such matters.

I think I have said enough to define the aim, purpose, and scope of this measure, which I believe will provide the basis of a successful organisation of agriculture in Queensland. It will also enable that organisation to be fixed permanently on a basis which will give good results.

I look to the producers of this State to study carefully the problems which affect their own interests and act accordingly. There is no Messiah in the agricultural industry or in the Department of Agriculture who can bring about reform and bring about permanent benefits to this industry. Producers must develop those powers of organisation and the successful marketing of their produce for themselves. In proportion to the intelligence with which they build up this organisation, and in proportion to the loyalty with which they support their own organisation, so will benefit accrue to themselves and the agricultural industry of Queensland be advantaged.

OUR INDIAN HORSE MARKET.

The Minister for Agriculture (Hon. W. Forgan Smith) informed the Press recently that he had received an intimation from the Prime Minister of the Commonwealth to the effect that the Indian Government had stated definitely that, whatever may be the future of horse breeding in that country, it was safe to say that India will require to purchase riding and draught horses from Australia for many years to come. It is obvious, of course, that the Government of India cannot give a definite guarantee as to the precise number of horses that will be required from year to year. The number needed would depend upon factors which cannot be definitely foreshadowed. It is, however, anticipated that the requirements of the army in India are not likely in the immediate future to fall short of 1,000 cavalry and 1,000 draught horses per annum. The breeders of horses in this State should not lose sight of the Indian market. Because of its geographical position Queensland is favourably situated, and with close attention to breeding the type of horses suited for army purposes this State should be able to secure the whole of the trade and provide the full requirements of the Indian army in horse flesh.

It is asserted that owing to the decline of the industry here a large number of horses produced by the breeders in Australia have to be rejected as unsuitable for military requirements in India, and Mr. Forgan Smith expressed the hope that this is only a passing phase and that every effort will be made by breeders here to maintain the high reputation credited to Australian horses.

Bureau of Sugar Experiment Stations.

CANE PESTS AND DISEASES.

The Director of the Bureau of Sugar Experiment Stations (Mr. H. T. Easterby) has made available the following report from the Southern Assistant Entomologist (Mr. R. W. Mungomery) for September, 1926:—

The Soldier Fly and its Association with Cane.

A visit was paid to the Mackay district, primarily with the object of carrying out further investigations in connection with the larvæ of the soldier fly, *Metoponia rubriceps*, Macq., which has been found attacking cane in the vicinity of Finch Hatton. This pest is one of the minor cane pests, and for some unknown reason it has been made to assume a much greater role than its present economic position in regard to the sugar industry warrants. From the point of view of the economic entomologists, its association with cane was of interest and of scientific importance, and was first recorded by Mr. E. Jarvis (see "Queensland Agricultural Journal," 1st August, 1925, page 100). However, without the instigation of the entomological staff, there appears to have developed in some of the growers a feeling akin to fear for this pest, which is out of all proportion to the damage it occasions. Probably on account of its limited occurrence accounts of its damage are circulated from one individual to another, augmented at each step, until one hears reports of its destruction which are by no means indicative of the true economic position of this insect. Whether this latter explanation be correct or otherwise, I would like to stress at the outset, that from my observations this year and from information of previous damage, I think the position of this fly in its relationship to cane has been greatly over-estimated, and without wishing growers to adopt a laissez-faire kind of attitude towards this pest, this statement is made purely in an attempt to allay a feeling of "seare" which might tend to develop amongst growers who encounter this pest for the first time.

On my previous visit to Finch Hatton towards the end of June, the adult flies were seen flying about and pupæ were to be found in the soil, but larvæ at that time were almost totally absent and no damage was being done. At the end of September only the larval stage was present, and these larvæ were doing slight damage to some cane planted in sandy soil on a few farms at the Gorge, Finch Hatton, the sets that had been planted a few months previously being attacked.

The maggots or larvæ were intermingled with the roots chiefly, and seemed to have the effect of destroying portion of the root system and weakening the plant, ultimately causing its failure to strike. Looking back over weather conditions there, we find that a considerable dry period existed previous to the September rains, and the plants attacked were those which had been planted up in July and August, and had been lying in a dry soil from six weeks to two months. Given a fair moisture content in the soil during this period the plants would have come away well before the maggots had a chance to do any serious damage, and an infestation of twenty to twenty-five maggots per set, such as was usually found to be a maximum, would have had little detrimental effect.

The same kind of maggots were found at the roots of blady grass, *paspalum*, couch, and two other local grasses unidentified. Although they were mainly found amongst roots, on a few occasions they were seen with their head portions embedded in the hard rind of the cane-set, and also in the rhizomes of blady grass. That it is a native grass pest which has turned its attention to cane was clearly instanced in one case in particular. A certain block of cane that had a patch infested with maggots was new land and had been growing lantana with a small clump of blady grass for a number of years. When this area was reclaimed and planted up with cane, it was seen that the patch of cane that was infested with maggots completely coincided with the area where the original blady grass intruded into the lantana.

In no case did I find ratoons badly infested with the maggots of this fly, and often these were quite free from pests, whereas in the previous year this cane had suffered infestation in the plant crop. Ratoons sometimes failed to come away owing to the effects of dry weather, or through cutting some varieties of cane too early in the season, or through other causes either individually or collectively. In many cases this state of affairs was invariably blamed to the activities of these maggots, but on digging the stools so affected I found no maggots nor evidence to support this view, and I was forced to attribute their failure to ratoon to some of the causes

enumerated above. Moreover, despite our frequent warnings not to plant bored sets, many of those that had been planted on some of the farms under consideration were found to have been completely destroyed through the activities of the weevil borer (*Rhabdocnemis obscurus*), and this damage was also credited to the Stratiomyid fly larvæ, which further led me to the above conclusion concerning its exaggerated position.

Control.

Up to the present no properly conducted control measures have been instituted against this pest, although numerous suggestions, such as the use of paradichlor., carbon bisulphide, and dehydrated tar and sawdust, have been made to the growers; and the fact that so few of these have thus far been tried is probably indicative that the pest has not assumed serious proportions.

Rotation of crops has been attempted, and potatoes were put in on one farm that was previously infested, but the block has not since been planted with cane, and, although on my last inspection the number of larvæ found were very small, it is premature to say that this procedure has been instrumental in checking their increase in that particular spot. However, other natural methods of control should be carried out, such as clearing all land under cultivation of grasses and keeping it clean; also the periodical firing of blady grass at the times when each brood of flies is emerging. These flies are slow of flight and sluggish, especially the egg-laden females, and numbers of these would fall victims to a good, brisk fire.

Some growers have been liming their sets, and claim to have had success with this method, but, unfortunately, no control plots were left by them, so no definite data concerning the results can be obtained. An experimental plot was laid out with the object of testing out this practice, and results will be watched with interest. However, weather conditions at the time were such that it is doubtful whether any definite conclusions will be drawn from this course.

Other Pests.

Weevil borers were still bad on some farms around the Gorge, and in parts of the Farleigh district. Cane at the Plane Creek mill coming from Carmilla was seen to be lightly infested, but as this cane has fortunately been mostly burnt this season, the danger of the weevil spreading to the Plane Creek areas is minimised. Wire worms (*Elatерidae*) had done some damage to young plant cane in the "glue pot" soils of the Racecourse area, and to a lesser extent around Mielere. At this last-mentioned place I discovered mole crickets (*Gryllotalpinæ*) attacking the young shoots on germinating sets.

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

Innisfail and Babinda.

Leaf Scald is practically epidemic in these districts. The average percentage of infection in those farms visited in the two districts is probably in the vicinity of 3 per cent., which is dangerously high and means considerable monetary loss. Fields where the infection exceeds 10 per cent. were found at Miskine Siding and South Johnstone (S.J.), Mourilyan, and Liverpool Creek (M.) and Mundoo (G.), and at Frenchman's Creek, Deeral, East Russell, Barclay's Road (B.). The losses caused, coupled with the infectious nature of the disease, should ensure us of the co-operation of every grower in the district in its eradication.

7 R 428, H.Q. 426, N.G. 24, and to a lesser extent N.G. 15 infected stools have now largely reached the acute stage, wherein the sticks quickly wilt and later die from the top downwards. This wilting stage differs in appearance from a "grubby" stool, in that with Leaf Scald (1) some of the sticks are often apparently unaffected; (2) the wilting is not necessarily nor usually from the tips and margins of the leaves towards the mid-rib, but usually from one or more grey-blue streaks which are occasionally dotted with dull red; (3) in the case of one or more of the suckers at the base of the stool a fine white line can often be found running right down from the leaf margin to the base of the leaf sheath. This is the definite or critical symptom, though it is difficult to find just now in 7 R 428 and H.Q. 426.

Leaf Scald differs from Top Rot and the sclerotial diseases of the leaf sheath now very prevalent, in that with the latter there is a narrowing and choking of the cane tip, the death and offensive rotting of the heart leaves, the outside ones often remaining green; the shooting of only the topmost eyes, and the absence of the pencil line.

N.G. 15 is still largely in the chronic stage, wherein the fine white pencil line can be found on the upper leaves. This merges into a more injured state wherein the heart is badly infected, the inner leaves show considerable bleaching (or chlorosis) and distortion, and the pencil line can only be distinguished, if, as often happens, it has turned red. The side shoots are well developed and show the pencil line or much chlorosis. Stems in this state slowly die back from the top.

Control.

In view of the rapid spread of the disease in recent years it is obvious that no seed cut from a diseased farm can be guaranteed clean, however lightly infected the farm may appear. This being so, I looked carefully for a farm which could be declared clean, but in vain.

Similarly, at Babinda, several farms, now lightly infected, are being concentrated on, with the assistance of the cane inspectors, so that these may be used with confidence as distributing centres of cane for planting purposes. Meanwhile the following measures are recommended:—

1. If the field is apparently less than 5 per cent. infected, dig out diseased stools, preferably when the cane is young, in plant and first ratoon cane. Two or three inspections should be made before the cane is six months of age.
2. If possible, plough out after harvesting all fields more heavily infected.
3. Select seed with the utmost care, avoiding even those stools adjacent to infected ones.
4. Sterilise knives by immersing them for thirty seconds in boiling water before cutting a clean or a lightly-infected field, as the germs of the disease—bacteria—have actually been transmitted from infected to clean cane by knives.
5. Discard, for the present, the more susceptible varieties, H.Q. 426 and 7 R 428.

ENTOMOLOGICAL HINTS TO CANEGROWERS.

By EDMUND JARVIS.

When to expect Appearance of Cane-beetles.

Greyback cockchafers will probably emerge from the soil towards the middle or end of this month, the date of such appearance being dependent, of course, on the amount of rain received about that time.

Farmers chancing to notice large numbers of these beetles on feeding-trees growing close to headlands would do well to collect and destroy them. Such control work would prove profitable during a period of about six weeks following the date of emergence. The position near fences of favourite food-plants of this insect—notably, the native figs (the weeping or broad-leaved varieties), and the so-called Moreton Bay Ash tree (*Eucalyptus tessularis*)—should be located a few weeks beforehand; since these, if visited at intervals of two to three days subsequent to first appearance of the beetles, will serve to indicate the probable degree of grub-infestation for the coming season.

Fighting Leaf-eating Caterpillars.

During the middle of last month (October) a rather serious infestation of *Cirphis unipuncta* occurred among cane at Woree, the caterpillars of this moth being in such numbers as to demand the adoption of control measures.

The advance of these "army-worms" was successfully combated by spraying the cane leaves with arsenate of lead, in proportion of about six ounces of the poison to one kerosene tin full of water. The solution, however, could have been made much weaker, as 2 lb. lead arsenate to 50 gallons of water has proved an effective spray for such leaf-eating caterpillars.

When applying same, it is always advisable to treat a strip about 10 ft. wide of the untouched cane into which the army-worms are advancing, in addition to that upon which they may be feeding.

Occurrence of Cane Butterfly.

Damage to cane caused by larvæ of this butterfly (*Melanitis leda*) resembles that characteristic of army-worm attack. Caterpillars of the former insect, however, can be at once distinguished from those of other lepidopterous species affecting cane, owing to its having two long blackish horns arising vertically from each side of the head, and by its tail extremity being prolonged horizontally into two fleshy points.

The fully-grown caterpillar is about $1\frac{1}{2}$ in. long, with body tapering gradually towards each end. An interesting infestation of this cane butterfly was noticed by the Assistant Entomologist (Mr. A. N. Burns) last month at Sawmill Pocket, where the caterpillars were present in great numbers, and causing conspicuous damage to the young cane plants. We should be glad to receive notice from any growers who may chance to observe these caterpillars in their canefields.

Importance of Co-operation between Entomologist and Canegrower.

Farmers are again reminded that assistance of an entomological nature afforded them by the Sugar Bureau could be taken more advantage of, not only as regards the liberation amongst their borer-infested cane of Tachinid parasites, but also in respect of identification of the various insects, useful or otherwise, associated with cane, which they may happen to encounter from time to time. Any insect specimens forwarded to us (addressed Entomologist, Meringa, Private Bag, Cairns) will receive prompt attention.

FIELD REPORTS.

The Central Field Assistant, Mr. E. H. Osborne reports (23rd October, 1926):—

Sarina.

Next year's prospects were much improved by recent rains. Most of the early plant was backward, many fields showing an undue proportion of misses, helped probably by the heavy soil covering that was thought necessary in such a season. Planting operations were general. D. 1135, M. 1900, Q. 813, H.Q. 426, Malagache, Innis, and E.K. 28 are all grown hereabouts, the three former being most in evidence. D. 1135 has given good results in this area, and the writer noticed a small plant paddock cutting 35 tons per acre, with its last two tests being 16.1 and 15.7. Moreover, this was growing on a good alluvial flat.

Frost was responsible for a certain amount of damage in the Sarina area. M. 1900 seems to have suffered most. Good work was being done by the mill, and the power alcohol works were also nearing completion, assuring further prosperity for this very go-ahead sugar centre.

Disease and Pests.—Red Rot was seen in several paddocks at West Plane Creek, principally in M. 1900, and to a smaller extent in Black Innis. Growers are again earnestly advised to use only the very best of seed, and after ploughing out a badly-infested block use a lime dressing and if possible a green manure crop.

Knife Cut was noticed in D. 1135 and M. 1900, and also in White Bamboo.

Grubs were also responsible for much damage in the Plane Creek areas this year, notably West Plane Creek. Several growers mentioned that Greyback beetles had been very plentiful about the end of last year. Fumigation had not been tried upon any of the farms, and it is a great pity that where the annual loss is so heavy such precautions are not taken.

Lime (burnt) was used upon very heavy low-lying soil by a grower, with very good results, giving better soil texture and higher c.e.s.

Finch Hatton.

Owing to heavy rain only a very brief visit was paid, but growers were getting in as much work as possible in cultivating operations. The mill was doing exceptionally good work at the time.

Proserpine (including Bloomsbury and Banana Pocket).

Proserpine was visited about the third week in September and had been marvelously freshened by recent rains, tractors and horse teams being fully occupied.

The mill was in full swing and having put through about 5,000 tons of burnt cane from Banana Pocket and a considerable quantity of badly frosted cane, was doing more satisfactory work, helped greatly by the new pan recently installed. About 86,000 tons of cane are expected to be harvested, and the season will probably last until nearly Christmas.

The town itself is still developing, and a complete telephone system has been installed to connect with many outside areas.

Cultivation.—Nearly every grower was making the most of the favourable weather conditions. Several large blocks of Italian-owned cane showed that no pains had been spared to keep same clean, plenty of hoe work being very evident.

Q. 813 was being planted in most cases as most suitable for such late planting. One Waterson grower was trying an experiment of using molasses as a fertiliser upon second ratoons, at about the rate of 2,000 gallons per acre, with untreated check rows near by. This same grower is also draining a very low portion of his farm by using 25 chains of 4-inch tile pipes. His experiments will be decidedly interesting in both cases.

Varieties.—Q. 813, M. 1900, D. 1135, H.Q. 426, N.G. 15, Goru, E.K. 28, Malagache, Q. 116, &c., are the principal varieties cropped, with the two first easily most in favour. E.K. 28 is also receiving a good deal of attention. It might here be mentioned that so far Mackay experience of this variety indicates that it is most suitable to poor and medium soils.

Pests.—Borers were doing a good deal of damage in N.G. 15 (Badila) in one or two parts of the area and inquiries were made as to Tachinid flies being liberated.

Wire worms (so-called) are easily one of the major pests in this area and are the direct cause of much loss to early planted cane. Grubs in the Kelsey Creek area were helped along by such dry conditions, and accounted for a good deal of damaged cane.

Disease.—Owing to unusually dry conditions it was extremely hard to definitely locate any disease, but Red Rot was noticed in Malagache on a couple of farms in Cannon Valley and in M. 1900 and H.Q. 426 elsewhere.

Bloomsbury.

This centre has progressed rapidly within the past couple of years, and is now a settled cane area, with its rich alluvial flats capable of growing heavy crops of cane. N.G. 15, M. 1900, H.Q. 426, and Q. 813 are the principal canes grown, and give good results upon the rich or medium soils respectively. Some very fine crops of young cane (plant) were seen, and also some extremely good young ratoons. Unfortunately, this year's crop was rather below expectations, due to the dry season, and also very heavy frosty conditions, said to be quite an exception hereabouts.

Insect pests and diseases were conspicuous by their absence, too.

Banana Pocket.

This fertile centre has progressed wonderfully during the past four years, being now a very compact cane area. Quite lately a new school has been opened by the Education Department, and attached to the Post Office is a very handy telephone system. A nice large Recreation Hall has been opened and a number of large and comfortable dwelling-houses were seen upon several of the farms. Motor cars and trucks were much in evidence, and in general the "Pocket" presented a very prosperous appearance.

A.I.F. Men's Success.

Most of the growers are ex-A.I.F. Diggers, and it is good to know that, given normal seasons and a living price for cane, they are bound to make good.

Although dry weather, frost, and heavy cane fires had been experienced, the crops in general looked far superior to any seen elsewhere in the Proserpine cane district. Some fine plant N.G. 15, M. 1900, and Q. 813 were noticed, as well as some remarkably good first, second, and third ratoons. N.G. 15 is naturally on such suitable soil the main cane grown and yields very heavy crops. Q. 813 also does very well upon the mixed forest and scrub soil, the ratoons in particular giving very good density returns. M. 1900 upon the heavy black soil is very promising.

As far as disease or pests are concerned, the only one noticed was some army worms attacking Badila ratoons.

Banana Pocket growers are advised to try and keep their cane as clean as it now appears, by using none but the very best seed taken from their most vigorous cane in their own area.

Bowen.

Owing to the recent rains this area looked greener than it had appeared for a very long time. Unfortunately, it had suffered so severely that many growers are speaking of again going back to tomato growing. So far, practically no planting has been done for next year.

Mr. J. C. Murray, Southern Field Assistant, reports (14th October, 1926:—

Booyal.

Cutting and earthing is in full swing. The growers here have no tramlines, consequently the handling has to be done by horse teams and motor lorries.

Farmers have established a variety plot at the school, under the supervision of Mr. Bates, the teacher. This is a step in the right direction, and is a matter that could be profitably taken up by other districts.

Mosaic disease is showing with a certain degree of frequency. As the writer was several times asked what was the origin and effect of this disease, the following description may be of use:—

Mosaic disease is a very old one in Queensland, having been noticed for over twenty years. Previous to 1919 it was known as "Yellow Stripe." This must not be confused with "Leaf Stripe" or Downy Mildew, this latter disease being due to fungus. B. 208 is a variety that consistently had to be discarded owing to its susceptibility. Later the general term "Mosaic" was applied to this malady. Mosaic was found in Hawaii in 1908, and has also been located in the Argentine, Porto Rico, Louisiana, Florida, Cuba, Jamaica, Trinidad, and Barbados. The disease in question is of the same general nature as the Mosaic disease of corn, and it is probable that it has been attacking this plant a considerable time also.

In dealing with Mosaic disease, plant selection is all important. Assume, for instance, a farmer requires plants from a certain block of cane. Let him get a sharp cane knife and enter the cane at the edge row. On looking along the cane, if there are Mosaic stools, the first thing that will attract his attention is the pallor of the effected stools. A closer examination will disclose that this paleness is caused by the disease gradually destroying the normal green colour of the leaf. This is usually evidenced by short, pale, irregular streaks or blotches on the leaf. On black, purple, or red canes, short, pale streaks are usually to be found on the rind of the cane itself, accompanied by shrinking and sometimes cankering of the tissues. With the cane knife, as he walks along the rows, the farmer can mark the effected stools by cutting the tops off one or two sticks. This is just a very brief description of the malady and method of plant selection, but it is hoped that it will be of some practical benefit to the farmers. Descriptions have often been published of diseases, but, usually, the only ones that the growers can digest are those that are brief and non-technical, the application of which can be converted into terms of pounds, shillings, and pence.

BUNDABERG DISTRICT.

Springfield.

The young plant and ratoon cane here has made a very good start, and if good weather comes shortly will give a fair yield next year. Conditions are as yet unsuitable for fertilisation. Cane varieties doing well are Q. 970 and Q. 813. Farmers are recommended to grow much more of the latter cane than they are doing. H.Q. 285 should be obtained and tried. Growers should bear in mind that Q. 813 is a shy ratooning cane if cut too early in the season. Gummy disease has a considerable hold in this locality, mostly in the M. 1900 Seedling, and the farmers should prepare to give this cane a spell, and this season, when the stools have been ploughed out, a good long fallow should ensue to allow the thorough rotting of the affected trash and root debris. It is impressed on farmers that it will be very unwise to neglect these recommendations.

Growers are doing excellent field work. Fields are well looked after, and there is no particular weed growth. The texture of the soil indicates that light dressings of lime each planting time would be beneficial. The writer believes that pulverised limestone, applied at the rate of about half a ton per acre every three or four years, would be of material benefit.

Farmers are apt to be misled by old sayings that lime exhausts the soil, overlooking the chemical point of view, and its value as a direct plant food; also its very valuable mechanical action on almost all crops. It is probable that in the past dressings of lime have been too liberal, practices not in accordance with the chemists' point of view.

Woongarra.

The autumn plant in this locality is green but growing very slowly, likewise the spring plant. Ratoons and standover look fairly well. The cutting is in full swing. The cane going to the mill is short, but of good sugar content. Gum is very much in evidence in some blocks, particularly in the variety Badila. Other canes affected are D. 1135, H.Q. 426 (Clark's Seedling), Black Innis, and M. 1900 Seedling. Q. 813 and Uba are apparently free from this disease, and H.Q. 285 is showing a certain degree of resistance.

Badila and Clark's Seedling are so susceptible to gumming disease that the further planting of these varieties should be discontinued. The growers should bear in mind that gumming disease promises to be very severe in the Bundaberg district, and they should make every effort to eradicate it. The following hints may be useful:—

Do not take plants from stools containing dead sticks.

Treat with suspicion any stools whose leaves have snuff-coloured or butter-coloured streaks or dead leaves.

Examine carefully cane sets before placing in planter. Any with discoloured cut surfaces should be discarded.

During lunch hour thoroughly clean knives with boiling water; in fact, clean knives always after cutting gummed cane, and be most careful in this respect when cutting plants, especially when cutting in different blocks.

Never buy plants unless they can be viewed in the field.

Sharon.

The cane in this district looks greener than that usually observed. Cutting is in full swing, some of the cane showing very fair growth.

Varieties looking well here are H.Q. 77, H.Q. 285, Q. 813, Black Innis, and E.K. 28. Black Innis and H.Q. 77 are not quite as good varieties as others mentioned. H. 227 is also being grown and making a fair showing. On the river the growers are having difficulty with Mosaic. It is to be feared that their losses are due to lack of early appreciation of the seriousness of this disease. However, Mosaic can be controlled easily enough, even in badly affected areas, if proper plant selection is made.

Mr. A. P. Gibson, the Northern Field Assistant, reports (5th October, 1926):—

CAIRNS DISTRICT.

Weather.

Showery, sunny, windy, and moderately cool nights have characterised the month. The district has been highly favoured, an unusual rainfall of 483 points had been recorded up to the 27th, thus increasing the year's total to 51 in.

Soils.

The sugar land is well balanced—that is, the alluvial deposits and volcanic red soils are proportioned well; this is of great benefit. The former mentioned is mainly found along the flooded lands of the rivers Barron and Mulgrave. Generally, they are higher in organic matter than are the red soils, and in parts are very fertile.

Cane-growing is mainly responsible for the upward progress of the district; it is favoured by having a fine port, with room for future extension. Many great Australian freighters are attracted to it weekly during the grinding season and depart heavily laden with the sugar won from the wonderfully rich soils. Many planters and business people have not fully recovered from the shock of last season occasioned by surplus sugar; this may happen again, therefore it is of paramount importance to encourage new industries which would stabilise the North and attract population to these parts.

The Crop.

Sugar-cane is truly a hardy plant and one possessing wonderful survival powers. Four weeks back the cane areas, especially on the higher and drier lands, were parched; timely rains came along and have caused quite a transformation. In spite of the low rainfall during the early growing period, the district has produced a big and sweet crop. It is expected that something like 548,000 tons of cane will be crushed by the three big mills, and that would be 17,000 tons better than last year. The mill work is good, and the average quality has never been better. Climatic conditions for the greater part have been marvellously suitable for the almost continuous working in field and mill, therefore good progress has been made. It is obvious that the season's output of sugar will easily over-shadow the 72,000 tons manufactured in the year 1925. The cane in general had stood well, and in consequence was weighing surprisingly well. Semi-dry conditions had rather favoured the planter on the moister lands; here the growth and leaf coloration was not affected, and the usual forced growth had been prevented which was an advantage. No damage had been occasioned by high winds or vermin, therefore such lands were raising high-quality crops and cutting well above early estimate, and to a great extent making up for the deficiency encountered on the drier areas.

Climatic conditions have been less favourable for harvesting this month. The almost daily intermittent showers had made the fields and headlands boggy, retarding the work of removing the loaded cane trucks from field to permanent way. This, in its turn, interfered with the factories' supply. The mills are working wonderfully well and reducing the district crop to the tune of over 20,000 tons weekly; even so, they must continue to work their hardest right to the year-end in order to finish. Mulgrave mill is treating its record crop, over 100,000 tons of which had passed between the rollers to the 25th instant; another 85,000 tons are expected. One week 1,050 tons of sugar were made. The rain generally had slightly lowered the quality of the crop.

Cultivation.

Great activity prevails on the farms. Weeds and cane alike are growing apace. This is a time when the interspaces are exposed and when weed growth would soon overmaster the new crop if not controlled. Most farmers realise the importance of this. The use of the expensive hoe and animal-drawn implements are being side-tracked as much as possible, preference being given to the more speedy tractor-drawn ones. The long stretches of dry weather had permitted more thorough preparation of the soil prior to planting.

Ratooning.

This operation should be performed immediately after trash is burned; many methods are adopted; the use of rotary cultivator is becoming popular for this work on the more friable ground free from obstruction.

Planting.

It is false economy to plant inferior seed; three months back attention was called to the planting of poor seed, the resulting crop was disappointing, and the lengthy empty spaces were replanted at a high cost. Planters had put over-much soil covering on plants because of the dry time, and in consequence the autumn strike was somewhat erratic. The spring plant at first germinated shyly; since the rain it has made remarkable progress. The bulk of the cane grown is Badila. More thought should be devoted to when this variety should be planted. A crop late planted on the virgin alluvial deposits and cut at twelve months may possibly yield a more profitable one than if harvested at fourteen months, whereas one planted late on the slower growing red soils may not be sufficiently advanced to harvest, and if cut would be so late that there would be a probability of it missing the ensuing year. It is generally considered that Badila as a plant is at its best at fourteen months, whereas Badila ratoons are at their best at twelve months. At present H.Q. 426 and D. 1135 are being planted; the soil is in fair order, but the work is made rather difficult owing to showery conditions.

Varieties.

It may be said that fully three-quarters of the crop grown are Badila, some areas are too poor to grow this kind profitably; instead H.Q. 426, D. 1135, B. 147, and a little Pompey are grown.

Manuring.

When we consider the great crop of sugar-cane raised annually and the large amount of plant food required in its making, it seems but common sense to return at least a portion of what is removed. Agricultural chemists know what plant foods are required by the cane, soil analyses should tell us if such ingredients are present and if balanced and in an available condition. Various mixtures at different rates per acre are added, the favoured ones are as follows:—

Basic super.—Deposited in drills when planting;

B3 and Howe's mixture.—Used when planting or deferred until the stool is well established, and to ratoons.

Sulphate of Ammonia and Nitrate of Soda.—As top dressings.

Lime is not largely used; organic matter is not being restored to the soil to anything like the extent that it should be.

Diseases.

Leaf Scald was observed throughout the area. Peg Leg: H.Q. 426 stools troubled with this did not ratoon. Leaf Stripe located in a paddock of Pompey has just been cut; the complaint may not appear until the year end. Mosaic: One stool of Shahjahanpur No. 10 contained this disease and was eradicated.

Pests.

Cane grub, weevil borers, and rats have caused very much less damage to the crop this year. Larvæ of the big moth borer, the tineid, the bud, and mid-rib borer were found abundantly. The tineid were widespread and were damaging ratoons. Their presence may be detected by the dead hearts of shoots.

Termites (White Ants).—It was interesting and new to find what appeared to be one of the ordinary wood-eating ants completely eating out cane stems high above the ground level at Aloomba. Cane sets were found destroyed by them in several fields at Freshwater. Yellow leaf ratoon patches similar to those noted at Innisfail were appearing here.

The mottled white patches at present showing on leaves is not a disease, such a condition is brought about by climatic conditions. Ants burrowing down to newly planted cane sets are possibly after insects surrounding the set.

Birds.

Many noisy Friar birds or Leather heads were observed licking the sugary substance exuding from the standing cane after burning. It is to be hoped this will not teach them to peck the standing cane.

Little Mulgrave Area.

This valley of brightness and wealth was again inspected. Big but rather low quality crops were being harvested. More standing scrub had been felled and new areas planted. The error of too close planting was noted, one good plant in a hole, with 3-foot spaces and 5 feet drills, should give satisfaction on such virgin fertile lands. It is expected the river valley portion of the cross-over road to Atherton will be finished by Christmas; this is, perhaps, one of the most interesting and scenic motor trips in Australia.

1927 Crop Prospects.

The unusually long dry spell had improved the soil conditions, and in conjunction with the splendid early rains had greatly benefited the new crop. Fields harvested this year had been ploughed out and replanted, therefore there will be a large area to cut from next year. The foregoing does not seem a wise procedure on the present face of things. It is, however, yet too early to state with any degree of certainty what the new crop will be, other than at present it is looking remarkably well and the making of a big crop.

RURAL CREDITS.

The Minister for Agriculture (Hon. W. Forgan Smith) has informed the Press that he had perused Mr. Earle Page's reply to Mr. Green's question in the House of Representatives on the matter of the Rural Credits Department of the Commonwealth Bank, as reported in the daily Press of recent date. "Dr. Earle Page," said Mr. Smith, "seems to assume that my remarks concerning the defects in the Rural Credits Act arose from an application to the Commonwealth Bank from the Queensland Peanut Pool. This is not the case, and my comment referred to the deficiency in the Act in question as applied generally to the financing of marketing Boards, and relates to all forms of agricultural produce.

"The Federal Treasurer quotes commodities that have been financed by the Rural Credits Department, but so far as I am aware few of the commodities mentioned have received any financial assistance in Queensland from the Rural Credits Department. Evidently, it is the intention to insist upon the pernicious practice of a State guarantee on the money advanced.

"It is obvious that producers must be able to obtain upon the security of their produce sufficient to cover the cost of harvesting and handling as soon as practicable after the crop is garnered and delivered to the Pool. I claim that this amount should be made available without insistence upon a Government guarantee. The Commonwealth Bank, as originally controlled, was prepared to advance on a State guarantee, and after the references that were made to the Rural Credits Department, particularly during the time of the election, it was to be expected that that Department would be constituted in a way that would be more helpful to primary producers.

"Personally, I am disappointed that in actual reality this is not the position, for in the ordinary conduct of trade difficulty would be experienced in giving legal possession of the commodity to a financial institution. This would apply particularly in the case of products that are exported, and where sales of the article are frequently arranged during the transit of the steamer overseas."

AN IMPORTANT QUEENSLAND INSECT PEST.

By ROBERT VEITCH, B.Sc., Chief Entomologist.

During the month of October many inquiries were received by the Department of Agriculture and Stock regarding the destructive activities of a small insect generally referred to as a "fly" or "moth"; these inquiries, on investigation, were found to refer to a small bug belonging to the Lygaeidae. Nearly all the insects included in this family of bugs are small, but certain species sometimes occur in such enormous numbers as to justify their classification as important pests, and, in fact, one species—the chinch bug—is generally regarded as being among the ten most destructive insects of North America.

The bug responsible for the present serious losses in Queensland (*Nysius* sp.) is a very small insect that measures slightly more than an eighth of an inch in length when it has reached the mature winged stage (see Fig. 1); it is then of a dull greyish brown colour and possesses two

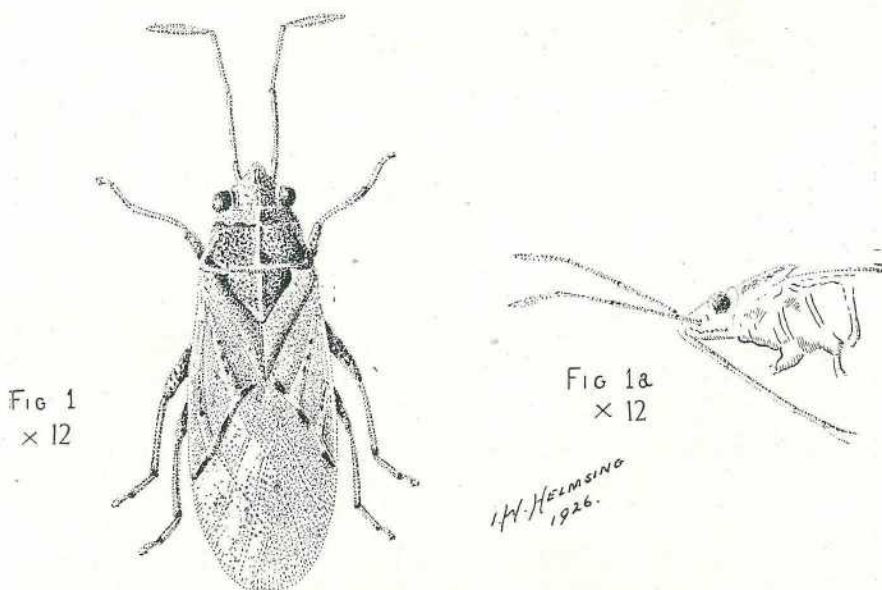


PLATE 83.

Fig. 1—*Nysius* sp.; mature insect. Fig. 1a—Side view of head, showing beak or rostrum on underside of body.

pairs of gauzy, silvery-grey wings that are folded flat on its back. During the daytime it moves about rather actively and readily takes to the wing when disturbed, but in the early morning and evening it is much less active.

A typical insect belonging to this group has three stages in its life cycle, the first being the egg stage; after the usual incubation period the eggs hatch into very small bugs that generally bear some slight resemblance to the mature insects into which they will later develop. These small bugs feed, grow, and moult several times and eventually produce the

mature winged stage; the mature insects then mate and lay eggs and so the life cycle is repeated.

The feeding habits of the bug are typical of the order to which it belongs in that it pierces the skin or epidermis of the leaf, stalk, or fruit on which it is feeding, and, through the puncture thus formed, it sucks the plant sap into its own body. The mouth parts are modified to form a beak or rostrum (see Fig. 1A) that performs this piercing and feeding function admirably.

The damage caused by each individual bug is trivial, but, unfortunately, at the present moment the bugs occur in enormous numbers in many fields and orchards, and the combined effect of their feeding is exercising a serious adverse influence on the plants attacked. When field crops are infested the leaves wilt and frequently die and the yield of the crop is thus seriously reduced; when the outbreak is in an orchard, many of the young attacked fruits fall to the ground, and of those that still remain on the trees many are blemished.

The bug has been found attacking many plants, among which mention may be made of the following:—Potato, tomato, peach, cherry, mango, grapes, and cotton. Its range of host plants is probably a very wide one.

With regard to control, it must be admitted that this pest is by no means an easy one to handle, and further field investigations are necessary before the position can be regarded as being at all satisfactory, nicotine sulphate, and kerosene emulsion have been used as sprays, but, for various reasons, these sprays cannot be regarded as offering a satisfactory solution of the problem of control. Spraying with such poisons as arsenicals should not be employed against this pest because it does not eat the foliage on which it is feeding, but merely punctures the skin or epidermis and sucks out the sap without eating the tissue that has been poisoned by the arsenical spray.

