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QUEENSLAND AGRICULTURAL JOURNAL.

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QUEENSLAND AGRICULTURAL JOURNAL

VOL. XXIV. 1 JULY, 1925. PART 1.

Event and Comment.

The Current Issue.

Pig-raisers have much to interest them in Mr. Shelton's additional notes on the marketing of pigs in Queensland, while poultrymen will find Mr. Rumball's note on breeding very useful. Citrus fruit improvement is discussed by Mr. Prest. The concluding instalment of Mr. Grenning's paper on softwood plantations is another special feature of this month's Journal. Silos and silage are dealt with by Mr. Gibson, and in two valuable reports Mr. Hubert Jarvis covers recent fruit fly investigations. Notes on the oviposition of the bean fly by Mr. Holdaway is another useful contribution. Topical interest is served by a report of an interview with Dr. Elkington on conditions in tropical Queensland, and a short reprinted article by Mr. Theodore on the Seventh State. Regular features are also of unusual interest and readers generally will welcome the July number.

Banana "Bunchy Top" Disease.

In a recent Press communication the Minister for Agriculture and Stock (Hon. W. Forgan Smith) stated that the committee of scientists which, with headquarters at the Tweed, is conducting its investigation into the occurrence of the "bunchy top" disease in Southern Queensland and New South Wales is doing excellent work. Not only does it appear that the disease is being controlled, but indications favour the finding of a remedy that will effect eventually its eradication.

Cassava Cultivation.

The report of Mr. G. B. Brooks, who returned recently from Java, whither he had been sent on a mission of inquiry into methods of cassava cultivation, and where he obtained a supply of cuttings of high yielding varieties, will be awaited with interest. While in Java Mr. Brooks visited all the principal cassava-growing areas, and observed closely field and factory operations on a number of large estates where cassava is grown and milled on an extensive scale. Arrangements were made for a supply of cuttings sufficient to plant 100 acres and meet all requirements, including a special selection of varieties from one of the plant-breeding stations conducted by our Northern neighbours. Mr. Brooks was also much impressed with the extent of the cultivation of leguminoseae in Java as green manuring and cover crops, particulars of numerous varieties of which he obtained in respect to habits of growth and fertiliser value. Samples of seed were also secured by him for experimental purposes.

Imperial Preference on Sugar.

The news that the House of Commons has approved of a preference on Dominion-grown sugar is of much importance to Queensland. The duty on sugar formerly was £25 13s. 4d. a ton. Subsequently the Imperial Government agreed to allow a preference of one-sixth of that duty, amounting to £4 5s. 7d. a ton. Later, this preference was reduced to £1 18s. 10d., and afterwards it was proposed to revert to the former scale of preference and this is, apparently, what has been done. It will mean that sugar from the Dominions sold in Great Britain will now be favoured with the original tariff preference of £4 5s. 7d. a ton. Not only will this apply to sugar, but, apparently, to the sugar content of jam or any other similar commodity of which sugar is an important component. As jams are often made up of something like 50 per cent. sugar they will enjoy, accordingly, proportionate preference. The decision of the Imperial Parliament was welcome news in sugar circles.

Country Women's Association.

The Country Women's Association is becoming a valuable factor in rural life and its activities are followed with great interest by those who are in sympathy with its very worthy aims. His Excellency the Governor, Sir Matthew Nathan, addressing branches of the association, recently stressed strongly the need to strengthen the association which, he said, creates a greater friendliness between various classes of people than could be arrived at or bridged by any other means. It brings the women of rural districts in close touch with each other, and no country in the world demands an association of this kind more than this State, and more especially those portions of Queensland which are as sparsely populated as our Western areas. The activities of the association are of interest to all its members. The Government wants to improve the amenities of rural life and the movement provides objectives towards which all the women of Queensland, both in the country and towns, may, meeting on common ground, work for their common good. In alliance with the Bush Nurses' Association the Country Women's Association is proving a powerful and very fine factor in the rural life of Queensland.

THE SUGAR INDUSTRY.

THE PROBLEM OF SURPLUS PRODUCTION.

MINISTERIAL STATEMENT.

At the recent Sugar Conference at Brisbane immediate problems facing the industry, together with suggested solutions, were reviewed. Proposals for dealing with this year's estimated surplus were also considered, and the address of the Minister for Agriculture and Stock (Hon. W. Forgan Smith) at the Conference on the points raised has a particular interest for cane-growers.—Ed.

Addressing the recent Sugar Conference, the Minister for Agriculture and Stock (Hon. W. Forgan Smith) said:—

I think at this juncture it would be advisable to say something in connection with the business before the meeting. You have a motion which reads:—

> "At meetings of the Councils of The Australian Sugar Producers' Association and The United Cane Growers' Association, it was unanimously resolved that the whole of the ensuing season's crop of cane be harvested, and that the making of the necessary arrangements to give effect to this decision be entrusted to the Sugar Board."

On that an amendment has been proposed, which reads:—

> "That the Sugar Board be requested to allocate to each mill throughout Queensland the percentage of sugar it bears towards the amount necessary to meet Australian requirements, such percentage to be calculated on the capacity of each mill during a standard length of crushing, and any surplus to be exported at world's parity."

The amendment and the motion contain very definite principles, and they require to be fully considered by every one here.

Why the Conference was Called.

I called this Conference with a view to getting some idea of the wishes of the growers and the millers in connection with the situation. We know that this year there is an estimated surplus of sugar, which has to be exported. This is the second year in succession in which there has been a surplus. Speaking from memory, I think there have been only four surplusses during the last twenty years. Climatic and other conditions have resulted in such a state of affairs existing. Every indication points to the belief that you are confronted with a normal growth of cane which is in excess of the sugar requirements of the Commonwealth. We have also to take into consideration the fact that any exportable surplus can only be exported at a price much less than the standard price which we consider to be just, having regard to Australia's standard conditions or cost of production.

Increasing Production.

We have to consider whether that surplus should be dealt with this year, and what shall be the future policy for next year and the years that are to come, because if expansion continues at the present rate this situation will confront us each year. In that connection we must remember that the available sources of production have increased considerably during the past year or two. Germany and Central Europe have overtaken their production of pre-war times and they are now in a position to produce as much beet sugar as they did prior to the war. In many of the European countries that standard has been increased, and a recent communication from the Minister for Agriculture in Great Britain indicates that he is proposing that a bounty be given for five years on the growth of beet sugar. They have demonstrated the fact that sugar beet can be grown successfully in England. The avenues of absorption are becoming narrower by reason of increased production, and that must result in a continued low world's parity for sugar.

That resolves itself into the position that you must consider whether you can continue to grow to any large extent more than Australia's normal requirements.

Position of Governments Concerned.

I now come to the motion. That deals with this season's crop. We must take into consideration the embargo on the import of sugar to which the Commonwealth Government have acceded, and which the Governments of the Commonwealth and the State, in conjunction with sugar representatives, are parties to. It is outside the scope of the normal policy of the Federal Government to impose an embargo on importations. There is a wide difference in policy between a protective tariff and an embargo. Under a protective tariff importations can be made provided the tariff duty is paid, but in the case of sugar, there is an absolute embargo on the importation of any sugar whatsoever, without the direct permission of the authorities. You have been given this protection with a definite end in view, that the sugar industry of Queensland and Northern New South Wales may be encouraged to the extent of producing the normal requirements of Australia. You are protected against the importations of cheaply grown sugar, so that the Australian standard of living may be maintained. That, briefly stated, is the position with regard to the Governments who are parties to this agreement.

Export of Surplus.

Now, it is proposed that a surplus be dealt with in various ways. The motion provides that it shall be all crushed and exported, and that the producers be paid on a 60 per cent.—40 per cent. basis, the price to be paid for the 40 per cent. quota to be dependent upon what is realised above costs.

Limitation of Areas.

Suggestions have been made that the areas be limited to Australia's requirements, in other words, that the amount of cane which represents this surplus be left on the land. My own view is that it would be a fatal and criminal policy to do that, because this potential wealth has been produced. Nature has been bounteous, and to destroy any wealth actually produced would bring about the violent opposition of the whole of the Australian people who certainly, in my opinion, would not stand for a policy of protection which enables anyone in an industry to destroy what might be termed "the bounty of Nature." We may, therefore, assume that public opinion generally is opposed to the destruction of wealth once it has been produced. That is a point I wish emphasised, because public opinion is something that determines the public policy of every Government, no matter what party may be in power. That is an important point. Public opinion and the view of the man in the street animates and influences very largely the policy of the Government in power, irrespective of parties.

Influence Upon Employment.

Again, you have as an industry to bear this in mind. In addition to the general opposition that would come from people opposed to wealth destruction, the further argument would be used that "Here is an industry with a policy specially provided for it destroying practically £3,000,000 of potential wealth, closing the avenues of employment and closing the avenues of the distribution of wealth"—because the production into sugar of that surplusage of cane means employment in the mills, fields, added freight for the railways, added work on the wharves, in shipping, and in the countless ways that wealth permeates throughout the channels of the economic system under which we live.

Personally, I consider it would be an outrage wantonly to destroy any of this surplusage of cane. On the question of how this surplusage is to be handled the movers of the amendment join issue with those who support the principle contained in the motion. In that connection there are very important points to be considered in addition to the immediate viewpoint you are dealing with to-day. There is the question of collectivism generally. We have formed, as part of the deliberate policy of Queensland, a method of pooling the available sugar resources of Queensland, that is to say for the past nine or ten years it has been part of the deliberate policy, not only of the Government but of all sections of the sugar industry, to stand united as an industry, pooling the resources of that industry and sharing equitably any advantages that have been obtained as the result of that policy.

The Crux.

What do you propose to do with the surplus? Do you propose that the losses which will inevitably be sustained by the export of a large quantity of sugar shall be borne evenly over the whole industry, or shall a different proportion prevail in the districts in which the industry is carried on? That is really the crux of the whole situation.

We have very shortly, as a Government, to issue a proclamation acquiring the whole of the crop of sugar in Queensland and a price has to be stipulated in the proclamation. Under the amendment there would have to be a different proclamation for each district, because the proportion being worked out on a different basis in each district, that would have to be taken into consideration when such a proclamation was issued.

In addition to that, one of the weaknesses that I see in the amendment is in the term "capacity of each mill." There are certain mills that only recently did not crush up to their capacity. The cane was not there. Consequently sugar had to be imported from other countries due to the fact that those mills did not work up to capacity by reason of the fact that they had not the cane to convert into sugar. I do not see how a differential policy could be approved of or justified generally in the community. The figures that were quoted by Mr. Powell indicate to me, if those figures are even approximately correct—someone pointed out that there were discrepancies—but if they were approximately correct, and if we were to go forth from this room and say that at Gin Gin, for example, or some of the mills in the Mackay district, they would get, say, 78 per cent. or 80 per cent. of the sugar paid for at the rate of £27 a ton, and that a mill in another district in Queensland would get only 50 per cent. paid for at the full rate, I do not think that the Government could justify its attitude under such a system in the public mind. That is my own view, and I think it my duty to give it.

Concern for the Small Grower.

I, personally, and also the Government I represent, would not like to see the small grower penalised in any way, particularly growers in areas where they have not had the advantages of good seasons when the price was £36 6s. 8d. a ton, and so on. Unfortunately, no policy can be brought into operation that does not adversely affect some one. Every Act of Parliament, every administrative act, affects someone's interests directly or indirectly. All we can hope to achieve is an equitable policy which, towards the whole of a section of a people, or the whole of an industry, can be justified on the ground of equity. Mr. Biggs referred to the average small growers, and showed that the tonnage grown was small. That is unfortunate. No doubt the small man on a three-quarter crop would be badly affected.

A Serious Position.