It seems probable that the most hopeful line of attack, if the area to be treated is not too extensive, is to use some mechanical means by which the bugs can be collected in large numbers. In New South Wales an endeavour has been made to do so by using sheets of galvanised iron the sides of which are turned up slightly to form shallow containers in which is placed a mixture of kerosene and water in the proportion of one pint of kerosene to one gallon of water. These containers are placed under the branches of the trees in the very early morning and the branches are then jarred sharply, when it will be found that numbers of torpid bugs fall into the kerosene and water and are rapidly killed. If sheets of iron are not available, or are regarded as too expensive, any large sheets of canvas or other material could be spread beneath the trees and when the bugs have been jarred on to these sheets they could be gathered up and the bugs shaken into a kerosene tin containing kerosene and water.

Where fields crops have to be treated it may be possible to exercise a certain measure of control by using a modification of this method by drawing shallow containers between the rows and beating the plants on either side to drive the bugs into these containers.

It will be realised from what has been said that there is as yet no easy and effective means of handling this serious pest, and it must be included in the category of those that require much further investigation. It is hoped, however, that if practicable under local conditions, some measure of relief may be obtained by the mechanical means just described.

TOMATO CULTURE.

By A. H. BENSON, Director of Fruit Culture.

Numerous inquiries are being received by the Department of Agriculture and Stock relative to the growing of tomatoes and to the diseases to which this fruit-vegetable is subject, and as no departmental pamphlet dealing particularly with this matter has been issued I purpose attempting to make good the omission and trust that the information contained in this publication, which has been collected from many sources, may prove of value not only to beginners but also to those who have been growing this crop for many years. During recent years few commercial crops have come into prominence more rapidly, become more sought after or universally used, than the tomato, as, despite the fact that it was introduced into Europe from South America at about the same time as the potato, it is only within the last half century that its use has become general—at any rate as far as Great Britain and her Dominions are concerned—and now it is in every-day use and in universal demand.

Like its near relative the potato, the cultivation of the tomato is practically world wide, and as far as Queensland is concerned it is in fruit throughout the year in one part of the State or another, and can be grown successfully from Stanthorpe in the south to the far north, and from the coast to extreme inland points where water is available. The tomato is thus always in season in this State and is fruiting freely in one part or another. In the Bowen, Townsville, and coast districts further north it is at its best during winter and early spring, and in coastal districts further south, where there is a total absence of frost, winter fruit is also grown, but the main crop is later than that of the more tropical North. The Brisbane district produces a heavy spring and early summer crop, and this is followed by a summer and autumn crop in the Stanthorpe district. In addition to these districts, tomatoes are grown generally throughout the State at the time of the year that is most suitable for their development. As tomatoes are always in season in this State, there is no occasion to specialise in the production of early fruit, and the use of hotbeds for raising early plants is not imperative; at the same time, as the tomato season in the Stanthorpe district could be considerably extended by this means, I will deal with this method of propagation later on.

Soils Suitable for Growing Tomatoes.

Although the tomato will grow in nearly any kind of soil, it does best when planted in a sheltered position well protected from cold and heavy wind and in a warm, deep, friable loam or sandy loam that does not become waterlogged during periods of heavy rainfall, or dry out rapidly or set hard during a dry spell. A friable soil that can be kept loose and which possesses the power to retain moisture during dry weather is especially suitable, as such a soil is conducive to the maintenance of an even growth of the plant—a very important consideration, as an intermittent growth renders it more susceptible to disease. Tomatoes should not be grown on land that has just produced a crop of potatoes or tomatoes, but should be grown in rotation with other crops, such as peas, beans, cabbages, maize, or any cucurbitaceous crop, otherwise the land is apt to become contaminated with the diseases attacking tomatoes and potatoes, as these diseases are carried over from one crop to the next. In addition to the danger of carrying over disease, continuous cropping with any one variety or class

of crop is bad farming, as much better results are always obtained by a judicious rotation of crops. The land should contain an adequate supply of all essential plant foods in a readily available form, but should not be too rich in available nitrogen, otherwise there is apt to be an excessive growth of foliage and a reduction in the yield of fruit.

Preparation of the Soil.

The preparation of the soil must be thorough. The land must be well and deeply worked and brought into a state of perfect tilth prior to setting out the plants. This is of the greatest importance, as heavy crops free from disease can only be grown where the plants can root deeply and freely, and are thus enabled to maintain a regular and healthy growth. Lack of care in preparing the soil will result in poor returns, especially if the planting is followed by dry weather conditions.

Raising the Plants.

Tomatoes are generally raised from seed in a specially prepared bed and the young plants transferred therefrom to their permanent position. Occasionally, however, the seed is sown where the plants are to remain, three or four seeds being set out in hills at convenient distances and the young plants thinned out when large enough. This method is not, however, commonly employed, nor is it recommended, except in the case of newly burnt-off scrub land where, if the weather conditions are favourable, good results can be obtained. A well-drained, sheltered spot, possessing a friable loam or sandy loam soil that will not set hard, should be selected for the seed bed, and if the soil is very dry it should receive a thorough soaking prior to its being prepared. The preparation of the seed bed must be thorough; the ground should be deeply worked, reduced to a state of perfect tilth, levelled, and a fine surface in which to sow the seed obtained. It can be marked off into beds of convenient size to facilitate watering and weeding, and it should be protected by means of a light framework covered with hessian or bushes, such as small-leaved tea-tree or others of a similar nature. The seed should be sown broadcast thinly over the surface of the bed and be lightly pressed into the soil and covered not more than half an inch deep. When planted, a light watering is all that is necessary, and the surface soil must be kept damp and not allowed to dry out till the young plants are well established; at the same time great care must be taken not to over-water, otherwise many of the plants will damp off or be destroyed by disease, and those that survive are apt to be weak and straggly. When large enough the young plants should be thinned out, as this will result in the production of strong, stocky plants instead of weak, spindly ones, and if there is any danger of disease they should be given a spraying with weak Bordeaux or Burgundy mixture. Weeds must be pulled out whenever they make their appearance, as the young plants must not be crowded out by weed growth. The beds should receive a thorough soaking the day previous to the lifting of the young plants, as this will enable the plants to be removed without any serious injury to their roots, and they will transplant better in consequence.

In the Stanthorpe district the use of a hotbed in which to raise the plants is well worth testing, as its use would enable growers to start planting out well developed plants as soon as there is no longer any danger from late frosts and thus tend to extend the fruiting period.

The simplest kind of hotbed consists of a heap of fresh horse manure from eighteen inches to two feet deep that is tramped down firmly and

covered with about four inches of fine sandy loam on the top, which is levelled and raked down fine. On this a wooden framework is placed, and this framework is covered with lights fitted with glass which can be raised or lowered as required, or with a screen covered with thick muslin, cheese cloth, or similar material that can be taken off or put on as required. Glass lights should not be essential, as a light covering should provide all the protection necessary against cold or sunburn. Where manure is scarce, the framework of the hotbed must be made much deeper and the manure placed within it, firmly tramped, and then covered with about four inches of fine soil. When the beds are prepared, the seed is sown as previously described. Care must be taken to see that the young plants do not become too tender, and they must be hardened off by removing the covered screens from the top of the frame prior to their being transplanted into their permanent position.

Planting.

The young plants, when removed from the seed bed, must have their roots kept moist and protected from wind or sun so as to prevent their drying out prior to planting, and when set in their permanent position they should be given a little water at the roots, and fine soil should then be placed round them, as this will tend, first, to give the young plants a good start, and, secondly, to retain the moisture round their roots, as the fine soil forms a mulch that prevents surface evaporation. The young plants should be set deeply in the soil, much deeper than they were in the seed bed, as by doing so a better and deeper root system is obtained, which is of very great importance in this State, where we are always liable to a spell of dry weather and where irrigation is in the majority of cases not practicable.

No hard and fast rule can be laid down for the distance apart at which to set the plants, as it depends on the variety, district, time of planting, and system under which the plant is to be grown.

When the plants are staked they can be planted in rows from 3 to 4 feet apart with the plants from 18 inches to 2 feet apart in the row. This gives room to cultivate the ground between the rows and to permit of gathering the crop. Another plan is to plant about 2 feet apart in the row with a good distance (6 to 8 feet) between the rows; but for the main crops, especially in dry districts where systematic cultivation to retain moisture is essential, planting 6 feet by 6 feet or 8 feet by 8 feet is recommended, the latter distance having proved satisfactory in the Stanthorpe and Bowen districts—as much as 10 feet by 10 feet being advocated by some Bowen growers.

Where the land has been well prepared and the soil moisture has been maintained by thorough cultivation, there is seldom any necessity for irrigation, as the tomato does not yield as heavily when over-watered as it does under drier conditions, as an excess of moisture tends to encourage excessive growth and to cause the blossoms to fall without setting fruit. Where irrigation is essential, owing to the dryness of the soil, the water channels should be made, first, close to the young plants and then further from them as the plants spread and cover the land, but care should be taken not to irrigate when the first blossoms are coming out or when the bulk of the crop is ripening.

The land must be cultivated after every watering in order to maintain a fine surface mulch, and it must be kept in equally good order when there is no irrigation as long as there is any space between the rows that can be worked.

Pruning the Tomato.

In order to obtain the best results tomato plants should be systematically pruned. The first pruning takes place in the seed bed, when, if the young plants are weak and spindly, it is advisable to pinch out the terminal bud when they are about 6 inches high. This has the effect of producing a stockier and more vigorous plant.

The main pruning is done when the plants are put out in their permanent positions, and it consists of pinching out the superfluous laterals that start from the axil of the leaves on the main stem or stems. Where the plants are staked they are usually pruned to a single stem and the fruit is produced on the opposite side of the stem to and midway between the leaves. The main stem is topped when it reaches the top of the stake to which it is tied and the whole energy of the plant is directed to the production of fruit, only sufficient leaves or foliage being allowed to remain on the plant to protect the fruit from sunburn. The same method is adopted when the plant is allowed to grow on the ground and several main stems are allowed to develop, as each main stem is treated in a similar manner to that employed in the case of a plant grown on a stake—that is, lateral growths are pinched out and the main stems stopped when they have made sufficient growth. By doing this excessive leaf growth is checked and the production of fruit is encouraged.

Manuring.

Although the tomato requires its plant food to be in a readily available form, thus indicating the desirability of applying quick-acting commercial fertilisers, the best results are obtained by combining the use of stable or farmyard manure with quick-acting fertilisers. The two sources of plant food should not, however, be applied at the same time, as stable or farmyard manure is found to produce too much vine growth at the expense of the yield of fruit if applied at or just prior to planting, and it is better therefore to apply it to the previous crop and to depend on quick-acting manures to be applied at the time of planting or even later. As the tomato is a comparatively short-lived crop and its actively growing period is limited, it must have its plant food available just when it requires it, and this is secured by following the instructions given above.

Several of the complete fertilisers now on the market contain all the essential plant foods required by the tomato in an available form, the percentage of nitrogen, phosphoric acid, and potash being about 4-8-10 respectively. A complete manure recommended by the Queensland Agricultural Chemist, Mr. Brünnich, is as follows, per acre:—1 to 1½ cwt. sulphate of ammonia or nitrate of soda, 4 to 5 cwt. superphosphate, 1 to 2 cwt. sulphate of potash. A top dressing of 1 cwt. to 1½ cwt. of nitrate of soda is sometimes very effective. It should be applied two to three weeks after the plants have been set out and when they have become well established. Care must be taken not to let the nitrate of soda touch the young plants or to apply it too near them; it should be spread broadcast on the ground between the rows and cultivated in. If any difficulty is experienced in distributing 1 cwt. to the acre evenly, mix the nitrate with three or four times its weight of dry sand and then apply.

Gathering and Marketing the Crop.

The exact stage of ripeness at which to gather the fruit depends on the market to which it has to be sent and the time occupied in the journey thereto. In no case, however, should the fruit be gathered until

it has fully developed, which does not mean that it is showing colour, but that the pulp surrounding the seeds fills the inside division or cells of the fruit and is becoming jelly-like. A slight tinge in the pulp is also visible, and in most varieties there is a slight fading of the dark-green colour of the skin at the apex of the fruit, which soon begins to assume a distinctly paler colour as well as browning at the point at which the fruit is attached to the stem. If gathered at an earlier stage the fruit will never develop its full flavour. Gathered at this stage it can be sent to distant markets without any difficulty, but where the market is close at hand it should be allowed to show at least a trace of colour before it is gathered. No hard and fast lines can be laid down, however, as different varieties require different treatment—a matter that can only be determined by careful observation. One thing, however, must be borne in mind, and that is, size has nothing to do with ripeness, and that palpably immature fruit will not ripen properly.

As the fruit, once it has become fully developed, matures rapidly it is necessary to go over the plants at frequent intervals, as if this is not done a quantity of fruit is apt to become over-ripe and unsuitable for any market other than one close at hand, or to be used for manufacturing purposes. The fruit should be handled carefully and all badly blemished or diseased fruit discarded. These should not, however, be left lying about on the ground to rot as is frequently done, but should be gathered and destroyed, as they are a ready means of spreading diseases.

The sound fruit is taken to the packing shed, where it is graded and packed in accordance with the regulations under the Fruit Cases Act and the cases marked with the grade of the fruit they contain. Tomatoes are usually packed in the half-bushel Australian case or the half-bushel long packer which has a central division. The former is the easier to pack, but the latter is preferred by many growers where the fruit has to be sent a long distance.

Varieties of Tomatoes.

Many varieties of tomatoes, varying greatly in size, shape, colour, and quality, are to be met with in this State, a number of which we would be better without. Whitish-yellow, pale coloured, or pale fleshed tomatoes are of little commercial value; irregular-shaped, ribbed fruit is not desirable, nor is outsized fruit. The ideal tomato is as nearly round as possible, from $2\frac{1}{2}$ to 3 inches in diameter, of a light-red colour, both skin and flesh, of firm texture, and, when cut in half transversely, it should show as little white pithy matter as possible and the cells should well filled with jelly-like pulp. The fruit should be free from blemish and the stem set in a small shallow cavity free from cracks or other imperfections. Such a fruit will carry well, is appreciated by the purchasing public, and is eminently suitable for canning or converting into sauce.

The question of improving our existing varieties of tomatoes by careful seed selection of approved types and the discarding of inferior types is well worth attention and it will pay growers to select ideal fruit from healthy, vigorous productive plants for seed.

The method of saving the seed is as follows:—The selected fruit should be allowed to become fully ripe on the plant, and when gathered it should be placed in a wooden tub and pounded into pulp. Fermentation will soon set in and the pulpy matter surrounding the seeds become decomposed and separate from the seed. Water is now added and the mass thoroughly well stirred. The good seed will sink to the bottom and

the pulp, &c., will rise to the top and can be skimmed off. The seed should then be well washed, placed on screens, and dried in the sun.

The following varieties are those most extensively grown in this State:—Burwood Prize, Stone, Chalk's Jewel, Crimson Cushion, and Livingston's Globe. In addition, the following wilt-resistant varieties have been tested and are worth further trial—viz., Columbia, Norduke, Norton, Marvel, Bowen Buckeye, and Denisonia.

Diseases of Tomatoes.

The tomato is subject to the attack of both insects and fungi, and serious losses are occasioned thereby. With respect to the former, the so-called tomato caterpillar *Chloridea obsoleta*, which is so destructive to maize and cotton, causes serious loss to our growers by eating into and spoiling the fruit. The only effectual remedy is to spray the plants and young fruit with arsenate of lead, using 4 to 5 lb. of the dry powder to 100 gallons of water. Several sprayings are necessary, and the first should be given as soon as the first fruit is formed, and this should be followed by further sprayings at intervals of about ten days till the fruits are full grown.

Where fungus diseases such as early or late (Irish) blight are likely to occur, Bordeaux or Burgundy mixture should be used in conjunction with the lead arsenate, as the combined spray or dust will act in the dual capacity of an insecticide and fungicide. Where dusting is used, the dust must be in the form of an impalpable powder, and it should be blown on to the plants by means of a dust gun, preferably a knapsack dusting machine, in the early morning when the dew is on the plants and there is little or no wind, as every part of the plant is then reached. Good results have been obtained recently where this has been carried out in an efficient manner.

Cutworms.

These extremely destructive insects, which remain hidden in the soil during the day and come out at dusk, frequently destroy large numbers of young tomato plants by cutting them off at the ground level. They also feed on the foliage of older plants and seriously injure them. These insects can be kept in control by the use of poisoned baits, the making and use of which is described by the Entomological Branch of this Department as follows:—

“Bran, 50 lb.; Paris green, 2 lb.; molasses, 2 quarts; 3 oranges; water, approximately 4 gallons. The Paris green and bran should be thoroughly mixed together dry; the juice of the oranges, the finely chopped 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. This must be determined by the user, but only sufficient water should be added to have the mixture in a crumbly condition and thus permit of being scattered broadcast on the ground; at the same time sufficient water must be added to ensure that each flake of bran has been moistened with the molasses to make it attractive and also to enable it to carry a small quantity of Paris green.”

Apply the bait in the evening so that it does not become dried up before the cutworms start feeding. If oranges are not procurable make the mash without them; they are only added as an attractant. If a smaller quantity than the above only is required, prepare the same proportions. Keep poultry away from the bait.

Nematodes.

These microscopic worms infest many of our soils and frequently cause serious injury to tomato plants. The worms form numerous swellings on the roots and the plants suffer in consequence. Nematodes are very difficult to control, as once a soil has become infested they are hard to get rid of, as they attack many different crops and many kinds of weeds. They can be materially reduced by growing a crop on the land that they will not attack, as, not having anything to feed on, they die out. On land infested with nematodes tomatoes should never follow tomatoes or potatoes, but a complete change of crop should be made.

FUNGUS DISEASE.

As regards fungus diseases, when weather conditions are favourable for their development—viz., muggy, misty, or steamy weather and a more or less saturated atmosphere—they cause serious loss and are very rapid in their effects.

Damping Off in the Seed Bed.

This is generally due to one or more species of soil-infesting fungi attacking the young plants at or a little below the surface of the ground and causing them to rot and shrivel up. The best preventive is to select new soil and not to use the same beds season after season. If it is found that the soil generally is fungus-infested, watering the seed bed prior to sowing the seed with a solution of sulphate of iron (1 lb. to the gallon of water) would probably have a good effect. Injudicious watering, bad drainage, too much shade, or insufficient ventilation where hotbeds are used, frequently cause the young plants to damp off.

Late or Irish Blight.

This is identical with the disease of the same name which attacks potatoes, and the remedy is of a precautionary nature as, once the disease has made its appearance, it cannot be cured. Systematic spraying or dusting with Bordeaux or Burgundy mixture before there is any sign of the disease is an efficient preventive, as the spores of the fungus that cause the disease cannot germinate if the leaves and fruit are protected by the fungicides named. Irish blight is always liable to make its appearance when the weather conditions, as previously described, are favourable, and it will pay growers to take the necessary precautions even though they may not always be needed, as one can never be certain of the weather, and it is always safe to err on the cautious side, as the grower who is able to market a crop of sound fruit when his neighbour's crop is a failure can depend on obtaining a good price for it.

Blossom End Rot.

This is a very common trouble and one that frequently destroys large quantities of fruit. It cannot be controlled by spraying, but the loss due to it can be lessened by taking the following precautions:—

- (1) Select seed from plants that show no sign of this disease.
- (2) Encourage the plants to root deeply by preparing the soil thoroughly prior to planting.
- (3) Maintain the supply of moisture in the soil by frequently stirring the soil.

- (4) Prune out laterals and stop terminal growths when four or five fruit clusters have formed so as to keep down an excessive but at the same time encourage an even plant growth. Uneven growth is one of the principal causes of this trouble.
- (5) Do not plant tomatoes on land where the previous crop has been affected.

Wilt.

This disease is caused by a soil fungus (*fusarium*) which enters the plant through its roots; and once the soil has become infected the disease spreads rapidly and all plants are liable to become affected. Tomatoes should not be planted on land in which the disease has previously made its appearance, but such land should be put under a totally different crop, and any weeds or plants of the same natural order as the tomato, such as the "blackberry" (*Solanum nigrum*), tobacco, Cape gooseberry, capsicum, petunia, devil's apple, thorn apple, &c., should be excluded. So far there is no known remedy other than the growing of resistant varieties, of which several have been introduced into this State—viz., Marvel, Norduke, Norton, and Columbia—and have shown that the resistant qualities they developed in the United States of America continue to a greater or lesser degree when they are grown in this State.

Variegated Foliage and Tomato Rosette.

Variegation of the foliage probably belongs to the Mosaic order of plant diseases, probably due to direct germ inoculation. The only remedy is to pull out and burn all affected plants. Tomato Rosette should be treated in a similar manner.

Remedies.

As the diseases of the tomato that cause the greatest loss are first the caterpillars that destroy the fruit and the various other insects that eat the fruit or foliage, there is one general remedy—viz., to poison the food on which the caterpillars or other insects are feeding, and the best poison to use is arsenate of lead, sprayed or dusted on the plants, and the gathering and destruction of all affected fruit.

With respect to fungus diseases, there is also one remedy—viz., spraying with Bordeaux or Burgundy mixtures or dusting the plants with these mixtures in the dry form in order to prevent the germination of the spores of these diseases. The 4-4-40 Bordeaux Mixture is made as follows:—

- (1) Dissolve 4 lb. of bluestone in 20 gallons of cold water in one cask by placing it in a bag and suspending it in the water.
- (2) Slack 4 lb. of unslacked lime in another cask slowly by first pouring about 3 pints of water over it. This will reduce the lime to a thick cream free from lumps. Water should now be added, stirring well till there are 20 gallons of milk of lime in the cask.
- (3) Stir the milk of lime up well, strain it and pour the whole of the 20 gallons of milk of lime and the 20 gallons of bluestone water together slowly into a third cask; stir well for three minutes, and if properly made the mixture is fit for use.

The mixture is much better if made in this manner than when a strong solution of bluestone and lime is first mixed together, and water to make up the required quantity is afterwards added.

In order to see if the mixture is properly made, plunge a bright blade of a knife into it for a minute. If the knife is untarnished, the mixture is all right; but if the knife is stained a coppery colour, then more milk of lime must be added. This is only a rough test; and where accuracy is necessary the mixture should be tested as follows:—To a small quantity of a solution of ferrocyanide of potassium in a test tube or small glass add a few drops of the mixture to be tested. If it turns brown, more lime is required to be added till the mixture fails to produce the brown colour. The solution of ferrocyanide of potassium is made by dissolving 4 oz. of this substance in one pint of water.

The mixture should always be neutral, as if there is an excess of bluestone it is apt to injure the foliage. Use water that is free from iron, and do not make the mixture in iron, zinc, or tin vessels of any kind—wood is the best.

If desirable, a stock solution of bluestone may be kept on hand for use as required. Such a solution may be made by dissolving 100 lb. of bluestone in 50 gallons of water. Place the 100 lb. of bluestone in a bag and suspend it in the cask of water, and in the course of a couple of days the whole of the bluestone will be dissolved, and each gallon of the solution will contain 2 lb. of bluestone.

To make the 40-gallon solution you therefore take 2 gallons of the stock solution of bluestone and add 18 gallons of water to it, to make up the 20 gallons of bluestone solution for mixing with the 20 gallons of milk of lime as previously described. A stock solution of milk of lime can also be made, but it is better to make it as required.

BURGUNDY MIXTURE.

As unslacked lime is not always procurable, Burgundy mixture can be used instead of Bordeaux mixture. It is made as follows:—

- (1) Dissolve 8 lb. of bluestone in a cask containing 35 gallons of clean water. This can be done by placing the bluestone in a small bag and suspending it in the water, or, if the mixture is wanted in a hurry, dissolve the bluestone in boiling water, reducing to 35 gallons with cold water.
- (2) Dissolve 10 lb. of washing soda in another vessel in 5 gallons of water.
- (3) When both the bluestone and the washing soda are dissolved, pour the washing soda solution slowly into the bluestone solution, stirring the mixture well whilst doing so, and it is then ready to use.

Be careful to always pour the washing soda solution into the bluestone solution; don't pour the bluestone solution into the washing soda solution.

Burgundy mixture should be used the same day it is made, as it loses quality by keeping. Both Bordeaux and Burgundy mixtures can be used in conjunction with arsenical sprays, when the combined materials form a dual-purpose spray that is efficacious as a fungicide, as in the case of Irish blight, and as an insecticide where the leaves of the tomatoes are also being eaten by caterpillars or other insects.

QUEENSLAND AT DUNEDIN.

NEW ZEALAND AND SOUTH SEAS EXHIBITION, NEW ZEALAND, 1925-26.

On his return from New Zealand, where he acted as Queensland's representative at the New Zealand and South Seas Exhibition at Dunedin, and was also officer in charge of the exhibit from this State, Mr. H. W. Mobsby, F.R.S.A., F.R.G.S., of the Department of Agriculture and Stock, presented a very complete report, from which the subjoined interesting abstract has been made:—

My first duty is to deliver a cordial official message from His Worship the Mayor of Dunedin, Mr. H. L. Tapley, M.P., who has asked me to convey greetings from himself and the citizens of Dunedin to the people of Queensland, and to congratulate the Government of Queensland on its display at the New Zealand and South Seas Exhibition.

The Exhibition was officially opened by His Excellency the Governor-General of New Zealand, Sir Charles Ferguson, on 17th November, 1925, in the presence of 45,786 people, and was officially closed on 1st May, 1926, by the Prime Minister, Hon. J. P. Coates.

During the currency of the Exhibition a total of 3,200,498 visitors was recorded, a daily average of 22,538; 1,778,400 paid at the gates, and the balance, 1,422,098, were season and other ticket holders; with an attendance of 83,952 on the closing day. In the course of the five months of the Exhibition 61,294 school children were brought from all over the Dominion free by the Government, and visited the Exhibition. They were cared for by the citizens of Dunedin in co-operation with the local school teachers, who willingly gave their time and attention to the children's comfort.

The children were escorted through the pavilions by their teachers in groups of from 100 to 300 each day, and were addressed by the officers in charge of the several displays. The teachers were supplied with descriptive literature, and the Queensland officer took the fullest advantage of this form of education as to the progress and possibilities of our State.

PUBLICITY.

Queensland on the Film.

Our cinema films of our cotton and banana industries were used in the Government cinema room during the whole course of the Exhibition, and proved to be a very valuable advertisement to Queensland.

On the Air.

Radio talks were given by me from V.L.D.N., the broadcasting station at the Exhibition, on Queensland, stressing the importance of purchasing goods of Australian production, especially Queensland pineapples and other products. Acknowledgments from "listeners in" in distant parts of the Dominion as to the interest and value of information broadcasted, and wishing Queensland every success, were received.

Literature.

The State of Queensland sent a large and attractive contribution in eight separate publications, containing a wealth of information for prospective tourists or settlers; and their careful distribution will result in Queensland becoming better known to New Zealanders and visitors from other parts of the Empire. The general broadcasting of such literature does little if any good; but all schools and institutions were supplied, and those who were interested needed only to apply and they were given booklets dealing with every part of Queensland and from every point of view.

First in the list of publications is the "Queensland Agricultural Journal," dealing with every side of life on the land in different parts of the State. It is an ordinary monthly issue of a magazine that is similar in many respects to the journal issued by the Government of New Zealand, but it is profusely illustrated, and contains features that are sure to interest all farmers and prospective visitors to the State. Other publications included the numerous pamphlets published by the Queensland Intelligence and Tourist Bureau.

The Press.

The daily newspapers of Dunedin, including the "Otago Daily Times" and "Evening Star," as well as the weekly paper "Otago Witness," were all untiring in their efforts to obtain Queensland news, and gave this State great publicity during the currency of the Exhibition. In fact, their demands for Queensland items were insatiable, and from this one may fairly judge that our State and its opportunities are highly regarded in the sister Dominion.

The amount of space devoted to Queensland's share in the Exhibition, to the unlimited field she offers to new settlers, and of trade opportunities, was amazing and most gratifying. Thus, through the agency of a distinctly friendly Press, a tremendous amount of public interest was aroused in Queensland's manufactures, primary products, and general resources. Much of the success of Queensland's effort at the Exhibition was undoubtedly due to the quantity of ably filled space allotted us by the local newspapers, which have reached a very high journalistic standard.



PLATE 84.—NEW ZEALAND AND SOUTH SEAS EXHIBITION, DUNEDIN, 1925-26.
Queensland Court, showing Central Avenue—Minerals, Forestry, Cotton, &c., on left;
Agriculture, Wool, and Fibres, Tropical, &c., on right.

Queensland's Products a Revelation.

Another important point stressed by the local Press was the desirability of removing all tariff anomalies that exist between the two Dominions. Queensland's products, both raw and manufactured, were a revelation to New Zealanders. Our tropical products particularly interested them, and many inquiries were received from leading local business houses with the object of opening up a direct trade with this State. The Exhibition and Queensland's share in it did much to remove what might be described as a provincial or insular prejudice that possibly to some extent had existed. It also gave point to a generally manifested desire for closer trade relationship. In this connection not the least of the benefits derived was the generation of a general desire to remove all fiscal anomalies and artificial trade barriers between the Dominion and the Commonwealth.

To the Dominion Press our thanks are due for stressing the existence of these disabilities and urging their removal in our common interests.

The many real kindnesses and courtesies extended to me by the Dunedin Press were appreciated greatly. Every effort was made to satisfy their eagerness for real facts about Queensland.

Australia Day.

Australia's birthday celebration at the Exhibition drew a great crowd of visitors. The Australian Silver Band being engaged for the day, they rendered a fine programme of music in the rotunda in the Grand Court. During the afternoon and in the evening they played in the Australian Pavilion, attracting such a crowd that the Queensland section was absolutely packed. Appropriately the band was accommodated within the space occupied by the exhibit of the Newcastle Steel Works, and alongside the Queensland Court. Of the band of thirty members ten were New South Wales, eight Victorian, six Queensland, four South Australia, and two Western Australia—a truly Commonwealth combination.

Anzac Day.

Anzac Day was observed in the Festival Hall at the Exhibition on Sunday, 25th April, with ceremonies befitting the occasion and with appropriate tributes. All the Commissioners of the British, Canadian, Australian, Queensland, New Zealand, and Fijian Courts at the Exhibition, as well as all public bodies and societies, attended. On behalf of Queensland I placed a wreath on the Cenotaph. There was an attendance of over 3,000 people. The Rev. Dr. E. N. Merrington, C.F., late of Brisbane, led the service in prayer. The chairman, Mr. E. J. Anderson, president of the Returned Soldiers' Association, expressed strong appreciation of Queensland's tribute.

THE QUEENSLAND COURT.

On the opening day His Excellency the Governor-General, Sir Charles Ferguson, Lady Ferguson, and party visited the Queensland Court, and were much interested in the exhibits, especially the cotton and tropical products displays. At the official dinner on the following day His Excellency, in his speech, singled out the Queensland exhibit for special reference; and Hon. J. P. Coates, Prime Minister, said—

“The Queensland Court will be the means of bringing Queensland and its people in front of all the people of this country.”

In the course of the Exhibition all the Ministers of the New Zealand Government visited the Exhibition, and all were very eulogistic of Queensland for having sent such a comprehensive, instructive, and informative display. The Commonwealth Special Commissioner, Mr. Clive McPherson, in his report to the Prime Minister, said—

“The Queensland Government exhibit is deserving of special mention, and is of the greatest value to the Australian Court; it is under the supervision of Mr. H. W. Mobsby, who is lending valuable co-operation to Mr. Smallhorn in any matters of Australian interest.”

The Hon. Wm. Allen, Premier of Victoria, visited the Exhibition, and on his return to Victoria said—

“The whole Exhibition was wonderful, but Queensland had by far the best display.”

The Rev. Dr. Merrington, formerly of Brisbane, paid several visits to the Exhibition and to our court, and in an address he gave at its close said—

“Memory and information abided; the Exhibition did not come to an end, but lived in minds and memories.”

His Worship the Mayor of Dunedin, Mr. H. L. Tapley, M.L.A., was a frequent visitor to the Queensland Court, and at the several functions associated with the Exhibition was generously appreciative of our exhibit.

EXHIBITS.

The exhibits were displayed on a space 60 feet by 51 feet, on which were trophies of Agriculture—Wheats, Grains, Chaff, &c., Wool, Fibre, Cotton, Forestry, Mining, Canned Fruits, Tropical Agriculture, Native Grasses, Dairy Products, and Canned Meats, and Fleeces of Wool.

Our space being next to the Canadian Court on entering the Australian section, Queensland was the first sighted. So much so that the Australian Commissioner placed an arch on columns with “Commonwealth of Australia” thereon to be seen first, backed up by Queensland products.

Agriculture.

The wheats (twenty-two varieties, bred at Roma State Farm, including early maturing and rust resistant varieties), maize (ten varieties), oats, barley, and other grains on this trophy impressed deeply the farmers and millers of New Zealand

visiting the Exhibition. They expressed astonishment at the number and quality of the varieties produced by this State. The exhibits formed an object lesson inasmuch as the method of seed selection and grading, especially as applied to maize, was shown. Teachers and scholars were also very interested in what appeared to them to be the systematic and careful methods carried out by our State Government for the benefit of the man on the land. There is at present an embargo on the landing of wheats and grains in the Dominion, although to all appearances New Zealand, climatically, will never be a recognised wheat producing country, for seasonal conditions are generally not quite favourable.

Cotton.

The exhibit showed the improvement effected in the types of cotton now grown, the system of grading, thus illustrating the desirable and undesirable characteristics. Specimens of graded, combed cotton seed showed the comparative lengths of staple and the benefits of careful seed selection.

The by-products, including the crude and refined oils, the seed cake, and the stages of process dealing with the crushed seed as a food for milk and egg production, were also a part of this trophy.



PLATE 85.—NEW ZEALAND AND SOUTH SEAS EXHIBITION, DUNEDIN, 1925-26. Queensland Court, showing Side Avenue—Cereals, Wheats, &c., Sugar-cane, and Wool.

The process of spinning from the raw material to the finished cloth was also shown; thus, as an educational display, it was a great favourite with the school teachers and children. Cotton cannot be produced in New Zealand, and if imported to the Dominion for spinning purposes there is at present a duty of 4d. per lb. on it.

Wool.

Our fleeces were shown in conjunction with our native grasses; a trophy of scoured and greasy wool also occupied a prominent position. The fleeces represented some of the high class merino wools from the western districts of our State, and, being Queensland's primary industry and one for which we have established a reputation in the world's markets, it created a deal of attention, and the quality was highly commended. The exhibit was awarded first order of merit, which award includes a medal.

Dairy Products.

Queensland's exhibit of dairy products, including butter, cheese, bacon, and hams, as well as canned meats, was only a small, though complete, representation of the dairying industry of Queensland, now so firmly established and steadily expanding. The information given regarding this section was eagerly sought by the schools and the man on the land, as well as by commercial men. The system of herd testing conducted by the Department of Agriculture and Stock, free of expense to the dairy farmer, and the figures associated with this branch for 1924-25, were appreciatively noted by both producers and distributors. The cheese exhibit also interested the visitors. After displaying for a time it was changed for other cheeses taken from the cold storage of the Tairie and Peninsular Dairy Company, and so shown alternately, the temperature of the building being suitable while it was on display. This company very courteously gave me every facility in the care of this product. At the test the manager declared that the Queensland cheese was the finest he had ever tasted of those imported into New Zealand. It was eagerly sought after by the proprietor of the largest up-to-date hotel in Dunedin, who bought it, and has since written commendatorily to the factories concerned, Pittsworth and Southbrook, about it.

Canned Pineapples.

This trophy was a source of great publicity to the opening up of the tariff question and to the slogan: "If you cannot buy Dominion goods, buy of the sister Dominion." In the matter of pineapples, it was found that the same product, grown by black labour, was imported to New Zealand from other countries under a British preferential tariff of 25 per cent., whilst the Australian product, grown by white labour, was burdened with an impost of 35 per cent. Our products were much sought after. I was able to obtain a shipment of the actual fruit to exhibit in conjunction with the cans. This was in great demand, and after a display of two weeks sold readily, the prices obtained ranging from 1s. to 3s. each, according to the size of the pineapple.

Tropical Products.

Queensland was in the unique position of being the only State that could display tropical products. Consequently, our tobacco, sugar, rice, and nuts (Pecan, Queensland, and peanut), cassava and its by-products, tapioca, and starch, in the stages of manufacture, and power alcohol, a product of cassava, all attracted the keenest attention and inquiries from those whom, commercially, they interested. For instance, the confectioners, who in their business use peanuts and walnuts, were much interested in the Pecan nut which is used largely in America.

The people of New Zealand are only too willing to trade with Australia in her products, especially as it applies to what they cannot produce themselves and which they have to import. Hence their slogan: "If you cannot buy Dominion products, buy of the sister Dominion, Australia," has some force.

AWARDS.

The following Agricultural Exhibits gained awards:—

Fifteen varieties Wheat	..	..	..	..	} First Order of Merit.
Six varieties Maize	..	..	..	..	
Two varieties Popcorn	..	..	..	..	
Eight varieties Rice	..	..	..	..	
Five varieties Sorghum	..	..	..	..	
Tapioca (stage of manufacture)	..	..	..	..	
Linseed	..	..	..	..	
Sisal Fibre	..	..	..	..	
Sisal Fibre (ropes and cordage)	..	..	..	..	} Awaiting final information.
Wool	..	..	..	..	
Cotton	..	..	..	..	
Tobacco	..	..	..	..	
Sugar	..	..	..	..	
Canned Pineapples	..	..	..	..	} Awaiting final information.
Native Grasses	..	..	..	..	
Canned Meats	..	..	..	..	
Minerals	..	..	..	..	} First Order of Merit.
Forestry	..	..	..	..	
Brimm and Son—Plywood	..	..	..	..	Second Order of Merit.

GENERAL.

Queensland and New Zealand Trade.

While I was in Wellington the possibility of making Brisbane a port of call during the Tourist or Fruit Season, so as to obviate the necessity of transshipping at Sydney, especially on the alternate round trip of Auckland, Sydney, Wellington, Bluff, and Melbourne, was suggested to those concerned.

Inter-Dominion Friendliness.

Early in the period of the Exhibition a rumour was rife that some unfriendly feeling existed between certain sections in Australia and New Zealand. When information on this point was sought the suggestion was vigorously rejected. The evident popularity of the Queensland Court, and of the Queensland Government which had seen that the industries and commerce were represented so effectively, gave a strong denial to the mischievous rumour. Quite the reverse was the case, and on all sides was expressed a desire to become better acquainted with Australia, Queensland particularly.

Queensland Regarded as the Most Progressive State.

Favourable comment was the order of every day towards the Queensland Government as controlling the destinies of the most progressive State in the Commonwealth Group. The presence of such a comprehensive range of exhibits—raw and manufactured products—that compared most favourably with the exhibits of other States and countries, was accepted as an example of Queensland's wide-awakeness, skill, primary wealth, prosperity, and good government.

Closer Trade Relationship.

The success and completeness of the Queensland Exhibit stimulated numerous trade inquiries and a strong desire for closer trade relationship.

New Zealand as a Market for Queensland Products.

On the other hand I submit that full consideration should be given by Queensland to the opportunities of improving her trade with New Zealand.

A very high opinion was formed of Queensland as a direct result of our very effective display; and complimentary remarks were made regarding a Government so alive to the interests of its people, both in primary and secondary industry, as to represent its industries and evidences of its substantial progress, so strongly at Dunedin.

The impressions of Queensland from the criterion of its successful and particularly representative industrial display were deep, and were expressed in the almost universal remark at the Exhibition, "Queensland is the coming State of the Commonwealth."

QUEENSLAND'S REPRESENTATIVE APPRECIATED.

The following appreciation of Mr. Mobsby is taken from the "Evening Star" (3rd June, 1926), Dunedin:—"To those who have been constantly in touch with affairs at the Exhibition from the opening to the close have been revealed some officials who, though not happening to wander overmuch into the spotlight's magic circle, have done invaluable work for the department or the country which they represent.

"One of these is Mr. H. W. Mobsby, F.R.G.S., specially appointed to look after the interests of Queensland at the Exhibition just closed, and in whose hands the striking exhibit of the 'Banana State' was made the feature of the Australian Court. Queensland, indeed, was the only Australian State that was adequately represented so far as a comprehensive exhibit is concerned, and Mr. Mobsby's good taste and experience made the most of the opportunity. He, on several occasions, broadcasted, in interesting fashion, information regarding the products of the State, and in divers ways kept it constantly before the New Zealand public.

"As we have indicated, Mr. Mobsby, while jealous of the reputation of his State, does not seek personal aggrandisement. He 'did his job,' and is satisfied with the result. It came as something of a surprise, therefore, when, in the course of a chat at the close of the Exhibition, a 'Star' representative drew from the Queensland Commissioner some details regarding his career. It appears that Mr. Mobsby is easily one of the most experienced and trusted of the overseas representatives, in that he has been associated with exhibition work all his life.

"It was as a lad that Mr. Mobsby got his first taste of the work when he accompanied his father in his official capacity to the Agricultural Exhibition on the Goldsmid Estate at Hove, Brighton, England. But his first personal connection with any exhibition was when he assisted Mr. A. G. Graysmith, artist, at the Royal Pavilion Building in Brighton. And after studying in art and design and in chemistry, and following a course of general commercial training, he practised as an artist and designer, and was on the instructional staff in decorative art and photography at the Central Technical College.



PLATE 86.—MR. H. W. MOBSBY, F.R.S.A., F.R.G.S.,
Queensland Government Representative at the New Zealand
and South Seas Exhibition at Dunedin, 1925-26.

"But this is not all. Mr. Mobsby's success at home qualified him for similar work abroad, and he has had charge of Queensland's interests at the Franco-British Exhibition, London; at the Panama-Pacific Exposition, San Francisco; at the British Empire Exhibition at Wembley; and now at the New Zealand Exhibition at Dunedin.

"Since 1897, however, Mr. Mobsby has been attached to the Department of Agriculture and Stock in Brisbane as Government Artist and Photographer, and it is during that period that he has become so closely connected with his State's representation at various exhibitions. Not only has he looked after Queensland's interests at the Australian Natives' Association's Exhibitions at Melbourne for several successive years, but also at Adelaide and Sydney, and at the Annual National Show at Brisbane.

"That he has not held these position except on merit is proved by the fact that he holds a number of diplomas, certificates, and fellowships which have been

gained in fields which have fitted him for his work. These include senior diploma, Chamber of Commerce (England); senior diploma, City and Guilds Institute (London); senior diploma, Cripplegate Institute (London). For Theoretical and Practical Photography: Certificate for drawing, South Kensington School of Arts (Brighton); certificate for motion picture work (San Francisco). He is also a medallist at the World's Photographic Competition, 1906; grand prix, Franco-British Exhibition, 1908; diploma and medal for photography at P.P.I. Exposition (San Francisco), 1915; and diploma and medal for distinguished services at the P.P.I. Exposition, San Francisco.

"It is safe to say that the many friends of Mr. Harry Mobsby has made in Dunedin did not realise that the little gentleman from Queensland with the grey moustache and the friendly, unassuming manner was such a much-travelled and widely-experienced man of the world. He did not tell them of his successes; it is not his way. But, nevertheless, those with whom he came in contact felt they had made a friend, and, now that the Exhibition is at an end, they will part with him with regret."

THE QUEENSLAND BANANA AND SUGAR INDUSTRIES.

MINISTER'S COMMENT ON A VISITOR'S CRITICISM.

The Minister for Agriculture (Hon. W. Forgan Smith), in the course of a recent Press statement, commented as follows on some critical remarks by a member of the Imperial Parliamentary Delegation on Queensland industries:—

"I note by the Press that Sir Sydney Henn, a member of the Empire Parliamentary Delegation, has been commenting on the banana and sugar industries of Queensland. Sir Sydney complains that he has not seen first-class bananas since he has been in Australia. In this respect Sir Sydney Henn appears to have been unfortunate, and if he comes again to Queensland I will see to it that he is provided with an opportunity of seeing as fine bananas as are grown in any part of the world. The 'Gallant Knight' is apparently much concerned about the prohibition of the importation of Fijian bananas into Australia. Surely this is a matter for Australian Governments to decide, and I do not think that any one will admit that Sir Sydney Henn is sufficiently acquainted with Australian conditions to pose as an authority as to what our fiscal policy in Australia should be. I would remind him that Australian Governments are concerned with Australia, and not primarily with Fiji. He might also be well advised to inquire into the prevalence in Fiji of such things as the Sigatoka disease.

"The tourist also turned his attention to the Queensland sugar industry, and there again indicates his lack of understanding of the conditions now prevailing. The Queensland sugar industry is carried on by white labour, the sugar produced in Australia is equal to the finest in the world, and Australia is the only country where the industry is carried on by white labour. That being so, it is necessary to afford adequate protection for the industry, so that it should not be subject to the competition of the product of countries where living standards are much lower than is approved of here. This industry has been of immense advantage, not only in the development of North Queensland, but to Australia generally. The price of sugar for many years has been based very largely on Australian costs of production, and I would remind those who listened sympathetically to Sir Sydney Henn in the South that during the war period Australia was the only country where sugar was not rationed, and where the prices were the lowest in the world at that time. World's parity may be an accepted fetish of free-traders, but it is not regarded favourably by those whose responsibility it is to lay down fair methods in Australia. I would remind Sir Sydney Henn also that there is no legal restriction on the output of sugar in Queensland. Any restriction that operates is based on the capacity of mills to accept and treat cane. In any case it is well to remember that manufacturers and business people generally do not, as a rule, continue producing for an over-stocked market. Why, therefore, should farmers be expected to produce in excess of requirements? In Cuba, under a law approved of recently by the United States Government, restriction of areas to the extent of 10 per cent. was imposed. Uba cane referred to by Sir Sydney Henn is grown extensively in South Africa, because it suits the conditions prevailing there. It is a variety not looked upon with favour by mill managers and sugar chemists here, who presumably understand their business in this regard.

"The remarks generally of this visitor are in accord with those usually given by tourists who are not here long enough to get a proper understanding of the conditions which they presume to criticise. The 'Gallant Knight' would be well advised to confine his remarks regarding Australian conditions to those matters which he has taken the trouble to study and fully understand."

MAIZE IMPROVEMENT.

By C. J. McKEON, Assistant Instructor in Agriculture.*

The principal part of the year's activities embraced both the technical and practical field work connected with the Departmental scheme of seed maize improvement. It is gratifying to be able to report that, notwithstanding the indifferent season experienced in many districts, excellent yields were obtained from the propagation plots in the Kilcoy and Mary Valley areas, and large stocks of high-class seed were selected for distribution.

After carrying on the Departmental maize breeding and seed selection work for several years, the opinion has been formed that a marked improvement has taken place in the type and quality of the different varieties employed, and the high yields obtained in the field trials have unmistakably demonstrated the value of propagating high-yielding strains of seed.

Up to the time of submitting the previous report some of the maize plots had not reached maturity, and the undermentioned details were unavailable:—

Grower.	Variety.	Area.	Yield per Acre.
		Acres.	
J. Tinney, Kilcoy ..	Improved Yellow Dent	5	Damaged by flood; no yield taken
A. J. Casten, Hivesville	Funk's 90 day ..	5	70 bushels
G. B. Mouatt, Kilcoy	Star Leaming ..	3	Failed through dry weather
A. Ind, Beaudesert ..	Golden Beauty ..	3	Failed through dry weather
J. Richards, Kilcoy ..	Golden Beauty ..	4	60 bushels
E. Witton, Manyung	Funk's Yellow Dent ..	14	50 bushels
W. Beverley, Boonah	Improved Yellow Dent	5	Failed
F. Turnbull, Kandanga	Improved Yellow Dent	8 and ear to row	

Seed Maize Improvement.

Although the maize crop for Southern Queensland, on the whole, will be a very light one, due to the dry conditions experienced in most of the principal maize-growing districts, the results from the Departmental plots, under the circumstances, can be considered very satisfactory.

The yields on the whole were not high, but very few of the plots were total failures, and at the end of the season sufficient seed to sow approximately 4,000 acres will be available for distribution to farmers. The whole of the seed selected was grown in the Mary Valley and Kilcoy districts, the crops in the other districts where plots were established being too light, owing to dry weather, for seed purposes.

Cutworms were responsible in a number of cases for the light yields, as many of the plots were attacked when the plants were only a few inches above ground, and considerable damage done.

In the Kilcoy district parrots were very troublesome, and in two or three cases practically every ear in the whole crop was more or less damaged. The damage was not only done by king parrots, which usually attack corn, but more so by Blue Mountain parrots, which usually confine their attention to sorghums. The scarcity of sorghums crops in this district was probably responsible for this.

The damage caused by the maize grub, regarding both plants and ears, was again very light. None of the plots showed any signs of blight. Weevils also caused much less damage than usual, except in one case where the crop was left in the field too long. The reduction in damage was due, perhaps, not so much to the fact that weevils were less prevalent than usual, but because growers are beginning to realise the necessity of picking the crop as early as possible, especially those crops ripening early in the season. Each season it is becoming more apparent that maize-growers are beginning to recognise the benefit of using pure strains of seed, and also to recognise the value of the seed maize improvement work which has been carried out by the Department for a number of years past. This is admitted, not so much in words, but from the fact that farmers with whom the plots are established receive numerous inquiries from local growers for supplies of seed from what is left

* Abstracted from the Annual Report, Department of Agriculture and Stock, Queensland, for year ended 30th June, 1926.

after the best of the seed has been picked out by Departmental officers. The fact that the Departmental supplies of seed have never yet been equal to the demand is also proof of this.

Although the total area of the plots sown this season was little more than half the area sown the previous season, due to dry conditions in some districts preventing arrangements being made for more plots, the amount of seed selected was greater than any previous season, and the quality and type of grain was more than satisfactory.



PLATE 87.—MR. C. J. McKEON, ASSISTANT INSTRUCTOR
IN AGRICULTURE,

Whose work in Maize Improvement, under the direction of Mr. H. C. Quodling, Director of Agriculture, has helped to win a high reputation for Queensland-bred grain.

Eighteen individual plots were sown, and these totalled $84\frac{1}{2}$ acres, of the following varieties:—

Funk's 90 Day, $8\frac{1}{2}$ acres; Star Leaming, 13 acres; Reid's Yellow Dent, 7 acres; Golden Beauty, 14 acres; Red Hogan, 4 acres; Improved Yellow Dent, 36 acres.

Some small plots were also sown with the strains that are being worked up with the idea of testing them out under North Queensland conditions. An "ear-to-row" test of each of the standard varieties, with the exception of Red Hogan and Reid's Yellow Dent, was also sown, the ears selected for the test plot of the latter variety being too badly damaged by weevils to be worth sowing.

Only three plots out of the total number sown failed to develop grain sufficiently good for seed purposes.

Funk's 90 Day.

This variety is becoming more popular each season, and in every district in which it has been tried it has been very highly spoken of, both by the growers and by local farmers who have seen it growing.

Three plots were sown, two in the Kilcoy district and one in the Mary Valley district. One of the former did particularly well and gave the very fine yield of slightly over 80 bushels per acre. The type and colour of grain and the size of the ears were very good. The field characteristics, on the whole, were very good, and show a very great improvement, particularly the husk covering. The other crop grown in the Kilcoy district suffered during the early stages of growth from dry weather. Germination was also irregular from the same cause. Portions of the crop where the land was better worked yielded very well, whilst other portions on the rougher land were only light. The ear-to-row test plot was sown in the centre of this plot, but was very irregular in germination and growth, and the ears were too small and irregular for further ear-to-row test work.

The plot sown in the Mary Valley district suffered right throughout from dry weather, and this, together with the heavy damage suffered by the young plants from cutworms, was responsible for the light yield. Portions of the area were so badly eaten out that the land had to be ploughed up and another crop sown.

Star Leaming.

Three plots were sown, two of which germinated poorly and consequently yields were light. Both crops also suffered from dry weather and were badly damaged by parrots when the grain was in the milk and dough stages. Owing to the light stand, and the excellent condition of the land when the seed was sown, the plants had a better chance of withstanding the dry weather and developed very large ears. The type of grain was very fine, and a fair quantity of good seed was selected from both plots.

The other plot, although patchy where cutworms had attacked the crop when young, did very well, and yielded slightly over 70 bushels per acre. The crop unfortunately was left too long in the paddock and was considerably damaged by moths and weevils, so the yield, all things considered, may be regarded as very good.

The ears were large and the type and colour of the grain was splendid. As 110 bushels of seed were selected from the crop—after discarding a large percentage of otherwise good ears owing to damage by weevil and moth, particularly the latter—it will readily be seen how even the type was.

The field characteristics were good, and are perhaps the best of any of the varieties.

The "ear-to-row" test plot gave fairly good results, the yields varying from 52.71 bushels per acre to 92.25 bushels per acre.

Reid's Yellow Dent.

Only one plot of this variety was sown and the result was good. The ears were very large, and, for this variety, were well covered. The grower remarked on the improvement in the husk covering, and it is to be hoped that this improvement will continue, as this is the only real defect in an otherwise wonderfully good corn.

As usual the type was very regular.

The grower, so far, has not advised as to the actual quantity of grain threshed, but the yield will not be under 75 bushels per acre. This yield is not nearly as high as some of the previous yields from this variety; but portion of the crop, which was sown a fortnight later than the first sowing, was much lighter owing to absence of rain during tasselling.

Golden Beauty.

One of the three plots of this variety failed owing to dry weather, and the other two gave fairly good yields. Both of these crops made splendid growth, and promised a very heavy yield, but the weather conditions during tasselling were very hot and dry, and consequently the yields were lighter than they would otherwise have been. The type of grain was very good, but naturally the ears were not as large as usual.

Field characteristics were good on the whole, and the position of the ears continues to improve, although there is still room for further improvement in this respect.

This variety has done particularly well in the Kilcoy district, and is now a very popular variety there. In the past great difficulty has been experienced in persuading farmers who do not know the variety to grow it, but in every case where it has once been grown the farmers have expressed a keen desire to continue growing it.

Results so far have proved that it is one of the best drought resisters of any of the varieties, and the grain when shelled makes a most attractive looking sample.

The "ear-to-row" test, in keeping with the rest of the plot, did not give any heavy yields, the best being 77 bushels per acre and the lowest 43.85 bushels per acre.

Improved Yellow Dent.

This is probably the most popular variety grown in Queensland to-day, the heavy yield and the large bright grain appealing to maizegrowers, and no difficulty is ever experienced in getting areas of land for all the plots required by the Department.

Four large plots were sown and one, after making great growth, was ruined for seed by hot winds whilst out in tassel. Two plots were harvested with good results, whilst the fourth remains to be harvested. A large quantity of seed was selected from the two plots so far harvested, the type and colour of the grain being particularly good. The ears were very large, and some of the best of these were secured, and when weighed were found to be from 1 lb. 2 oz. to 1 lb. 6 oz. each. The yields in both plots worked out at approximately 75 bushels per acre. One plot was damaged, just after sowing, by bandicoots, and the other by cutworms, and consequently they were rather patchy in places. Very few of the ears were damaged by weevil—due partly to ripening late in the season but more so to the exceptionally good husk covering. Although the majority of the field characteristics were good, there is room for considerable improvement in the height of the ears, a large number being carried far too high.

Half of the "ear-to-row" test plot was resown on three occasions owing to kangaroo rats digging out the seed and then was destroyed. The remainder was more or less damaged and of no use for comparison purposes.

Red Hogan.

Only one plot was shown, and was a failure owing to dry weather. This crop looked very promising up to the tasselling stage, but hot dry winds destroyed the pollen.

Unnamed Selections.

Two one-acre plots and a small plot were sown with strains which are being worked up in connection with the proposed seed maize improvement scheme for the Atherton Tableland.

One of the larger plots was practically ruined by dry weather, and the others were only light from the same cause. Parrots were also very troublesome and did considerable damage. The results, however, were more than satisfactory, the type of grain being much more regular than was expected. The ears were small owing to the dry weather, but the quality of the grain was good.

A detailed list of plots is appended.

General Duties.

During the past year the following places were visited on instructional and work other than seed maize improvement work:—

Kilcoy, to judge at the Show and to give advice on making stack silage.

Mount Garnet, to report on the suitability of the district for growing seed maize.

Atherton Tableland, in connection with the proposed seed maize scheme.

Runcorn and Cooroy on several occasions, in connection with the pasture improvement plots established in those districts.

Boonah, Kalbar, Wangalpong, and Beaudesert, to make arrangements for the carrying out of dairy and pig fodder trials.

Mount Walker, to give advice on silage.

With regard to stack silage, officers of this Department have given demonstrations at different times in all of the principal districts where maize-growing is carried on in conjunction with dairying, and are constantly pointing out to dairymen the necessity of making provision for the winter by conserving fodder in some form, and it is remarkable that in such a season as the past one, during which thousands of acres of splendid crops of maize were ruined for grain, but which would have made excellent silage, very few stacks of silage were seen. In most cases the stalks were either cut and thrown out to stock, with the result that much of it was wasted, or were left to mature a very light crop of pinched grain, which would in many instances barely pay for picking.

Variety.	Grower.	Area.	Yield per Acre.	Extracts from Reports.
Funk's 90-day ..	T. W. Dunning, Kilcoy	3 acres ..	80 bushels ..	First sowing made 2-11-25 and the second sowing a couple of weeks later. The ground for both plantings was in very fine condition. Plants made very good growth and averaged about 9 ft. in height. Second sowing missed the rain when cobbing and was too pinched for seed purposes. First sowing did splendidly and gave a very good yield. Field characteristics were very good, particularly the husk covering, which shows a great improvement. Type and colour of grain were good. Ripening was fairly even. Selections were made in the field from early maturing plants possessing other desirable features and sufficient seed for next season's plot requirements was secured. One of the best crops of this variety to date. Period of maturity 108 days.
Funk's 90-day ..	J. Tinney, Kilcoy ..	3 acres ..	50 bushels ..	Sown 1-10-25. Weather was very dry for several weeks after planting and crop had a hard time. Crop responded well when rain fell, but patches, where the ground was a bit rough, had received too big a check to properly recover. This reduced the yield considerably. Ears on the whole were only of medium size but the type of grain was good. Husk covering much improved. A number of plants carried ears with exceptionally long shanks. This is a peculiarity of the variety and appears very hard to breed out. Selections were made from early maturing plants and about 3 bushels of seed were secured. Ear to row test was harvested, but the growth was too uneven and the germination too irregular to be of any use for comparison purposes. Period of maturity 113 days.
Funk's 90-day ..	H. Roselund, Imbil	2½ acres ..	No yield taken	Sown 26-12-25 and germinated very well. Over half the crop was completely destroyed by cutworms just after germination and the remainder was badly damaged. Crop suffered from want of rain throughout and only gave a light yield.
Star Leaming ..	G. Meyers, Imbil ..	6 acres ..	70 bushels ..	Sown 2-11-25 and germination was only fair. Crop made good headway right throughout. Cobs were very large and very regular in type. Plants were between 9 ft. 6 in. and 9 ft. 10 in. high and of very upright growth. Portion of area was patchy owing to cutworms, but the remainder was very fair. Very fair quality seed was selected. Crop left too long in the field and a lot of damage was done by moth and weevil. Period of maturity 130 days.

30	Variety.	Grower.	Area.	Yield per Acre.	Extracts from Reports.
	Star Leaming ..	T. A. Beanland, Kilcoy	3 acres ..	40 bushels (approx.)	Sown 6-1-26 on a very nicely prepared piece of land. Germination was very poor for some unknown reason, and would not be more than a 50 per cent. strike. Dry weather prevailed practically throughout growth and only the splendid state of the land at planting time and the thin stand was responsible for any crop at all. All things considered the crop did remarkably well to produce ears of such size and quality as it did. The supply of seed available was very limited, but what there was of it was of very good quality. Period of maturity 138 days.
	Star Leaming ..	G. B. Mouatt, Sandy Creek, Kilcoy	4 acres and "ear to row"	30 bushels (approx.)	Sown 18-11-25 and germinated very poorly. Ear to row germinated much better. Weather conditions throughout were very unfavourable. Considering this the crop made good headway and developed very fair ears. Quality and type of grain were very good. Parrots played havoc with the ears and practically every ear was more or less damaged. Seed selected was of very good type. Ear to row test was sown in the centre of the plot and was not damaged to the same extent as the bulk of the surrounding plot; yields in this were good considering. Time of maturity, 138 days.
	Reid's Yellow Dent	F. Turnbull, Kadanga	7 acres ..	75 bushels (approx.)	Sown at the end of September and germinated well. Second sowing of about 1½ acres made a couple of weeks later. Plants made very strong upright growth and cobbled very well with the exception of the second-sown portion, which had very hot weather during tasselling. This was much lighter and reduced the yield for the whole area. Ears were very large and well filled. Grain was very true to type. Husk covering very good for this variety. Field selections were made and about 6 bushels of very fine seed was selected. This variety does particularly well in this locality. Period of maturity, 122 days.
	Golden Beauty ..	J. Richards, Sandy Creek, Kilcoy	4 acres and "ear to row"	50 bushels ..	Sown 18-11-25 on a very well prepared piece of land and a splendid germination resulted. Crop made very fine growth, plants reaching a height of 10 ft. 6 in. and looked very promising until dry weather set in during tasselling. Ears were small, but grain was of good type. Field characteristics were good. Position of ears much improved. Ear to row test yields were fair, varying from 43·85 bushels per acre to 77 bushels per acre. Period of maturity, 146 days.

Variety.	Grower.	Area.	Yield per Acre.	Extracts from Reports.
Golden Beauty ..	G. B. Mouatt, Kilcoy	6 acres ..	60 bushels ..	Date of sowing not kept. Germinated wonderfully well, hardly a grain missing. Made very fine growth and cobbled very well. Had weather conditions been more favourable during the cobbing stage the yield would have been very good. Ears were of medium size and were very well filled. Field characteristics on the whole were good. Position of ears is still slightly irregular, but shows an improvement. Type of grain was very fine and the seed selected was of as good type and quality as any seed of this variety to date.
Improved Yellow Dent	F. Turnbull, Kandanga	10 acres and "ear to row"	75 bushels ..	Sown 15-11-25 and portion germinated splendidly. The other portion was eaten out by kangaroo rats and was resown, but was again practically eaten out. Crop made very good growth, plants reaching a height of 11 ft. Cobs on the whole were large and the type and colour of grain was excellent. Field characteristics, with the exception of the position of the ears, were good. Many of the ears were carried far too high, and there is room for considerable improvement in this respect. Ear to row test plot was sown but was too badly damaged by rats to be of any use for record purposes. Half of the rows were completely eaten out and were resown three times with the same result. The balance were more or less damaged. Period of maturity, 152 days.
Improved Yellow Dent	G. Meyers, Imbil ..	12 acres ..	75 bushels ..	Half the area was sown on 28-11-25 and the balance on 12-12-25. Both germinated splendidly, but cutworms thinned out the plants considerably, particularly in the first sown plot. First sowing made splendid growth and cobbled very well. Ears were large and particularly well covered. Height of ears was very irregular. Other field characteristics were good. Plants were very tall and upright. Second sowing did very well up to the tasselling stage, but suffered from then on from dry weather. Ears were small and the grain was too pinched to be used for seed purposes. No seed was selected from this. The yield given was estimated from the first sown portion. Period of maturity, 156 days.
Improved Yellow Dent	C. Behrendorff, Boonah	9 acres ..	..	This was a most promising looking crop up to the tasselling stage. Very hot, dry weather prevailed during this period, and the result was a very light crop of grain. Ears were very small and poorly filled and of no use for seed purposes.
Improved Yellow Dent	J. Tinney, Kilcoy ..	5 acres ..	Not harvested	Sown 12-1-26 and germinated well. Weather conditions were very unfavourable, practically no rain falling after planting took place. Crop did very well considering. Plants naturally were much shorter than is usual for this variety. Ears on the whole are small, and it is expected that much of the grain will be pinched. This will be only a light crop.
Red Hoga, 1 ..	W. Beverley, Boonah	4 acres ..	Failed ..	Crop ruined for grain by dry weather.

"EAR TO ROW" TEST—STAR LEAMING.

Row No.							Yield per Acre. Bushels.
403 x 141	..	..	..	..	..	..	61.5
403 x 142	..	..	..	..	..	..	70.28
403 x 143	..	..	..	..	..	..	55.64
403 x 144	..	..	..	..	..	..	67.35
403 x 145	..	..	..	..	..	..	73.21
403 x 146	..	..	..	..	..	..	52.71
403 x 147	..	..	..	..	..	..	61.50
403 x 148	..	..	..	..	..	..	92.25
Check	..	..	..	..	..	..	55.64
403 x 149	..	..	..	..	..	..	77.60
403 x 150	..	..	..	..	..	..	79
403 x 151	..	..	..	..	..	..	64.42
403 x 152	..	..	..	..	..	..	82
403 x 153	..	..	..	..	..	..	73.21
403 x 154	..	..	..	..	..	..	55.64
403 x 155	..	..	..	..	..	..	74.67

Sown 18-11-25; ripened 11-4-26; period of maturity, 138 days (five days allowed for germination).

"EAR TO ROW" TEST—GOLDEN BEAUTY.

Row No.							Yield per Acre. Bushels.
410 x 121	..	..	..	..	..	..	57.14
410 x 122	..	..	..	..	..	..	66.44
410 x 123	..	..	..	..	..	..	77
410 x 124	..	..	..	..	..	..	63.78
410 x 125	..	..	..	..	..	..	50.49
410 x 126	..	..	..	..	..	..	45.18
410 x 127	..	..	..	..	..	..	57.14
410 x 128	..	..	..	..	..	..	69.09
410 x 129	..	..	..	..	..	..	51.82
Check	..	..	..	..	..	..	51.82
410 x 130	..	..	..	..	..	..	54.48
410 x 131	..	..	..	..	..	..	61.12
410 x 132	..	..	..	..	..	..	75.74
410 x 133	..	..	..	..	..	..	57.14
410 x 134	..	..	..	..	..	..	57.14
410 x 135	..	..	..	..	..	..	43.85
410 x 136	..	..	..	..	..	..	54.48
Check	..	..	..	..	..	..	55.81

Sown 18-11-25; ripened 19-4-26; period of maturity, 146 days (five days allowed for germination).

DRY SEASONS—A COUNTERING FIELD CAMPAIGN.

By A. E. GIBSON, Instructor in Agriculture, and C. S. CLYDESDALE, Assistant Instructor in Agriculture.

The loss of national wealth to this State brought about by periods of drought cannot be accurately estimated by figures—but their effects are undoubtedly far-reaching. If action can be taken over certain areas whereby increased production can be brought about, it naturally follows that dry periods are robbed to some extent of their devastating influences and the loss to the State as a whole is decreased. A policy of this kind is naturally educative in its character to all, but when certain sections are dealt with it becomes more particularly of value to those directly interested, and this is increased when illustrations are given for the purpose of proving the policy advocated.

For some time past the Department of Agriculture and Stock has interested itself in increased production of dairy and allied products, and with this object in view has initiated a series of fodder trials in various districts for the purpose of pointing out that if means are adopted for the annual provision of fodder crops for dairy stock and pig raising, the fluctuations which have in the past taken place in the supply of these products will be considerably reduced if not entirely removed.

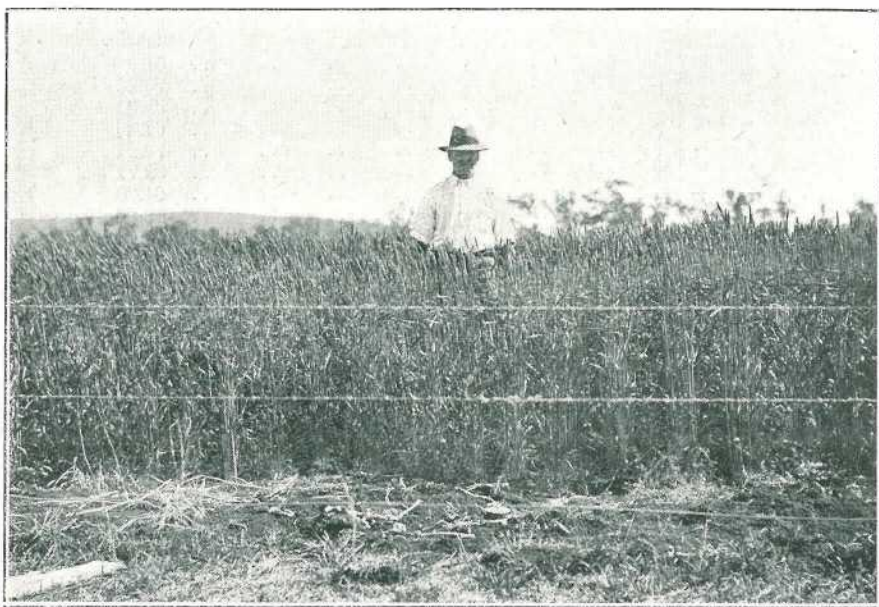


PLATE 88.—PEAS AND PILOT WHEAT AT BEAUDESERT.
Weight—10 tons 13 cwt. 2 qr. 19 lb. per acre.

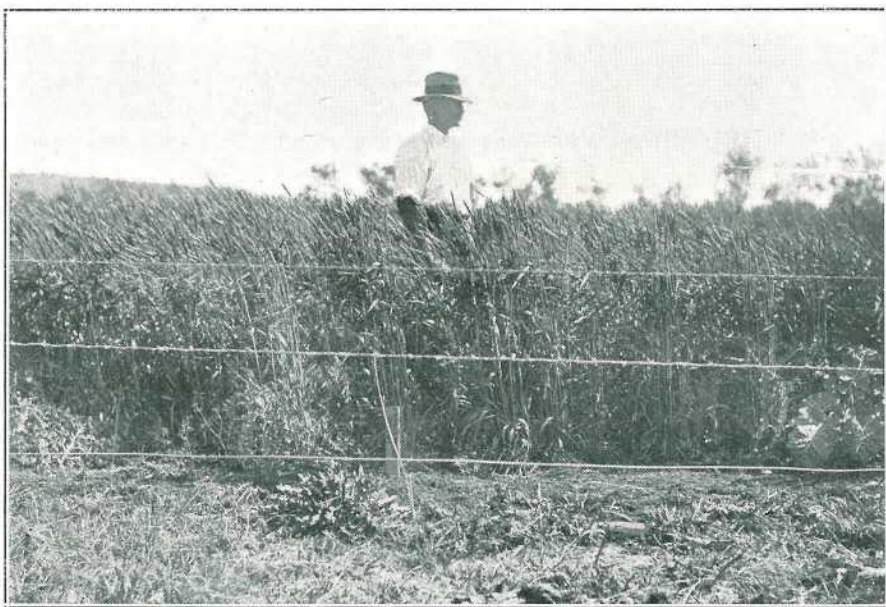


PLATE 89.—PEAS AND FLORIDA WHEAT AT BEAUDESERT.
Weight—11 tons 17 cwt. 2 qr. 20 lb. per acre.

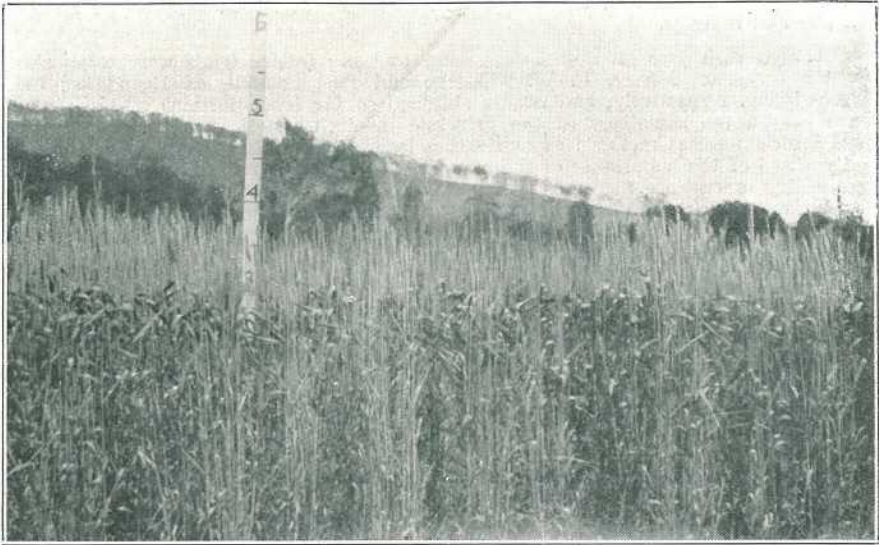


PLATE 90.—PILOT WHEAT AND PEAS AT P. CASWELL'S, WANGALPONG
(FODDER PLOTS).



PLATE 91.—FLORIDA WHEAT AND VITCHES AT P. CASWELL'S, WANGALPONG
(FODDER PLOTS).

During the past few months the losses to dairymen and others, brought about by lessened production resultant of the dry period experienced, amounts to a considerable value, and attention is drawn to the fact that these can be considerably reduced by adopting the policy of careful soil preparation and the sowing of crops calculated to fill the void caused by the absence or decreased supplies of natural grasses and herbage.