There is the position as I understand it. It is a serious one, and while I do not want to attempt to influence you in any way, gentlemen, the position is before you. It is your industry, and on your decision the future of the industry will depend. I feel it my duty as Secretary for Agriculture and representative of the Government, and also as the representative of a large sugar district, to outline the position as it appeals to me, from a broad viewpoint; the industry as a whole and the State as a whole.

United Front in The Industry.

Certainly it could be shown that some policy could be introduced to provide a minimum standard of living for the man who grew a small acreage, or to provide a bounty, without detrimentally affecting the industry, that should be provided, but my own personal opinion is this—and I never seek to evade an expression of my opinion; matters of expediency will not animate me—you cannot have the principle of collectivism and act individually at the same time. If you differentiate between the various districts in the State it is the beginning of the end of the united front in the sugar industry, and one district would be worked and operated against the other. You must consider that and determine which district would win if there was competition between the various sections. It is of the utmost importance that the united front presented by all sections of the industry be maintained, and that nothing be done to divide the various districts.

Bureau of Sugar Experiment Stations.

CANE PEST COMBAT AND CONTROL.

Mr. E. Jarvis, Entomologist at Meringa, near Cairns, reports to the Director of the Bureau of Sugar Experiment Stations (Mr. H. T. Easterby) under date 27th May, 1925:—

Further Experiments with Paradichlor.

An Experiment Plot was established at Meringa this season on highland red volcanic soil among a crop of second ratoons of D.1135, which at the time of injecting with paradichlor. were from 12 to 18 in. high; the cane having been cut very late (15th January).

Owing to pressure of work (the farm having changed hands about that time) the present owner decided to plough out these late ratoons.

On 18th February (about six weeks after cutting) we treated one-tenth of an acre with ½-oz. doses, placed 4½ in. deep, 1 ft. apart, and about 6 in. from centre of stools, on both sides of the rows of cane.

At the time of injecting no cultivation had been given, the trash still remaining on the surface; but as this crop had been left uncut until after grey backs had laid their eggs, I concluded it would be a good spot for injecting, since egg-laden females of *albohirtum* generally prefer to oviposit among standing cane when it chances to be growing alongside young ratoon or plant crops.

This proved to be so in the present instance, as an examination of five stools taken at random yielded an average of 22 grubs per stool.

Unfortunately, it was rather late for injecting (18th February), as the wet season had commenced, 15.20 in. of rain having fallen during the preceding thirty-seven days. Such opportunity, however, of putting in an experiment plot on an area where the cane was certain to be completely destroyed by grubs was too good to miss; despite, therefore, of the probable continuance of rainy weather the work was carried out in the manner described above.

Wet conditions again set in a couple of days later, the rainfall during the subsequent period up to the end of March (forty-one days) being 35 inches at our laboratory; so that only six days were recorded, at intervals, on which some rain did not fall.

At the beginning of April I was advised by the grower that the only cane remaining green on this area of ratoons was that which had been fumigated. Upon visiting the spot, I found such to be the case, and that practically every stool around the treated area was either dead or fast succumbing to grub injury.

Owing to non-removal of trash and lack of any cultivation whatever the cane had not, of course, had a chance to make growth during the interval of seven weeks from date of injecting.

Arrangements were at once made with the grower to leave this, and an adjoining control plot, undisturbed when the ratoons surrounding it should be ploughed out; and accordingly I had the trash removed, the weeds chipped, and a light dressing of basic super given both to the treated and check plots; the ground was scarified about 3 in. deep between the rows on 27th April to within about 1 ft. from centre of stools, in order not to injure surface feeding-roots around the base of the plants.

The accompanying photograph, which was taken three days earlier (24th April) shows one side of the treated plot, together with portions of three rows of the control. The few stools of fallen cane seen in the foreground of the latter plot at A are dead and brown, but still cling to the soil, the rest of this grub-eaten cane having been eaten out of the ground when about 18 in. high, and been mostly blown away.

Not a living stool remains on the control area; while on the treated plot one sees by contrast seven rows of green stools covering a space of 136 ft. by 28 ft., unaffected by grubs.

The data obtained from this experiment plot at Meringa is of exceptional interest, showing that even during wet weather one can successfully fumigate cane-grubs with paradichlor. on well-drained land, provided the cane be not high enough to constantly shade the ground between the rows. It was found also that evaporation of the

paradichlor. injected had been checked at intervals after heavy falls of rain, and after remaining about seven weeks underground two-thirds of a ½ oz. injection had evaporated, thus leaving two scruples still in the ground to carry on fumigation for another fortnight or three weeks.

Wireworm Control.

Complaints have come to hand of late from various growers of injury to cane sets by wireworms, the larvæ of which damage or destroy the eyes and developing shoots, thus preventing a uniform strike.

This pest causes enormous damage to a number of crops in many parts of the world. Experimentation, however, has shown that calcium cyanide promises to be an effective fumigant; but before making definite statements regarding its possibilities against wireworms in our Northern canefields, it will be necessary to conduct a few laboratory and field experiments—a branch of activity which we hope to undertake in the near future.

(1) Calcium cyanide is sold in the form of dust, granules and flakes, costing about 1s. 7d. per lb. Upon coming into contact with the air or damp soil it gives off hydrocyanic acid gas which is exceedingly deadly to animal life. The two chief factors influencing its efficiency appear to be moisture and temperature; the former of which, when excessive, tends to break down the calcium cyanide; forming ammonia, and also absorbing and lessening the amount of gas generated.

During low temperatures, the wireworms being somewhat sluggish are not affected by the fumes to the same extent as when thoroughly active. Application is made by drilling it into the soil—which should not be loose or too compact—in such manner as to bury the flakes or granules at about the level at which wireworms are feeding.

In dry ground the fumes are said to be operative during a period of from three to four days, but in a wet soil no cyanide could be detected after two days; the amount applied in both cases being 150 lb. per acre.

(2) Poison baits have given good results, one of which consists of rice shorts or rice bran roasted dry in pans over a fire, these having a strong odour which is said to be attractive to wireworms. This roasted substance is moistened with water and moulded by hand into small compact balls, which are then placed in the ground about 10 ft. apart.

A week or ten days later they are taken up, broken open, and the wireworms removed and destroyed. The baits can then be remoulded and reset. A single bait used twice on a heavily-infested spot has yielded as many as ninety wireworms. Another method consists in setting in furrows baits of bran or shorts to which have been added a small quantity of Paris green or white arsenic. It is said to be possible to eradicate this pest by the use of poisoned bran-mash during two successive seasons, as "skip jack" beetles (into which wireworms ultimately develop) will readily eat the poisoned bait even when there be an abundance of unpoisoned food available. Such bait was found to be as effective after ten days as when first distributed.

Another very successful bait consists of bran, Paris green, amyl acetate, and water, distributed over the bottom of furrows ploughed at regular intervals.

(3) Crude naphtahlene applied at the rate of 3 cwt. per acre has been found effective against wireworms.

(4) Draining the land is an important controlling factor against this pest.

(5) Increasing the humus content of the soil, and heavy rolling are also well known remedial measures; the latter tending to prevent these larvæ from moving easily.

(6) Deep ploughing of the ground before planting, and collection of the wireworms by hand are sometimes advocated.

Field Experiments Against Termites.

Towards the end of last month a couple of Experiment Plots were established at Jarvisfield, in the Burdekin district, in order to test the merits of certain insecticides against the large cane termite *Mastotermes darwiniensis* Frogg. An area of one-tenth of an acre, consisting of thirteen rows of a chain in length, was employed as a test plot for dehydrated tar; seven rows being treated and six left as controls.

The cane sets after being dipped in the tar were allowed to drain in various ways, and afterwards planted in the usual manner.

Unfortunately, one of the experiments against this white ant had to be postponed owing to the absence of suitable plants; there being no termite-infested cane showing just above ground.

A field test with calcium cyanide against *Mastotermes darwiniensis* Frogg. was carried out on a small scale; a line of stools 66 ft. long being treated the day after planting with doses of two scruples, injected 1 ft. apart on both sides of the rows, at a depth on a level with the sets, and 3 to 4 in. from same in a lateral direction.

A row of cane plants was treated also by Mr. G. Bates, who had charge of this work, with paradichlor.; the doses in this case being ¼ oz. injected on both sides of stools, 12 in. apart, 4½ in. deep, and 5 in. from plants.

Several termite-infested farms were visited, and it was encouraging to note that growers on the Burdekin are bestirring themselves and endeavouring to combat the ravages of white ants. Mr. J. C. L. Kamp claims to have obtained excellent results from the application to fence posts, logs, stumps, &c., harbouring these termites of a bait composed of arsenic and molasses; the manufacture of which is described by him —in a report circulated amongst farmers of the district—as follows:—"A two-pound fruit tin of arsenic was mixed with a tablespoonful of caustic soda, the mixture covered with water, causing the soda to boil and thoroughly dissolve the arsenic. This was then added to four gallons of molasses and thoroughly stirred."

CANE PESTS AND DISEASES.

The Director of the Bureau of Sugar Experiment Stations has received the following report (22nd May, 1925) from Mr. W. Cottrell-Dormer, who is investigating pests and diseases in the canefields:—

Herbert River.

Diseases.—The disease question is now well in the hands of the staff of the two mills of the district, and the growers would seem to fully realise the necessity of co-operation, as in no instance did the writer hear any whisper of dissension on the question of plant control. At the time of visiting most of the growers were busy planting, and all abided by the decision of the Mill Pathologists as to the suitability of the cane they were using for planting purposes. Gumming disease, which has made these control measures necessary, is, of course, still well in evidence, though not to the same extent as last year, as many acres of ratoon Clark's Seedling have been ploughed out and replaced by plant crops of Korpi, Q.813, and other canes which so far have shown but very little susceptibility to gumming. H.Q. 409 is another cane which has become very popular, but which needs watching, as having shown slight tendencies of weakening resistance.

On this occasion the writer devoted most of his time to those localities lying west of Victoria, with the exclusion of Long Pocket and Toobanna, so that nothing can be said as to whether gumming is on the increase or decrease on the Herbert River; however, it is safe to say that in those districts which have been visited twice the cane was looking a good deal healthier than it was last year, probably owing to the advent of good seasons.

Leaf Scald disease was met with only on one occasion on the Stone River, where it was also met with last year, so that this disease would appear to be at something of a standstill.

Insect Pests.—Very slight evidence of the presence of grubs is showing at Seymour and on the Upper Stone River, but there is no indication of severe damage. Moth Borers and Beetle Borers are doing but slight damage.

The Giant White Ant (*Mastotermes darwiniensis*) was met with in the Rollingstone district, where it was found infesting timber on a sandy ridge. This insect had done slight damage to a neighbouring cornfield, but had not yet been known to attack sugar-cane. Growers of this district are referred to the section of this report dealing with the Lower Burdekin district.

Cane Killing Weed.—The Cane Killing Weed (*Striga* sp.) was found occurring on one farm on new forest land at Waterview, 14 miles from Ingham, on the Townsville line. Three or four rather large patches of cane in a field of H.Q. 426 had been destroyed or seriously stunted by this weed. At the time of visiting the weed was all dead (it being an annual), but it appeared to be the same species as occurs in the Home Hill district. The only sure remedy for this parasite is that of digging it out and destroying it before it seeds. Its roots attain a depth of some 6 or 7 in., so that chipping is of no value, since the underground stem possesses many scales or buds which quickly sprout up when the parent plant is cut down.

Lower Burdekin.

Diseases.—Three serious diseases are known to occur in this district—viz., Leaf Stripe, Mosaic, and Top Rot.

Leaf Stripe disease is especially prevalent in the Klondike area, though it is also found at Airdmillen, and to a less degree in other localities. The variety most affected is B. 208. Growers finding this disease in their crops of this cane should plough out all affected fields after cropping and substitute it with more resistant varieties for at least two years. Badila, Q. 813, M. 1900 Seedling, and others could be used for this purpose according to their suitability to the field in question.