It was with such an object that dairy and pig fodder trials were established on the farms of Messrs. F. W. Thiedeke and Peel Caswell, of Beaudesert and Wangalpong, respectively, and results obtained so far from portions of these plots have proved the soundness of the principle involved. Both farmers are capable agriculturists whose methods of cultivation leave little to be desired, and who are fully seized of the importance of fallowing and thoroughly preparing their land prior to seeding operations. The results obtained on the comparatively low rainfall experienced at Wangalpong speak for themselves; and whilst the soil at Beaudesert is of a heavier nature than that met with in parts of the Canungra Valley, the heavier rainfall experienced more than compensated for the difference in soils and their moisture retaining qualities.

The plots were planted on the 9th and 10th June at Mr. Thiedeke's at Beaudesert, whilst those at Mr. Caswell's, at Wangalpong, were planted on the 12th and 14th of June. Rainfall experienced between the 9th June and 23rd September (the date of harvesting) at Mr. Thiedeke's being 3.66 inches, but it must be noted that a fall of 1.06 inches was experienced on 7th June, two days prior to planting. At Mr. Caswell's the rainfall received between the 12th June and 24th September totalled .91, the previous rains to that date being 1.25 inches, registered on 14th and 17th May.

The following weights of green fodder were recorded:—

	Mr. F. W. Thiedeke, Beaudesert.					Mr. P. Caswell, Wangalpong.				
	Tons cwt. qr. lb.					Tons cwt. qr. lb.				
Florida wheat and peas	..	11	17	2	20	..	7	6	1	22
Florida wheat and tares	..	10	8	3	13	..	7	4	0	5
Pilot wheat and peas	..	10	13	2	19	..	8	5	2	17
Pilot wheat and tares	..	10	4	0	7	..	6	12	0	5
Skinless barley and peas	..	11	8	0	8	..	6	4	3	10
Skinless barley and tares	..	4	16	0	3	..	7	1	2	16
Cape barley and peas	..	6	2	1	21	..	4	18	1	20
Cape barley and tares	..	9	7	1	1	..	4	16	0	3
Rye and peas	..	5	15	0	27	..	4	16	1	20
Rye and tares	..	8	0	3	11	..	3	7	0	25

The varieties of wheats used in the trials were Pilot, a Bunge-Florence crossbred, and Florida, a Bobs-Florence crossbred, both of which were raised at Roma State Farm. These varieties made excellent growth, and were remarkably even throughout the trials. At the time of harvesting both varieties were in the flowering stage, averaging 3 feet 6 inches in height.

At Wangalpong both Pilot and Florida showed signs of flagrust, but at Beaudesert no signs of rust were apparent. This was probably due to local conditions and to the fact that humidity in the Canungra Valley is greater than in the more open areas around Beaudesert.

Cape Barley.—This crop made fair growth, and when harvested was in the shot-blade stage—the height averaging 1 foot 9 inches of good healthy growth. From the general appearance of the crop a later cutting will give a heavier yield.

Skinless Barley was a clean and attractive crop, averaging 3 feet in height, which had made a remarkable growth of foliage. When harvested the grain was in the soft dough stage.

Rye.—In each case this crop made rapid growth, and was in the flowering stage when harvested, averaging 3 feet in height. Generally speaking, growth was somewhat on the thin side, and heavier quantities of this cereal should be sown when the season is somewhat advanced, as it was in this particular instance.

Field Peas in all plots made fair average growth of 1 foot 6 inches in height. When harvested they showed signs of wilting, thus reducing the weight per acre that under other conditions would have been recorded.

Vetches, usually rather slow in maturing when compared with peas, made favourable growth.

COTTON PLANTING.

The recent rains which came at a most opportune time have enabled excellent strikes of cotton to be secured in many of the districts. Reports received by the Department from the Field Officers indicate that exceptionally good strikes are being obtained in the sowings which have just been coming through during the past week. Such splendid results demonstrate the soundness of the Department's advice on the early preparation of the seed bed. Farmers who have had their seed beds prepared for some considerable length of time report that the rains penetrated well below the surface soils. This will assist in the development of a deep tap-root system, which will enable the young plants to resist periods of hot winds and dry weather during the next few weeks.

Examinations on some late prepared fields show that where ploughing has been fairly deep, a dry layer of loose soil exists on top of the subsoil. If a strike is obtained on such a seed bed, further rains are necessary within a week or two if the plants are to survive.

At the Callide Cotton Research Station in the Callide Valley, last season's cotton plants were cut down during the first part of July, then stacked and burned. Owing to no frosts having occurred the plants were in leaf and all of the top crop of bolls unopened. It is estimated that at least 100 lb. of seed cotton per acre was lost by cutting the plants at this stage. However, it was believed that the results to be obtained in the coming season's crop, through early preparation of the seed bed, would more than compensate for the loss. In addition to this advantage, enormous numbers of the "stainer" bugs and any pink boll worms, peach grubs or corn ear worms which might be present, were destroyed. Ploughing was effected following the destroying of the plants.

The seed bed was prepared by rolling to break up the dry clods and then harrowing. Following the rains a thorough harrowing was performed and planting took place immediately afterwards.

Excellent strikes have been obtained on the plots which were treated in the above manner and it is anticipated that with another rain in the near future the crop will be sufficiently established to go for a considerable length of time before receiving further rains.

On a small plot on the Station the preparation of the seed bed could not be effected until a somewhat later period than for the rest of the Station. Examination showed that the recent rains had not given sufficient moisture, owing to the seed bed being of an open and unsettled nature, to afford any assurance of a strike being maintained if one had been secured. It will be necessary, therefore, to wait until the occurrence of more rain before planting, whereas the same rain will thoroughly establish the strike which has been obtained.

Where insufficient rain fell to effect the securing and establishing of a strike, decided assistance has been given in the preparation of a good seed bed. It is to be hoped that the cotton growers will not allow the feeling of uncertainty, which exists as regards the prices to be obtained for this season's crop, to influence them to the extent of seriously reducing their acreages. In the event of good planting rains falling in the near future it is suggested that the growers should plant acreages which they can properly thin and cultivate. Under such a system the chances of obtaining good yields of high quality cotton are greatly increased. It is believed that in obtaining such results the future of Queensland's cotton crop is assured.

The cost of producing cotton in Queensland compares favourably with the average values in the United States of America. The quality of the cotton more than compares favourably with the average quality of the United States of America cotton crop. The greatest difference is that our picking charges are practically double of those in the American crop. These charges were brought about in the seasons of 1923-24 and 1924-25 by the employing of pickers in fields of poorly grown cotton where sufficient cotton could not be picked by the inexperienced pickers to return them a wage comparable with the basic wage unless the rate was 2d. per lb. of seed cotton. The standard of cultivation has improved to a marked degree since then, and furthermore, the more uniform Durango variety of cotton is being grown over the whole of the belt. These factors, taken into consideration with the fact that the pickers are becoming more experienced, have considerably raised the rate of picking. A 100 lb. of seed cotton a day used to be considered good picking two years ago, whereas during this past season 100 lb. a day was very ordinary picking, many tallies of 150 to 180 being reported and in one case 300 lb.

It can be seen, therefore, that the present high rate for picking is not justifiable as compared to former years, especially in view of the reduced prices which are liable to be received this season. Under the circumstances it is possible that some reduction

may be effected, especially if the growers do not ask the pickers to start work until there are a sufficient number of open bolls per plant to enable a good tally to be obtained.

It is believed that if the growers pay more attention to the improving of their methods of cultivation, such as using the most efficient and labour-saving machinery, that the reduced cost of cultivation per acre in conjunction with the increased yield, will materially reduce the cost of production per lb. of seed cotton. If some reduction can be effected in the cost of picking, it is anticipated that cotton growing can be made a profitable enterprise in spite of the low world's prices which are existing to-day.

WHEAT AND PASTURE IMPROVEMENT.

By C. S. CLYDESDALE, Assistant Instructor in Agriculture.*

In the season under review the wheat crops throughout the State compared very favourably with those of past seasons.

Wheat crops generally in the early part of September were giving great promise of a record yield, but the late frosts experienced on the 18th and 24th September did considerable damage on the low-lying and exposed country. This setback, followed by a continuation of the dry weather, proved detrimental to these latter crops, which in some instances proved a complete failure as far as grain was concerned. However, the incidence of these two factors was not so pronounced elsewhere, especially on the more elevated country, with the result that average yields were good and many individual crops gave splendid returns.

The variety "Florence," which at the present time is undoubtedly the most popular kind amongst the wheat farmers on the Darling Downs, suffered a good deal of damage this year from frost, when grown on the low-lying country.

Gluyas and Canberra did well; these being mid-season varieties and slower in development were not affected to the same degree as Florence. Yields of from 13 bags of Canberra were obtained, 7 and 8 bags being quite common, and Gluyas also gave good returns.

Novo (Bunge x Indian Pearl 9), a Roma crossbred, did well generally. In one instance which came under notice a crop in the Allora district planted at the end of June gave a remarkable return of 14 bags per acre. Splendid results were also obtained during the season from Pusa 4 wheat. It is interesting to note that this variety was introduced about sixteen years ago by the Department of Agriculture from Pusa, India, and after thoroughly testing it out on experiment plots over several seasons, it was grown under field conditions in the Allora district. Since then its cultivation has been extended. Last year there were several thousand acres cropped with this particular variety. It has one disadvantage—susceptibility to frost. Growers who planted it on low-lying situations suffered loss through the late frosts in September. On slopes and ridges, high returns of excellent grain were obtained, many yields ranging from 10 to 15 bags per acre. Wheat of this description should obviously be grown on the higher lands wherever possible.

Wheat Plots.

The field work connected with the wheat propagation plots was carried out at Allora, Southbrook, Inglewood, Jandowae, Kaimkillenbun, Pittsworth, Pratten, and Murgon. Actually, a continuation of the wheat plot work which the department has been carrying on for a considerable number of years.

With few exceptions, these wheats were bred at Roma State Farm and are first tested out in nursery plots, under field conditions, before being transferred to the propagation plots. Planting was carried out from 28th May to 18th June, 1925. In all districts good moisture was present and excellent germination resulted.

Seed which was treated with carbonate of copper at the rate of 1 oz. per bushel as a bunt preventive was sown at the rate of 45 lb. per acre, and the resultant crops were absolutely free from bunt. Nineteen varieties were tested out, representing 63½ acres, from which pure supplies of seed were drawn for future operations.

In localities affected by the drought, notably at Inglewood and Pratten, only a little more than seed was obtained, but elsewhere the yields were fairly good. The

* Abstracted from the Annual Report, Department of Agriculture and Stock, Queensland, for year ended 30th June, 1926.

highest ones, Florida and Pilot, gave a return of 37 and 33½ bushels per acre respectively at Murgon, where a good deal of interest is being shown in wheat-growing.

Nursery Plots, Season 1925.

Last year, at each of several centres where field tests were carried out, small nursery plots ranging from 28 to 88 varieties were established, interesting results being obtained.

The wheat which stood out prominently last year was planted in plots one-eighth of an acre this year at Allora for observation and for the propagation of additional quantities of seed.

Certain new crossbred wheats gave most encouraging results. These in particular will be persevered with. In addition to these minor tests semi-field trials were undertaken with several promising Roma crossbreds.



PLATE 92.—MR. C. S. CLYDESDALE, ASSISTANT
INSTRUCTOR IN AGRICULTURE,

Who under the direction of Mr. H. C. Quodling, Director of Agriculture,
has done some notable work in Wheat and Pasture improvement.

Seed Wheat Improvement Scheme for 1926 Season.

Following on a conference between officers of the Department of Agriculture and the Wheat Board, and the acceptance by the Board of the proposals made to extend the cultivation of certain standard varieties of wheat (which include 60 per cent. of departmental varieties), an active campaign was initiated.

In company with the members of the Wheat Board, an itinerary was made of the principal wheat-growing districts, with a view of locating reliable growers to undertake the raising of pure strains of seed, which were to be supplied in the first place by the department at a fixed price per bushel to the growers, on the understanding that, exclusive of the specified quantity which the individual grower was at liberty to retain for his own use, the resultant crop would be purchased by the Wheat Board at a premium of 6d. per bushel over and above the price of No. 1 milling wheat.

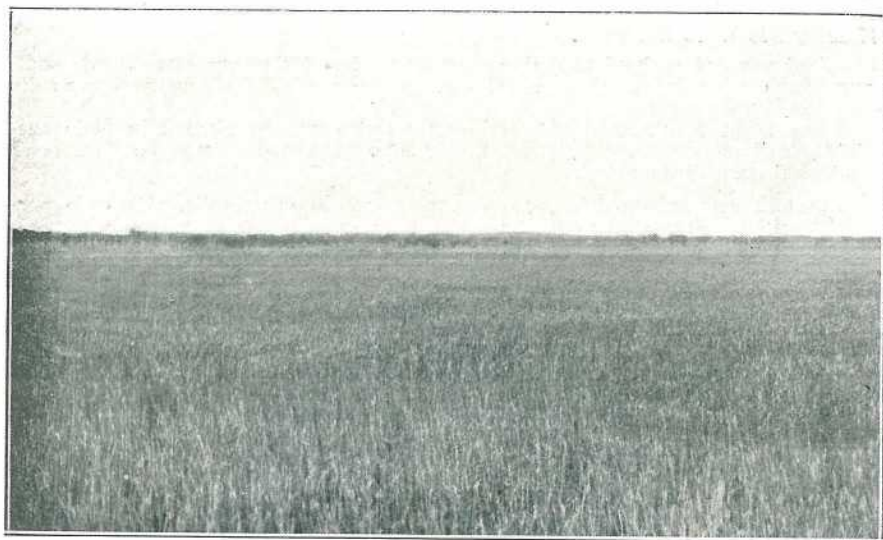


PLATE 93.—WHEAT IN THE WEST.

A Crop of "Gluyas" on John Broughton's Farm, Hodgson, immediately adjoining the Mount Abundance Lands.



PLATE 94.—A CROP OF CEDRIC WHEAT (BRED ORIGINALLY ON THE ROMA STATE FARM),

On Messrs. J. W. Aisthorpe's Farm, Bindango, immediately adjoining Mount Abundance Holding, which is in process of resumption for closer settlement.

The scheme was well received by growers, and no difficulty was experienced in placing all the seed which the department had available. Given a satisfactory season, the Board should have several thousand bushels of pure seed available for its seed extension work. As part of the scheme involves the installation of up-to-date cleaning and grading machinery, it is anticipated that a considerable improvement will soon be effected in the purity, type, and quality of the State's seed wheat.

Departmental Wheat Propagation Plots, Season 1926.

Early in the season arrangements were made to carry out a number of tests in nursery rows and to establish field propagation plots where special strains of new and promising varieties could be grown for seed purposes.

In the former case separate plots were laid down at Allora and Southbrook, with eighty Roma crossbreds and a few standard varieties, while in the latter case Cunningham, Southbrook, and Inglewood were chosen as centres for the production of several promising Roma crossbreds.

Light rains were experienced, which permitted of sowing all the wheats, which generally gave a very fair percentage of germination.

Progressive Report on Paspalum Pasture Renovation Experiments.

On 2 acres chosen for this work at Maleny and Cooroy the results, since the establishment of the plots in 1924, go to prove that the rich volcanic soils at Maleny are of high stock-carrying capacity and eminently adapted to dairying, a fact manifested by the heavy yields obtained by cutting and weighing the grass produced on the experiment plots. At Cooroy the soil proved to be less responsive, due largely to its different physical characteristics and to the fact that the subsoil is a rather close-textured clay, which favoured rapid growth only during the warmer months of the year.

At each centre marked differences were to be noted between the quality and yield of the grass from the ploughed and unploughed plots, it being shown unmistakably that where breaking and aeration of the paspalum sod was carried out it proved itself to be the first and most certain method of renovation that could be applied to old, established pastures.

Later on, when the results of the analyses of grass cut from the respective plots are summarised by the Agricultural Chemist, it will be possible to make deductions as to the most suitable fertilisers to use.

On the ploughed area several months elapsed (two months at Maleny and eight months at Cooroy) before the new growth of paspalum established itself.

RAINFALL.

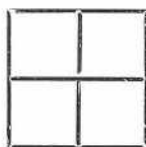
				COOROY.		MALENY.	
				Wet Days.	Points.	Wet Days.	Points.
1925.							
July ..	..	..	..	1	40	1	40
August ..	..	..	..	9	242	7	606
September ..	..	..	..	3	89	2	63
October ..	..	..	..	5	142	4	183
November ..	..	..	..	14	373	13	786
December ..	..	..	..	11	616	10	685
1926.							
January ..	..	..	..	11	701	11	1,129
February ..	..	..	..	6	185	1	10
March ..	..	..	..	16	404	11	418
April ..	..	..	..	12	425	9	565
May ..	..	..	..	9	558	7	646
June ..	..	..	..	13	549	11	677

The following list gives details of the individual and aggregate weights of green grass cut from each individual plot:—

COOROX.					MALENY.					
Plot Number Ploughed Area.	Plot Number Un- ploughed Area.	1924-1925.	1925-1926.		Plot Number Ploughed Area.	Plot Number Unploughed Area.	1924-1925		1925-1926.	
		Date of Cuttings.	Date of Cuttings—				Date of Cuttings—		Date of Cuttings—	
			19/11/25; 21/12/25; 18/1/26; 17/2/26; 23/3/26; 22/4/26; 24/5/26.	Aggregate Weight per Cutting.			Total Weight of Grass.	25/2/25; 15/6/25.	Aggregate Weight per Cutting.	Total Weight of Grass.
..	1	No cutting was made during the season	Tons.	Tons.	1	..	Tons.	Tons.	Tons.	Tons.
1A	..		.929	6.502	..	1A	2.13	4.26	1.65	11.57
..	2		.62	4.33	..	..	1.40	2.81	.65	4.58
2A	..		.745	5.218	2	..	2.23	4.47	2.03	14.19
..	3		.73	5.11	..	2A	1.91	3.82	.51	4.19
3A	..		.95	6.68	3	..	3.11	Only one cutting made. Second cutting not recorded owing to temporary damage to hurdles and grass by stock	1.79	12.42
..	4		1.17	8.21	..	3A	3.87		.81	5.70
..	4		.92	6.49	4	..	2.48		1.84	12.91
4A	..		.69	4.83	..	4A	3.14		.99	6.99
..	5		1.54	10.78	5	..	2.62	5.25	1.81	12.65
5A	..		1.19	8.35	..	5A	2.60	5.21	.96	6.72
..	6		1.90	13.33	6	..	2.73	5.47	2.29	16.00
6A	..		1.55	10.82	..	6A	3.50	7.00	1.35	9.42
..	7		1.54	10.78	7	..	3.04	6.09	1.89	13.20
7A	..		.91	6.36	..	7A	2.90	5.81	.80	5.59
..	8		1.25	8.75	8	..	4.24	8.48	2.09	14.61
8A	..	.69	4.86	..	8A	2.36	4.73	.72	5.08	
					7B	..	..	2.27	15.93	
					8B	..	..	2.33	16.31	

SKETCH PLAN AND DETAILS OF MALENY PLOTS.—AREA, 2 ACRES.

Uploughed, 1A to 8A inclusive.		Ploughed, 1 to 8 inclusive.	
8A Basic Super. $1\frac{1}{2}$ cwt. per ac.		Basic Super. $1\frac{1}{2}$ cwt. per ac.	8
7A Nitrate of Soda $1\frac{1}{2}$ cwt. per ac. Nauru peosphate 1 cwt. per ac. Sulphate of potash $1\frac{1}{2}$ cwt. per ac.		Nauru phosphate 1 cwt. per ac. 7 Sulphate of potash $1\frac{1}{2}$ cwt. per ac. Nitrate of soda $1\frac{1}{2}$ cwt. per ac.	
6A Nauru phosphate $\frac{3}{4}$ -cwt. per ac. Superphosphate 3 cwt per ac.		Nauru phosphate $\frac{3}{4}$ -cwt. per ac. 6 Superphosphate $\frac{3}{4}$ -cwt. per ac.	
5A Control. No manure.		Control. No manure.	5
4A Nauru phosphate 1 cwt. per ac.		Nauru phosphate 1 cwt. per ac. 4	
3A Slacked lime $\frac{1}{2}$ -ton per ac.		Slacked lime $\frac{1}{2}$ -ton per ac.	3
2A Pulverised lime $\frac{3}{4}$ -ton per ac.		Pulverised lime $\frac{3}{4}$ -ton per ac.	2
1A Control. No manure.		Control. No manure	1



Intersections of plots enclosed with wire-netting-covered stock-proof hurdles.

Runcorn Paspalum Pasture Improvement Trials.

In accordance with instructions received, arrangements were made to lay out twenty additional grass experiment plots in conformity with the plan supplied by the Manurial Experiments Committee. Series A and B, consisting of ploughed and unploughed experiment areas, ten plots each, were in this way extended by the addition of series C and D (ten plots each), ploughed and unploughed areas respectively, to which latter fertilisers were supplied.

Arrangements were made in the middle of December, 1925, for the breaking up on series C of the paspalum sod with an English type of mouldboard plough, in furrows 8 in. by 3½ in., the crown of the land being first opened out prior to "ridging."

Subsequent attention was given to the whole of the plots A, B, C, and D in the way of harrowing, mowing with a horse mower (two horses), raking and cleaning up the experimental area.

First cuttings were made later on in the season from the whole of the series for the use of the Agricultural Chemist. Although certain effects were observed through the use of quick-acting fertilisers, which in some instances promoted a fresh green shoot of grass on some of the plots, these latter failed to continue the improvement.

Generally speaking, the results were nullified by the lack of the usual monsoonal rains. Cattle were ultimately introduced to graze down these plots during the off season.

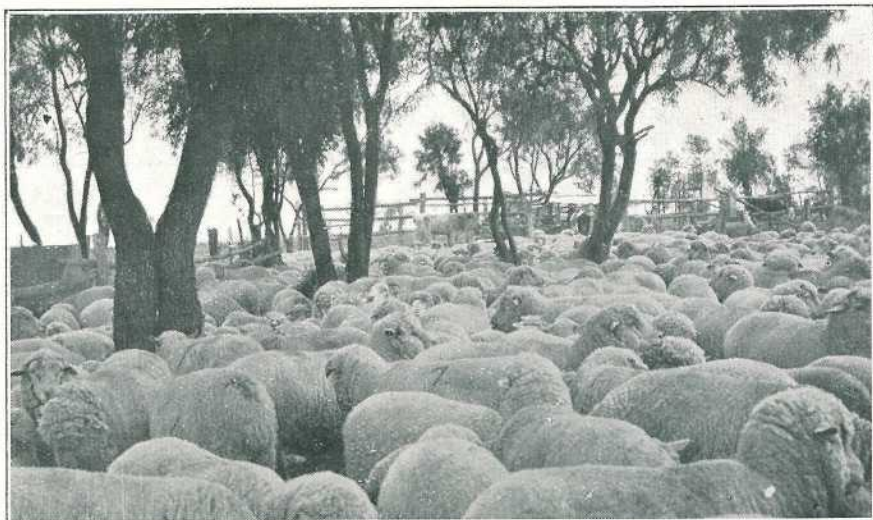


PLATE 95.—WHEAT AND SHEEP IN THE WEST.

A fine mob of ewes, real farmer's sheep, on Mr. J. W. Aisthorpe's property, Bindango, where wheat and wool raising are combined.

Fodder Trials at Runcorn.

At the request of the Manurial Experiments Committee, a small area of land adjoining the paspalum pasture improvement trials was utilised for the purpose of conducting fertiliser experiments with saccaline, maize, Sudan grass, and foxtail millet.

The land was brought into good tilth at the end of December, being ploughed and cross-ploughed and harrowed twice previous to the reception of the seed.

The seed was sown at the following rates:—

- Foxtail millet, 30 lb. per acre;
- Maize, 56 lb. per acre;
- Sudan grass, 20 lb. per acre;
- Saccaline, 30 lb. per acre.

These varieties occupied eight plots, each one-fiftieth of an acre, and were seeded down on 6th January, 1926. The seed and fertilisers were supplied from the Head Office.

The rainfall was as follows:—

January, six wet days, 145 points;
February, three wet days, 18 points;
March, eleven wet days, 297 points.

The more rapid growing plants made use of the moisture to better advantage than those naturally requiring a longer period to mature in.

Striking differences were noticeable between certain of the manured and unmanured plots, reference to which is made in photographic records appearing in the report of the Agricultural Chemist.

In the case of the maize plots the results were influenced by the lack of sufficient moisture and by the depredations of pigeons, which removed a proportion of the seed after sowing.

RAINFALL IN THE AGRICULTURAL DISTRICTS.

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

Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.		Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.	
	Sept.	No. of Years' Records.	Sept., 1926.	Sept., 1925.		Sept.	No. of Years' Records.	Sept., 1926.	Sept., 1925.
<i>North Coast.</i>					<i>South Coast—continued:</i>				
Atherton	In.		In.	In.	Nambour	In.		In.	In.
Cairns	0.61	25	2.81	0.27	Nanango	2.41	30	7.36	0.30
Cardwell	1.68	44	4.83	0.72	Rockhampton ...	1.90	44	2.25	0.87
Cooktown	1.43	52	11.18	0.82	Woodford	1.30	39	5.26	1.04
Herberton	0.57	50	2.32	0.65		2.17	39	3.90	0.37
Ingham	0.50	39	0.94	0.99					
Innisfail	1.29	34	11.08	1.71	<i>Darling Downs.</i>				
Mossman	3.55	45	13.15	3.12	Dalby	1.78	56	1.74	0.53
Townsville	1.32	13	6.25	1.07	Emu Vale	1.92	30	1.09	0.93
	0.79	55	4.43	1.33	Jimbour	1.60	38	1.77	0.21
<i>Central Coast.</i>					Miles	1.47	41	1.43	0.28
Ayr	1.48	39	4.66	1.48	Stanthorpe	2.44	53	0.73	0.49
Bowen	0.81	55	4.30	0.98	Toowoomba	2.22	54	3.11	0.30
Charters Towers ...	0.76	44	1.96	0.87	Warwick	1.89	61	1.25	0.61
Mackay	1.59	55	6.23	1.61					
Proserpine	2.10	23	8.01	1.95	<i>Maranoa.</i>				
St. Lawrence	1.32	55	0.69	2.12	Roma	1.53	52	1.74	0
<i>South Coast.</i>									
Biggenden	1.65	27	1.37	0.89	<i>State Farms, &c.</i>				
Bundaberg	1.75	43	0.87	0.57	Bungewongera ...	1.25	12	1.38	0.01
Brisbane	2.05	75	2.41	0.42	Gatton College ...	1.67	27	1.36	0.26
Childers	1.91	31	1.51	0.76	Gindie	1.13	27	1.57	1.51
Crohamhurst	2.71	30	6.32	0.59	Hermitage	1.68	20	1.24	0.78
Eak	2.23	39	3.13	0.27	Kairi	0.60	12	2.63	0.35
Gayndah	1.57	55	1.82	0.89	Sugar Experiment Station, Mackay	1.48	29	5.39	1.40
Gympie	2.14	56	3.72	0.53	Warren	0.76	12	2.10	1.07
Caboolture	1.90	39	2.75	0.24					
Kilkivan	1.73	47	3.71	0.81					
Maryborough	1.96	54	3.46	0.67					

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

GEORGE G. BOND,

Divisional Meteorologist.

WEIGHTING THE SILAGE STACK—A PROBABLE SOLUTION OF THE DIFFICULTY.

BY A. E. GIBSON, Instructor in Agriculture.

With the advent of warmer weather the dairyman and stockowner who lays claim to foresight in making provision for his live stock or has learnt a lesson from recent drought experiences, will be engaged in the laying down of areas with summer-growing crops that lend themselves to conservation in the form of hay or silage.

A good deal of attention has in the past been drawn to the inexpensive method of converting succulent fodders into silage by means of the stack method, and demonstrations have been given over an extensive area in this State by officers connected with the Field Branch of the Department of Agriculture and Stock.

Although these demonstrations have been widely appreciated, unfortunately, the quantity of silage annually conserved in this manner shows no great increase, and from observations made during visits to farmers, the opinion has been formed that one of the main difficulties in connection with the making of stack silage is the matter of "added weight," which is necessary to eliminate the waste which otherwise occurs.

Speaking broadly, the success of all silage stacks is summed up in the words "sufficient weight added," and it is in this connection that the average silage stack builder "falls down."

The addition of weight to a mass of material which it is desired to convert into silage is necessary in order to bring about consolidation and thereby exclusion of air—practically controlling the temperature at which chemical changes take place. For dairying purposes it is particularly desirable that this temperature should be as low as possible in order to reduce the decomposition of carbohydrates and proteins, which are partially lost or decomposed in the process of fermentation. The subject of a sufficiency of weight, therefore, is one to which attention must be drawn, and, although in the past mechanical presses have been placed on the market, the initial cost of these would go a long way towards providing the cost of a concrete silo which, after all, should be the ultimate goal of every farmer who combines agriculture with stock-keeping.

The most popular methods of applying weight are—

- (a) By the addition of soil.
- (b) By the addition of rock or water-worn stones.
- (c) Timber in the form of logs, &c.

The first method, whilst easy of adoption, and being, of course, close at hand, has its drawbacks. Not the least of these are easy displacement by heavy rains if insufficiently protected; the difficulty of preventing during feeding operations the admixture of soil with at least a portion of the silage; labour involved; and finally soil, by reason of its susceptibility to climatic conditions, cannot be regarded as a stable or constant weight.

Rock or stone, preferably water-worn, lends itself admirably to the purpose of weighting a stack, but unfortunately it is not always available; apart from which the handling of stone is more or less laborious even when a whip or other mechanical means of hoisting are available. The chief advantage of this class of weight is that once obtained it is available without any great amount of transport for further stack building operations.

Weighting by means of logs is a laborious business, and is perhaps the most unsatisfactory, unless such material as fencing posts or sawn firewood blocks are available. Even with these at hand the work is more or less laborious, apart from which weight cannot be concentrated to the same extent as in the case of stone.

The probable suggested solution lies in the direction of cheaply constructed concrete blocks of a size that can be readily hauled, and by reason of their shape lend themselves to close stacking where a concentration of weight is desirable.

Few farmers of to-day are very far distant from supplies of empty petrol tins, and with these, a few bags of cement, a quantity of gravel and sand, a few odd pieces of galvanised wire, plus water and a little energy, a number of cheaply and quickly constructed concrete blocks can be acquired, capable of being easily lifted into position with a simple whip, and practically indestructible. Even when the outside covering of tin rusts away, as it does in the course of a season or two's use, the block itself is sufficiently hard enough to stand rough usage.

The concrete mixture recommended is that known as 4—2—1: *i.e.*, four of gravel or finely broken stone, two of sand, and one of cement. Where economy has to be rigidly adhered to the mixture may be reduced to 5—2½—1, or even 6 to 1 may be used; but for a lasting job the 4—2—1 is preferred.

It is not absolutely necessary that a mixing board should be used if a hard level clayey surface is at hand, but all vegetable matter should be removed therefrom before beginning operations. A few mixings improves this substitute for a mixing board. The petrol tins will require to have their lids removed, which is easily accomplished by means of a sharp tomahawk or old butcher's cleaver; loose edges should be well hammered down. At the same time remove by hammering any dents in the tins which would prevent the concrete settling well into the sides, as an irregular-shaped mould naturally means a similar shaped block, which will for ever give trouble when it comes to stacking.

The pieces of galvanised wire should be bent to form loops large enough to slip a trace hook into, and should be hung across the middle of the top of the tin by a piece of round iron during the process of filling the tin with concrete. Twist the spare ends in any irregular shape calculated to hold in the concrete. Well ram the concrete till it comes to the level of the top of the tins. Sufficient shrinkage will take place during drying to leave exposed the loop of galvanised wire, but before the concrete is thoroughly set it is as well to make a slight indentation around and between the loop to admit of rapid hooking and unhooking during hoisting operations.

The blocks, when set, should be allowed to dry out slowly and should be kept moist either by wet bags or sand for at least a week; afterwards being allowed to "cure" slowly, preferably in some form of shade from the direct rays of the sun.

For those who contemplate constructing the blocks as set out, the following information may be useful:—Approximately 37 petrol tins will hold 1 yard of concrete, and a strength of 4—2—1 will require per cubic yard of concrete $4\frac{1}{2}$ bags of cement, 9/10 cubic yard of finely broken stone or gravel, and $\frac{1}{2}$ yard, nearly, of sharp sand free from soil. One yard of concrete weighs approximately 4,050 lb. Approximate weight per block, 109 lb.

FIELD DAY AT THE ROMA STATE FARM.

A PROMISING NEW WHEAT.

About sixty farmers and other visitors took advantage of the recent annual field day to visit the Roma State Farm. The visitors were cordially welcomed by the manager (Mr. R. E. Soutter) who conducted them around the experimental wheat plots. Adjoining these, the visitors noticed an area of wheat considerably more advanced toward maturity than any of the other plots. This was a comparatively new variety—"Watchman"—a cross between Soutter's Early and Warren. This variety is also being grown in a small way by one or two farmers in the Maranoa, who report favourably on its behaviour under the very dry conditions prevailing this season. From experience to date, "Watchman" is likely to prove a valuable addition to the wheat suitable to the Maranoa district. Rows of experimental wheats, including about 120 varieties, were inspected, and Mr. Soutter briefly explained the history, characteristics, and suitability or otherwise of these to the Maranoa soil or climate, so far as experiments to date had proved.

Other plots where the value of fertilisers is being tested were inspected, and the manager stated that the yield from an area which had been fertilised compared with an adjoining one which had not, was, over a number of years, 21 bushels to 18 bushels per acre respectively. The additional yield from the manured plot, he said, more than paid for the extra cost of fertilising, and where sheep were on the farm (a combination which is rapidly growing in favour throughout the Maranoa) there was an added advantage from better pasture subsequently.

Mr. Soutter gave an interesting demonstration of crossing wheats, and the visitors then inspected the grape vines and fruit trees, noting with much interest the methods of pruning, training, and grafting. Training of the growth of peach trees along wires, somewhat on the same principle as grape vines, was a novelty to many, and created much interest.

Following afternoon tea, the visitors were shown the farm's method of grading wheats, and the manager then, by means of a number of small phials containing cow peas and wheat, attached to a screen, gave an instructive little demonstration of the results of the crossing of distinct varieties of each. In simple language Mr. Soutter pointed out how the dominant characteristics in the crossed plants prevailed, and how a definite conclusion as to the ultimate product was reached. Mr. Soutter had also something to say about the olive trees planted eighteen years ago, which form an excellent avenue leading to the manager's residence.

Before the gathering dispersed, Councillor J. S. Murphy (chairman of the Bungil Shire Council) expressed the thanks of the visitors to Mrs. Soutter and her lady friends for a very welcome cup of tea, and to the genial manager for a very instructive tour of the State Farm. He paid a well-deserved tribute to the splendid experimental work being carried on by Mr. Soutter, remarking that while its value was already recognised by many, it would be much more highly appreciated in the years to come.

Mr. Soutter, in replying, said he hoped that the field day would be made an annual event. In answer to a question, he mentioned several varieties of wheat which he considered to be among the most suitable for the Maranoa, including Amby, Gluyas, Florence, Bunge, Cedric, Warren, and Watchman. He added, however, that a great deal depended upon location, the nature of the soil, and methods of cultivation. He advised any farmer who had growing on his place a wheat which suited his land to stick to that variety.

The field day was greatly appreciated by district farmers as being something much more than a very enjoyable social event, and the practical work carried out by Mr. Soutter on the Roma State Farm was warmly commended.

IRRIGATION IN THE WEST.

By J. DAVIES, Inspector of Dairies.

What can be done by irrigation on a Western farm has been well demonstrated by Messrs. Page Brothers, of Miles. They took up a selection there about two years ago. The timber comprised apple, ironbark, and cypress pine. After felling the timber and milling it themselves, they erected a substantial homestead. In the meanwhile, they cultivated a small area as a market garden, and together with dairying, this acted as a means of keeping the pot boiling. The cultivation has been extended to about 6 acres irrigated from a spring lagoon. This lagoon had, at the time of writing, some 18 feet of spring water; in good seasons it has a depth of 25 feet, and covers about 3 acres. Irrigation is carried out by the engine which was used for the milling of the timber, together with some 400 feet of piping, to which are attached eleven sprinklers. These sprinklers were made on the farm, and each has a radius of 18 feet and they do their work well. The piping can be taken up without very heavy lifting and placed at will in any part of the garden. Messrs. Page Brothers are believers in fertilising as well as irrigation, and the abundance of the crops fully shows what can be done, though it is in what is considered more or less a dry belt. The soil is a fine sandy loam, and is ploughed to a depth of 1 foot. The local market is good, and last summer they were unable to keep up with the demand, which extended as far as Charleville.



Photo.: J. Davies.]

PLATE 96.—A WESTERN CABBAGE GARDEN—WATERED WITH A SMALL BUT EFFECTIVE SPRINKLING PLANT.