Mosaic disease was found to be fairly prevalent in the Ayrdale district in H.Q. 426, and is, if anything, on the increase. It is advisable, therefore, that growers in this locality obtain a fresh supply of this variety from another district, say Airdmillen or Ivanhoe, and cease using their own cane for plants.

Top Rot, though very prevalent throughout the river farms, has done very little damage indeed this year.

At the completion of work in the Lower Burdekin district a brief visit was paid to Mount Pelion and St. Helens, where living samples of cane affected by a rather serious fungus disease, which occurs in these localities, were gathered. This disease, by arrangement with Professor Goddard, is to be studied at the University, as well as by this Bureau, since it is an indigenous disease, and will require careful research work before measures can be suggested for its control.

Insect Pests (White Ants).—Although the annual damage due to grubs undoubtedly aggregates higher than that done by white ants, the active interests of the members of the farming community of this district appears to have focussed itself far more on the latter pest than on the former; it is fitting, therefore, that prominence be given in this report to the white ant question. During the course of this visit the writer made it a point of visiting as many of the growers who were known to have termite-infested farms, and of discovering as many more who had the pest without it being generally known, as was possible during the time at his disposal. Thus twenty-two of the farms visited were found to be sheltering white ants, all of these farms being situated on the northern side of the Burdekin, since the southern side was not visited.

It was found that the white ants were distributed in the Ayr district over a large tract of land having somewhat the shape of a crescent, with its western point lying at Waterview, its eastern point a mile or so west of Pyott's Beach, and its belly mostly close to the Burdekin River, which makes a big curving sweep as it approaches the delta. Fortunately, this crescent-shaped tract of country does not represent an area of unbroken infestation; Maidavale, Ayrdale, Macdesme, Anna Branch, and Seaforth are found to be the main centres of this pest, between the tips of the crescent.

Although *M. darwiniensis* is so well distributed in the Lower Burdekin, it is only known to attack cane in a few places. This insect is a dweller of sandy soils especially, and it will in some cases remain established on a sandy ridge or knoll for a great many years without doing appreciable damage to cane growing nearby in heavy soils. However, in those parts where this insect is habitually attacking sugar-cane it is doing so "with a vengeance" and causing great loss to the growers concerned. Besides this great loss in sugar-cane is the loss in timber. *Darwiniensis* is a foe who works in the greatest of secrecy and delights in preparing surprises for the "man on the land." A grower stated that one night, some two years ago, two of the legs of his bed sank through the floor of his room shortly after he had retired. This indeed was a surprise to him, and was the first intimation he had received of the presence of this giant white ant; on examination he found that his house was riddled, the boards being about as strong as cardboard, and the posts in some cases unsafe to lean against, with the result that a new house had to be built, and that only the iron roof of the old residence was of any value for building purposes. However, this case is rather remarkable, since when a great number of these white ants are at work a soft, dry crackling sound can be distinctly heard as thousands of pairs of jaws chisel in the wood, and six times as many thousand tiny feet scurry through the vaults and passages of the "termitiere," and one would be inclined to think that the sleeper would have realised the state of affairs before his bed could have sunk beneath him.

Several of the growers in infested areas have displayed great initiative in the task of controlling the white ant, and success has been obtained by the application of poisoned molasses to timber and cane found harbouring this pest. The poison used is sodium arsenite, formed by the combination of white arsenic and caustic soda. A great deal of guess work has been employed with regard to the proportions to be used in the mixture. The correct proportions are four parts by weight of arsenic to one part by weight of caustic soda (Q.D.A. formula). These are to be mixed dry

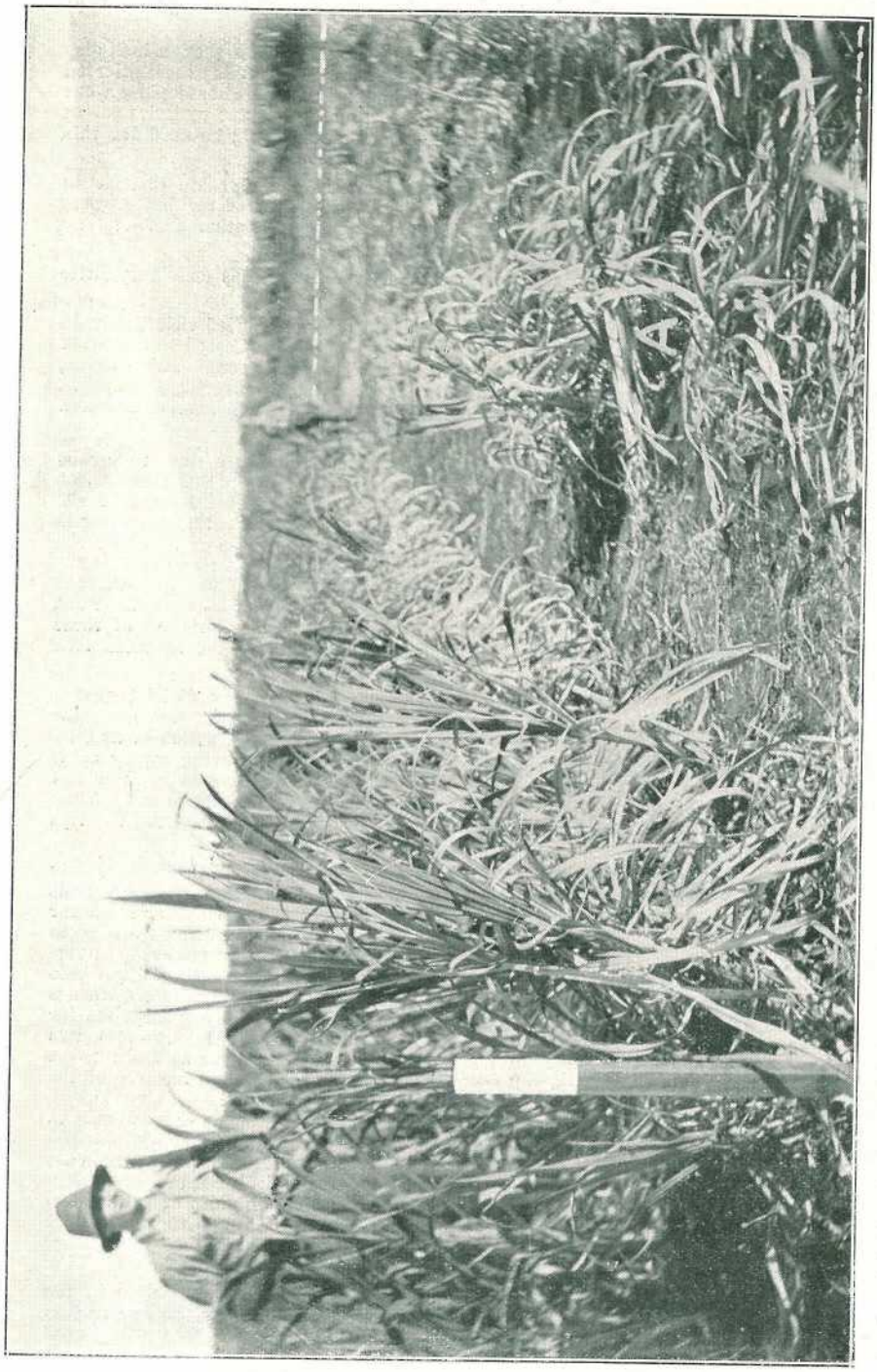


PLATE I.

Experiment. Plot of ten weeks' old second ratoons of D.1135; treated with Paradichlorobenzene. Note Control Plot (indicated by dotted lines) on which the cane has been totally destroyed by grubs, in contrast to treated cane on left hand of photograph.

and water added gradually until the whole is dissolved. Used in this manner 3 lb. of arsenic added to 6 gallons of molasses make a poison bait of ample strength. If it is found that the molasses is inclined to be too thick to be conveniently used in timber, 3½ lb. of arsenic can be used with the 6 gallons of molasses and a gallon of water added. In order to treat timber, holes are bored into the wood or made with a sharp axe, and the poisonous mixture poured into the tunnels with an old teapot or squirted in with a glass syringe. Three or four tablespoonfuls have been found sufficient as a dose to treat an average sized fence post.

It has been observed by some farmers that dead termites are sometimes found in untreated timber lying close to treated timber, and the question has arisen: Are the white ants cannibals? White ants of other species have been proved cannibals, and it is quite probable that this species indulges in similar habits, which would account for the finding of dead termites in the untreated timber; however, this discovery could also be accounted for in the following way—namely, that besides wood, sugar-cane, skins, &c., the food of termites also includes what is known as proctodeal and stomodeal foods. Proctodeal food consists of that food which has been cast out after having been once digested—*i.e.*, excreta, while stomodeal food is that which has only been partly digested—namely, regurgitated food; thus in a community of white ants food may pass through three or four stomachs before it is finally disposed of and used for building purposes or for lining the tunnel walls, so that if this food contains a small quantity of arsenic several members of the community may succumb through the mistake made by one in eating of the bait. In order that full advantage may be taken of this slow poisoning, it is advisable that the white ants be disturbed as little as possible during the application of the poison and for some weeks after, lest they be too quickly scared away from the treated area.

It is not claimed that poisoning white ants in this way will completely eradicate them from the district, as nests will unavoidably remain in the timber country in outlying localities. Nevertheless, it is in the interests of the canegrowing community of Ayr that all growers whose farms harbour white ants, poison or burn all timber containing the pest. Co-operative work of this nature cannot but bring *Mastotermes darwiniensis* down to a comparatively harmless minimum. Arsenic may be obtained free of cost from the Lower Burdekin Pest Destruction Board, whose most active secretary, Mr. W. M. Saxby, the writer takes this opportunity to thank for the invaluable assistance he has always tendered him when in this district.

A very good photograph of the white ant and its damage can be seen in Mr. E. Jarvis's latest bulletin (B.S.E.S. No. 18).

Grubs.—This pest has done a certain amount of damage in the Ivanhoe district, but this damage does not in any way compare with that suffered by some of the more northerly areas. Several affected farms were visited and advice given. During the course of inspections digger wasps were seen visiting flowers, so that this friend of the farmer is apparently well established here.

FIELD REPORTS.

The Southern Field Assistant, Mr. J. C. Murray, reports under date (19*th May*, 1925):—

Homebush.

Cane here looks well, although so far as this area is concerned it is unlikely there will be any over-production. Farmers are ploughing and planting and generally putting "their house in order" before the season begins. They are fortunate in having to deal with a minimum of disease, the only serious affection noticed being Mosaic on a limited scale in a field of Malagache. The owner assured me that this disease has been present for many years in the Homebush district, and has spread to a very limited extent. This observation suggests that Malagache, which is, and has been a staple variety here for years, is fairly resistant to Mosaic disease.