New Cultivation on Messrs. Page Brothers' Farm at Miles.



Photo.: J. Davies.]

PLATE 97.—“SPLASHES OF THE NEEDFUL.”
Sprinklers on Messrs. Page Brothers' Farm at Miles.

DISTENDED ABDOMEN IN POULTRY.

By P. RUMBALL, Instructor in Poultry Raising.

Hens with distended abdomens are not an uncommon feature in many poultry yards, and when such hens are noticed the cause should be ascertained, as this condition generally is not indicative of high production.

There are several causes of distended abdomen, and they may be grouped under two headings—viz., (1) Physical conditions and (2) diseased conditions.

Physical Conditions of Enlargement.

Under physical conditions may be classed birds which are carrying an excessive quantity of internal fat. This fat is situated in a layer around the bowl or soft portion of the abdomen, frequently being an inch or more in thickness. Birds in this condition also have much fat upon the intestines and connective tissue, and



PLATE 98 (Fig. 1).—SHOWING THE OVIDUCT OF A BLACK ORPINGTON HEN FILLED WITH PARTIALLY FORMED EGGS.

Stoppage of the organ in the first instance was due to the irritation caused by the breaking of an egg, possibly the result of a knock following a fright.

this together with the thick layer referred to causes that swollen or distended appearance. This condition can easily be ascertained upon handling. The bird will be exceptionally heavy and the thickened wall of the abdomen can be felt.

Another class of bird which comes under the heading of physical conditions is the bird in which there has been partial rupture of the membranes which hold the intestines in position. This ruptured condition allows the intestines to rest upon the soft portion of the abdomen, giving it that distended appearance. This condition is termed "down behind," and is easily ascertained by handling, the abdomen being soft and yielding, and by gentle pressure with the forefinger upon one side and the thumb upon the other the intestines can be felt.

This condition is more frequently met with in birds which are very short in the breast-bone and occasionally in excessively fat birds. The dragging and constant brushing with the legs against the abdomen often causes the formation of small abscesses, but apart from that the constant irritation is sufficient to retard production. The evil of the short breast-boned bird has probably been accentuated by breeders selecting birds which show great length or distance between the end of the pelvic bones and end of the breast-bone in their search for capacity, forgetting that in measuring the distance or depth of a bird on these lines, the angle at which the measurement is taken upon a short breast-boned bird is greater than one with a relatively long breast, while the true depth may be the same. While the internal organs are held in position by membranes, and are not naturally dependent upon the framework of the body for support, in cases of fright, particularly when the hen is in full lay, the framework does act in this direction.

There is yet another class of bird which could be treated with under physical conditions, and that is one in which there has been a rupture or derangement of the reproductive organs. There are two principal forms of this trouble, one as

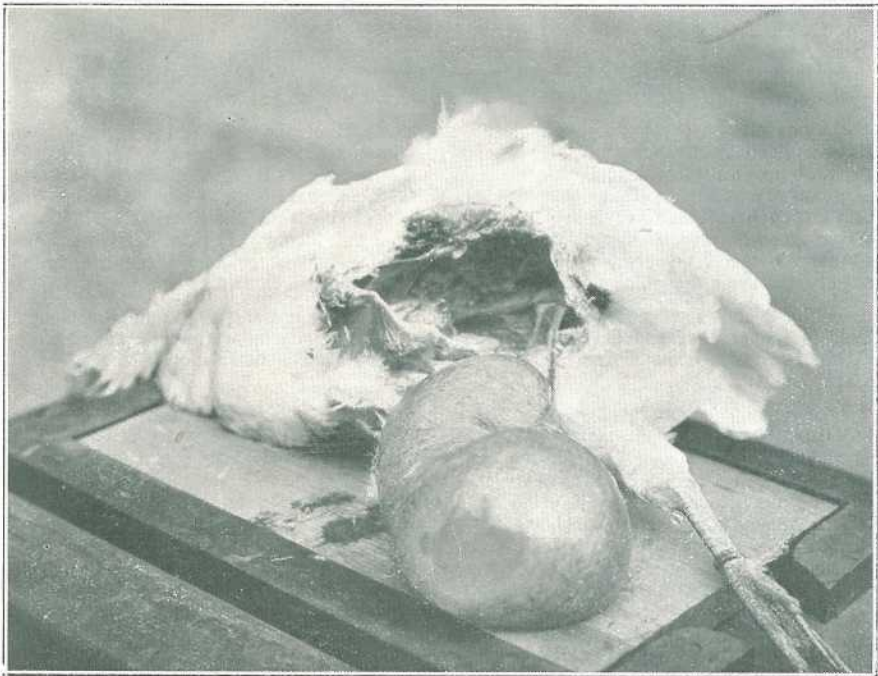


PLATE 99 (Fig. 2).—CYSTIC FORMATION NEAR THE CLOACA.

Can be removed by operating. In doing so, sever the attaching cord about midway between the cyst and seat of attachment.

illustrated in Figs. 1 and 2, cases where a distinct rupture occurs in the oviduct, allowing the individual egg to fall through into the abdomen. The condition of the oviduct as illustrated in Fig. 1 is undoubtedly due to an egg becoming broken in the lower portion of the oviduct. This broken egg, by causing local inflammation, has prevented the eggs which followed from being laid, with the consequent packing up as illustrated. This condition, as will be noted from the illustration, took some considerable time to form and externally the bird showed no signs of distress, looking all that a good layer should, the swelling of the abdomen being the only optical indication of possible trouble. If an examination had not been made the bird would not have been culled out, the oviduct becoming still more enlarged, possibly rupturing and allowing the mass of egg matter to fall into the abdominal cavity. Examination with the fingers would indicate, when gentle pressure was exerted, a hardened mass, enabling the poultry keeper to eliminate still another unprofitable bird.

Enlargement Due to Diseased Conditions.

There are two primary diseased conditions responsible for the enlargement of the abdomen—namely, abdominal dropsy and cystic diseases. With either of these troubles the hens affected will generally stand more erect than normally and in advanced stages will be nearly as upright as a runner duck. They become disinclined to move about and when action is forced on them the comb becomes more or less darkened in colour and they experience difficulty in breathing, due to the pressure of fluid or cysts on the air sacs. In both cases the abdomen becomes very much enlarged and feels like a bladder of fluid. When pressed gently in one place there will be greater undulation in another, indicative of the presence of fluid. Judging by the abdomen alone it is difficult to distinguish dropsy from cystic trouble, but the breeder may be guided to a large extent by the condition of the bird. With abdominal dropsy the bird generally becomes thin and emaciated, while the bird with cystic trouble is generally in good condition, particularly if the cyst is not of long duration. Dropsy is due to chronic inflammation of the liver or peritoneum and the carcass is unfit for consumption. It is more frequent in old birds, particularly those that have been heavy layers, and in many cases it may be associated with internal tumours.

Cystic troubles are not infrequent in poultry. For every case of fluid due to dropsy coming under the notice of the writer there have been twenty or more due to cystic troubles. The seat of the cysts commonly met are in two distinct positions—namely, on the ovary and near the upper portion of the cloaca.

Cysts on the ovary vary considerably in formation. In some cases ovaries have been noticed in a general cystic condition, the cysts varying in size from a pea to that of an exceptionally large egg, and in other there has been but one large cyst similar to that illustrated in Fig. 2. Ovarian cysts are probably due to the degeneration of certain cells, and it is probable that the forcing and stimulating foods given to poultry assist in the development of this class of cyst. Poultry keepers, however, need not be alarmed when one or two birds are found affected in their flocks, as no case of general infection are known.

Fig. 2 shows a cystic formation situated near the upper portion of the cloaca. This is the seat of the majority of cysts coming under the writer's notice. They attain enormous dimensions, the one illustrated holding a little more than one and a-half pints of fluid.

Birds can be operated on for the removal of cysts, but the low value of the individual hen hardly warrants the labour involved. Breeders, however, who desire to remove cysts should take action before the cyst becomes too large, as when it is in this condition it is difficult to make an incision in the walls of the abdomen without puncturing the cyst. To operate make an incision about 2 inches in length on the side of the bird, where the wall of the abdomen is thin. An effort can then be made to get a small portion of the cyst out. This now forms a neck in the cyst and by slight pressure upon the abdomen some of the fluid can be forced into that portion of the cyst outside, then more of the cyst withdrawn, and the process repeated until the whole of the cyst is removed from the abdominal cavity. The attachment between the cyst and the body can then be severed, the wound sown up, and the operation is then completed. It will, however, be understood that all of this work should be performed under conditions to prevent the poisoning of the wound. Operations have been performed upon birds with cystic troubles and their laying has not been interfered with, but in these cases the cyst was caught in the early stage. If it had been left to develop, it would have of its own accord stopped the bird from laying.

FATTENING POULTRY.

By P. RUMBALL, Instructor in Poultry Raising.

In dealing with this subject there are two distinct classes of birds to receive consideration—namely, young growing cockerels and culled or old hens. Owing to the constant development of the bony structure and muscular development of cockerels there is a necessity for a slight variation in the ration used, but there are, however, similar conditions for the method of feeding, housing, and general treatment.

General Health.

Both cockerels and hens intended for fattening should possess good health and be free from both internal and external parasites. It is uneconomical to try and

fatten birds which do not possess these qualifications, and, therefore, sickly birds and birds not possessing constitution should be destroyed and wormy stock treated for worms before commencing operations.

Period of Fattening.

When birds are placed under conditions most suitable for fattening—that is, more or less confined conditions—exercise is restricted with the result that in time it is impossible to induce the birds to eat sufficient quantities necessary for further development, and therefore the maximum period recommended for special fattening is fourteen days.

Methods of Feeding.

Pen Feeding of Young Cockerels.—When cockerels are about eight weeks old they should be separated from the pullets, graded according to size, and placed in pens. The pens should be small to restrict exercise and provided with sleeping quarters and ample shade.

The following ration will be found to give satisfactory results:—20 lb. bran, 20 lb. pollard, 40 lb. maize meal, 10 lb. oatmeal pollard, 5 lb. bone meal, 5 lb. meat meal, and $\frac{1}{2}$ lb. salt. This mash should be moistened with milk and fed two or three times a day, but it is essential to maintain the appetite of the birds and only quantities that would be consumed, say in half an hour, should be fed at a time.

Grain is not essential, but if it is desired to feed only two mashes per day, small quantities of a grain mixture of 2 parts maize and 1 part wheat may be fed. Green feed is not necessary in any quantities, but small amounts might be used to assist in maintaining appetite and health.

If it is desired to produce larger cockerels for marketing purposes, pen them under similar conditions to those above when twelve to fourteen weeks old, but separate them from the growing pullets early in life and feed them on growing foods until fattening operations are commenced.

In pen feeding culled or old hens cracked maize can be fed both morning and night with two mashes during the day. The mash should consist of 50 per cent. maize meal, 20 per cent. bran, 25 per cent. pollard, and 5 per cent. meat meal. This mash should be moistened with milk if available.

When available the drink supplied to pen-fattened birds should be sour skim milk or butter milk, and when so, no other drink is required. Plentiful supplies of hard grit and charcoal should always be available.

Crate Fattening.

It is only desirable to resort to this method of fattening when adult birds or well-grown cockerels are to be treated, and then only for assured markets. This method needs more attention and adds to the work of the farm, hence the necessity of obtaining returns commensurate with the cost of labour and material used. A crate 2 feet long, 18 inches deep, and 18 inches high is simple of construction. This crate will hold three to four birds according to their size. A long crate of similar dimensions could be built, divided into 2-foot sections, and raised on legs to facilitate the work. It will be understood that under such conditions the sanitation of the crate must receive strict attention; dirty crates soon lead to sickness and poor results. A V-shaped trough placed in the front for the purpose of holding the porridge or gruel form of food given, together with receptacles for grit and charcoal, is all that is needed in the way of furnishings.

Under this system it will be found that hens will obtain the maximum results in six to seven days, cockerels seven to ten, and capons ten to fourteen. Birds kept under these conditions for a longer period soon go off. The food should be mixed into a paste with skim milk or buttermilk, having a consistence that will permit of it running fairly freely from the receptacles. This can be made of 2 parts maize meal and 1 part of pollard or wheat meal and a little bran. Small quantities should be fed until the birds become accustomed to the altered condition of feeding, then increasing the amount until the birds have had all they will consume in half an hour. Three feeds should be given daily. No other food or drink is necessary.

In all methods of fattening it is important to keep the birds as quiet as possible, having rooms or sheds well ventilated but free from draughts and sunlight. All coops, sheds, &c., must be kept clean and be frequently disinfected, internal and external parasites guarded against, and any bird sickening under the process given its liberty. Supplies of grit, both hard and charcoal, should always be available.

COTTON IMPROVEMENT LAWS IN CALIFORNIA.*

By O. F. COOK, Bureau of Plant Industry, U.S.A.

Conditions are favourable for cotton in the irrigated valleys of California and Arizona, including the better qualities of fibre. In view of the higher costs of production, it has not appeared that a cotton industry could be maintained on a basis of direct competition with the eastern Cotton Belt in raising ordinary short staples. The Pima variety of Egyptian cotton is grown in Arizona, while most of the cotton in California is of an Upland variety called Acala, introduced from Southern Mexico.

The growing of short staple Upland cottons has been profitable in California in seasons of high prices, but the need of producing uniform, high quality fibre has been recognised by the growers, in order to stabilise the market relations. The reasons for standardising the production of cotton are the same that have been recognised with other crops in California, and similar methods are being followed, through co-operative organisations of the growers.

The production of miscellaneous, mongrelised cotton is wasteful, and the commercial classification of the bales is a difficult and costly operation, with results that do not satisfy either the farmer or the manufacturer. Many of the commercial difficulties are reduced or avoided through standardised production, so that all of the bales contain the same kind of cotton. The sampling, grading, and stapling of the individual bales may prove unnecessary in districts where production is standardised.

Cotton is grown as an annual crop, and production can be standardised only by establishing and maintaining adequate supplies of pure seed, which is possible only in communities that restrict themselves to one variety.

The Coachella Valley in Riverside County was the first community to adopt the Acala cotton in 1920. The seed-stocks were maintained in isolated districts, and other varieties gradually eliminated. The same course is being followed in several other valleys. The advantages of standardised production of cotton are clearly understood and the stage of legal recognition and protection of such communities has been reached. The Legislature of California recently has enacted two laws in behalf of the cotton industry, one to stabilise the pure seed districts, where only a single variety of cotton may be grown, and another providing for the certification of pure cotton seed by the California Department of Agriculture.

The Acala variety is a superior type of Upland cotton, discovered in 1906 in Southern Mexico by the U.S. Department of Agriculture, acclimatised in Texas, and grown on a large scale in Texas and Oklahoma, to the extent of the supplies. It is an early, productive variety, with large "storm-proof" bolls, well adapted for easy and clean picking. A bale per acre is considered as a normal yield in California and two-bale yields are not infrequent in some of the irrigated valleys. The fibre is abundant and of excellent quality, with a length of one and one-eighth or one and one-sixteenth inches under favourable conditions, and generally commands a premium over the shorter staples. In addition to uniformity, strength, and good spinning qualities, a special characteristic is reported from England and France, in taking dyes better than most cottons of the same staple.

The following statement regarding the community law is from the Official Record of the U.S. Department of Agriculture for 5th August, 1925. Also the text of the law will be of interest to cotton breeders and to those who are concerned with the problem of pure seed supplies.

LEGAL PROTECTION OF COTTON COMMUNITIES IN CALIFORNIA.

That the farmers of each community restrict themselves to the planting of a single variety has been urged by the Department of Agriculture as an essential step in the progress of the American cotton industry. The advantages in community production are now so well recognised in California that legal protection is being given to the one-variety communities against the danger of mixture and impairment of the seed-stocks by careless or irresponsible individuals.

In two of the California cotton-growing counties, Riverside and Kern, ordinances were passed by the boards of supervisors to keep other kinds of cotton seed from being planted in the one-variety communities. At the last meeting of the State Legislature an Act was passed which definitely excludes other varieties

*Reprinted from "Journal of Heredity," XVI, No. 9.

of cotton from specified districts where the farmers have restricted themselves to the Acala variety.

The purpose of the enactment to protect the public interest in the improvement of the cotton industry is clearly stated in the first section of the Act (California Assembly Bill No. 167), and is regarded by the farmers of the Act as in line with well-established precedents. It is recognised in other public improvements that the responsibilities are to be shared by the entire community that establishes the improvement, as in irrigation or drainage districts. No extra cost is involved in establishing the one-variety improvement, but only the requirement that growers refrain from injuring their neighbours who have adopted an improved system of production. The cotton land becomes more valuable in a restricted community because it can be used with greater advantage to the farmer, as in parts of California where a definite exclusion of noxious weeds or diseases is being maintained.

As compared with the usual conditions of mixed-variety production each individual farmer of a one-variety community is able to raise more cotton and cotton of better quality, which can be sold at a higher price. The manufacturers are willing to pay more for dependable supplies of uniform fibre because the spinning and weaving are less expensive and the resulting fabrics are better. The advantages to be expected eventually through establishing and maintaining a system of community production and marketing of the crop of Acala cotton in the single-variety communities may be estimated conservatively at from 3 to 10 cents. per lb., or from 15 dollars to 50 dollars per bale, more than the growers would receive if other varieties were admitted and the usual mixing and mongrelising of the seed stocks took place.

Under the usual conditions of production, with different varieties grown in neighbouring fields and the seed mixed together at the public gins, most of the crop is produced from mongrelised, "gin-run" seed and the lint is of irregular, inferior quality. On account of cross-pollination by insects and the construction of the gin machinery the mixing and deterioration of seed stocks is practically inevitable if different varieties are grown in the same community. No general utilisation of superior varieties is practicable without the one-variety communities where the pure planting seed can be produced in sufficient quantities to maintain the quality of the cotton throughout that region.

The protection of one-variety communities is of interest in other States not only as a step in working out the general problems of the cotton industry, but as assuring a source of seed supply of good varieties that may be drawn upon in emergency years. Twice in the last ten years most of the good stocks of planting seed have been lost over wide regions of the eastern Cotton Belt, as a result of unfavourable weather and excessive weevil damage, so that most of the crop of the following years had to be planted with inferior seed, for lack of any supply of good seed in sufficient quantity.

TEXT OF ONE-VARIETY LAW.

An Act to provide for the growing of one variety or species of cotton, to wit, Acala, in certain prescribed and defined districts in the State of California; to prohibit the picking or harvesting of any variety or species of cotton other than that known as Acala in such districts; to prohibit the possession within such districts for the purpose of planting any seeds or plants of any variety or species of cotton other than that known as Acala in such districts; to prohibit the ginning of any variety or species of cotton other than that known as Acala in such districts; defining such districts; and fixing the penalty for a violation of this Act.

The people of the State of California do enact as follows:—

Section 1. The Legislature hereby declares that the purposes of this Act are to promote, encourage, aid, and protect the planting and growing of cotton in the State of California; that it believes this purpose best can be accomplished by restricting within certain areas hereafter defined the planting and growing of but one variety or species of cotton, to wit: Acala; that by this means alone is it possible to bring the cotton-growing industry in the State to its highest possible development and to insure the growing of the most superior and economically most profitable variety or species of cotton; that the planting of pure seed is essential to the production of a more merchantable and better grade of cotton and cotton seed and for the production of a grade of fibre best suited for manufacturing purposes; that the planting of impure seed or plants other than that permitted in the areas hereinafter defined is an economical harm and loss to the planter thereof and an irreparable injury to the adjoining or neighbouring growers; that

the restriction of the use to which cotton lands may be used, as provided in this Act, is essential to the highest development of the cotton-growing industry and of benefit even to one who would violate the provisions of this Act; that it is essential that but one variety of cotton should be ginned in the district in this Act defined, otherwise the gin will mix the different kinds of seed, crossing takes place in the fields, the varieties are mongrelised, and cease to be uniform, the fibre deteriorates in quality, and the seed rendered unfit for planting; that solely by restricting the growing of one variety or species of cotton in certain areas can the fibre be grown of uniform length and quality, and the highest price paid for the cotton thus obtained, and the production of fibre of different lengths or grades be prevented; that fibres of different lengths and grades are commercially inferior and when assembled in one lot or grade are classed and given the value of the lowest grade in the lot or sample; that Acala cotton is now the variety or species of cotton that has been most highly developed and improved and most suited commercially for growing in the districts in this Act defined; that if future experiments should develop an improved variety or species of cotton, this Bill can be amended to designate it; and that the districts in this Act defined can be altered, restricted, or extended.

Section 2. This Act shall be so interpreted and construed as not to be considered the taking of private property without due process of law; nor disturbing the owner in the control or use of his land for lawful purposes; nor restricting his right to dispose thereof, but as a declaration by the Legislature that its use for the purposes herein forbidden is prejudicial to the public interests and an economical loss to the State and an irreparable loss and injury to the cotton growers.

Section 3. In the districts in this Act defined, it shall be unlawful to plant any seeds or plants of any variety or species of cotton other than the seeds or plants of that variety or species known as Acala.

Section 4. It shall be unlawful in the districts in this Act defined to pick or harvest cotton of any variety or species other than that known as Acala.

Section 5. It shall be unlawful for any person, individual, co-partnership, association, firm or corporation, or agent or employee thereof, to have in his or its possession within the districts in this Act defined for the purpose of planting any seeds or plants of any variety or species of cotton other than that known as Acala.

Section 6. It shall be unlawful for any gin located or operating in any one of the districts in this Act defined to gin any variety or species of cotton other than that known as Acala.

Section 7. District number one shall consist of the county of Riverside; district number two shall consist of the county of Kern; district number three shall consist of the county of Madera; district number four shall consist of the county of Fresno; district number five shall consist of the county of Kings; district number six shall consist of the county of Tulare; district number seven shall consist of the county of Merced; district number eight shall consist of the county of Stanislaus; district number nine shall consist of the county of San Joaquin.

Section 8. Any person, individual, co-partnership, association, firm, corporation, agent, or employee who or which shall violate any of the provisions of this Act shall be deemed guilty of a misdemeanour, and, in addition thereto, shall be liable in a civil action for all damages that may be occasioned or caused by a violation of this Act.

Section 9. If any clause, sentence, paragraph, or part of this Act shall, for any reason, be adjudged by any court of competent jurisdiction to be invalid, such judgment shall not affect, impair, or invalidate the remainder thereof, but shall be confined in its operation to the clause, sentence, paragraph, or part thereof directly involved in the controversy in which such judgment shall have been rendered. The Legislature hereby declares that it would have passed this Act irrespective of the fact that any clause, sentence, paragraph, or part thereof be declared unconstitutional.

Section 10. That this Act shall not apply to the planting or growing of cotton in the experimental stations or farms conducted by the United States Government; the State of California; nor to the transportation of seed or plants by interstate or intrastate commerce, nor to seed in transit from a point without one of the districts in this Act defined to a destination without such district; nor to the transportation of plants or seeds into one of the districts hereinafter defined for experimental or technical purposes by the United States Department of Agriculture, the Department of Agriculture of the State of California.

Section 11. All Acts and parts of Acts in conflict herewith are hereby repealed.

THE POLAND-CHINA PIG.

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

Of the several breeds of pigs originated and developed under American conditions and including breeds suited for the production both of the very heavy lard hog—for which, in America, there is a continuous demand—for bacon production both for home consumption and for export, and pork, we have in Australia but two representative breeds—viz., the Poland-China and the Duroc-Jersey, the red hog, to which extended reference is made in the pamphlet now available, dealing with the Duroc-Jersey, the most recently introduced of these two American types.

The Modern Poland-China.

It would be as well, possibly, in describing this one of America's leading types of pigs, to state quite distinctly that the reference is to the more recently introduced modern type of Poland-China and not to those old spotted types one sees occasionally in different districts here in Queensland and on the Northern Rivers of New South Wales. These older types are now out of date in so far as their usefulness for the purposes of stud breeding is concerned; they are also invariably coarser and less profitable than the types described and illustrated herein (see Figs. 1-6), whilst it is impossible in most instances to trace their breeding or to record their pedigrees. On the other hand, the modern type of Poland-China is up to date in this, as in every other respect.

It would not be correct, in view of the above statement, to classify our Poland-Chinas as belonging to two special groups or types, such as might be referred to as old type Poland-Chinas and improved or modern Poland-Chinas, though it is correct to state that the Poland-Chinas referred to in this article as modern or improved in type are a decided improvement on the types of fifty years ago, and it is anticipated now that they will become much more popular as time goes on and breeders generally learn to appreciate their special and valuable qualities more than they have done in the past. It is necessary, too, that special care should be taken to guard against unfavourable features of the breed, for the breed is inclined to fatten very readily, and unless carefully handled, to become far too fat for our market requirements.

How the Poland-China Originated.

Apart from the several breeds of pigs originating in the British Isles from the old English wild pig crossed onto the Chinese and Neapolitan types, there are numerous other breeds and types in various parts of the world, some of which are specially worthy of note; many of these have been evolved under American conditions, the American types possibly now being more widely known than the types of any other country, with the single exception of the British Isles. Prominent among the American types is the Poland-China, which originated in the Miami Valley, Ohio State, in the counties of Butler, Hamilton, and Warren.

While the improvement of various types of animals was taking place in Great Britain, our "Yankee" brethren looked on, took notes, and eventually decided to attempt improvement of the wild razor-back type of which America and Canada, in those days, apparently had an unlimited supply. As far back as 1816, there is record of the attempt to improve the old Byfield and Russian hogs by crossing them with an imported type then known as the "Big China," a breed specially introduced for the purpose by one John Wallace, a leader of a sect of people known as "The Shakers." These "Big China" pigs were white in colour, and were noted for fine quality of flesh and for their comparatively quick growth.

Later, and in the year 1834, an Irish type of pig—known as the "Irish Grazer"—resembling the Old English Berkshire, was introduced into Ohio State, and the progeny of these pigs, when mated with the native hog, were so favourably commented on that the Berkshire type, as it was then, was, as opportunity offered, freely introduced and used liberally for crossing on the partly improved stock available.

During the period 1816 to 1845, several other breeds and types of hogs were brought into South and Western Ohio and were used in the building up of the breed, including the Irish Grazer, a medium-sized white hog with ears erect and with characteristics of smoothness and early maturity, and the Siamese, a small black hog of very early maturity. The Berkshires, introduced about 1839, were very

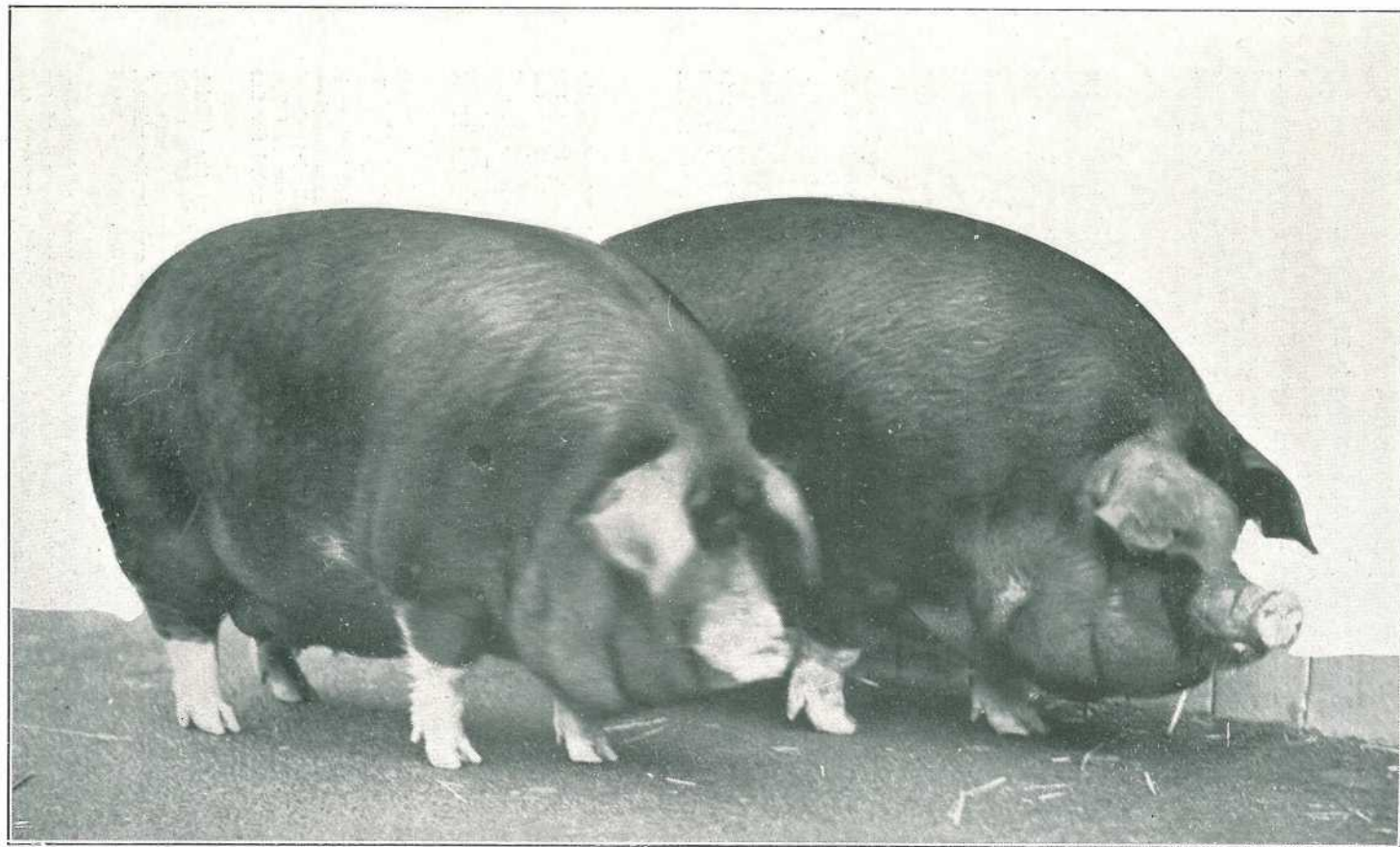


PLATE 100 (Fig. 1).—A PAIR OF POLAND-CHINA CHAMPIONS.

This photograph also illustrates the modern type of Poland-China as they appear when polished up and in Show condition. These two sows have both proved good breeders, their progeny also winning numerous prizes.

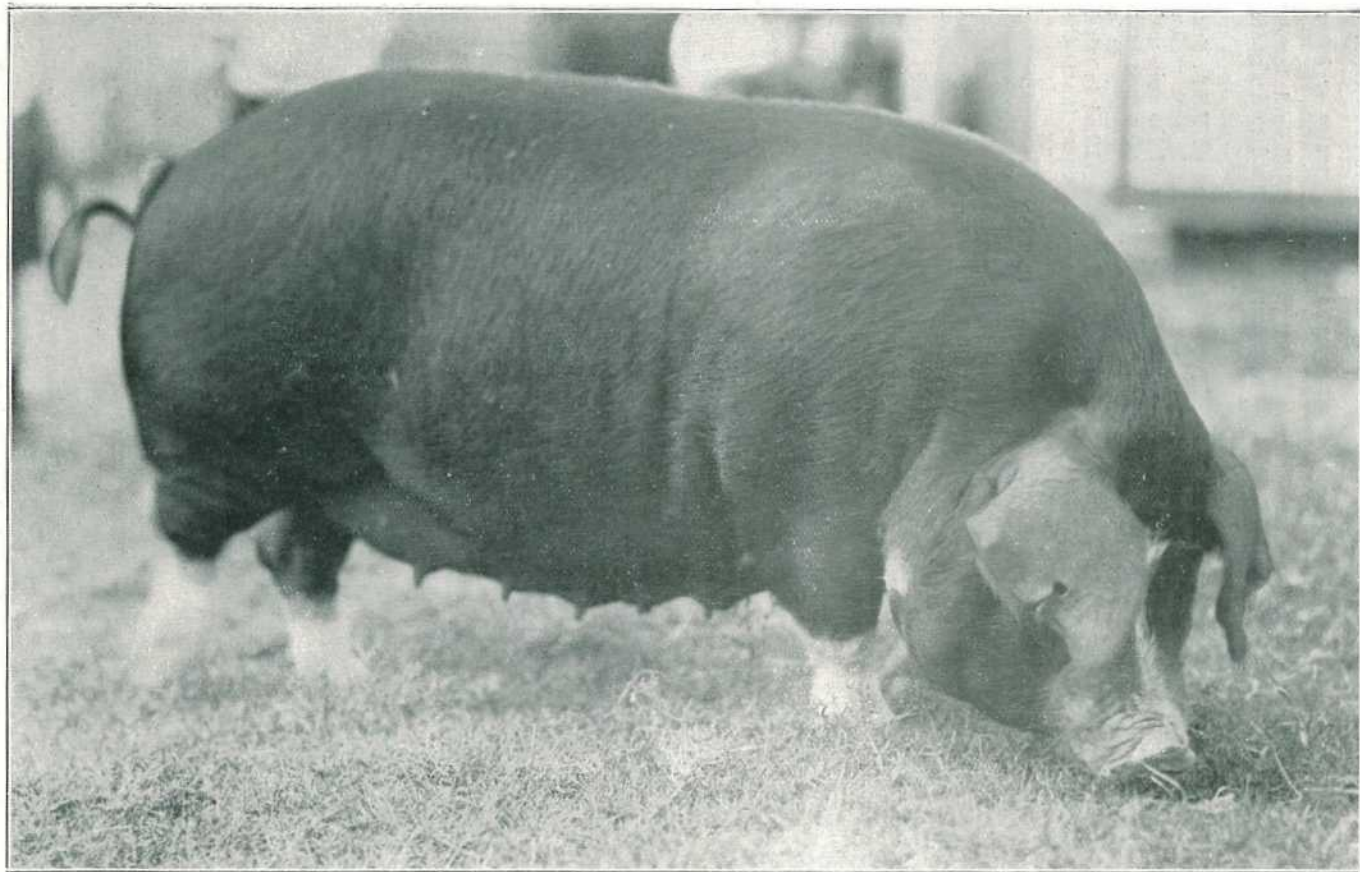


PLATE 101 (Fig. 2).—A CHAMPION PRIZE-WINNING POLAND-CHINA SOW "DANESBORO JUDY 131."
Bred by Mr. Trevor Brown, of Narellan, New South Wales. Note her great quality and evenness of type, up-to-date in every respect.

large hogs "of even top and bottom lines, with good feet, not much depth of body, and drooping ears." These old Berkshires were red or sandy coloured, and were known in Ohio as Berkshires because their ancestors came from that part of England. There has been, until quite recently, a fairly popular "red" Berkshire in America.

Other so-called breeds mentioned as having been used to a greater or lesser extent in the making up of Poland-Chinas were the Bedfords, or Woburns, the Byfields, Neapolitans, Russians, and others. These were not well-defined breeds such as exist to-day; the names given to them were merely terms used to designate certain kinds of pigs with more or less variation in type.

It is claimed by the Poland-China Breed Promotion Committee of U.S.A. that the world's first real "corn belt" of commercial importance was in that region of South-Western Ohio known as the Miami Valley, in which one of the principal problems presented to farmers of that section was the production of a hog that would best convert the abundant corn crops into pork and carry it to market. It is not likely that the men who assisted in the development of this breed had in mind a definite type of animal as the final result of their breeding operations; it was the corn belt and the corn-belt environment alone that determined the ultimate type. No one type or breed used in the moulding of Poland-Chinas exerted a predominating influence, but about 1850, when the process was considered complete, the result was a hog such as had never existed in the corn belt before. This hog was the product of the corn belt and of the constructive efforts and commanding genius of the farmers of that community. The claim has been made by those familiar with what took place that no new blood (*i.e.*, blood of other than the Poland-China breed) was introduced into the breed after 1845. By that time it had come to be well recognised as a breed, although it was known for some time by several different names, such as the Warren County hog, the Miami Valley hog, the Magie hog, and others.

The name "Poland-China" was officially adopted in 1872 at a convention of hogmen held in Indianaapolis for the purpose of naming the breed. The word "Poland" is generally thought to be a misnomer. Some of the hogs that were used in the making up of the breed were known as Poland hogs. This led to the belief that they were descended from hogs imported from Poland. The facts of the case, as stated by the Poland-China Breed Promotion Committee, are that one of the most successful and outstanding hogmen of the period around the year 1840 was Ascher Ascher, a Polander by birth, who lived in Butler County, Ohio. He brought no hogs to that locality, but was able to produce a superior class of hog from the material at hand, and sold a great many boars. His pigs were known as Poland hogs, and this forms a part of the breed's present name. Until 1870 the breed was largely described as dark spotted; soon after the fashion or fancy changed, and in a few years the breed was to a very large extent black with white points, and this is the prevailing preference to this time. No hard and fast rule is enforced as to the white points, and few breeders will discard a good animal because it has a little extra white on it. The first Poland-China record was established in 1877; within three years two others were started, and later the breed had six records. These have been reduced to three at the present time. Joint action of these three records for united breed promotion started in 1920, and is the most hopeful promise of the breed's future welfare. In Australia, Poland-Chinas are catered for, in so far as herd book registration is concerned, by the Australian Stud Pig Breeders' Society, in whose herd books quite a large number of Polands have been registered. This society, which is controlled by a Federal General Council, has branch committees in each of the several States of the Commonwealth, so that Poland-China breeders desirous of registering their stock should get in touch with the local secretary in order to obtain full details.