Good results have been obtained from the use of burnt lime. According to figures supplied, it costs about £3 8s. to lime an acre of ground near the old mill site. That covers cost of material, cartage, and labour. The correct way to treat a paddock with burnt lime is to place in heaps about land, cover with soil, allow to

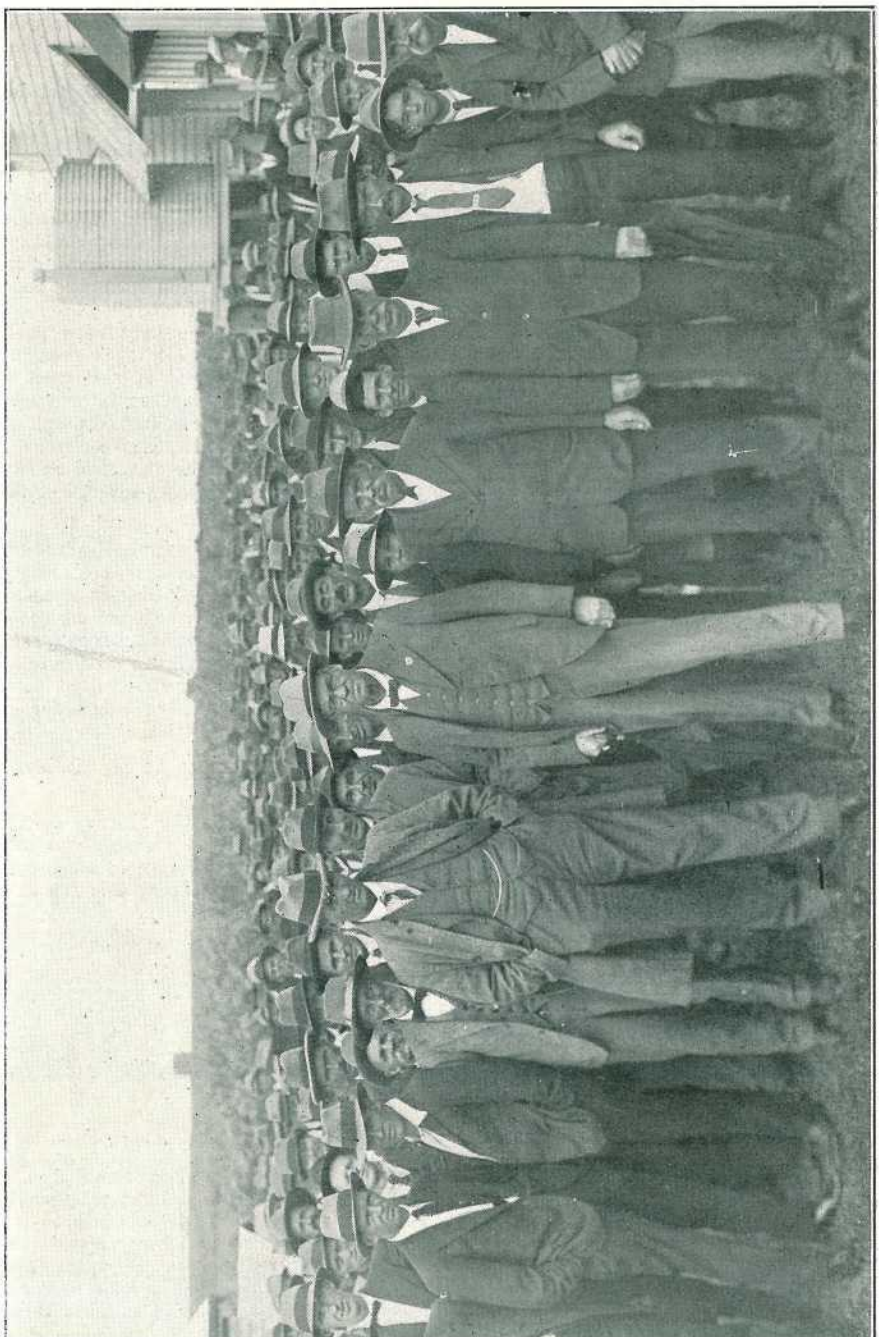


PLATE 2.—FIELD DAY, SUGAR EXPERIMENT STATION, MACKAY.

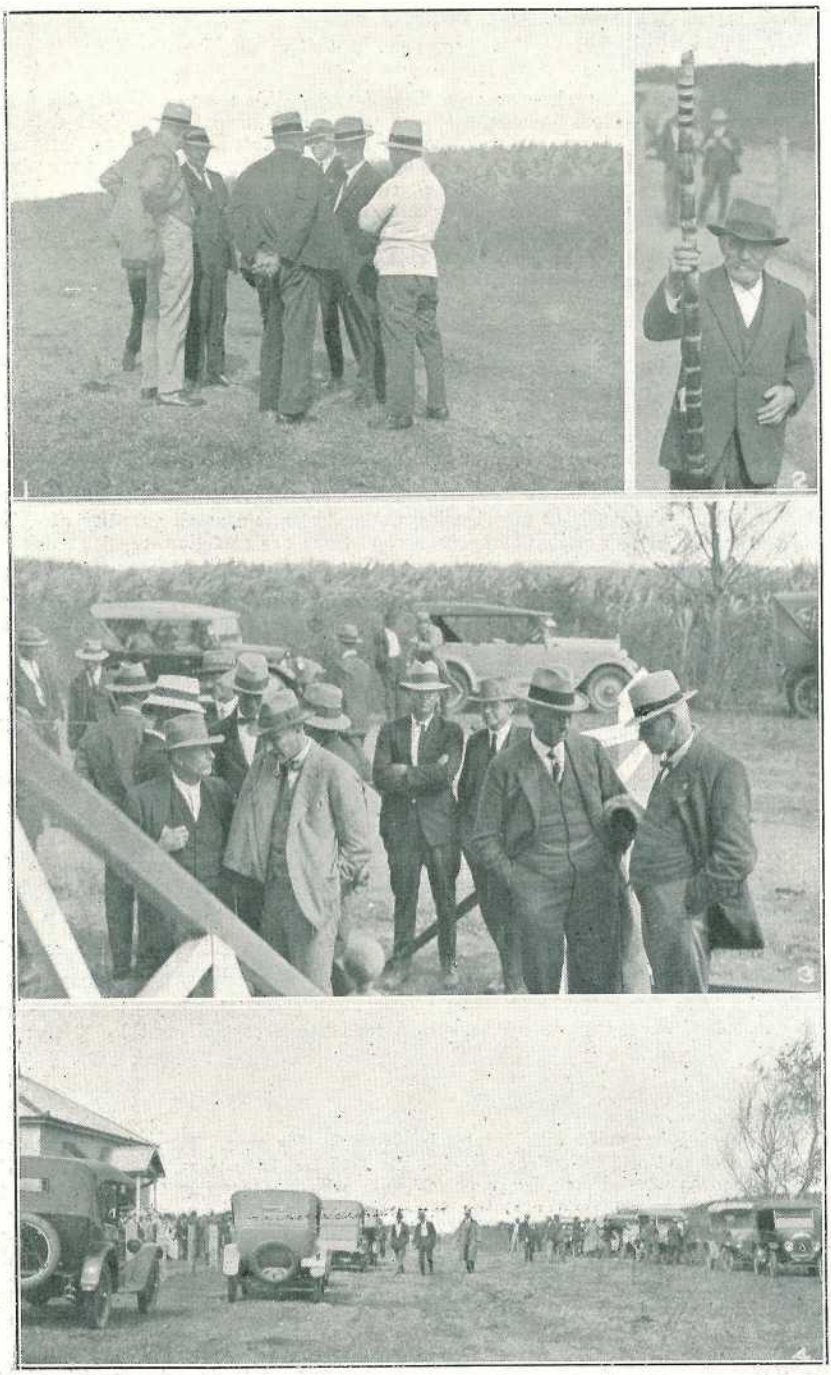


PLATE 3.—FIELD DAY, SUGAR EXPERIMENT STATION, MACKAY.

1. Mr. Easterby meets the early arrivals.
2. The oldest Cane Farmer in Mackay.
3. The Cane Farmers arriving at the Station.
4. The Farmers' motor cars

air slack, spread in absence of wind, plough in, and let ground spell for six weeks. If possible, follow with a crop of cowpeas, which, by the way, grows best in a well-limed soil.

Pests.—Borers cause whatever loss there is from this source. While the borer itself may not cause serious damage, the holes they make very often allow the entrance of injurious fungi which cause loss at the mill and, if planted, bad strikes. It would be a good idea, if farmers noticed fungus hanging round the plants they were planting, to make their planters watertight and treat the sets with a fungicide. This is a disinfectant, destructive to the lower forms of plant life (the fungi), but not strong enough to injure the higher forms. If cane plants are immersed for an hour in 50 gallons of water to which half a pint of formalin has been added, they will probably find that the percentage of misses caused by fungi will diminish.

Eton.

Farmers are finishing planting. Crops, generally, look healthy. There is a small amount of Leaf Stripe and Mosaic. The former may spread if growers do not take the precaution of destroying affected stools; and where the disease is appearing, to use the abovementioned fungicide. However, there is absolutely no cause for alarm, the suggestions being intended as useful in preventing further spread.

H. 109, E.K. 28, M. 1900, E.K. 1, H.Q. 285, Cheribon, H. 227, N.G. 24A, N.G. 24, N.G. 24B, 7 R. 428, and Q. 813 are showing well. There is a small quantity of Q.855 doing well also. Some details of appearance of these are as follows:—

E.K. 1—Purple, long internode, slightly waxed, eyes prominent, foliage fibrous and spreading at tip, pronounced ring at node, good ratooner and stand-over variety, rind cracks freely and therefore susceptible to attack by fungi.

E.K. 2—Green, long internode, slightly waxed, eyes flat, good stooler and ratooner, erect, good root system. Foliage spreads and droops slightly at tip. Light ring of wax at node. Seldom cracks, therefore not readily attacked by fungi.

E.K. 28—Greenish-brown, small hard eyes, internode long and slightly waxed, pronounced wax ring at node, erect, good stooler and ratooner, erect foliage, good rooter, green leaf sheath.

Q. 855—Red cane with a purple blush, the red gradually disappearing as the cane matures, slightly waxed on nodes, long internode slightly oval, blue leaf sheath, foliage fleshy and erect, eyes prominent. Good stooler.

In experimenting farmers are recommended to keep other varieties entirely separate from the main crop, which should be confined to not more than three.

On the Eton farms lime and green manures are essential. Pulverised limestone is recommended on a typical soil, about 2 tons per acre, followed by a crop of cowpeas.

Koumala.

Canegrowing has made considerable headway in this area. There is a great deal of land in this and other districts between the 21st and 23rd parallel that is suitable for other crops, particularly bananas. People who are coming to Queensland to settle would do worse than examine the possibilities of these rich scrub slopes. Tramlines have brought land of this class in touch with the railways and as it can be acquired very cheaply, the growing of tropical fruits may relieve congestion in the North Queensland sugar fields.

Cane varieties giving satisfactory results are Q. 813, M. 1900, Badila, and Black Innis.

Pests and diseases are so far giving the grower no trouble. A parasitic plant, commonly known as the "witch weed," is causing small losses. The following is a weed-killing mixture and should be worth trying where the hoe is not effective:—Water, 12 gallons; arsenite of soda, 1 lb. The weed, if sprayed with this, should quickly die. If insects are to be killed 1 lb. of sugar could be added, but it should not be used where stock are present.

PLATE 4

5. The Superintendent takes the farmers around the plots.
6. Farmers examining the Experimental Plots.
7. Luncheon, where the Superintendent addressed the visitors.