In America an attempt was made some years ago (and with considerable success) by a number of breeders to retain the qualities of the original type under the name of the Spotted Poland-China, and since then this type has been developed to such an extent as to be quite distinct from the Poland-China proper; but these Spotted Polands have never attained the same popularity, nor have they been distributed to the same extent, as the Poland-China proper. Even of the last-mentioned type, in America, there are two separate classes—one the big-boned, growthy, lard type; the other the medium bacon or pork type, similar in colour and shape but distinct in size and development of bone. The types common in Australia are of this latter medium bacon and pork class; the former type has not yet been introduced.

As we have them now it is proved that success can be attained only by allowing them to have considerable range and by forcing them to take exercise freely every day. They should be given a variety of foods, not too liberal in quantity but of good quality. They have comparatively small appetites and have wonderful powers

of assimilation, but unless they are judiciously handled and compelled to take exercise freely in these warm climates, they become sluggish and excessively fat. They must be allowed ample shade and fresh cold water, as they cannot stand continuous dry heat. They likewise require protection from the cold winds of winter, and should be given adequate accommodation at all times.

Special care should be exercised to have the animals in proper condition at mating and at farrowing time—they must be in medium condition only, not too fat nor too thin and worn. They must at all times be carefully bred and fed, and it is wise to introduce fresh blood occasionally, as the type is inclined to deteriorate unless properly attended to. Special care should likewise be paid to the selection of breeding stock from large, thrifty, sturdy litters, correctly marked and shaped and of proved vigour.

Poland-Chinas were first introduced into Australia about forty years ago by one William Marks, but records showing from where the type came appear to have been lost. One of the early breeders, and one who still handles this breed, is Mr. G. H. Gray, of Federal, Richmond River, N.S.W. Writing concerning his experi-

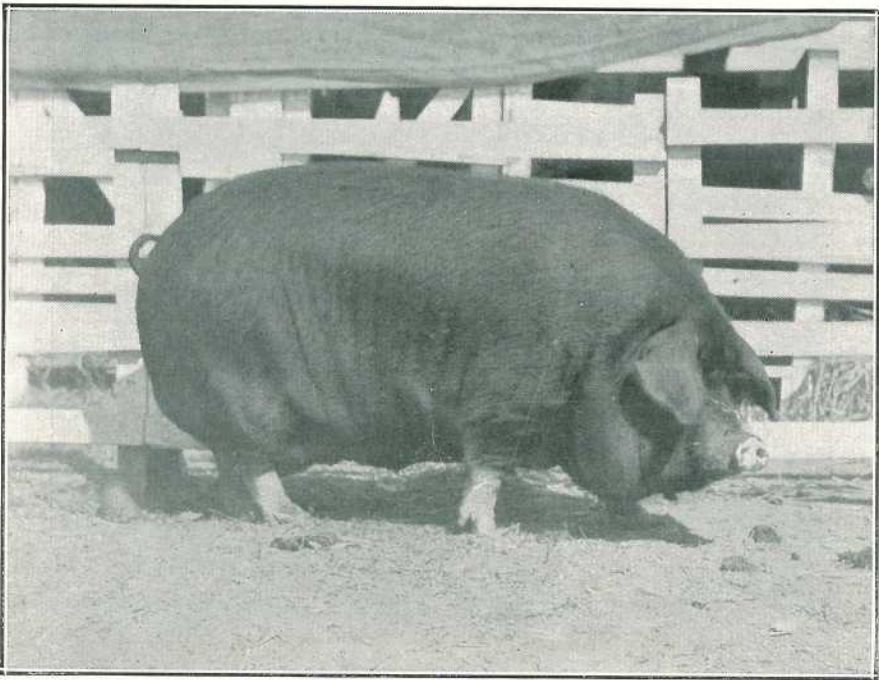


PLATE 102 (Fig. 3).—ANOTHER CHAMPIONSHIP WINNER. POLAND-CHINA SOW
"DANESBORO WINIFRED 172,"

Exhibited by Mr. A. N. White, of Penrith, N.S.W. Her quality and type are worthy of note, also her colour markings. She won championship honours at Brisbane Royal National Show, 1926, and has also won similar honours at other Shows. The photograph was taken when she was "in full bloom" for Show purposes, rather too fat for successful stud service.

ences, Mr. Gray says:—"I have been a breeder of pure-bred Poland-China pigs since 1882, and have never in-bred my stock. Have never had a Poland condemned on slaughter, and have sent pigs of this breed to the bacon factory for over twenty-five years. Am still breeding and selling boars and sows, and sending them all over the State. I bought my first Polands from T. H. Davey. He got his pigs from A. M. Woodhouse out of imported American stock about 1882, and in 1885 I bought a young boar from A. A. Dunnieliffe, of Burrawong, New South Wales. The sire of this pig was 'Crown Prince Imported,' his dam being called 'American Imported.' The records of his breeding also appear to have been lost, although it is understood

that he was of the 'Magie' strain bred by D. M. Magie, of Butler County, Ohio. In those days pedigree were not as carefully preserved and recorded as they are now nor were there any record associations for pigs in Australia."

Probably the earliest importations of value in improving the type of Poland-China in Australia were those made by the New South Wales Government about twenty-five years ago. These, at any rate, were the first to be recorded, and prominent amongst these was the boar named after that famous American statesman and President, Abraham Lincoln. Another boar imported at the same time was called "Roosevelt." He also came from the Flossmoor Stock Farms, Illinois, and, although not as true to type as "Lincoln," he left a lot of very useful stock in the studs in which he was used, principally at the Hawkesbury College.

Many years before this there was a boar imported whose name was "United States." He also appears to have come from the Flossmoor Farms, but his pedigree also has been lost. The boar "Abraham Lincoln" was the best Poland ever introduced into Australia prior to 1912. It was in that year that the New South Wales Government made a further importation for the Hawkesbury Agricultural College

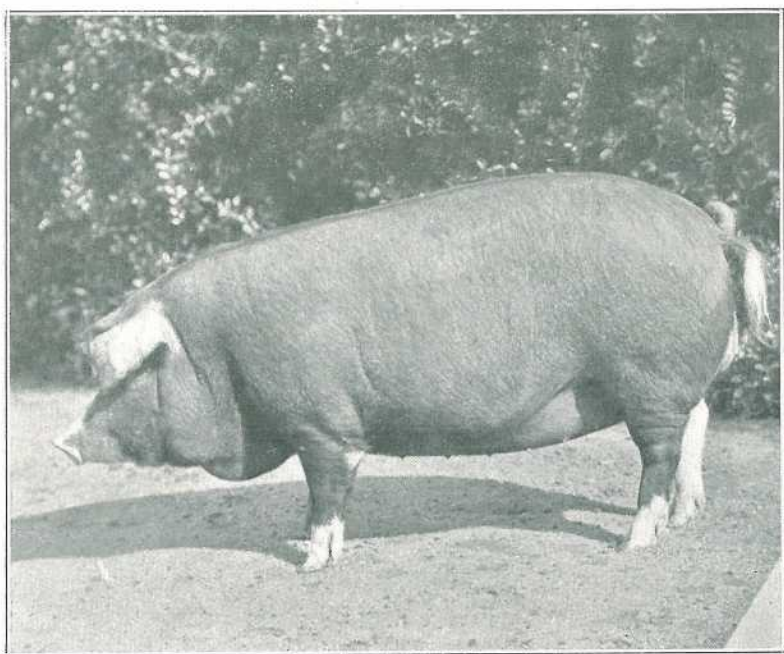


PLATE 103 (Fig. 4).—AN ATTRACTIVE YOUNG SOW OF THE POLAND-CHINA BREED.

This type of sow, mated with a Tamworth boar, should produce bacon pigs of an ideal fleshy early-maturing class, such as is in keen demand in these days. She was bred at the Hawkesbury Agricultural College, N.S.W.

stud; these were high-class pigs, and it was the progeny of these importations that are recorded as the parents of most of the Polands we have to-day. Prominent amongst the animals forming this shipment was the boar called "Manager," 177881, bred by Jno. Francis and Sons, of Illinois. Amongst the sows in this same shipment was one called "Chicago's Pride," another sow was named "Iowa Beauty," still another was known as "Missouri Girl," whilst the other two were named "Wisconsin Pet" and "Kansas Pearl." Two sows, which formed part of the shipment of which the boar "Manager" formed a part, were named "Ohio Beauty" and "Ohio Gem," but neither of these sows were successful breeders, therefore none of their stock have been recorded.

Probably the most useful boar we have ever had, so far as a sire, was the boar "Sydney," 228381, bred by J. G. Drennan, of Chicago. This boar was imported

in 1913, and was an active, serviceable animal until quite recently. He has sired more Poland-Chinas than any boar it has been Australia's good fortune to import, and was the best and truest specimen of this now famous type. A fellow voyager from the U.S.A. in 1913 was a boar named "Judge K," bred J. S. Kemp, of West Kenney, Illinois. He was sired by a boar called "On the Dot," 106355, and was from a sow, "She's a Honey," 403940. He represented a less prepotent type, probably more suited to the State's trade than to the markets of the South. "Judge K" was, however, a good investment, as he left a host of useful pigs behind him, and it is the progeny of these two boars mated with representatives of the earlier importations that have been distributed throughout Australia.

More recently still Messrs. Wilson and Keppie, of "Woodlands," Paterson, New South Wales, have come to the rescue of Poland-China breeders and have imported several first-class animals from Canada. These have developed into very fine specimens of the breed, and their progeny are now being distributed; they are distinctly unrelated to the types formerly imported and are, therefore, filling a very useful purpose in the breed.

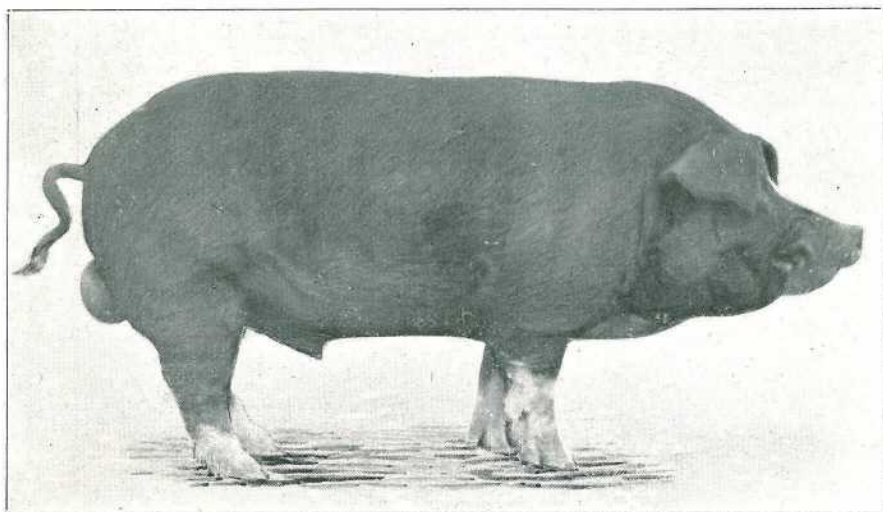


PLATE 104 (Fig. 5).—A PRIZE-WINNING POLAND-CHINA BOAR, "DANESBORO ONWARD" (189).

Exhibited by Mr. J. H. Whittaker, of the Broxburn Stud, Broxburn, Darling Downs. This photograph was taken on the farm when the boar was in ordinary breeding condition. He is of good type and quality.

The great call in Queensland is for a medium-type pig that will grow into a prime bacon pig, dressing from around 110 lb. to 125 lb. at six months of age. These same pigs would weigh round about 300 lb. live weight at twelve months old if they were forced on to those weights, but we find it unprofitable to exceed the 125 lb. dressed limit, and the tendency is now to reduce this weight to 120 lb. dressed, as representing the most profitable sale weight.

For the production of medium-weight porkers, weighing about 70 lb. dressed at four and a-half months old, the Poland-China is an ideal type, but there is not a great demand for pork in Queensland, hence we find the Poland-China more useful for crossing with the Berkshire grade or even with Tamworth grade pigs. A Poland-China boar mated with these types gives excellent results. Poland-Chinas are destined to become one of the most profitable of all breeds, provided they maintain a fair standard of prolificacy and do not become too fat, coarse, or heavy. As a breed they are not noted for great prolificacy—an average litter of eight must be considered good—but they have acclimatised well and appear to be more prolific under Australian conditions than they are in their native home. However, they possess a wonderful aptitude to fatten readily on a comparatively small amount of food,



PLATE 105 (Fig. 6).—PEN OF THREE POLAND-CHINA BARROWS, GRAND CHAMPIONS AT THE AMERICAN ROYAL LIVE STOCK SHOW, KANSAS CITY, MISSOURI, 1925.

Shown by Columbian Stock Farm Kansas City. Note their even development, characteristic shape, and neat attractive appearance,

whilst they are easy feeders and contented; these are features that must to an extent stand them in good stead even if they are less prolific than some of the other breeds.

In summing up their good qualities, one of the American Poland-China records says:—

- (1) They are the best known machines for manufacturing corn into pork. They thrive better than any other breed upon a diet composed mostly of corn.
- (2) They are docile, hardy, reasonably prolific, and almost invariably good mothers.
- (3) In large pastures they are not inclined to waste flesh by over-exercise; they have little or no desire to roam far away from home.
- (4) The better type Poland-China has as small a proportion of "offal," in comparison with the size of their carcass, as any hog in the hands of the general farmer. Their great feature is their easy and quick-fattening propensities with a tendency to very early maturity.

The recent importations of Poland-Chinas have done much to popularise and improve the type, but we want more of them as they are bound to prove of great value here in introducing their several valuable qualities into our herds. Poland-Chinas are the ideal type for the suburban pig farmer, as they cross well on comparatively common stock—stock that are usually deficient in compactness, early maturity, and good feeding qualities.

Special attention should be paid in selecting pigs of this breed to ensure purity of type. This is more important than with some of the other older established breeds; select long roomy sows that give every evidence of constitutional vigour. Avoid delicate sows, short in body and showing excessive fat, and with drooping quarters and coarse curly hair.

The scale of points adopted by the several Record Associations in America for the Poland-China breed is as follows:—

Colour.—Black, with white points, tip of tail, four white feet, white on face, or on nose, or on point of lower jaw, all to be perceptible without close examination; slashes of white on jaw, legs, flank, or few spots on body not objectionable.

Skin.—Fine and free from wrinkles.

Hair.—Fine, straight, smooth, lying close to and evenly distributed, covering the body well.

Head and Face.—Broad, even and smooth, wide between and above the eyes, slightly dished, tapering evenly and gradually to near the end of nose, broad lower jaw, head moderately short.

Ears.—Neither too large nor too small, but even, fine, thin, leaf shape, slightly inclined forward, standing up slightly at the base to within two-thirds of the tip, where a gentle droop should occur.

Jow!.—Broad, deep, smooth, and firm, carrying fulness back near to point of shoulders, and below the lower jaw, so that lower line will be as low as breast bone when head is carried up level.

Neck.—Wide, deep, short, arched on top from poll to shoulders.

Shoulders.—Broad and oval on top, showing evenness with back and neck, with good width top and bottom, and even smoothness extending well forward.

Back and Loin.—Broad, straight or slightly arched, carrying same width from shoulder to ham, ribs well sprung.

Flank.—Belly broad, straight, and full, flank well let down, with straight underline.

Hams.—Broad, full, deep, and long from rump to hock, fleshy, plump, and rounding fulness perceptible everywhere.

Legs and Feet.—Legs.—Medium length, straight heavy bone, well set apart, and squarely under body, wide above knee and hock. Feet.—Firm, short, and strong.

Action.—Free, clean, firm, easy, and graceful.

Prominent breeders of Poland-Chinas who usually have stud stock for sale include Queensland Agricultural High School and College, Gatton, Q.; J. H. Whittaker, Stud Piggery, Broxburn, *via* Toowoomba, Q.; R. L. Burns, Avondale, Wondai, Q.; W. Cordwell, Kureelpa, *via* Nambour, Q.; Yalden Bros., Cowper, Clarence River, N.S.W.; A. T. Beezley, Casino, N.S.W.; Wilson and Keppie, Paterson, N.S.W.; A. N. White, Penrith, N.S.W.; Trevor Brown, Narallan, N.S.W.; Hawkesbury Agricultural College, Richmond, N.S.W.; George Bevan, Brush Creek, Wyong, N.S.W.; John Alcock, Mogilla, Bemboka, N.S.W.; and others.

Farrowing Records.

A complete report on the farrowing records of Poland-China sows in the United States of America during the spring of 1923—February to May—and published in the "Poland-China Journal" recently, shows that sows in this breed can hold their own against any other breed so far as prolificacy is concerned. Reports from upwards of 4,000 litters farrowed by young and old sows in all sections of the States show an average of 8.5 to the litter. Statistics covering a period of seven years show that the Poland-China sow is maintaining her reputation for the production of numerous litters, for, as the following table indicates, the test has been a severe one:—

Year.	Number of litters reported upon.			Average number of pigs per litter.
1917	..	..	3,448	8.63
1918	..	..	4,205	8.34
1919	..	..	5,264	8.03
1920	..	..	13,195	8.10
1921	..	..	10,000	8.48
1922	..	..	9,675	8.43
1923	..	..	4,283	8.50

These figures include the litters of both "tried" or proved breeders and yelts or gilts (young sows on their first litters). The general average of 8.36 pigs to the litter (tried sows and yelts included) on 50,070 litters, covering the period of seven years, shows a gradual increase from 8.10 to 8.50 from 1920 to 1923, proving that not only has the Poland-China sow repudiated the slander against her prolificacy but that she is steadily increasing her production. Reports on the 1923 spring pig crop were received from 4,283 litters with a general average of 8.50. The total number of pigs farrowed in these 4,283 litters was 36,387; of these 26,802 were alive at the time the reports were posted, making the percentage of pigs saved 73.65, as compared with 72.04 per cent. during the previous year.

Cross Breeding.

For the production of fleshy, early-maturing bacon pigs, such as those for which there is an increasing demand in these days, the Tamworth boar mated to Poland-China sows gives excellent results. Where it is not convenient to cross in this particular way, the Poland-China boar might be used and be mated with Tamworth or Tamworth-Berkshire cross sows. The Poland-China crossed with a Middle Berkshire also gives excellent results, while for a heavier bacon pig Large Yorkshire and Poland-China crosses should be ideal. So far experience has not demonstrated the value of crossing Poland-Chinas and Duroc-Jerseys together, though there would appear to be no reason why this cross should not prove of value; while where they have been tried the Gloucester Old Spot crosses with Poland-Chinas have proved equally valuable.

The Poland-China as a pure breed is increasing in popularity, though there is as yet in this State a limited demand for stud boars and sows. It is for their value in cross-breeding that better results might be expected, and for this purpose Tamworth and Poland-China crosses and similar type pigs should give better returns.

CARE AND HANDLING OF PIGS.

A special notice, as set out hereunder, has been issued to pig farmers, carriers, loading agents, and officials:—

Queensland bacon-curers affirm that the pig farmers of this State suffer loss to the extent of thousands of pounds sterling annually through careless handling of live pigs in transit to market. This is the result of excessive bruising and damage, deaths in transit, &c.

Your attention is specially drawn to the following general recommendations:—

Remember that the great demand now is for prime light to medium weight fleshy bacon pigs.

See that your pigs are properly fed and "topped up" on grain food for several weeks before marketing.

Give your pigs ample exercise during the growing and "topping up" stages. Do not keep your pigs closely confined in small sties, as this is conducive to overfatness and to soft, flabby fat.

Allow your pigs clean drinking water at all times, and provide shade and protection from the effects of the weather.

Be careful to market at correct weight; you should weigh your pigs regularly and accustom them to being handled and driven. Ask your factory for their current schedule of weights and prices.

Avoid beating the pigs with whips, rods, or sticks; every time you strike them you inflict a bruise which reduces the animals' value.

Do not feed your pigs on the morning of despatch (they travel better on an empty stomach), but provide plenty of clean water.

Co-operate with your neighbours in arranging assistance at sale and trucking time.

Firebrand your pigs with your registered firebrand. Ear marks and ear tags have not proved satisfactory; the factories prefer firebranding.

Be certain that the factory receives early advice *re* your consignment, the numbers, grade, brand, mark, and time and date loaded. Hand a written statement to the buyer or official loading agent.

Co-operate with the Railway Department and the factories in their endeavours to deliver your pigs at destination in the best condition possible.

Use purebred boars only and sows of the best breeding you can obtain in producing your pigs, and buy store pigs only from reliable sources.

Help us to help you succeed in the industry.

Write to the Department of Agriculture and Stock, Brisbane, for all available information on the subject of pig-raising.

Issued under the authority of the Department of Agriculture and Stock, Brisbane, Queensland, 1926.

PIGS AT THE MELBOURNE SHOW.

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

The Pig Section at Melbourne Show is always an interesting and attractive one, one well worth travelling a long distance to see, for it is one representative of an important industry, an industry that has for more than half a century been recognised not only as an important and very necessary one, but a profitable one to all concerned. Small wonder then that it attracts considerable attention from an ever-increasing number of exhibitors and ringsiders. Possibly, too, at this year's show greater interest was displayed than at former shows, for two or three new breeds were in evidence, and these in themselves created an additional attraction. Never before, for instance, has there been such a splendid display of Tamworth pigs at Melbourne Show as on this occasion, though perhaps the display in this breed does not yet come up to the standard of Sydney or Brisbane. There were also good entries and some

really choice stock in the Large Black and Large Yorkshire breeds, as well as in the recently introduced Gloucester Old Spot breed, a breed that this year created quite a stir among breeders and fanciers, many of whom were totally unacquainted with the type and character of this old world breed, a breed practically new also in the other States. The pork and bacon classes and the carcass contests, though not heavily catered for, created more than an ordinary amount of interest, and at times quite heated discussions. Strangely enough there were no entries in the Poland-China or Duroc-Jersey sections, in which a good deal of prize money was available, nor were there any crosses of these types exhibited in the pork or bacon classes. In this the Melbourne Show differs from both Sydney and Brisbane, for at both of these shows the entry of these two American breeds is quite an important one. Victorians as a body are somewhat averse from the American breeds, though it is difficult to understand this also, seeing that both the breeds referred to have made good headway north of Victoria.

There were many useful lessons to learn around the pig pens, and, as a slight departure from our usual custom in writing up show reports, several of these will be referred to here. Just as it happened, though the Berkshires and Middle Yorkshires, and even the Tamworths, were all well represented by really good selections of animals, these sections did not appear to create any stir, breeders accepted the decisions of the judges without demur and, as it were, went about their business. They were, of course, interested and business-like, but for some one or other reason it seemed to be an accepted fact that these three breeds were "set," there could be little or no argument about them, for it seemed to be accepted that there was nothing to argue about. It was when one appeared on the scene in the sections devoted to Gloucester Old Spots and Large Yorkshires and Large Blacks that all the argument was heard. It was here where the battles were fought and here where breeders appeared to rally to argue again, as they did in the days when the Tamworth breed was first introduced into our show rings. There were many useful lessons to learn, however, in the other sections referred to, for though one could safely say the Berkshires generally were of a high standard, there were many who complained that the "Berky" as a breed is "slipping"—that means that they are not as good consistently as they were at the shows of several years ago. This point was stressed by many breeders, all of whom regretted such a tendency. It is largely accounted for by the fact that it has been very difficult, and it is still difficult, to secure satisfactory unrelated strains of a standard suited to our show yards. It seems unfortunate that this should be so, and at the moment there appears little hope of relief, at least in so far as importations from the old world are concerned, for the Foot and Mouth disease position overseas does not seem to improve to the extent desirable, nor does there seem at the moment much chance of the embargo against importation being lifted to allow of the introduction of fresh strains for many months ahead. This weakness among the Berkshires was displayed, perhaps, more among the young boars than among the sows, and possibly more among the sows and litters than among the mature stock, though it must be said in their favour that the prize-winning litters would be difficult to equal in any show ring. The same conditions, perhaps, do not apply to the Middle Yorkshires, for in this breed recent importations both to Victoria and New South Wales have been very productive, and their influence has been for good in this favourite Old White breed.

The Middle Yorkshire litters were as good as one would expect anywhere, and the general average was up to a high standard, though there were many weak animals in the younger classes, many that did not show to advantage. The champion Middle Yorkshire Boar would easily have won the championship of the show over all breeds if a class had been available, as he was pre-eminent and represented about the best we have yet seen in this popular breed. The first prize Tamworth boar in the class for boars under fifteen months old (and this boar was the championship winner) was the best Tamworth boar the writer has yet seen at any Australian show—he would have scored similar honours in the very much keener competition at either Sydney or Brisbane. This view was supported by the judge in this section, Mr. A. F. Gray, of the Hawkesbury Agricultural College, Richmond, New South Wales, who also was judge in similar sections at the two other Royal Shows referred to.

Unfortunately, space will not permit of a more extended reference to individual prize-winners nor to the entries of individual breeders, but the section was a good and productive one. It seems very unfortunate, though, that the Tamworth breed, noted for its prolificacy and quick growth, should so often be represented at these large State Shows in the sow and litter class by litters that are, in comparison with other breeds, poorly developed and lacking in polish, and that the litters should be of small families, fives, sixes, and sevens, with an occasional eight, and very rarely any more, while in the Berkshire and Yorkshire sections, tens and even twelves are not uncommon, all big hefty suckers attracting the crowd the whole day long—suckers that

indicate the truly prolific and profitable nature of the strains represented. It is difficult to understand, though it is largely accounted for by the fact that breeders of the Tamworth type do not pay the same attention to their show litters as do the breeders of the more successful Berkshire and Yorkshire types. On this occasion Large Blacks were represented by some really choice entries and litters, the best I think that have been exhibited here since the days when Mr. Herbert Garratt boomed the British Large Black and created such wonderful records, not only with matured stock but with sows and litters and young stock of all ages. The Large Yorkshires were a very representative lot, and in this case also the young stock showed off to advantage, while the Gloucester Old Spots were just as good as the exhibitors of this type could display them.

FLUSHING THE BREEDING SOW.

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

In perusing the pages of several of the older established text-books on "Animal Husbandry," one frequently comes across the term "flushing," as applied to "flushing the mare," or the ewe or the sow or cow or as the case may be, in each instance prior to the time the female is mated.

This "flushing" is not a common term in Australian live stock literature nor is it a regular practice on our farms, consequently an explanation of the term "flushing the sow" before mating will be of interest to readers of this Journal.

The term "flushing" simply means a general stimulation of the whole of the internal organisation of the animal, the object being to increase the number of pigs produced at farrowing time. The purpose is accomplished by increased feeding of grain or by the use of fresh or more succulent pastures than have previously been available.

The practice is understood and practised more by the sheep men than by the breeder of pigs or of most of the other classes of live stock; still it is a well recognised old time as well as modern practice. The sheep man follows it by turning the breeding ewes into a fresh, succulent pasture just prior to "joining the rams," the time when the ewes are to be mated, the objective here being to secure a larger percentage of twins or a higher general average at lambing time.

There is no reason why the pig breeder should not adopt the same practice with his breeding sows, especially with sows that are advancing in age and that might otherwise produce rather unsatisfactory litters.

The most beneficial results are obtained when the flushing begins two or three weeks before the breeding season opens. Supposing that the sows have been running on pasture alone during the greater part of the "off" season; at the beginning of the breeding season, or when the sows are about to be mated, they should be turned into a fresh patch of rape, lucerne, or other green stuff that would furnish an abundance of the most succulent forage.

In the case of a single sow, the breeder might begin by feeding a slop composed of milk and pollard or wheat or maize meal, &c., and give more than the usual supply of green food. The idea is to stimulate the whole system without putting on any great amount of fat. It is, of course, expected that the animals will begin to gain a little more rapidly in early spring or as the breeding season opens, and the majority of breeders will see to it that their stock put on flesh at this time, but it is important that the sows should be in medium breeding condition and be gaining in weight and flesh at the time when they are mated. After the sow has been mated, continue the practice for a week or two before turning her out to pasture again.

All sows should, of course, be kept in good breeding condition during the gestation period, but there is no necessity that they should be "rolling" in fat—in fact, it is ruinous to load breeding sows (or boars) with fat, for it invariably leads to unsatisfactory results. On the other hand, it is disastrous to have breeding stock very low in condition, a condition described as "as thin as rags," for in this state good results cannot be expected. Plenty of good, nutritious food and water, plus compulsory and regular exercise plus a liberal supply of mineral matters, is what is required in order to secure best results, and "flushing" in the manner described above will certainly improve prospects and prove well worth while.

Neither boar nor sow should be used for stud purposes before they are ten or twelve months old. There is no reason why they should not prove satisfactory breeders up to seven or eight years old.

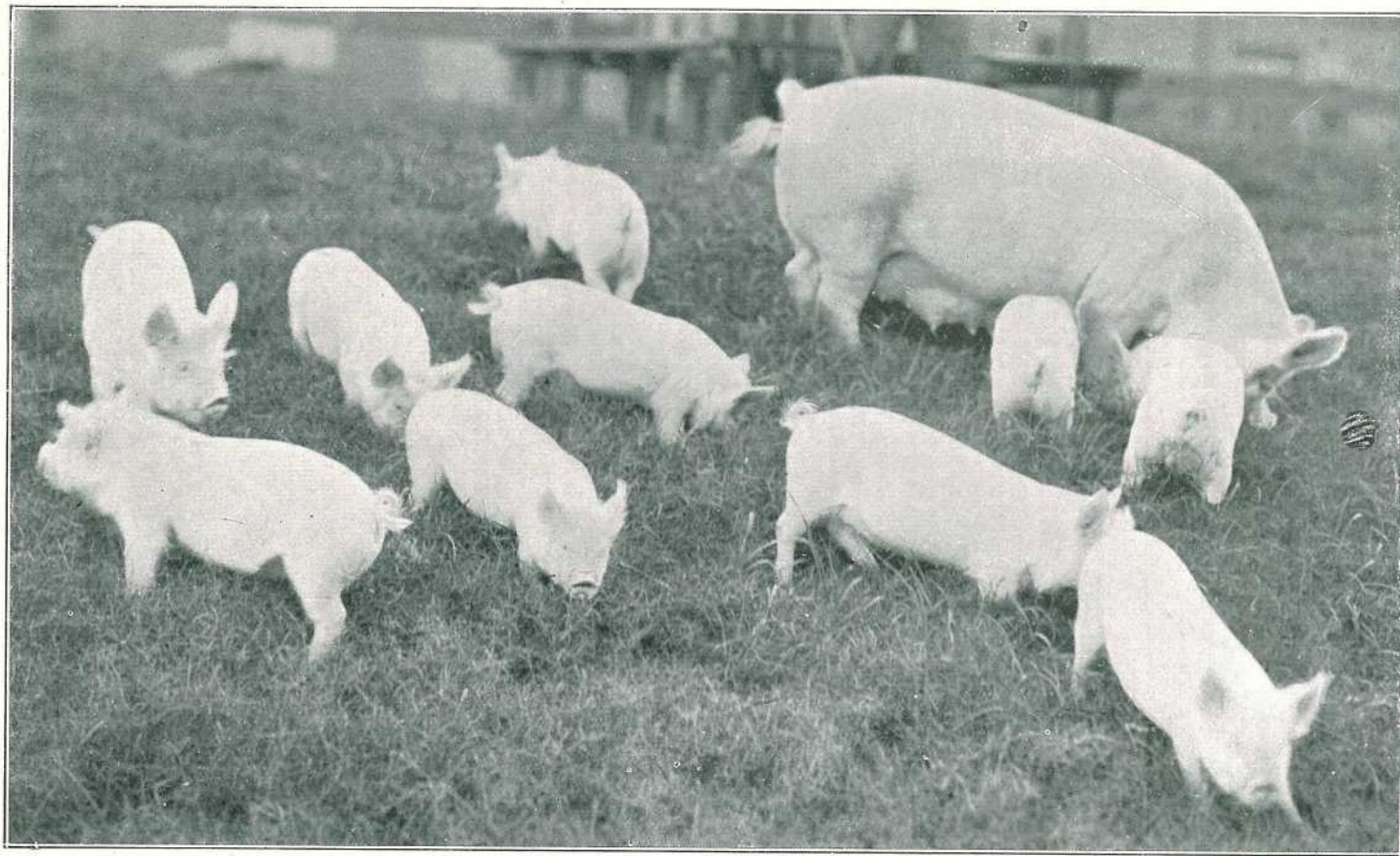


PLATE 106.—A BONNY YORKSHIRE LITTER JUST READY FOR WEANING.

This photograph illustrates the advantages to be obtained by "flushing" the breeding sow before mating and carrying her in medium breeding condition during her gestation and suckling period. The young pigs also have been properly cared for from birth and will not suffer ill effects as a result of weaning.



PLATE 107.—PUZZLE: FIND THE SOW.

The sow, the mother of these young pigs, was well "flushed" before mating, the result, as indicated, being a large, thrifty, vigorous litter. They were eight weeks old when the photograph was taken, and numbered fourteen. There is no reason why other sows should not do likewise.

WHITE WOMEN IN THE AUSTRALIAN TROPICS.

By J. S. C. ELKINGTON, M.D., D.P.H., Director, Division of Tropical Hygiene, Commonwealth Department of Health, of Australia.*

Tropical Australia is a very large country—more than twice as large as the combined areas of France, Germany, and the United Kingdom. It has all variations of tropical climates, since the greater part of it is over 1,000 feet, and many thousands of square miles are from 3,000 to 4,000 feet, above sea-level. Only about one-sixth is within the "humid tropics," which have over 50 inches of rain yearly, and possess those hothouse attributes which are popularly ascribed to all tropics.

Seventy years ago its only white inhabitants were a handful of pioneers. To-day more than 200,000 people live there, of whom the larger part were born there, many of them from tropic-born parents. Ninety per cent. at least are, as yet, in Northern Queensland, either in the neighbourhood of the coast, or along the railway lines, which stretch westward for several hundred miles. That their numbers are still increasing rapidly is apparent from the fact that in the three principal districts of North Queensland the population grew from 130,412 to 179,801 during the ten years which elapsed between the two census-takings of 1911 and 1921—that is, by nearly 39 per cent. The total increase in population for all Australia during the same period was 22 per cent.

Two of the five largest Australian tropical towns have over 20,000 inhabitants each, and three others have over 6,000 each. Tropical Australia thus has a definitely settled population, and is no mere changing house for transients. Its industries are extensive and prosperous. Educational and other facilities of civilised existence are developed to a high degree in the more closely populated areas. It is no longer a pioneering country, except in the far-back. Even there the motor-car, wireless, the aeroplane, and the ever-growing woman population have wrought great changes in a few years.

A Very Beautiful Country.

Much of it is a very beautiful country. There are great forest-shrouded mountain ranges, wide silver-breasted rivers flowing to a sunlit sea, open care-free plains, and jewelled tropic nights. Much of it is already occupied by a prosperous and healthy people, free above all other men and women. Vast fertile areas, cooled by elevation half a mile above sea-level, still hold out welcoming arms to those who have the courage to leave the crowds and the turmoil. For those who love not solitude there are other avenues to prosperity in pleasant and beautiful surroundings. But, for all, the will to work is essential.

The white resident of Tropical Australia is not merely an employer or director of coloured labour, living amongst a native population saturated with disease. He and his wife do not direct the work. They do it. Tropical Australia is the only tropical country in the world where every class of work from the highest kind of intellectual effort to the roughest and most arduous manual labour is done, practically exclusively, by white people.

These features have, of course, a very intimate bearing on the lives and welfare of the white women who live there. The silent-footed, ever-attentive coloured house-servant, who forms the comfortable background of tropical house-life elsewhere, does not come into the picture at all. Nor do the dysentery, or cholera, or smallpox, which he is always liable to contribute to the master's household. Aboriginal girls can sometimes be turned into excellent domestics, but they are hard to come by, except on outback stations, and are always liable to display disconcerting traits of character. White domestic help is costly and often unsatisfactory.

No Life for the Weakling—Cheerful, Healthy and Happy Housewives.