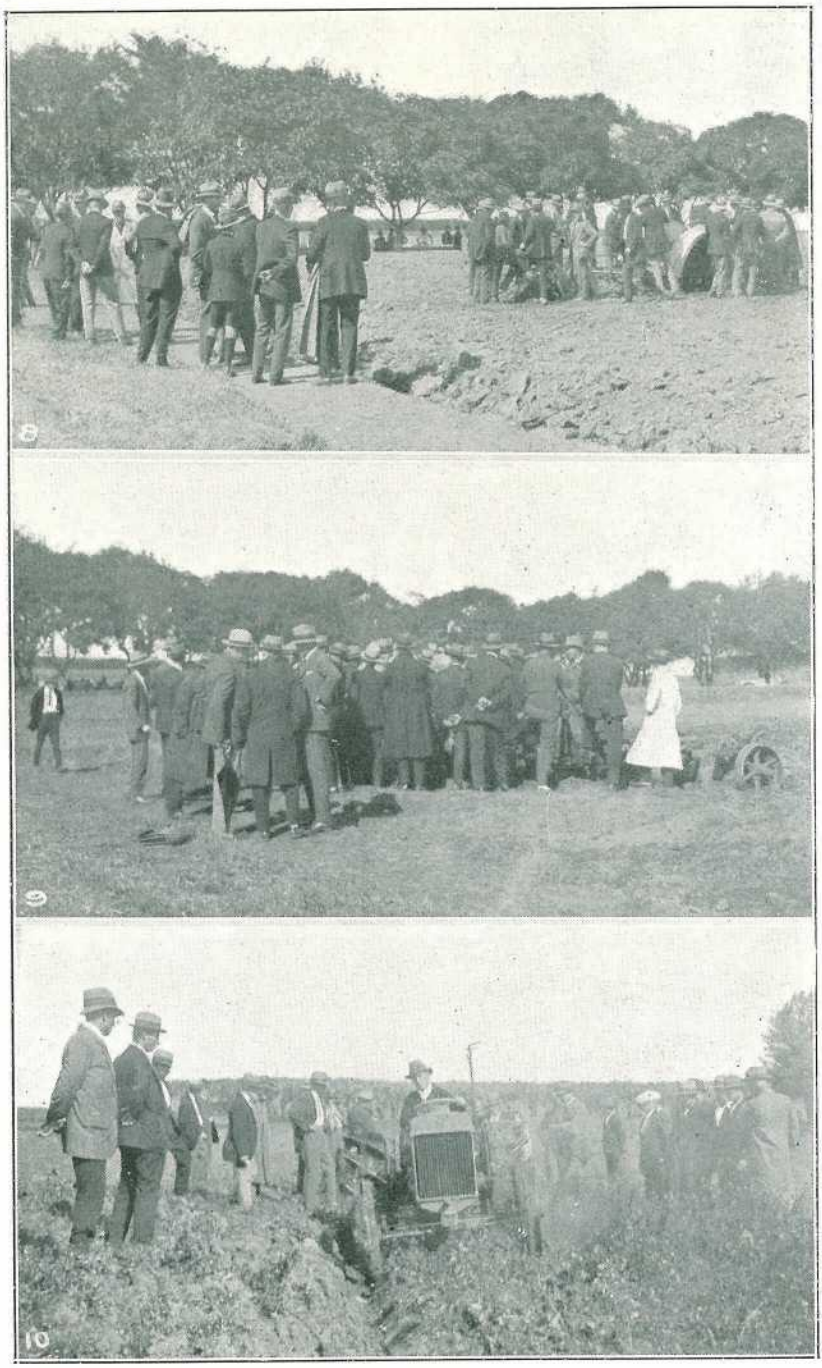


PLATE 5.—FIELD DAY, SUGAR EXPERIMENT STATION, MACKAY.

8.
9.
10. } The Farmers are interested in the Tractor Trials.

MARKETING PIGS IN QUEENSLAND.—II.

E. J. SHELTON, Instructor in Pig-raising.

The marketing of his products is claiming much closer attention from the man on the land, and in this series Mr. Shelton describes how the farmer's pigs are handled at the selling end. In the first instalment in the June Journal several marketing systems with which Queenslanders are familiar were reviewed, and in the second article are many points of equal interest to the wide-awake pig-raiser.—Ed.

In the previous article dealing with this subject the following marketing systems were discussed:—

(1) The sale of store pigs from farmer to farmer, either direct or per the auction-sale system in saleyards.

(2) The sale of porkers direct to butchers or by auction.

(3) Consigning pigs direct to co-operative or proprietary factories.

(4) Selling pigs "over the scales" at country saleyards, railway stations, &c., to buyers representing proprietary bacon factories and receiving payment for the animals (dressed weight) on a basis of allowing approximately 30 per cent. as the difference between actual live and dressed weight.

(5) The fifth method is that of selling pigs under the pooling system as carried on under the Atherton Tableland Pig Pool.

This system will be referred to in full in a future article, when it is hoped to have a number of illustrations of special interest in this connection. Reference will then also be made to the subject of pig pools and stabilisation of prices. At the moment these matters are being investigated in detail by a select committee appointed by the Council of Agriculture, Brisbane, functioning under the Queensland Producers' Association and the Primary Products Pools Act.

(6) The sale of stud pigs for breeding purposes

will also be dealt with in the August or September issue, for at that time extended reference will be made to the annual sale of stud pigs held during the currency of the Royal National Show and at which on this occasion the largest selection of stud pigs yet placed before Queensland breeders will be submitted to public auction. The stud sales will be held early in Show week, and the writer will be pleased to supply any information available to breeders in connection with the breed, age, pedigree, and other particulars of the stock to be offered.

Queensland Bacon Factories.

It is proposed, in the several issues through which this series of articles will run, to illustrate the various factories and to show how efficiently manufacturers are handling the pigs which arrive at their establishments. The principal fault with our bacon pigs is not that they are handled inefficently when they reach the factory—it is at the production end where improvement is most necessary, as will be shown as we proceed. The illustrations in this issue are from Messrs. Foggitt, Jones, and Co., of Oxley, proprietors of one of the oldest and most efficiently managed factories in the State.

As will be seen from the photograph of the Oxley Factory, it occupies a prominent, well-drained position and covers an extensive area of ground. It is situate some 2 miles south-east of Oxley Railway Station, and is 8 miles or so south of Brisbane. This company have factories in operation also in New South Wales, Victoria, and Western Australia, and have permanently established themselves in the industry.

Inspection of Carcases.

As is the case with all the bacon factories, every pig is carefully examined both before (*ante mortem*) and after (*post mortem*) slaughter by competent officials from the Department of Agriculture and Stock, Brisbane, the Stock Department of which controls the various meat inspectors officiating at the bacon-curing establishments.

Fig. 2 shows Mr. Inspector Wills at work in his official capacity as meat inspector at Oxley Factory.

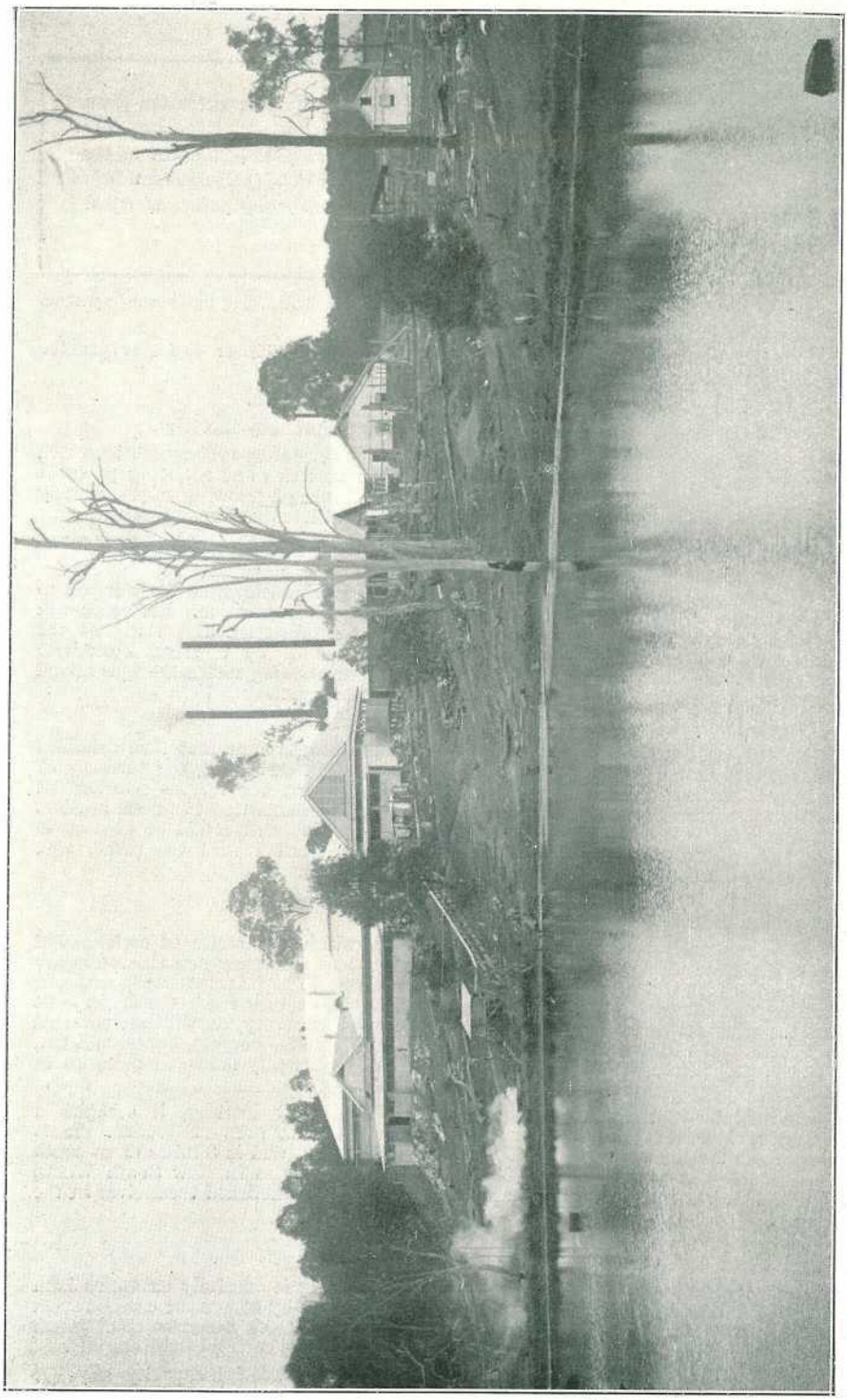


PLATE 6. (Fig. 1).—ONLEY BACON FACTORY. FOGGITT, JONES, LIMITED, FINE MODERN WORKS ON THE BANKS OF ONLEY CREEK, NEAR BRISBANE.

PLATE 7. (Fig. 2.)

In the course of his inspection the Meat Inspector has located a deep-seated bruise, probably the result of the animal having been prodded by a sharp-pointed stick when in a loading race. Bruising of carcases is responsible for very considerable loss each year. The object of this picture is to emphasise the importance of careful handling at all times.

In his examination of the carcass, both the internal and external surfaces are being inspected, and whilst examining the latter a severe bruise is noted; this has been opened and the partly congealed blood will be seen below the opening. This depicts in a striking manner one of the most serious of the losses to the bacon-curer and to the pig industry in general, for as a result of careless, even brutal, handling of pigs in transit to the saleyards or trucking stations, in trucking, and in delivery to the bacon factories, curers estimate that the losses run into thousands of pounds annually. This certainly emphasises the necessity of careful handling and the provision of suitable saleyards in which the pigs can be handled to more advantage at point of despatch. Some saleyards the writer has inspected are in a shocking condition; they are indirectly responsible for a good deal of the trouble referred to above.

Fig. 3 illustrates another phase of the inspection. In this photograph the slaughterman is busily engaged opening up the carcass and removing the internal organs prior to splitting the carcass down the back and handing same over to the inspector for further attention.

Figs. 4, 5, 6, 7, and 8 illustrate the examination of lymphatic glands in various parts of the carcass and internal organs, and show how efficiently every carcass is handled to ensure freedom from disease of the bacon, ham, &c., passing into human consumption.

Fig. 9 illustrates another phase of factory operations, this being a view of portion of the small goods department at the Oxley Factory. It is not possible to secure good photographs depicting the more detailed operations.

Fig. 10 is a view of portion of the ham and bacon packing department at the Oxley Factory. These various operations will be described more fully in future issues.

There can be no denying the fact that to be successful in raising and marketing pigs the pig-raiser requires to be sound in his knowledge of the job, to give personal attention to all details of management, to have reliable breeding stock, and, above all, a good farm. He requires to be very efficient in all operations, keeping an ever-watchful eye on the growth and development of each animal he possesses, and to carefully study the costs of production.

Trade Classification of Market Pigs.