The average tropical Australian housewife thus works fairly hard. It is no life for the weakling or the grumbler of either sex. As some compensation it may be said that an extensive sociological inquiry carried out in 1924 from the Australian Institute of Tropical Medicine proved that the health of the average house-mother was good, and that for all classes of women and girls examined, those leading sedentary lives compared very unfavourably with those engaged in more active occupations. The same inquiry revealed that, as in non-tropical places, those housewives who organised their work on a definite plan, and who possessed knowledge of practical domestic science, had time for other interests and for rest, and were the most cheerful and happy.

*In "The Spectator" (London), 11th September, 1926.

The outlook of the average conscientious housewife comprises the welfare of her menkind, of her (other) children, and lastly of herself. The infant death-rate of any country is perhaps the most delicate and reliable of all tests concerning the general fitness of that country for family life. Any common peril will take first toll from the new-born lives.

Thriving Babies.

Let us see, therefore, how babies thrive in tropical Australia. From 1920 to 1924, the babies born numbered 26,175. Out of every 1,000 of these, 59 died before twelve months. 15,562 of them were born in the two most typically tropical coastal areas, but of these only 50 died out of each 1,000. During the same period, Australia generally (which has the fourth lowest infant death-rate in the world), lost 57 out of each 1,000 born. The tropic-born Australian baby's chances of survival are therefore substantially better than those of babies born in, say, London (69 per 1,000), Switzerland (70), England and Wales (75), Canada (79), or Scotland (98), during the last available statistical years. Curiously, the lowest of all Australian infant death-rates during these five years, occurred in the North-west of Western Australia, the very hottest part of tropical Australia, where out of the 200 born, only 8 died (40 per 1,000).

What of the risks to the mother? A full quarter of the population of Queensland lives in the tropics, and any unusual mortality amongst mothers in childbirth would obviously be reflected in the Queensland death-rates from this cause. But actually, the death-rate in childbirth in Queensland (5 per 1,000 live births) is lower than that for all Australia, and for New South Wales, Victoria, and South Australia.

The Australian tropic-born infant and its mother thus seem to be both doing well. Let us see how it grows up. It may be here mentioned that the 1924 sociological investigation showed that the number of children born per marriage in tropical Queensland is higher than the average for Australia generally. The infant is not, therefore, to be regarded as an only child.

Healthy School Children.

Analysed results of a long and extensive series of medical examinations of North Queensland school children have shown that tuberculosis, rheumatism, rickets, heart disease, and skin diseases are rare. Sight defects form but a fraction of the percentages found elsewhere in Australia, and in Great Britain. A tendency to pallor amongst tropical children has often been quoted as a proof of unhealthiness. This matter was worked out some years ago at the Australian Institute of Tropical Medicine, and was found to be a surface condition only, due to epithelial accumulation. The red corpuscles and hæmoglobin content of the blood differed in no way from those of children in cold climates. The tropical Australian child is distinctly taller and somewhat heavier (after relative clothing-weights are taken into account) than is his or her fellow-Australian of similar age in the Southern States.

Mentally, these children are, at all ages and in both sexes, as far advanced in school work as are children born or living elsewhere in Australia. Of 44 students at Cairns who, in 1924, had passed the examination entitling them to a high-school education, 39 had been born in the tropics, and of these 23 were of the second tropic-born generation.

After studying and working every type of tropical labour force, coloured and white, for over twenty years in the sugar fields of tropical Australia, a very large employer of labour recently recorded his opinion that, in this very arduous tropical work the British gangs headed the lists against all comers. By "British" was meant all British white nationalities, whether born in Australia or Great Britain.

Queensland's Low Death Rate.

Fully a quarter of the population of Queensland lives in the tropics, and over 90 per cent. of the population of tropical Australia lives in North Queensland. If the death-rate for tropical Queensland were high it would naturally appear in the general Queensland death-rates, but Queensland's death-rate is considerably below that for Australia generally. And the Australian death-rates are below those of any other country in the world except New Zealand.

The Need of Proper Housing.

Only in one feature have the results of scientific observation agreed with the statements of the adverse critics who have so often and so unjustly accused tropical Australia of being everything that a country should not be. The "tin house" is a blot on the landscape in every sense, and only too often the Australian tropic-dweller permits himself and his family to live under conditions of unnecessary discomfort. But the "tin-house" is a blot which is being rapidly removed. The Australian Institute of Tropical Medicine and the Commonwealth Department of Health have given much attention to the subject, and have erected models suitable to the climate and condition. This teaching is bearing fruit. With the rapidly increasing proportion of women in the population—between 1911 and 1921 the masculinity surplus fell from 17 to 12—housing conditions will tend rapidly to improve. But defective as they have been, and often are, it is clear that they have not had any bad effect on the physical or mental attributes of the people who are born and live amongst them.

Tropical Australia essentially suitable for White Habitation.

The present writer has personally known tropical Australia and its people for over thirty-five years, during the last fifteen of which he has been closely associated with the scientific investigation of its suitability or otherwise as a permanent habitation for a working white race. He is personally familiar with, and has studied on the spot, tropical living conditions in several parts of Asia, in Africa, in the Dutch Indies, Malaya, New Guinea, and the Pacific Islands. This, and the results of organised investigation quoted above, will explain why he has formed the matured opinion that tropical Australia is essentially suitable for habitation by white women, their menkind, and their children to many generations.

THE FIRST WHEATGROWERS.

Mr. Walter S. Campbell, of Vaucluse road, Rose Bay, Sydney, writes:—

In Vol. XXIII., Part 5, 1st May, 1925, page 445, there appears a paragraph, "Sowed the First Grain, &c." Sir Alfred Robbins, as well as many other persons, have been misled by an error on Ruse's tombstone, "I sowed the first grain." John Ruse did nothing of the sort, at Parramatta, at any rate on the land granted to him. I have written the correct story to dispel the fairy tale about John Ruse. This appeared in the Sydney "Daily Telegraph," of which I send you a copy. Ruse sold his grant for £30 very soon, and pretty well came to grief afterwards. At least, he never seemed to succeed with his subsequent attempts at farming.

Following is the full text of Mr. Campbell's article in the Sydney "Daily Telegraph" of 24th April, 1926, which is of general interest, as well as of historial value:—

THE FIRST WHEATGROWERS.

By WALTER S. CAMPBELL, Ex-Director of Agriculture.

An idea seems to prevail that the first wheat produced in Australia was grown by James Ruse on Experiment Farm, Parramatta, but such was not the case.

Governor Phillip brought with him from England some seed-wheat, and he was instructed before leaving England to procure seed-grain from the Cape of Good Hope, where he obtained all that was needed. Very soon after arrival at Port Jackson cultivation was started at the head of Sydney Cove, according to Phillip's report to Lord Sydney, 15th May, 1788, "for raising a little corn" (that is, wheat), "for their stock; and this I have endeavoured to promote as much as possible, for I fear the consequences if a ship should be lost on her passage out with provisions. . . . The great labour of clearing land will not permit more than eight acres to be sown this year with wheat and barley."

On 9th July, 1788, he reported:—"The Lieutenant-Governor has about four acres in cultivation. I have from eight to ten acres in wheat and barley. The officers will be able to raise sufficient to support the little live stock they have. . . . All the corn raised this year and next will be saved for seed, and, if necessity should oblige us to use it, it would be only a few days' support for the colony."

The eight acres referred to were situated at the head of Farm Cove, on portion of the area now devoted to the Botanic Gardens. Cultivation work was begun at Rose Hill (Parramatta) towards the end of the year 1788, and in December, 1790, the wheat

was harvested with the barley. About 200 bushels of wheat was obtained, as well as 60 bushels of barley. The ground Phillip had under cultivation returned about 40 bushels of wheat.

After that, Phillip reported, 17th June, 1790:—"In order to know in what time a man might be able to cultivate a sufficient quantity of ground to support himself, I, last November, ordered a hut to be built in a good situation, an acre of ground to be cleared, and once turned up, it was put in possession of a very industrious convict, who was told if he behaved well he would have thirty acres. This man had said the time for which he had been sentenced was expired, and wished to settle. He has been very industrious, and has received some assistance from time to time, and now he tells me that if one acre more be cleared for him he shall be able to support himself after next January, which I much doubt, but think he will do tolerably well after he has been supported for eighteen months." So he should, indeed, under such favourable conditions. I judge from my own practical experience on far inferior land without any encouragement.

"I mention," continued Phillip, "the particulars respecting this man; some judgment may be formed of what an individual will be able to do if no assistance is given him more than the year's provisions." In his report, 8th November, 1791, Phillip encloses a note showing encouragement to settlers, amongst whom is James Ruse.

"To James Ruse.—One acre and a-half of ground broke up, assisted in clearing the heavy timber off five acres, clothed and supplied with the ration issued from the public store for fifteen months, a hut built, grain for sowing his ground for the first year, with the necessary implements of husbandry. Two sow pigs and six hens given him."

Captain Watkin Tench, in his "Account of Port Jackson," relates that when inspecting the cultivation going on around and about Parramatta:—"I next visited a humble adventurer who is trying his fortune here—James Ruse, convict, who was cast for seven years at Bodmin Assizes, in August, 1782. He lay five years in prison and on board the *Dunkirk* hulk at Plymouth, and was then sent to this country. When his term of punishment expired in August, 1789, he claimed his freedom, and was permitted by the Governor to settle in the country, to take in December following an uncleared piece of ground, with an assurance that if he would cultivate it, it should not be taken from him. Some assistance was given him to fell the timber, and he accordingly began.

"His present account to me was:—"I was bred a husbandman at Launceston, in Cornwall. I cleared my land as well as I could with the help afforded me; the exact limit of which ground I am to have I do not yet know; but a certain direction has been pointed out to me in which I may proceed as fast as I can cultivate. I have now one acre and a-half in bearded wheat, half an acre in maize, and a small kitchen garden. On my wheat land I sowed three bushels of seed—the produce of this country—broadcast. I expect to reap about 12 or 13 bushels." Ruse married, and found his wife of much assistance."

Timbered land in those days was cleared without removing stumps. Captain John Macarthur, writing to the Duke of Portland, 10th September, 1796, referred thus to clearing and cultivating land:—

"Two men who have been but little accustomed to labour can cut down the trees of an acre of the most heavily-timbered of ground; they can burn them off, and completely cultivate the whole with wheat in one month without labouring more than eight hours a day. As the season for sowing wheat commences in April and continues till the end of July, a settler beginning to clear his land as late as February can with great ease clear and cultivate six acres with wheat, allowing only the assistance of one servant."

When a resident pupil at Parramatta just sixty-five years after Ruse was farming his land, I was frequently roaming about Experiment Farm and on country in its primeval condition. I am able to say with certainty that Ruse's land was not heavily timbered, and could not have presented much difficulty in clearing. The timber was forest mahogany, eucalyptus microcarps chiefly, some swamp oak, *casuarina suberosa*.

Ruse received his grant of 30 acres on 22nd February, 1792—an interesting historical event, as that was the first grant of land issued in Australia.

I may add that, although Ruse was not the first individual to grow wheat in Australia, he may have, possibly and probably, assisted others in the growing and sowing of that first produce.

Answers to Correspondents.

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.

Bottle Tree as Fodder.

E.R.A. (Mount Larecom)—

Bottle-tree is largely used as a fodder in Queensland wherever it grows. Analysis made by the Agricultural Chemist, however, showed it to have a low nutritive value, the material being just sufficient to keep stock alive.

Shade Trees in the Burnett.

F.G. (Mulgeldie)—Trees suitable for growing for shade at Mulgeldie are—

Bottle Tree (*Sterculia rupestris*).

Kurrajong (*Sterculia diversifolia*).

You may be able to find young trees in the Burnett scrubs; both transplant fairly readily. They can also be raised from seed.

Crows Ash (*Flindersia australis*).

Silky Oak (*Grevillea robusta*).

Celtis sinensis. Commonly called "Portuguese Elm" in Queensland, though a native of China. This tree is run out here and there along the Burnett River. It makes a good shade tree, but is deciduous. The leaves are relished by stock. We can send you seed in about two months' time.

Phytolacca dioica. The *Phytolacca* or Bella Sombra Tree. A very rapid growing tree, a good shade, and leaves and twigs relished by stock. Seeds have been forwarded. Free them from the pulp, sow in tins or boxes, and transplant to permanent positions.

Pines (*Pinus* spp.). The best exotic pine for Queensland is *Pinus longifolia*.

Figs (*Ficus* spp.) make good shade trees.

The foregoing is a small selection. Some of the scrub trees, and also forest trees, make good shade if left standing or planted.

"Mexican Clover."

W.G.S.R. (Eumundi)—

The specimen proved to be *Richardsonia scabra*, a native of Tropical America, naturalised as a weed in Queensland. In the United States it has been highly spoken of as a fodder under the name of Mexican Clover. J. S. Smith, in a Bulletin on "Fodder and Forage Plants," issued by the United States Department of Agriculture, has the following to say on this plant:—

"An annual weed, native of Central America and Mexico, which has been introduced into the Southern States and has now spread along the Gulf westwards into Texas. It is a succulent, creeping, prostrate plant, chiefly valued as a renovator of sandy fields on the coast. It is not a true clover, but belongs to the Rubiaceae, the family in which coffee is included. Reports concerning it are conflicting. According to some it is a valuable fodder plant, while others affirm that neither cattle nor horses will eat it. On rich lands it can be cut, making a nutritious and palatable hay, which is readily eaten by all kinds of stock. Chemical analysis shows that the hay contains nearly as much nutriment as Red Clover. It is never cultivated, but appears as a weed after corn and cotton have been laid by. In Florida it is considered as an excellent plant to grow in orange groves as a mulch and to turn under for green manure, but not equal to either beggar weed or velvet bean."

Our experience here has been that stock practically never touch it; only one instance has come under my notice of stock taking to it, when a farmer in the Maryborough district wrote me to the effect that his horses were particularly fond of it. The name Wild or False Ipecacuanah has sometimes been given to the plant on account of the nodular roots.

Sarsaparilla.

H.O. (Waterford).—

Sarsaparilla of commerce consists of the dried roots of various species of *Smilax*, cultivated and wild in Tropical America and the West Indies. None of these species, so far as I know, is in cultivation anywhere in Australia, and you would have to obtain supplies of roots or seeds from abroad. If you are very keen on this matter you could write to the Director, Imperial Department of Agriculture for the West Indies, Barbadoes, West Indies, for further information.

We have two native species of Sarsaparilla; one of these, *Smilax glycyphylla*, used to be collected by herbalists in New South Wales and also used in the manufacture of cordials. The parts used in this case were the stems and leaves. I have tested this same species in Queensland at different times, but in most cases the leaves when chewed have lacked the typical sarsaparilla flavour. Plants often vary a good deal as to their properties with geographical distribution.

Yams—Bulbils.

S.A. (Buderim Mountain).—

Both specimens represent the aerial tubers or bulbils of one of the yams (*Dioscorea bulbifera*). Some time ago I wrote to Dr. Burkill, the Director of the Botanic Gardens, Singapore, and a great authority on yams, regarding the edible qualities of the aerial bulbils of the various races of this *Dioscorea* grown in Queensland. He replied—

“There is every degree of edibility in the bulbils of *Dioscorea bulbifera* from something quite pleasant to something absolutely dangerous; and the only way of finding out what condition you have is to cook and taste discreetly. Once I was given the race which is called Otaheiti potato, and thought it tasted like kohlrabi. I have struck others very nauseous. Cut a bulbil and see if it goes brown quickly, in which case it is probably unfit to eat.”

Some Australian Plants.

F.H.D. (Monterey, California, U.S.A.).—

Pituri.—This is the dried leaves and stalks of *Dubosia Hopwoodii*, a small tree of the Solanum family (Solanaceæ) and a fairly close ally of the common Tobacco, and the poisonous principle has been found to be identical with nicotine. It stretches from Western Queensland, through the Northern Territory and Central Australia to the interior of Western Australia. The dried leaves are a source of trade between the natives for chewing; they are mixed with ashes. Sheep are sometimes poisoned by eating the young plants.

Caustic Vine.—This is *Sarcostemma australe*, a member of the Asclepiadaceæ. It has been suspected of poisoning stock, but there is considerable doubt on this point. Several of the same family are found in the United States, and are known definitely to be poisonous. It is a leafless climber, the milky sap of which is applied to sores, &c., by bushmen.

Nardoo is *Marselea Drummondii*, and is a mud or water plant. It is not a flowering plant, but is closely allied to the ferns—the parts eaten by the natives are the dried and pounded up spore cases and spores. It has very little nourishment. It is a shamrock-like plant, and as the water dries up the spore cases are formed and are easily gathered.

Edible Water-lilies.—The tubers of the big Blue Water Lily (*Nymphaea gigantea*) are eaten. The seeds of the Lotus Lily or Pink Lily (*Nelumbium speciosum*) are eaten. The gigantic Boo-bab (*Adamsonia Gregorii*) does not occur in Queensland, but only in the Northern Territory and north-west of Western Australia—a very fine series of pictures of these trees was recently published in the Transactions of the Royal Geographical Society of Australia (South Australian Branch). A drink is made from the diluted mucilage exuded from the trunk, and the seeds are eaten by the natives. Water is stored in pits or hollows of the branches and remains quite sweet; these holders often hold many gallons of water. Another boo-bab of similar growth and properties is found in the drier parts of Northern Africa.

For information on the aborigines, fauna, &c., you are advised to write to the Director, Queensland Museum, Brisbane (Mr. H. A. Longman), and on Geology to the Chief Government Geologist, Geological Survey, Brisbane (Mr. B. Dunstan).

Tanning Barks.

F.J.M. (Fletcher, Southern Line)—

The two chief sources of tan barks in Australia are *Acacia pycnantha*, the Golden Wattle of South Australia, and *Acacia mollissima*, the Black Wattle of Victoria and Southern New South Wales. Queensland barks from the Stanthorpe district have been received at Brisbane from time to time, but are not so good nor so regular in quality as the Southern barks. In regard to the differences between Black, Gold, and Silver Wattles these are almost impossible to give here, as the different names are very loosely applied in Queensland. Your best plan is to send small twigs (with flowers or pods if at all possible) for identification of all the wattles you have on your place. Number each specimen, retain a duplicate, and names will be returned to numbers.

You can get in touch with Brisbane tanners or with the Secretary of the Master Tanners' Association. A leaflet on "Wattle Bark—The Possibility of its Cultivation in Queensland" has been forwarded. The most impressive work is "Wattles and Wattle Barks" by the late J. H. Maiden, obtainable from the Government Printer, Sydney, or any bookseller. Price, 1s. 6d. Oak bark.—This has no commercial value. A number of barks of low tannin content are used in the bush, but have no market value as general tans.

Bracken Fern Eradication.

Inquirer (Brisbane)—

Where practicable one of the best means of eradicating bracken fern is regular weeding. This is best done just before the ferns mature their spores; this weakens the underground portions and also prevents spread of spores. New leaves will spring up shortly afterwards, and should be mown within a few weeks of their growth. Burning off the dead fronds acts as a further check.

Bracken is a pest in all temperate countries, and "Farmers' Bulletin No. 687" of the United States Department of Agriculture is devoted to methods of eradicating bracken and other ferns from pastures. The conclusion drawn from experiments was that cutting was more economical than spraying. Salt was found to be the best material for spray solution. Arsenic was effective, but its use is a risk to stock. About 200 lb. of salt was required per acre, and was used in a strong solution—1 lb. to 1½ quarts of water.

Eradication by smother crops.—Some success in New South Wales has attended the use of Kikuyu grass for smothering bracken. Mr. Jas. N. Whittet, the Government Agrostologist of New South Wales, writing in the "Agricultural Gazette," of New South Wales, for January, 1923, gives the following method of procedure:—

"The fern country on which it is intended to grow Kikuyu should be ploughed and worked prior to planting in the spring, or if the soil be of an open free nature the fern fronds should be cut in the early spring, burnt, and the grass roots hoed in. On large areas drills 3 feet apart should be struck out with a single-furrow plough, the Kikuyu being dropped every 3 feet in the bottom of the drill, and covered with a light furrow, or by running a harrow along the drills in the direction in which they run. If the weather is at all favourable, the Kikuyu grass makes headway as soon as, or before the fern, and by winter there is only sufficient fern showing to protect the grass from frost. By the following spring a mat of grass has formed over the blank spaces and the fern is gradually choked out."

Bracken in England is a pasture weed, and Morse and Palmer in their work on "British Weeds" recommend summer cutting, and state that after cutting a dressing of lime is beneficial. They go on to say—

"The best method is spraying with diluted sulphuric acid (Oil of Vitriol). On rough hill pastures this may be done with knapsack sprayers. The water must first be put in the sprayer, and the acid very carefully and slowly added in the proportion of 1 pint to 4½ gallons of water. The first spraying should be given early in July, and a second in August. Cut surviving plants the following year. Breaking up and cultivating a pasture exterminates bracken most effectively."

Their July and August would, of course, correspond to our midsummer months.

Plants Identified.

G.P. (Herberton).—The specimens proved to be—

1. *Hibbertia volubilis*—Snake Vine. Has been suspected at different times as being poisonous, but feeding tests have given negative results.
2. *Legnephora Moorei*. Known as "Native Grape," though not a true grape. The fruits are borne in grape-like bunches and have been eaten at times with fatal results—poisonous.
3. *Clematis glycinoides*—Native Clematis, or Headache Vine. Not known to be poisonous. The leaves, if crushed up and strongly sniffed, make the eyes and nose "run," and are supposed to cure headaches.
4. Material insufficient for determination.
5. Material insufficient for determination.
6. *Epilobium junceum*. A native plant of the "Evening Primrose Family." Common in damp places. Not known to be poisonous or harmful in any way.
7. *Aster subulatus*. A native of North America—fairly common as a naturalised weed in Queensland—not known to be poisonous or harmful in any way; most abundant on damp ground.
8. *Vitis hypoglauca*. A native Grape or "Water Vine." Not known to be poisonous.
9. *Cordyline terminalis*. "Dracena" or "Palm Lily." Not known to be poisonous or harmful in any way.
10. *Aspidium molle*. A very common fern in damp paddocks; not known to be poisonous or harmful in any way.

You will notice from the above list that only one species (No. 2—*Legnephora Moorei*) is known definitely to be poisonous. Where there are numbers of weeds and a fair amount of secondary growth in scrub areas one commonly finds several plants more or less harmful.

Any plants that may be growing in the paddocks, but of which you did not send specimens are:—

The Tape Vine.—Round or heart-shaped leaves, glossy dark green above, paler beneath.

The Native Bryony or Wild Melon.—(*Bryonia laciniata*). A red fruit streaked with white wavy lines.

Wild Peach (*Trema aspera*), and, perhaps, others.

J.H. McC. (Dalby).—The specimens from Chinchilla proved to be—

No. 1. *Podolepis longipedata*, a fairly common plant on the Downs and in parts of the West. It is not known to possess any harmful properties. I have not heard a common name applied to it.

No. 2. *Oenothera longiflora*. Evening Primrose. A native of South America, naturalised in Queensland, though not a bad weed. It is not known to possess any harmful properties.

The vine from the Bunya Mountains is one of the Milk Vines (*Asclepiadaceæ*); in the absence of flowers or pods it is not possible to name the species. However, as so many plants of this family have a bad reputation in Queensland and elsewhere, it is always as well to cut them out of paddocks where they are growing as secondary growth.

The smaller specimen is the Knot-Weed or Knot Grass (*Polygonum aviculare*), a common weed widely distributed over the temperate regions of the globe. It is not known to possess any poisonous properties, but its long wiry stems may cause mechanical injury if eaten in any quantity.

M.G. (Meesines)—The specimens proved to be—

1. *Pomaderris prunifolia*. "Pomaderris."
2. *Poranthera corymbosa*.
3. *Zieria Smithii*. "Sandfly Zieria."
4. *Boronia microphylla*. "Small-leaved Boronia."
5. *Boronia repanda*. "Boronia."
6. An Epaerid. Flowers would be required to determine the species.
7. *Daviesia corymbosa*. "Bitter Pea."
8. *Daviesia acicularis*. "Bitter Pea."
9. *Dillwynia juniperiana*. "Parrot Pea."
10. *Pultenaea microphylla* var. *cuneata*. "Bush Pea."
11. *Bassia rhombifolia*. "Bossiaea."

Hibbertia stricta, without number. "Guinea Flower." A small yellow-flowered plant.

The collection was an interesting one, and contained one plant not previously found in Queensland—viz., No. 2, *Poranthera corymbosa*. I will take an early opportunity of making the record.

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:—

Dieting of Pigs.

H.B. (Crawford, Kingaroy Line)—

Apparently your pigs have been fed on a mixture of skim milk, water, and molasses, and that owing to the exceptionally dry weather skim milk has been in rather short supply, which indicates that the pigs have largely been "fed" on sugar and water, both very necessary items in any system of feeding, but both very poor foods in the absence of other more appetising and nutritious items. Development of Yellow Jaundice also indicates that the diet is unsuitable and the blood out of order, for it is apparent from description of post-mortem examination that death was, in part at any rate, due to Yellow Jaundice, a complication of diseases of the liver (congestion or inflammation probably). This may have been exaggerated by the too free use of molasses as a food and by constipation or loss of tone in the bowels. In any case it is evident that the trouble was largely due to faulty diet and to lack of green foods and grain, &c., conditions, presumably, largely the result of the dry season.

Swede Turnips as Pig Food.

W.T.C. (Byrnestown)—

Swede turnips are in reality not a good crop to grow for pigs. It is preferable to grow mangel-wurzels, for they are far more succulent, nutritious, and appetising to the pig, though they are slightly more difficult of cultivation, success depending largely on securing seed of fresh stocks from a reliable seed merchant. Swede turnips will be appreciated most by mature stock, breeding sows and boars, and to them they should be fed raw. If using them for young pigs they are best cooked and used as part of a morning mash. Dwarf Essex rape is the crop usually recommended in preference to Swedes, but rape does not form a bulbous root, its food value being in the growth of succulent leaves. It is a winter crop, and is therefore of much value on most farms.

VETERINARY.

Worms in Sheep.

H.G.S. (Jericho)—Mr. W. G. Brown, Instructor in Sheep and Wool, advises—

I am much interested to learn that your correspondent's sheep are infested with worms in the large intestines. I have submitted his letter to Mr. A. H. Cory, M.R.C.V.S., Chief Inspector of Stock, and he asks that specimens of these worms be sent along for identification. He states also that the action of arsenic plus the excessive amount of salt administered will probably make a deadly poison. In any case send along the worms from the intestines.

The formula of feeding shows that this grazier has been feeding 100 lb. of meal to 60 lb. of salt, with other (non-poisonous) ingredients. Hungry sheep placed on a meal and salt diet in the above proportions would certainly be poisoned in greater or less degree. In my opinion it has caused nearly all his losses. Cut out the iron sulphate and the raw linseed oil. Give the salt separate from the meal, and he will find that his sheep will do well. Salt is a purgative. Don't ever forget that. Excessive salt causes severe diarrhoea. To put it all concisely I shall answer his questions seriatim—

- (1) Are these worms in the intestines stomach worms?

Answer: Cannot say unless you forward some specimens. Stomach worms may be found outside the fourth stomach as far along as the Caecum (Bung gut in the vernacular), but if they leave the stomach they die and are promptly dissolved by the gastric juices.

- (2) If so what drove them out of the stomach?

Answer: Cannot say without knowing the worm.

- (3) Should the drench act on the worms in the intestines just the same as if they were in the stomach?

Answer: The drench naturally weakens as it goes along the alimentary canal, mostly by absorption. I have yet to know that the worms you saw were really stomach worms (*Strongylus contortus*).

- (4) What caused the sheep to be so sick after the drenching? Would it be from the effects of salt?

Answer: Undoubtedly nearly all your troubles are caused by the use of excessive salt.

- (5) Is it advisable to drench ewes heavy in lamb?

Answer: Not advisable, but if heavily infested there is a choice of two evils—death by the worms, or lambing troubles caused by the knocking about of the animals. There is no danger from the drench; it is the knocking about the animals get in the most critical time of their life (parturition) that the danger lies. Handle them carefully, and there will be little trouble.

- (6) What causes the sheep to have diarrhoea?

Answer: In your case, excessive salt.

- (7) What amount of salt does a sheep require to obtain best results?

Answer: When sheep are salt hungry and are offered salt they will consume at the rate of 4 oz. per week for the first ten days. This amount dwindles until the regular requirements per week per head is about 1½ oz.

- (8) What would be a suitable lick for this district?

Answer: 100 lb. salt, 10 lb. finely-ground Nauru phosphates; both cheap and effective.

- (9) Would the worms affect the sheep in the intestines as much as in the stomach?

Answer: Depends on the worm. Tape worms are intestinal worms. Broadly, stomach worms are not. I cannot say that I know others than the Nodule worm. It is known by the nodules to be found all along the intestines, but unless in great numbers are not regarded as sheep-killers.

- (10) Can you advise me as to the best method and drench to shift the worms from the intestines?

Answer: The arsenical drench of this Department is good for the worst worm, the Stomach worm, and should be good for the intestinal worms you speak of.

Kindly send along specimens. Under separate cover is forwarded "The Farmer's Sheep in Queensland" Bulletin, and "Stock Foods," which may be informative on sheep matters.

Vitamins.

P.B. (Ipswich)—The Agricultural Chemist, Mr. J. C. Brünnich, advises—

As a rule stock living under natural conditions, with plenty of green pasture and herbage, get a sufficient supply of vitamins. An extract of an article by Prof. Harden gives all details up to date.

Following is the extract referred to by Mr Brünnich:—

“When we come to consider the vitaminic requirements of an average individual we have to confess to a lamentable lack of accurate information. We are, indeed, in a better position with regard to many of the lower animals, for it has become possible to ascertain with some degree of accuracy by direct experiment the amount of milk or orange juice necessary to protect a guinea pig or a monkey from scurvy, or the amount of yeast which will perform a similar function for a rat or pigeon with regard to polynneuritis. One important conclusion which has been definitely ascertained in this respect is that different animals, even although closely related, vary very considerably in their need for vitamins. A striking instance is afforded by the guinea pig and the rat, both rodents, in relation to the anti-scorbutic vitamin. The guinea pig is very sensitive to lack of this principle, and on a scorbutic diet rapidly shows symptoms of scurvy, and finally dies of the disease. The rat on a similar diet shows scarcely any sign of the absence of the principle, grows to a good weight and produces young. Careful examination has, indeed, revealed a certain inferiority in the scorbutically fed animals, but scurvy never develops. A less extreme difference is shown by a comparison of the anti-scorbutic needs of the guinea pig and the monkey, animals which are both affected by scurvy. The latter, of about ten times the weight of the former, requires almost exactly the same amount of anti-scorbutic (orange juice or milk) to protect it from scurvy.”

TABLE 1.

---	Vitamin A.	Vitamin B.	Vitamin C.
Synonyms	Fat Soluble A.	Water-soluble B. Anti-neuritic	Water-soluble C. Anti-scorbutic
Effect of deficiency	Retarded growth ending in death Eye-disease (Keratomalacia) Probably one factor in causation of rickets	Retarded growth ending in death Beri-beri Polynneuritis of birds, rats, &c.	Scurvy
Chief sources	Animal fats Fish liver oils Green vegetables Egg-yolk Butter and milk Oleo-margarine, in proportion to animal fat	Seeds, particularly in the germ, pericarp and aleurone layer Yeast Egg-yolk	Green vegetables (especially Cruciferae) Orange and lemon juice Tomatoes Germinated seeds Swedes and turnips
Present in smaller amounts	Oil-seeds Carrots	Meat Milk Potatoes and some other tubers and roots Green vegetables Some fruit juices	Meat Milk Potatoes and some other tubers and roots Many fruit juices Dried vegetables
Absent from	Most vegetable oils Most lard Most margarine White bread Egg white Yeast Purified proteins and carbohydrates	White bread Polished rice Fats Egg white Purified proteins and carbohydrates Sugar and Corn starch	Seeds White bread Fats Yeast Purified proteins and carbohydrates

General Notes.

Introduction of Sugar-cane Plants.

Further Proclamations, Nos. 11 and 12, have been issued under the Diseases in Plants Acts. No. 11 prohibits the introduction into Queensland from New South Wales of plants or portions of plants of every variety of sugar-cane unless a permit in writing be first granted by an inspector.

Northern Pest Infested Lands.

The lands of the suppliers to the South Johnstone and Tully Central Sugar Mills have been declared cane pest infested areas under the Sugar Experiment Stations Acts.

Cotton Prospects.

The Minister for Agriculture (Hon. W. Forgan Smith) mentioned, in the course of a recent Press announcement, that the cotton-growers were considerably concerned with the present prospects of their industry. It will be remembered that representatives of the cotton-growers approached him as Minister for Agriculture and asked that the State Government agree to the decontrol of the industry. He informed the cotton-growers that in the event of the growers being able to arrange for a bounty on seed cotton from the Federal Government, the State would be prepared to grant the request for decontrol.

Investigation and report upon the matter of a bounty on seed cotton was referred by the Federal Government to the Tariff Board. The Tariff Board in turn recommended to the Federal Government that a bounty on seed cotton be granted. The bounty to be at a rate of 2d. per lb. on seed cotton for six years, and a tapering bounty for the remaining four years of the term.

The Federal Government did not accept in entirety the recommendation of the Tariff Board, but agreed to a bounty on seed cotton for five years at a rate of 1½d. per lb., and additionally made provision for monetary assistance to cotton spinners with a view of establishing a secondary industry of cotton spinning.

If the growers find that the rate of bounty is insufficient to enable them to carry on in cotton-growing with reasonable prospects of success, it is for the growers to prepare a case and submit the whole matter for consideration by the Federal Government.

It is not the function of a State Government to give a bounty super-imposed upon a bounty granted to any industry by the Commonwealth.

Action should be taken in this matter without delay, as the time for the planting of cotton will soon be passed. Prospective growers of cotton would be well advised to plant areas under cotton without further loss of time, as it is obvious that if favourable opportunity to plant the seed is not taken advantage of there will be no cotton crop to harvest and no bounty collected by the growers.

It is true that the price of cotton on the world's market has declined, and values to-day are comparatively lower than those that have prevailed for many years past.

Should it be that the bounty granted to cotton spinners by the Federal Government operates in the direction anticipated by the Commonwealth authorities, it appears there are prospects of the cotton-growers receiving some monetary advantage upon cotton grown by them that is used for manufacturing purposes in Australia, and although a definite statement as to the return to the grower that will be derivable from this source cannot be stated at this juncture, it does appear that growers can expect to receive benefit from this source. There are additional channels through which economy might be exercised, such as reduced costs of ginning, and these are matters that are being investigated, and should it be found possible to devise means whereby the return to growers can be increased as a result of action along the lines indicated, it might ultimately be that growers will receive a higher

rate for their seed cotton than a superficial examination of the existing prospects seems to indicate.

In any case, I would strongly urge growers to give urgent attention to the matter of setting an acreage under cotton seed immediately the soil conditions are favourable for planting.

Australian Chilled Beef for the United Kingdom Market.

Commenting on the recent experimental shipment of chilled beef from Australia to London carried out by the Perfect Food Process Pty. Ltd., the "Cold Storage and Produce Review" of London in its leading article of the issue of 19th August states:—"The shipment has demonstrated, in spite of the mouldiness of a portion of the cargo, that the Antipodean voyage is not a bar to chilled meat carriage. No chemical preservatives were used, and the temperature at which the meat was landed was distinctly higher than that at which a considerable portion of the Argentine chilled beef, sometimes frost-laden, is now marketed. Comparing the Australian trial shipment with the South American chilled experiments of twenty years ago, the present experimenters have nothing to be ashamed of. Having said this much, we have to pause in our conviction as to the immediate hopefulness of the system as applied to the Australian beef export business. Australia has been so neglectful of the counsel to improve her herds that, as a matter of common knowledge, and in spite of her large total holding of 15,000,000 cattle, she has nothing like the quantity of chilling-quality meat to gather in comprehensive cargoes for competition with the Argentine product in European markets. Everyone knows that in this position the Argentine powers that be, and they are many, could easily quash such new competition, if it were practicable. It would be merely an ordinary step of commercial self-protection. Of course, if Australia could induce the British navy, or army, to take its meat in chilled shipments at, say, a parity of price with market rates, that would be of considerable assistance. But the Commonwealth industry has got to improve its herds by regularly systematic breeding—not by the occasional importation of a pedigree bull—by the reform of its transit conditions between works and ships, and by the economic arrangement of its works centres. Only thus can the Australian beef export trade get properly on its feet, and although it will take more than a season or two to accomplish the work Australians must have faith to enter upon the task set before them, as there is no other hope for Commonwealth beef export."

According to the same journal, the shipment comprised nearly 800 hindquarters of beef (752 from Brisbane and 41 from Wyndham). On discharge of the meat from the vessel a large proportion of the Brisbane quarters were found to be extensively affected by surface moulds. The Wyndham beef was, however, perfectly fresh in appearance and sold at from 3s. 10d. to 4s. per 8 lb. wholesale. The interior of the meat affected by mould, and even the fat, was found to be quite fresh and sound, and this meat marketed in pieces was reported to have made an average of 3.8d. per lb. net.

The quality of the meat was declared to be excellent. It is believed that a leading cause of mould was the failure to reduce the initial temperature of the chamber at Brisbane immediately prior to loading.

In spite of the presence of mould on the Brisbane quarters, the trade as a whole passed favourable comment on this experiment, which is considered to have proved the possibility of carrying beef over the long voyage at a chilling temperature. The meat which formed the basis of the first experiment carried out last year was wrapped in two stockinette covers, as well as an outside hessian wrap, one of the stockinette covers having been washed in boracic water; but no preservative at all was used on the meat in the recent experiment.

According to the journal, interest has been displayed in the further intentions of the Perfect Food Process Pty. Ltd., and it is believed that more than one shipping company is favourable to the fitting of a vessel or vessels with the company's equipment.

Sugar-Cane Levy Regulations.

Regulations have been issued under the Primary Producers' Organisation Acts empowering the Council of Agriculture to make the following levies on canegrowers:—

- One half-penny per ton on all cane delivered at the Qunaba Sugar Mill;
- One half-penny per ton on all cane delivered at the Bingera Sugar Mill;
- One farthing per ton on all cane delivered at the Rocky Point Sugar Mill;
- One penny per ton on all cane delivered at the Pleystowe Sugar Mill; and
- One penny per ton on all cane delivered at the Millaquin Sugar Mill;

during the 1926-27 season.

These levies will be utilised for the following purposes:—

Qunaba and Bingera.—To meet Mill Suppliers' Committee expenses.

Rocky Point.—To defray local expenditure in connection with the functioning of the Rocky Point Mill Suppliers' Committee.

Pleystowe.—To defray the expenses connected with the appointment of two farmers' representatives to this mill.

Millaquin.—To defray the expenses of a grower's representative at the Millaquin Mill, and any other expenses which the Mill Suppliers' Committee may have.

Provision is made for the cane suppliers to the above mills to ask for a referendum to decide whether or not the levy shall be made, and such petition must reach the Minister by not later than the 1st November next.

Cotton Market—The American Decline—Relation to Local Crops.

"The report from New York that United States Government experts forecast a cotton crop of 17,454,000 bales, the largest on record, and that there has been an appreciable drop in the price for American middling cotton backs up the contention of the Queensland Department of Agriculture that the Queensland farmer should endeavour to grow long staple cotton of a good grade and quality," said Mr. W. G. Wells (Cotton Specialist of the Department of Agriculture), in the course of a recent Press interview.

Mr. Wells added that advices from Liverpool indicated that at least 2d. per lb. premiums are being received for the greater portion of the Queensland crop, and an appreciable quantity is receiving even higher premiums.

"No attempt," said Mr. Wells, "has been made to estimate the effect such a yield as reported from the United States will have on prices for the coming season. It must be understood that this is a forecast as to the possible crop which may be obtained this season in the United States. October is the month when the bulk of the picking is being accomplished in the United States, but a very large amount of cotton will be harvested in November and up to the end of December. As these are the beginning of the winter months in the United States of America, and the fact that the crop is later this season, it can be expected that a considerable proportion of the crop may be of low grade. If this occurs it will mean that the price of the lower grades of cotton of an inch or under will be low for the next two years, as there is a large carry over of this quality of cotton from the past season's crop.

"This makes it all the more imperative for the Queensland grower to give his crop the very best methods of cultivation, such as early thinning and sufficient weeding during the season, so as to maintain a good mulch free from weed growth. In other words, every effort should be made to produce as high a quality of cotton as we can during this coming season.

"If we can maintain the standard of the higher grades of the past season's crop it is anticipated that very substantial premiums will be obtained for Queensland cotton, which, with the Commonwealth Government's bonus, should make cotton-growing a profitable enterprise for the Queensland farmer."

Staff Changes and Appointments.

Mr. H. J. Freeman has been appointed an Inspector under the Diseases in Plants Acts.

Mr. H. B. Carney, Clerk of Petty Sessions, Childers, has been appointed Chairman of the Childers and Isis Local Sugar Cane Prices Boards, *vice* Mr. A. H. Anderson, transferred.

Mr. J. R. Collier, Inspector of Slaughter-houses, has been also appointed Inspector of Stock.

Mr. C. F. Adermann has been appointed Chairman of the Peanut Board.

The following transfers of Inspectors of Slaughter-houses have been approved:—

J. R. Collier, from Maryborough to Cairns; and

E. C. Todd, from Cairns to Maryborough.

Mr. H. C. J. Hansen has been appointed Canegrowers' Representative on the Farleigh Local Sugar Cane Prices Board, *vice* J. J. Hand, resigned.

Mr. J. C. Pryde has been appointed Inspector of Stock, Brands, and Slaughter-houses, as from the 1st November, 1926, to the 30th November, 1926.

Mr. F. H. Hyde has been appointed Chairman of the Northern Pig Board until the 31st December, 1926.

Mr. H. Barnes has been appointed an Inspector under the Diseases in Plants Acts.

The resignation has been accepted of Mr. W. H. Austin as Queensland State Executive Officer on the State Meat Advisory Board.

The Public Service.

It has become the fashion at various times to joke about the public servant who is tied down by rigid regulations, which tend to destroy any initiative an individual may possess. However, in spite of that, it produces men of high character and independence of thought, who climb to the top, and by their sterling abilities keep for all public servants that respect which the community owes them. Many a brilliant lad goes into the service because he must do something, and the position is open to him. Perplexed parents, with boys whose abilities are general, find relief from their worries by placing the young hopeful in the Government employ. Not many are able to launch their children in professions. So it happens that the sons begin life by serving the public in one of the many Government departments of the country. Not all remain there. The service is no place for a restless spirit or for the man with acquisitive ambitions. The essential psychology of the public servant is to wish to serve rather than to acquire, and there are many intellectually brilliant men who prefer a life of service to one of making money. It is a grand thing that such men find their way into the public service, and reserve their capabilities for the benefit of the country as a whole, when they might do far better for themselves, in the material sense, in other walks of life, and it is well to bring these facts before the community so that they will not be forgotten.

There are men in the service who could make far more money outside of it. There is no limit to what they might achieve in commercial and industrial walks of life. Many instances could be quoted of brilliant employees of the Government who have been snapped up by private firms at salaries which would excite the cupidity of most people, but when men of high quality and great integrity find their feet in the civil service, they discover that the ideal of service to the community carries with it compensations which cannot be assessed in coin of the realm. And those who give whole-heartedly are always greater than those who take. Our public service has been singularly fortunate in its leaders. Out of the many hundreds whose salaries come out of the Treasury, the man for the job has always been found. There are youths to-day with their feet on the first rung of the public service ladder who will one day lead their departments. The "old original heads" are gradually disappearing, but they are leaving behind them standards of character and ability which should establish traditions to which the younger generation will aspire.—"Dalgety's Review."

"Stock Foods"—Corrigenda.

In Mr. J. C. Brünlich's excellent pamphlet on stock foods, published recently and which was also reproduced in the September Journal, several inadvertent errors occurred. Following are the corrections:—

Page 26, pamphlet; page 202, "Queensland Agricultural Journal (26th September)—

Ration I. for hens should read—

9 lb. wheat, 5 lb. pollard, 5 lb. bran, and 15 lb. (1½ gallons) skim milk.

Table I. in pamphlet—

Column 1 to read Moisture (not Mixture).

Column 16—3rd line from the end should read ∞ (infinity), not S, as molasses do not supply any digestible protein.

Royal Society of Queensland.

Dr. J. V. Duhig, M.B., presided at the last meeting of the Royal Society of Queensland.

Dr. W. H. Bryan exhibited Permo-Carboniferous fossils from Cressbrook Creek. These prove the existence of a hitherto unsuspected area of Permo-Carboniferous rocks. The fossils included *Trachypora wilkinsoni*, *Monilopora nicholsoni*, *Zaphrentes* sp., *Strophalosia* sp., *Mourlonia* sp., *Pleurotomaria* sp., and *Conularia* sp. In fossil content, lithological character, and association with acid volcanic rocks, the new area can be closely correlated with the Condamine Beds of the Silverwood-Lucky Valley area.

Dr. E. O. Marks exhibited pebbles of igneous rocks from sandstone at Deception Bay. These pebbles suggest a Tertiary Age for the sandstone or Mesozoic igneous activity.

Mr. A. K. Denmead exhibited, on behalf of Rev. C. H. Massey, a number of rock specimens apparently of the Brisbane Schist Series which were obtained from Kanaipa Point, Russell Island, Macleay Island, and Stradbroke Island. These prove that the Brisbane Schist Series is more extensive in the southern part of Moreton Bay than had been supposed, and suggest that other adjacent areas which are assumed to represent more recent series may prove to be in part made up of deeply weathered Brisbane schists.

Professor Richards and Drs. Bryan and Whitehouse commented upon the exhibits.

Mr. A. P. Dodd read a paper entitled, "The Genus *Scelio* Latreille in Australia (Hymenoptera: Procto trypoides)." The author recognises twenty-nine species. The following new species are described:—*Scelio concinnus*, *S. fulvithorax*, *S. sulcaticeps*, *S. perspicuus*, *S. improcerus*, *S. piosifrons*, *S. contractus*, *S. asperatus*, *S. notabilis*, *S. amoenus*, *S. nigrobrunneus*, *S. ignobilis*, *S. panithorax*. Mr. H. Tryon and Prof. Goddard commented upon the paper.

Mr. H. Tryon read a paper entitled, "Queensland Fruit Flies (Trypetidae, Series I)." The following new species are described:—*Chatodacus fagrae*, *C. halfordiae*, *C. bryoniae*, *C. barringtoniae*, *C. musae*, *C. bancrofti*, *C. jarvisi*, *Dacus signatifer*, *D. niger*, *Rioxa araucaria*, *R. jarvisi*, and *Bactrocera pulcher*. The following species are recorded for the State:—*Chatodacus dorsalis* Hendel, *Bactrocera caudatus* (Fabr.) Bezzi. For *Chatodacus tryoni* Froggatt, twenty-nine hosts included in twenty-two families of indigenous fruits and forty-three hosts included in eighteen families of naturalised economic fruits are enumerated. Professor Goddard commented upon the paper.

On the motion of Professor Richards, seconded by Mr. H. Tryon, the Society's sympathy with the widow of the late Charles Hedley was expressed. Appreciative acknowledgment of Mr. Hedley's notable work for the general advancement of scientific knowledge and in connection with the activities of the Great Barrier Reef Committee was also made.

The development of Permo-Carboniferous beds in Queensland was the subject of a discussion towards the conclusion of the meeting. Drs. Whitehouse and Bryan, Mr. J. H. Reid, Professor Richards, and the following visitors (Professors Benson and Leo. Cotton and Mr. E. C. Andrews) took part in the discussion.

Fiji Disease of Sugar-cane.

Proclamation No. 12 prohibits the removal of any sugar-cane plant or part of plant to be used for the purpose of planting, from any place situated in the counties of Ward, Stanley, Canning, and March, owing to the prevalence of Fiji disease of sugar-cane. If, however, an inspector is satisfied that any particular place is and always has been free from the disease, he may issue a permit for the removal of sugar-cane plants from such place, which must be mentioned in the permit.

Dogs and Hydatids.

The hydatid cysts found in stock and also in man are only one part of the life cycle of a parasitic worm known as the echinococcus. This is a tapeworm which is found in the dog's intestinal tract, the ripe eggs being passed in the excreta. Stock become infected by eating herbage which has been contaminated with these eggs either directly or blown on to it by the wind when dried into dust. Once the eggs are swallowed by stock or man they develop into immature worms, which make their way into the liver or lungs, and sometimes other parts of the body, where they develop into the well-known hydatid cysts. These cysts may slowly increase in size, and give rise to symptoms accordingly, but they do not develop into the mature tapeworm until swallowed by a dog or similar animal. Once a dog eats raw meat containing hydatid cysts the cysts soon become dissolved, and the mature tapeworm appears, and the whole life cycle begins again. The only way to treat hydatids in man and stock is to prevent them from eating food contaminated with echinococcal eggs from infected dogs. This means cleanliness, and care in handling dogs in the case of man, while for stock it means keeping infected dogs away as far as possible from their pasture. In both cases all infected dogs should be treated, and every care taken to prevent reinfection by keeping dogs away from the slaughter yards and raw offal, and seeing that the liver and lights, &c., are well boiled before being used as dog food. Contrary to general belief, rabbits are not so often infected as sheep, and rabbits' dogs are not, as a rule, so heavily infected with tapeworms as are station or drovers' dogs. The treatment of tapeworm in the dog is usually by areca nut or, better still, by a mixture such as:—Felix mas (male fern), 30 grains; areca nut, 90 grains; mixed with 1 oz. mucilage of acacia and 10 to 15 drops of chloroform. This mixture should be given in one dose after a preliminary twelve to twenty-four hour fast, and should be followed by a purgative (not castor oil). If necessary the treatment should be repeated in forty-eight hours. By such routine treatment of infected dogs, and the destruction or proper cooking of all offal, particularly livers and lights, hydatid disease would become very much rarer than it is at present in Australia, which has the unenviable reputation of being the home of hydatids. No treatment beyond surgical removal can deal with cysts themselves.—“The Australasian.”

“Soft Bone” in Cattle—A North Coast Farmer's Experience.

Mr. Walter Tronson, Ringwood, Pomona, writes—It may interest you and your department to know how I have got on with combating our trouble known as “Soft Bone” on our coastal country. Some years ago we had trouble with cows becoming cripples, and as we were at a loss to understand the trouble we wrote to you, and you sent up one of your vets., and he slaughtered one of the animals and declared that soft bone was our trouble. We acted on your suggestion to try licks, but had very indifferent results, because the bad ones would not look at licks, until about eighteen months ago. There was a splendid article on “How they were overcoming ‘Soft bone’ in South Africa,” which was published in the ‘Queensland Agricultural Journal.’ This article stood out on its own, and has saved me pounds. The year previous to reading this article I sold twenty-eight cows and heifers on first calf because they were that bad with soft bone they were useless in the yard. Since then I have not had a trouble simply because I have put up to half a cup of bonemeal to each cow at each feed of chaffed cane. I have given up to a cupfull a feed to cows that had previously shown signs of soft bone. I found that the cows or heifers that are inclined to or have soft bone will not take to bonemeal if left in boxes as a lick.

If they would it would be splendid, as I am sure bonemeal will cure any beast no matter how badly affected in a very short time—up to six weeks. One farmer in our locality that had no means of feeding his cows, on reading that article (which I drew his attention to), tried to induce three heifers that were getting crippled to take to the bonemeal, but failed, and in place of putting the bonemeal (as suggested in the article) on their tongues he conceived the idea of mixing it with water, and gave them their dose as a drench out of a bottle, and got them right. I am satisfied that if you can get up to $\frac{1}{2}$ lb. regularly into your cows per week soft bone will disappear on the worst affected farms. I would like to say that our coastal scrubs, when they were new burns, kept our cows in great order, but as years go by they evidently get poorer in quality and the grass fails to keep up the supply of phosphates, and this thing is going to get worse. In my opinion the dairy farmers will simply have to give them phosphates in some form or other, and bonemeal seems to me the easiest and quickest way of doing it. I tried mixing molasses and bonemeal, and gave them free access to it. But there were too many gluttons about, and some of them would take a regular feed of the mixture. I found that if a cow was turned out of the yard she invariably got right in a short time with or without feeding bonemeal; this applied particularly to heifers. The better the heifer the sooner she fell to soft bone. But to carry out this form of cure you would soon have no cows in the yard.

Production in the Commonwealth.

The Commonwealth production statistics for the year 1924-25, prepared by the Commonwealth Statistician and Actuary (Mr. Chas. H. Wickens), contains particulars respecting the various primary and secondary industries. Of the total area of Australia 173,621,854 acres, or about 9 per cent., have been either alienated or are in process of alienation, and 915,302,610 acres, or 48 per cent., are held under lease or license, leaving a balance of 814,807,776 acres, or 43 per cent., still in the hands of the Crown. The area under crop in Australia during 1924-25 totalled 17,278,191 acres, an increase of 750,000 acres on the previous year, while the value of the produce amounted to £107,096,393, or an average of £6 4s. per acre. Wheat is the principal feature of Australian agriculture, and 11,859,000 acres—or nearly 69 per cent. of the total area under crop—were devoted thereto during 1924-25, of which rather more than 1,000,000 acres were cut for hay. Other main crops in the order of acreage were hay, oats, green forage, maize, fruit, sugar-cane, barley, potatoes, and vines. The favourable climatic conditions coupled with the high price of wool, were responsible for large sheep gains in 1924. The number returned, 93,154,953, represented the greatest total recorded since 1894. The wool clip was correspondingly increased, and 729,242,550 lb. were produced for a record value of £76,020,000. Economic factors prevented any gains in the numbers of cattle and horses depastured, but pigs increased to 980,009 during the year. The value of all pastoral products amounted to £121,891,000, composed as follows:—Wool, £76,020,000; meat, £30,319,000; skins, £10,673,000; other products, £4,879,000. Reflecting the bounteous season the dairying industry progressed considerably during the year. The value of dairy production amounted to £45,189,543, of which butter contributed £20,485,521. Permanent employment was provided for 451,813 persons in the agricultural, pastoral, and dairying industries, and the value of the implements and machinery used in these occupations was estimated at £41,000,000. The value of the production amounted to £274,177,000, of which £14,170,000 was shipped overseas. The total value of all minerals produced increased from £22,232,000 in 1923 to £24,646,000 in 1924. The number of establishments engaged in manufacturing during the year was 20,795, employing 439,949 persons, and paying in salaries and wages £81,360,021. Raw materials to the value of £221,993,978 were used in factories, and the value of the output was £380,843,986. The amount added in the process of manufacture or the creation of new wealth by the manufacturing industries was £147,136,758, or £334 per employee. Capital invested in land, buildings, plant, and machinery represented a value of £200,484,807. The total value of the production of all recorded industries in Australia during 1924-25 amounted to £449,157,000, or an average of £76 9s. 5d. per head of population.

Bacteria in Milk—Measures for Prevention.

Bacteria may enter milk in several ways. Large numbers may be in the lower part of the teat, and these are usually associated with cow-dung, dirty water, &c., and are very harmful. Other sources are dirt from the cow's udder and sides, the milker's hands and clothes, unclean buckets, dirty or dusty yards and bails, flies, unclean straining cloths, separators, separating or cream-room surroundings, and unclean cream cans.

The first source of contamination in healthy cows is in the teat; it is therefore advisable to discard the first milk from each teat, which in any case is not rich in fat.

Cows' udders and flanks should be brushed, if dirty, and then wiped with a wet cloth. This has the effect of firstly removing any dirt, and the damping prevents a large amount of dust, &c., from falling into the bucket.

Milkers' hands should be washed after the milking of each cow. This prevents dirt accumulating on the hands, minimises the danger of carrying disease from one cow to another, and also lessens the chance of milkers getting sore hands. Water containing a little formalin should be used for this purpose.

Clean buckets are buckets that are free from all bacterial life, and have been properly cleaned and scalded since last using. The slightest trace of any dried milk or grease means that considerable bacterial life is present, usually of a harmful nature, and these bacteria will be in a position to start growing the moment they come in contact with the milk.

DO NOT LET MANURE ACCUMULATE.

The bacteria which live in dung, &c., are particularly objectionable in milk, and among them are found most of the organisms which cause fermentation; therefore, the freer the yards and bails are kept of manure, the less chance of infection from this source, as the smallest breeze will lift the dust and deposit numbers of bacteria in the milk. A lot of infection from this source can be prevented by keeping all cans covered and on the windward side of the bails, remembering also that the milk must be kept free from the contaminating smell of all animal excretion. If water is available the bails and yards can be washed down after each milking; contamination from this source will then be practically nil.

Although nobody would argue against straining milk, nevertheless, if the operation is not done properly, it may itself be the cause of much trouble. An efficient strainer should remove as much foreign matter as possible from the milk, it should be large enough, and it should be easy to clean. With regard to cleaning, all strainers should be free from grooves, &c., which might collect milk, and it is more satisfactory if the gauze can be removed for washing. If cloths are used it is absolutely essential that these be washed, boiled, and dried after each milking, otherwise they are often a bad source of infection. If any large lumps of dirt, &c., are noticed in the strainer, these should be washed out before the next milk is put through, as otherwise they may become dissolved, and the bacteria they contain will be washed through into the milk.

DANGER FROM THE SEPARATOR.

An unclean separator or a separator which is not washed after each using is a very bad source of infection, because the infection will consist of live, virile organisms. As the modern separator is so easily cleaned, and in the majority of cases free from any corners, &c., and can all be boiled after use, it should be the last cause of trouble.

The separating or cream room should be so constructed that the floor drains quickly, and both the floor and at least some distance up the walls are quite impervious to moisture. It should be free from any acute corners, so that it can be easily flushed out each day with boiling water. Very many troubles in milk and cream which is otherwise well looked after can be traced to bacteria breeding in cracks in floors and walls, &c., of separating and cream rooms. Good ventilation is essential in cream rooms. No wet bags or cloths should be allowed to remain about, as they are a harbour for mould growths, &c. The room should also be guarded against any infection from pigs, fowls, ducks, dogs, &c.

CONTAMINATION FROM CANS.

In many cases the cream cans are a very bad source of contamination, and care should be taken that only rustless and seamless cans are used, and that they are thoroughly washed and scalded with *boiling* water and allowed to cool and thoroughly drain before any cream is put into them. Petrol tins, which are often used for storing cream, are a very grave source of infection, chiefly on account of the cream which collects in the seams. This trouble can be minimised by having the seams filled with solder before using but a tinne steel seamless bucket or can is preferable.

Orchard Notes for December.

THE COASTAL DISTRICTS.

The planting of pineapples and bananas may be continued, taking care that the ground is properly prepared and suckers carefully selected, as advised previously in these Notes. Keep the plantations well worked and free from weed of all kinds, specially if the season is dry. New plantations require constant attention, in order to give young plants every chance to get a good start; if checked when young they take a long time to pull up and the fruiting period is considerably retarded. Small areas well worked are more profitable than large areas indifferently looked after, as the fruit they produce is of very much better quality. This is a very important matter in the case of both of these fruits, as with the great increase in the area under crop there is not likely to be a profitable market for inferior fruit. Canners only want first-class pines of a size that will fill a can, and cannot utilise small or inferior fruit, except in very limited quantities, and even then at a very low price. Small, badly filled bananas are always hard to quit, and with a well-supplied market they become unsaleable. Pineapple growers, especially those who have a quantity of the Ripley Queen variety, are warned that the sending of very immature fruit to the Southern markets is most unwise, as there is no surer way of spoiling the market for the main crop. Immature pineapples are not fit for human consumption, and should be condemned by the health authorities of the States to which they are sent.

Citrus orchards require constant attention; the land must be kept well worked and all weed growth destroyed. Spraying or cyaniding for scale insects should be carried out where necessary. Spraying with fungicides should be done where the trees show the need of it. A close lookout must be kept for the first indications of "maori," and as soon as it is discovered the trees should either be dusted with dry sulphur or sprayed with the lime-sulphur, potassium, or sodium sulphide washes. Borer should be looked for and destroyed whenever seen.

Early grapes will be ready for cutting. Handle carefully, and get them on to the market in the best possible condition. A bunch with the bloom on and every berry perfect will always look and sell well, even on a full market, when crushed and ill-packed lines are hard to quit.

Peaches, plums, papaws, and melons will be in season during the month. See that they are properly handled. Look out for fruit fly in all early ripening stone fruit, and see that none is left to lie under the trees to rot and thus breed a big crop of flies to destroy the mango crop when it ripens.

Keep leaf-eating insects of all kinds in check by spraying the plants on which they feed with arsenate of lead.

Look out for Irish blight in potatoes and tomatoes, and mildew on melons and kindred plants. Use Bordeaux or Burgundy mixture for the former, and finely ground sulphur or a sulphide spray for the latter.

THE GRANITE BELT, SOUTHERN AND CENTRAL TABLELANDS.

Early ripening apples, plums, apricots, peaches, and nectarines will be ready for marketing during the month. They are unsatisfactory lines to handle, as the old saw, "Early ripe, early rotten," applies to all of them; in fact, the season of any particular variety is so short that it must be marketed and consumed as quickly as possible. All early ripening deciduous fruits are poor carriers and bad keepers, as their flesh is soft and watery, deficient in firmness and sugar, and cannot, therefore, be sent to any distant market. The available markets are quickly over-supplied with this class of fruit, and a glut takes place in consequence. Merchants frequently make the serious mistake of trying to hold such fruits, in the hope of the market improving, with the result that, instead of improving, the market frequently becomes more and more congested, and held-over lines have to be sent to the tip. There is only one way to deal with this class of fruit, and that is to clear the markets daily, no matter what the price, and get it distributed and into consumption as rapidly as possible by means of barrowmen and hawkers. Most early ripening fruits are useless for preserving in any way, their only value being what they will bring for consumption whilst fresh. This being so, it is only a waste of time and money to forward immature, undersized, and inferior fruit to market, as it is not wanted, and there is no sale for it. It should never have been grown, as it is frequently only an expense to the producer, besides which, unless the fallen or over-ripe fruit is regularly and systematically gathered and destroyed in the orchard, it becomes a breeding ground

for fruit fly and codlin moth, as well as of fungi, such as those producing the brown and ripe rots. Early ripening fruits should, therefore, be carefully graded for size and quality, handled, and packed with great care, and nothing but choice fruit sent to market. If this is done, a good price will be secured, but if the whole crop—good, bad, and indifferent—is rushed on to the local markets, a serious congestion is bound to take place and large quantities will go to waste.

Orchards and vineyards must be kept in a state of perfect tilth, especially if the weather is dry, so as to retain the moisture necessary for the development of the later ripening fruits. Where citrus fruits are grown, an irrigation should be given during the month if water is available for this purpose, excepting, of course, there is a good fall of rain sufficient to provide an ample supply of moisture.

Codlin moth and fruit fly must receive constant attention and be kept under control, otherwise the later-ripening fruits are likely to suffer severely from the depredations of these serious pests.

Grape vines must be carefully attended to and sprayed where necessary for black spot or downy mildew, or sulphured for oidium. Where brown rot makes its appearance, spraying with the potassium or sodium sulphide washes should be carried out. Leaf-eating insects of all kinds can be kept in check by spraying with arsenate of lead.

Vegetables will require constant attention in the Granite Belt area. Tomatoes and potatoes will require to be carefully watched in order to prevent loss from Irish blight, and no time should be lost in spraying these crops should this disease make its appearance in any part of the district, as it can be prevented by spraying with either Bordeaux or Burgundy mixture. These fungicides effectually protect the plants to which they are applied if used in time. If leaf-eating insects, such as beetles, grasshoppers, and caterpillars, are doing damage as well, add 3 or 4 lb. of arsenate of lead to the 100 gallons of spraying mixture used for the prevention of early and late blight (potato macrosporium and Irish blight), so that the one application will be effectual for both classes of diseases.

Keep all kinds of vegetables well worked, stirring the land frequently to retain moisture, and taking care to prevent the formation of a surface crust should rain fall. Remember that vegetables require plenty of moisture; therefore leave nothing to chance, but do your best to retain all the moisture in the soil you possibly can.

Farm and Garden Notes for December.

Although November is regarded generally as the best period for planting the main maize crop, on account of the tasselling period harmonising later on with the summer rains, December planting may be carried out in districts where early frosts are not prevalent, provided a known quick maturing variety of maize is sown.

To ensure a supply of late autumn and winter feed, dairymen are advised to make successive sowings of maize and sorghums, to be ultimately used either as green feed or in the form of silage. The necessity for such provision cannot be too strongly urged. Farmers who have not had any experience in building an ensilage stack can rest assured that, if they produce a crop for this purpose, information and instruction on the matter will be given on application to the Under Secretary for Agriculture and Stock; also that, whenever possible, the services of an instructor will be made available for carrying out a demonstration in ensilage-making for the benefit of the farmer concerned and his immediate neighbours.

In districts and localities where supplies of lucerne are not available, sowings of cowpeas should be made, particularly by dairymen, as the lack of protein-yielding foods for milch cows is a common cause of diminished milk supplies and of unthriftiness of animals in dairy herds. Cowpeas and lucerne can be depended upon to supply the deficiency. The former crop is hardy and drought-resistant. When plants are to be used as fodder, it is customary to commence to feed them to stock when the pods have formed. Animals are not fond of cowpeas in a fresh, green state, consequently the plants should be cut a day or two before use. Economy is effected by chaffing beforehand, but the plants can also be fed whole. Chaffed in the manner indicated, and fed in conjunction with green maize, or sorghum, when in head, in the

proportion of one-third of the former to two-thirds of the latter, a well balanced ration is obtainable. Animals with access to grass land will consume from 40 to 50 lb. per head per day; a good increase in the milk flow is promoted by this succulent diet. The plant has other excellent attributes as a soil renovator. Pig-raisers will find it invaluable also.

A great variety of quick-growing catch crops, suitable for green fodder and ensilage purposes, may also be sown this month, notably Sudan grass, white panicum, giant panicum (liberty millet), Japanese millet, red and white French millet. Well prepared land, however, is required for crops of this description, which make their growth within a very limited period of time. French millet is particularly valuable as a birdseed crop, the white variety being more in favour for this purpose.

Successive sowings may be made of pumpkins, melons, and plants of this description.

In districts where onions are grown, these will now be ready for harvesting. If attention is given, in the case of garden plots, to bending over the tops of the onions, maturity of the crop is hastened. Evidence will be shown of the natural ripening-off process, and steps should be taken to lift the bulbs and to place them in windows until the tops are dry enough to twist off. If a ready market is not available, and it is decided to hold over the onions for a time, special care should be taken in handling. Storage in racks in a cool barn is necessary; otherwise considerable deterioration is to be expected. Improved prices are to be looked for in marketing by grading and classifying produce of this description.

Cotton areas which were subjected to a thorough initial preparation, thereby conserving a sufficiency of moisture for the young plants, should now be making good headway and sending their taproots well down. Keep down all weed growth by scarifying as long as the growth will admit of horse work.

KITCHEN GARDEN.—Gather cucumbers, melons, vegetable marrows, and French beans as soon as they are fit for use. Even if they are not required, still they should be gathered; otherwise the plants will leave off bearing. Seeds of all these may be sown for a succession. Tomatoes should be in full bearing, and the plants should be securely trained on trellises or stakes. Where there is an unlimited supply of water, and where shade can be provided, lettuce and other salad plants may still be sown. All vacant ground should be well manured and dug two spits deep. Manure and dig as the crops come off, and the land will be ready for use after the first shower.

FLOWER GARDEN.—Keep the surface of the land well stirred. Do not always stir to the same depth, otherwise you are liable to form a "hard pan," or caked layer beneath the loose soil. Alternate light with deep hoeings. A few annuals may still be planted, such as balsams, calendulas, cosmos, coreopsis, marigold, nasturtium, portulacca, zinnia, and cockscomb. Plant out whatever amaranthus may be ready. These may still be sown in boxes. Clear away all annuals which have done flowering. Bulbs should have all the dead leaves cut away, but the green leaves should not be touched. Stake chrysanthemums, and, as the flower buds develop, give them weak liquid manure. Coleus may now be planted and propagated from cuttings. Dahlias are in various stages, but the greater part will have been planted by this time. Give them liquid manure, and never let them dry up. Lift narcissus about the end of the year, but do not store them. Plant them out at once in their new positions. Top-dress all lawns.

ACALYPHA AS A FODDER SHRUB.

Mr. H. A. A. Dawson, of Mount Christian (N.C. Line), writes:—"I enclose a twig of a bush which horses eat ravenously; in a few days after it is eaten down it is covered with new shoots. When a branch is bent down to the ground it takes root readily, and also strikes from cuttings."

The specimen sent proved to be a species of *Acalypha* (*Acalypha Godseffiana*), a native of the Pacific. *Acalyphas* are widely grown as ornamental leaved shrubs in coastal Queensland and tropical and sub-tropical countries generally. *A Godseffiana* is the species in which the leaves are green, edged all round with a white border. Another very common species is *Acalypha marginata*, in which the leaves are brownish, edged with white or red. The plants are readily propagated by cuttings during the later spring and early summer months.—C. T. WHITE, Government Botanist.

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.

1926.	NOVEMBER.		DECEMBER.		MOONRISE.	
	Rises.	Sets.	Rises.	Sets.	Nov.	Dec.
Date.					a.m.	a.m.
1	5.3	6.9	4.50	6.32	2.42	2.16
2	5.2	6.10	4.50	6.32	3.14	2.47
3	5.1	6.11	4.50	6.33	3.45	3.21
4	5.0	6.11	4.50	6.34	4.17	3.54
5	5.0	6.12	4.50	6.35	4.49	4.40
6	4.59	6.13	4.50	6.35	5.24	5.26
7	4.58	6.13	4.50	6.36	6.2	6.18
8	4.57	6.14	4.50	6.37	6.43	7.16
9	4.57	6.15	4.50	6.37	7.31	8.16
10	4.56	6.15	4.51	6.38	8.25	9.21
11	4.56	6.16	4.51	6.39	9.23	10.25
12	4.55	6.17	4.51	6.40	10.24	11.29
13	4.55	6.18	4.51	6.40	11.28	12.32
14	4.54	6.18	4.52	6.41	12.33	1.33
15	4.54	6.19	4.52	6.41	1.37	2.35
16	4.53	6.20	4.52	6.42	2.40	3.37
17	4.53	6.21	4.52	6.43	3.45	4.41
18	4.53	6.21	4.53	6.43	4.48	5.53
19	4.52	6.22	4.53	6.44	5.52	6.43
20	4.52	6.23	4.54	6.44	6.57	7.40
21	4.51	6.24	4.54	6.45	7.59	8.33
22	4.51	6.25	4.55	6.46	8.58	9.20
23	4.51	6.26	4.55	6.46	9.53	10.1
24	4.51	6.27	4.56	6.47	10.44	10.38
25	4.51	6.28	4.56	6.47	11.28	11.13
26	4.50	6.29	4.57	6.47	nil	11.45
27	4.50	6.29	4.57	6.48	12.6	nil
28	4.50	6.30	4.58	6.48	12.42	12.15
29	4.50	6.31	4.59	6.48	1.14	12.47
30	4.50	6.31	5.0	6.49	1.46	1.19
31	...	...	5.0	6.49	...	1.54

Phases of the Moon, Occultations, &c.

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

6 November	● New Moon	12 34 a.m.
13 "	☾ First Quarter	9 1 a.m.
20 "	○ Full Moon	2 22 a.m.
27 "	☾ Last Quarter	5 15 p.m.

Mars will be in opposition to the Sun on 4th November—that is, on the opposite side of the sky—in the east when the sun is setting, in the west when it is rising, and in a favourable position for observation. Mercury will be at its greatest elongation, 23 degrees east, on the 5th—that is, about 23 degrees below the horizon when the Sun rises, and about the same distance when it sets; it is therefore in a favourable position for observation on or near that date. It will rapidly draw nearer to the Sun, which it will pass on the 20th, becoming of course invisible.

Venus will be in superior conjunction on the 21st—that is, in that part of its orbit which is almost directly behind the Sun; it will therefore be invisible during this month. Saturn will also be in conjunction with the Sun on this date—that is, almost in a direct line behind it. Mercury will be in conjunction with Venus on the 25th, therefore there will be an apparent grouping of these three planets near the sun on or near that date.

The Moon will pass over and occult Epsilon Tauri on the 20th, a little before 9 p.m.

Zeta Tauri, another star of Taurus, will be occulted between 1 and 2 o'clock in the morning on the 22nd. These can be observed throughout Queensland.

An occultation of Eta Iouis will occur on the 27th in the north-west, about 3 a.m., lasting about twelve minutes.

5 December	● New Moon	4 11 p.m.
12 "	☾ First Quarter	4 47 p.m.
19 "	○ Full Moon	4 7 p.m.
27 "	☾ Last Quarter	2 59 p.m.

Jupiter will be in conjunction with the Moon on 10th December, at 5.4 p.m.; both will be visible in the west after sunset.

Mercury will be at its greatest elongation, 21 degrees 13 minutes west, on the 14th, and will therefore be visible in the eastern sky before sunrise, with Saturn apparently in remarkably close proximity.

Mars will be in conjunction with the moon at 6.18 p.m. on the 15th, and when visible soon after sunset will be rather more than the length of the Southern Cross from the Moon.

The Sun will arrive at its greatest declination south about half an hour after midnight on 22nd December, when the Australian summer solstice will occur. On and near this date, at midday, it will be noticeable that the Sun will cast the least amount of shadow of any time during the year.

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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