The farmer cannot expect to receive top market rates for his pigs unless they are correctly classified in accordance with conditions ruling in the markets at the time his pigs go forward. The trade classification necessarily varies from time to time, for market conditions are, unfortunately, not permanently stabilised, nor are public demands always the same; in fact, the consumers' demands have changed so much in recent years that quite a different type of bacon and pork (and also stud) pig is in demand now to the type so popular twenty or thirty years ago. Nor is this variation confined alone to this part of the world, for latest market reports from overseas indicate that the demand is rapidly changing there also, and both the markets of Europe and of the United Kingdom are now calling for the comparatively light to medium weight fleshy bacon and pork pigs so popular and so much in demand in Australia.

To secure the maximum profits in the marketing of pigs it is also necessary that they be of correct type, be properly grown and developed on suitable foods—foods in a condition to be readily assimilated and converted to use in the production of rich red flesh and firm white fat—and that they be properly "topped up" prior to actual despatch. This topping up, as it is frequently called, does not of necessity mean that the pigs should be closely confined in a small and low or dark pen and that they be given all the corn or other grain they will consume during the last two or three weeks of their lives, for pigs require ample exercise and a sufficient supply of green or flesh-forming (usually referred to as protein) foods, in addition to a liberal supply of grain (grain being classed as carbohydrate or fattening food). They also require an abundant supply of mineral foods—charcoal, lime, bonemeal, rocksalt, &c.

It is important also that the pigs be judiciously graded into the various classes prior to marketing, and that special attention be given to careful handling in transit to the factory, this including transit from the farm to point of despatch per rail, road, or steamer and transit to the factory. In this connection attention is called to Fig. 2, in which the Meat Inspector in his search for disease comes across a badly bruised carcass, an occurrence unfortunately all too common, and resulting in very considerable loss to the industry each year. The bruising and damage to carcasses in transit will be referred to again later in this series of articles.

The following table, which sets forth the names, ages, approximate weight and value of market pigs in Australia—and this refers to Queensland conditions particularly—will be found very useful in connection with the preparation for

PLATE 8. (Fig. 3).

The Inspector keeps an eye on various operations in his search for disease. Here he is seen "giving an eye" to the slaughterman whilst the latter is engaged in the removal of the internal organisation of the pig. A point worthy of note is that it is well worth while sparing the time necessary to visit bacon factories in order to become better acquainted with the handling of the carcass at the hands of the manufacturer.

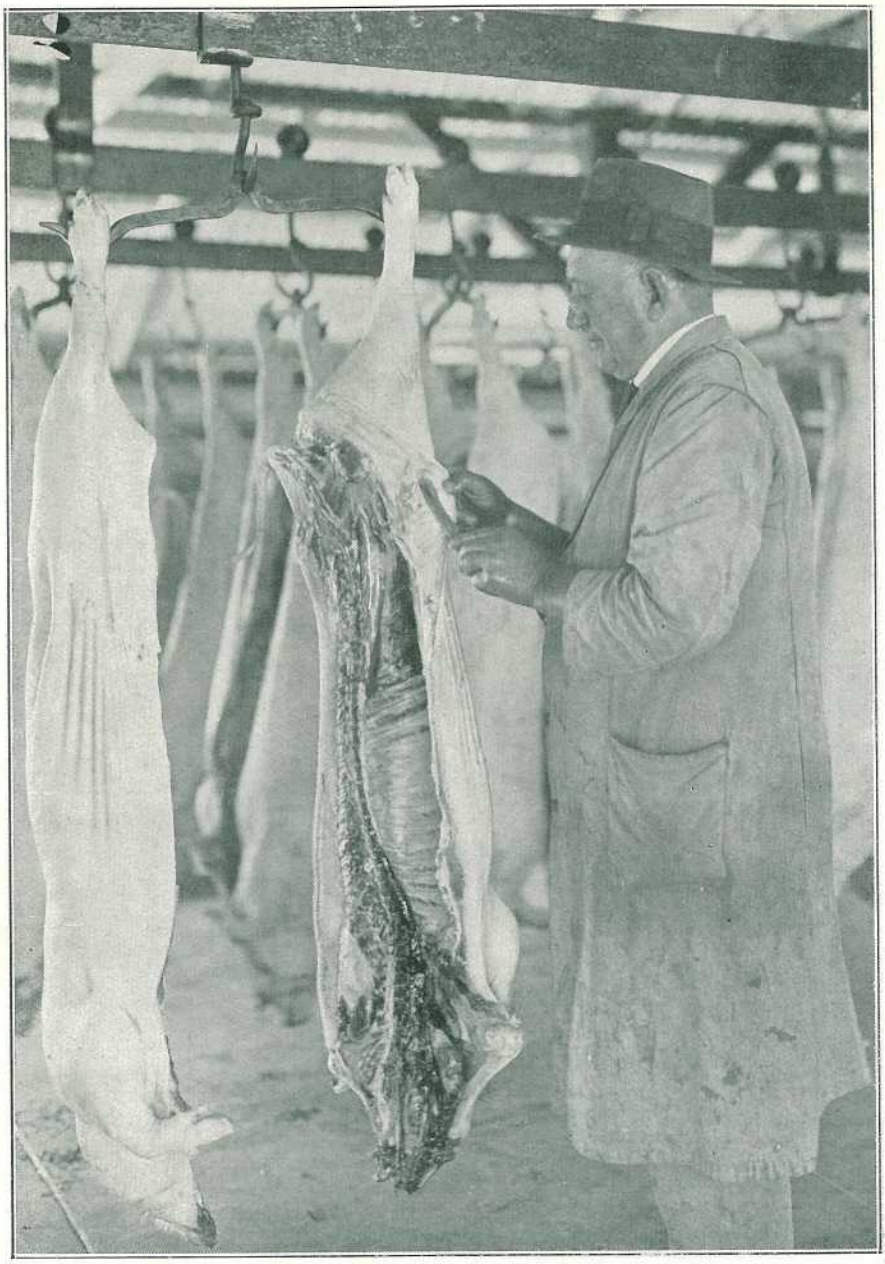


PLATE 9 (Fig. 4.)

INSPECTION OF LYMPHATIC GLANDS IN THE HINDQUARTER.

These glands are not infected as frequently as the glands in the head and neck, hence it is that many carcases pass inspection even if it is necessary to condemn the head on account of tuberculosis. Each gland is carefully incised in the search for diseased areas.

PLATE 10 (Fig. 5).

Discussing the matter of inspection at the time the photograph was being taken, Mr. Inspector Wills remarked that as far as possible every gland in the carcass was examined. This picture shows another group of glands being sliced, for it is only by cutting deeply into each gland that the inner surfaces can be seen. Consumers need have no fear that diseased pigs slip through, for the Inspectors are men well versed in their job.

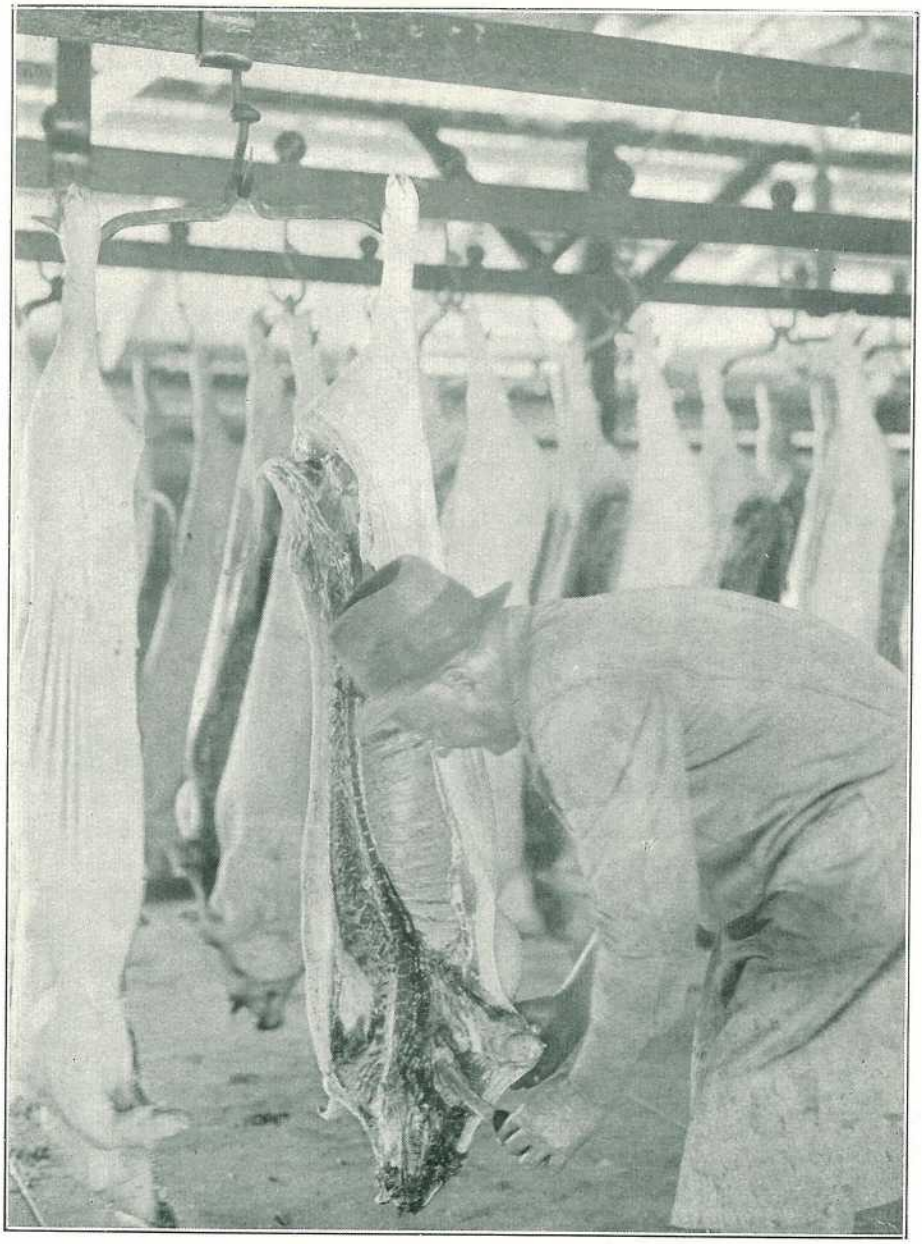


PLATE 11 (Fig. 6).—INSPECTION OF SUBMAXILLARY AND SALIVARY GLANDS IN THE HEAD AND NECK.

It is this group of glands to which extra special attention is paid, for they are the most frequently infected of the various glands throughout the body. The subject is one well worth careful study on the part of every pig raiser.

PLATE 12 (Fig. 7).—INSPECTION OF THE BRONCHIAL GLANDS BETWEEN THE LUNGS.

The various organs are the subject of careful examination also, for it happens occasionally that they are diseased and that condemnation is necessary. The pig is subject to several lung diseases, of which pneumonia appears to be the most frequent. This is the disease most commonly referred to as "pants," a disease in which the lung itself is seriously affected.

PLATE 13 (Fig. 8).—INSPECTION OF THE MESENTERIC GLANDS IN THE INTESTINES.

These glands are also frequently diseased. Great care is necessary in feeding pigs on food such as meat, milk, &c., per

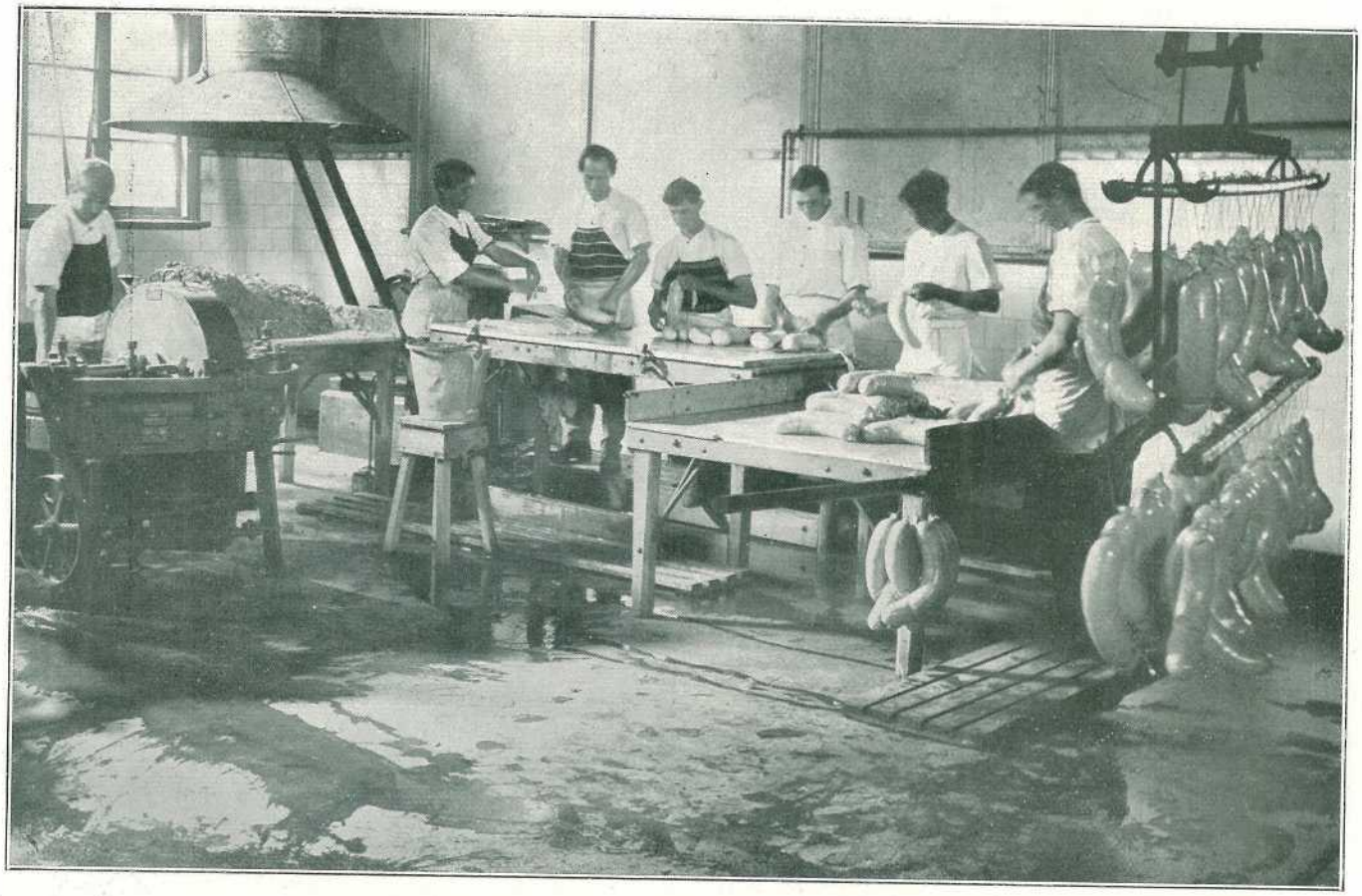


PLATE 14 (Fig. 9).

Portion of the Sausage-room at the Oxley Bacon Factory. The preparation of the small goods is an item of very considerable importance in bacon factories, for many tasty, nutritious items are manufactured from the less valuable portions of the pig's carcass.

PLATE 15. (Fig. 10).

Portion of the Packing Room in which the final touches are given both to the bacon and to the package before it goes forward

market (auction sale, &c.) or for factory of every description of pig which the farmer will be handling. The figures given are reliable, and, though approximate only, are quoted as a guide. The demand for pigs of all ages and classes is on the up grade, and though values fluctuate a good deal for all classes, it can be taken as a general rule that the medium weight animal, whether he be marketed as a porker or a bacon pig, is the one most in demand and, under normal conditions, is the most profitable.

MARKET CLASSIFICATION—QUEENSLAND, JULY, 1925.

Name or Grade of Animal.	Approximate Age.	Approximate Weight.	Approximate Value Per Pig.
Sucker or Sucking Pig ..	6 weeks	15 lb. dressed	12s. 6d. to 15s.
Weaner	8 ,, ...	25 ,, alive	15s. to 20s.
Slip	10 ,, ...	32 ,, ,,	20s. to 25s.
Store	12 to 14 weeks ..	45 ,, ,,	20s. to 30s.
Light Porker	4 months	50 ,, dressed	40s. to 50s.
Medium Porker	4½ ,, ...	60 to 70 lb. dressed	50s. to 60s.
Heavy Porker	5½ to 6 months ..	80 to 85 ,, ,,	55s. to 60s.
Light Baconer	5½ to 6 ,, ..	86 to 94 ,, ,,	55s. to 65s.
Medium Baconer ..	6 months	95 to 125 ,, ,,	65s. to 75s.
Heavy Baconer	Up to 9 months ..	1st grade 126 to 135 lb. ,, 2nd ,, 136 to 145 ,, ,, 3rd ,, 145 to 160 ,, ,,	from 50s. to 80s.
Backfatter	Up to 6 years ..	Up to 4 cwt. dressed	£3 to £4
Stag	Up to 7 years ..	Up to 4 ,, ,,	£1 to £3
Chopper	Up to 2 years or more	Up to 3 cwt. dressed or heavier	£2 to £5
Boars	Over 5 to 6 months	Various weights	These are of little value as "meat" pigs

Bacon Factory Classification.

Most of the Queensland bacon factories are paying for pork and bacon pigs in accordance with the following schedule, as at July, 1925. These figures are subject to variation; current rates will always be supplied by the factories on application.

Rates of Payment for Current Month.

Note.—In the case of payment by proprietary factories, this is a straight-out cash payment, whilst in the case of co-operative factories the price represents an advance payment, balance (if any) being paid in the form of bonus or deferred pay at end of each year.

Prime baconers, 95 lb. to 125 lb. dressed weight, 6d. per lb.; 126 lb. to 135 lb., 5½d. per lb.; 136 lb. to 145 lb., 4½d. per lb.; 146 lb. to 160 lb., 3½d. per lb.; 86 lb. to 94 lb., 5½d. per lb. Pigs other than prime according to quality.

Porkers are paid for at 5d. per lb. dressed weight. Fat sows for small goods (referred to as backfatters in the market classification), 2d. per lb. dressed weight. Stags are only worth 1d. per lb. dressed weight.

Boars.—For these there is practically no demand at all, and factories in many instances refuse to take delivery of boars of any age; other factories pay for young boars, say, up to twelve months old, at price paid for fat sows, but aged boars will not be accepted at any price, nor will rough stags.

A limited demand exists for light-weight fat sows at better prices than those quoted above, but the market fluctuates very much, and owners would be well advised to secure quotations from factories before marketing.

A careful perusal of the above figures will show that the principal demand is for good quality porkers and for prime light to medium weight baconers. There is no call for very fat pigs of any age or weight, and the old world champion heavy-weight pigs so much in popular favour years ago are not worth marketing now. So great has been the change in public taste that it is difficult for many farmers to realise this even now.

The three outstanding faults in Queensland bacon pigs during the past year or two have been referred to on previous occasions. They are—

The pigs are being held too long on the farm;

They are, when marketed, very frequently over the profitable limit in age; and

They are, as a class, too fat and too heavy for the most profitable market outlets, this referring to both local and interstate trade. Thus they are less profitable to the farmer than they should be.

The whole of the factories operating in this State agree that this statement is, unfortunately, very true, and they are all anxious that producers should study market requirements more than has been customary in years gone by.

(*To be continued.*)

MAIZE FOR PIGS.

A correspondent told us recently that he had decided, in view of the low market value of maize at the time, there was no better way of converting his crop into cash than by feeding it to pigs. He installed a crusher with the idea of boiling the resultant meal for the pigs. He stated that he had bought a boar and seven sows, the latter in pig, and from his investment he estimated a return up to £250, or perhaps £270, per annum, and asked was that a fair thing. Following was the general reply with special references to the points raised in the letter of inquiry:—

Maize certainly holds pride of place as the most prolific and readily grown grain crop in this State, but to secure best results it must be fed in conjunction with other crops (such as lucerne, &c.) having a higher protein content and a more bulky succulent nature.

In seasons like the present, when there is an abundance of most classes of green food, and when maize is of very low commercial value, it would certainly pay better to convert the maize into pork on the farm than to go to all the trouble and expense of placing it on the market in the form of shelled maize. Hence, the intention of utilising the bulk of the crop in the way indicated is sound, particularly as the expenses connected with marketing of pigs are not excessive.

Maize fed in conjunction with skim milk and lucerne gives even better results, hence the wisdom of keeping also a few milch cows as suggested.

There are many other crops, too, that can be grown and fed to advantage, particularly Dwarf Essex Rape and Skinless Barley, a combination specially to be recommended for the purpose indicated.

With regard to the grinding of the maize core at the time the maize grain is being handled. We have no record of extensive tests being carried out in this State with "corn and cob meal," but Professor Evvard, one of the most prominent American authorities, condemns the practice of grinding the grain and core, claiming that the results do not justify the expense. Experience at the Hawkesbury Agricultural College in New South Wales also leads us to believe that there is little or no feeding value in the core, and the fact that the pigs do not, or would not eat the core ordinarily, seems to indicate that instinct tells them that it contains too high a percentage of indigestible fibre. However, the practice of feeding corn and core meal is carried out at the Warren State Farm, and the manager, Mr. Bechtel, reports good results. I would like to see our correspondent carry out some experiments on these lines, and feed one or two groups on maize meal and one or two on maize and core meal. He would gain some useful and interesting experience and would not suffer any monetary loss. Nevertheless, I advocate the practice of burning the maize cores and feeding them in the form of charcoal, and have always found the results more beneficial than by feeding in the form of meal.

With regard to cooking the maize and core meal and feeding in this form, my opinion is that cooking food pays only when the animals are given that extra care and attention which always results in securing a few extra shillings in the sale pens. If the animals are well cared for, provided with suitable accommodation, and sanitary feeding places, and can be fed in groups of, say, six to twelve, then good results will accrue, and it will pay to cook the food. Whereas, if the pigs are running at large and are fed on a rough and ready "get all you can while you can" system, then it would pay better to feed the maize on the cob and let the pigs do their own grinding, &c. In any case, this feeding of the maize on the cob is preferable in the case of breeding sows and the boar, for it is not necessary in their case to go to the extra expense. Nevertheless, they require ample supplies of green food, &c., as in the case of bacon pigs, and all should have access to abundant supplies of charcoal and wood ashes.

Regarding the estimate of profit and loss, careful attention to detail and expert management mean an immense amount in reckoning up profit and loss. It has been estimated that 1 bushel of corn fed along the lines indicated will produce 10 lb. of pork, this latter at present representing a factory value of 6d. per lb. or 5s. per bushel for the corn as against a much lower sale value; but even if the results were only 50 per cent. as good as this, pig feeding is the better proposition, and it invariably happens that when maize soars to 5s. per bushel, pork also advances up to 10d. per lb. The figures given, however, are a fair estimate of a probable return if conditions on the farm are favourable.

The whole business is one calling for expert management, and seeing that the Department of Agriculture and Stock is prepared to assist settlers in every way possible, there should certainly be a "way out" for our correspondent *viâ* his pig-breeding scheme.—E. J. SHELTON, H.D.A., Instructor in Pig Raising.

LIFE IN THE QUEENSLAND TROPICS.

EFFICIENCY OF WHITE AUSTRALIAN WORKERS.

HEALTH AND WEALTH IN THE NORTH.

The population of the North is increasing faster, proportionately, than that of any other part of Australia, and the prosperity of the North is undeniable. Careful observations show that Northern families neither die out nor degenerate, nor do they show any evidence of commencing degeneration up to the third generation. The tropic-born woman is quite as healthy as the woman born elsewhere. Her children at school ages are taller and heavier than, and at least as mentally able as, children elsewhere in Australia. Life insurance records show that their chances of longevity are rather greater than elsewhere in Australia. Industrial records show that they can outwork any non-British race in the sugar fields under the ordinary present conditions of living.—Dr. J. S. C. Elkington, Director of Tropical Hygiene, Commonwealth Department of Health.

Statements made recently by a distinguished visitor concerning the condition and probable future of the white population of Australia met with an effective reply from Dr. J. S. C. Elkington, Director of Tropical Hygiene, Commonwealth Department of Health. In the course of a Press interview, Dr. Elkington said: "It is interesting to note that Sir George Buchanan, during his few weeks of sojourn in tropical Australia, would appear to have reached the same conclusions concerning the need for better conditions of housing and living as were expressed by the Australasian Medical Congress which met in Brisbane in 1920. These needs are, of course, obvious enough to any one who visits the North. But when Sir George goes on to describe white labour in the North as 'neither efficient nor economic,' and to quote some unnamed doctor as stating that 'the sole subject of conversation between wife and husband turns on requests by the woman to be permitted to go South for rest and change,' it makes one regret that he has not given a little attention to the recorded opinion of those who have given a lifetime of observation to such matters. For example, a Townsville surgeon (Dr. Humphry), with more than thirty years' experience of the Australian tropics, told the 1920 congress, after expressing his very definite opinion as to the unsuitable houses and the hard life of the Northern working woman: 'If 100 boys were taken out for a week's hard military manœuvring, I believe they would hold their own with any other 100 boys from any part of Australia. . . . Anybody who says the race will not thrive in tropical Australia, to my mind, is talking rot.' Again, a writer in 'Health' in September, 1923, gave as his matured opinion, after more than twenty years' experience in handling labour in sugar plantations in North Queensland: 'The British gangs head the list' (*i.e.*, in efficiency and economy of labour) 'against all comers. . . . The term British is used to cover all white British nationalities, irrespective of whether the men were born in Australia or Great Britain.' The same writer ('C.V.H.') makes it clear that the climatic origin of the individual has no bearing on his capacity for performing hard work in our tropics.

Telling Facts—What a Sociological Survey Revealed.

"Had Sir George Buchanan found time to call at the Australian Institute of Tropical Medicine, at Townsville, where the whole subject of white races in the Australian tropics has been under very careful study for years past, he would have been shown evidence which would have saved him from a number of unfortunate statements and hasty quotations from evidently uninformed and inexperienced sources. The statement (attributed to unnamed medical men in Northern Queensland) that 'women rapidly deteriorate mentally and physically, and the whole white race in the

coastal area under the existing conditions is only kept up by the influx of new blood from the South, otherwise it would in a few generations become enfeebled and ultimately die out,' is totally at variance with observed facts. At the Institute, Sir George could have seen summaries of an extensive series of family histories of North Queenslanders, extending to the third generation, and showing no sign whatever of becoming enfeebled. The originals are confidential, but he could have met a number of the actual people forming these families. He would have had the opportunity to read the results of an extensive sociological survey which was carried out in 1924 on some 740 North Queensland households in seven areas selected for their diversity of climatic and other conditions. From this he could have learned—learned from actually observed facts, not from speculative off-hand opinions—that, despite her hard home life, the health of the ordinary working mother in North Queensland is at least as good as in any other part of Australia, that the fertility of the tropic-born Australian white woman is at least as great as that of the woman born in non-tropical climates, that the average weight and height of tropic-born Australian school children is (after allowing for lighter clothing and for the absence of boots) greater than those of school children in other parts of Australia, and that the majority of the home-mothers amongst these 740 households had been born in the Australian tropics. Sir George would also have learned from the educational records which form a part of the Institute's collected material that the school performances of these tropic-born Northern Australians compare rather more than favourably with those of children in other parts of Australia. He would have been shown the records of the percentages of those rejected and accepted, respectively, over a series of years for the Citizen Forces and for the A.I.F. From these he would have learned that the percentage of rejects for tropical Australia was actually less over some years than for all other parts of Australia, and that in some of the observed years the percentage of cadets rejected in tropical Queensland was less than that for Tasmania, New South Wales, Victoria, or South Australia. For the A.I.F. the percentage of fit amongst tropical Queensland volunteers was greater than that for Southern Queensland.

Life Insurance Outlook.

"If Sir George Buchanan had desired to go into the actuarial side of tropical Australia, a paper by Mr. Elliott, chief actuary of the Australian Mutual Provident Society, was presented at the 1920 Congress, and would have given him full information as to the life-insurance outlook. Mr. Elliott, after conducting an exhaustive analysis of nearly 5,000 policies issued from the Cairns and Townsville offices, concluded thus:—'The rates of mortality deduced from the inquiry were surprisingly low. . . . I have no hesitation in saying that, as far as we know at present, there is no need for life assurance offices to treat proponents who live in North Queensland differently from proponents who live in other parts of Australia.' The condition of living which Sir George Buchanan treats, and rightly so, as matters requiring urgent improvement, thus do not apparently shorten life. Nor, apparently, do the ungranted prayers of the Northern wife-mother for a change South, so feelingly described by Sir George's medical informant.

North Queenslanders in the A.I.F.

"Whilst on this subject, I may mention that some of the best people I have ever seen, in the sense of completely useful Australian citizens, have been Northerners who have never been 'South,' and who have not wanted to go South. They are apt to find the Southern climate unpleasant—for example, I have known Northerners to complain bitterly of the close summer heat of Sydney and Melbourne—and the living conditions cramped and stuffy. That they are well able to bear climatic extremes when necessary, however, is shown by the thousands of born North Queenslanders who went through winter trench life in France and elsewhere. It is a matter of attested experience amongst army medical officers that these men did not show any inferiority to other Australian units under the test of actual war.

The Vigour of Northern Families.

"With regard to the people of the North (apparently all of them) being in what Sir George describes as 'a state of nervous tension,' I can only say that, after more than thirty-five years' acquaintance with tropical Australia, this is the first I have heard of it. The survey made last year covered the principal causes of ill-health amongst women, and the proportion ascribed to neurasthenia is not higher than one would expect to find under the same domestic conditions elsewhere. I mean those of the hard-working house-mother. Sir George points out that cases of delirium tremens are by no means uncommon. This complaint is not infrequent, I believe, in non-tropical places—even in London—but to infer, as Sir George apparently does, that

nervous tension and delirium tremens are rendering it impossible to settle the country is altogether ridiculous. The population of the North is increasing faster, proportionally, than that of any other part of Australia, and the prosperity of the North is undeniable, even to a casual visitor. Careful observations show that, despite the defective housing conditions of a quite considerable part of the population, Northern families neither die out nor degenerate, nor do they show any evidence of commencing degeneration up to the third generation. There has not been time for more than a third generation to develop yet. The tropic-born woman in tropical Australia is quite as healthy and quite as fertile as the woman born elsewhere. Her children at school ages are taller and heavier than, and at least as mentally able as, children elsewhere in Australia. Hospital and family records show that they do not suffer from any greater amount of illness in after life than do persons elsewhere in Australia. Life insurance records show that their chances of longevity are rather greater than elsewhere in Australia. Industrial records show that they can outwork any non-British race in the sugar-fields under the ordinary present conditions of living, and the only chance which coloured labour would have with them would be under much lowered conditions of living. Dr. Breinl, in 1920, showed, by a careful series of observations with the Kata thermometer—a far more delicate instrument than the wet-bulb referred to by Sir George—that the climatic conditions of the North even under the most unfavourable circumstances, did not affect health or output under conditions of the hardest labour. I have quoted North Queensland more particularly in the foregoing, but the same conditions apply to the Northern Territory. It is not the climate nor the housing conditions which have kept Darwin back.

Dangers of Coloured Labour.

"It is perhaps also advisable to point out that tropical Australia differs from every other tropical country in the world, including all those in which Sir George Buchanan's previous experience has lain, in that it has no appreciable coloured population, but is peopled by a white race only. Had it a large coloured population, the housing conditions to which Sir George refers would probably be very much better, but the health and robustness of the white people would be very much worse. The underlying factor which determines success or failure in every other tropical country, so far as the prospects of a white race thriving are concerned, is well known by every experienced observer in tropical hygiene to be that of the extent to which the whites are open to infection with disease from the coloured population living alongside them. The native servant is a useful person to have about the house, so long as one does not go too closely into such matters as what he has last been doing with his hands before he puts his thumb into one's soup, or before he resumes his labours in the cookhouse. The native labourer is cheap, though seldom really economic, but he serves as a reservoir for malaria from which are infected the anopheline mosquitoes which bite his white neighbour. His habits, too, provide a plentiful supply of unpleasant material which the ubiquitous fly is ready to deposit on the white man's foodstuffs. The white man's native cook does not worry much about protecting his master's food when left alone in the kitchen. I have had a fairly extensive experience of the tropics, and have observed these matters rather closely. They provide one excellent reason for strongly preferring white neighbours rather than coloured ones.

"Probably Healthiest Population in Australia."

"Sir George states that he knows that 'the truth is rarely palatable,' and it is, therefore, well that he should have the real commodity. He has based, on the results of a few weeks' visit and a few ill-informed statements, a sweeping condemnation of the pluckiest, the most self-reliant, and probably the healthiest population in Australia. With his remarks on the tin houses I agree wholly, and also with the need for tropical hygienic teaching and practice. These matters were gone into fully at the 1920 Medical Congress. As to the rest of Sir George's remarks concerning the tropical Australian, I can only say that, in all main details, they are at total variance with the results of a long and thorough series of observations which have been carried out in tropical Queensland by trained observers. I feel sure that were Sir George Buchanan to go again over the ground with the assistance of this material, with sufficient time, with adequate personal observations of the people and conditions on which it is based, and with the requisite scientific help, he would feel himself called on to tender a hearty apology to the tropical Australian men, women, and children whom he has so hastily and incorrectly condemned."

THE SEVENTH STATE.

A NATION-BUILDING PROPOSAL.

BY HON. E. G. THEODORE, M.L.A.*

The latent land resources of the far North, which give most promise of effective settlement, are the broad acres of first-class agricultural and grazing lands which extend along the banks of the numerous large rivers which flow into the Gulf of Carpentaria and the northern seas. There is no insuperable difficulty in the way of establishing a new and prosperous State under vigorous administration in Northern Australia. The creation of a new Province with a sovereign Government would rid the Commonwealth of an intolerable burden, and Australia of an ever-increasing anxiety.

Among the people living in the Southern States the popular conception of the character of the country and the climate in the northernmost portions of the Continent are quite erroneous. The absence from the published maps of Australia of detailed features or indications of settlement in those areas extending to the northern shores tends to create an impression of barren wastes and infertility. This impression is enhanced by the knowledge of naked sandy wastes in the interior; the common belief being that desert and spinifex wilderness extends throughout the whole of the area of North Australia. Nothing can be further from the truth.

All around the coasts of North Queensland, Northern Territory, and the northernmost part of Western Austarlia the country extending 200 miles back from the sea is blessed by Providence with a mean average rainfall of 30 to 40 in. in the less favoured districts, and up to 80 in. a year in selected places. There are many thousands of square miles of plateau, covered with the luscious Mitchell, Flinders, and blue grass, similar to those which have made Queensland famous as a producer of high-class merino wool.

Latent Land Resources.

In addition, there are illimitable tracts covered with a rougher natural pasture, which make the ideal cattle runs of colossal size, for which the Territory and Kimberley districts are noted. But the latent land resources of the far-north, which give most promise for effective settlement, are the broad acres of first-class agricultural and grazing lands which extend along the banks of the numerous large rivers which flow into the Gulf of Carpentaria and the northern seas. Rich alluvial flats are found on the Fitzroy, Ord, Victoria, Daly, and Macarthur Rivers and their respective tributaries.

Here are agricultural resources offering immeasurable opportunities for development and settlement, with possibilities of dairying, pig raising; cotton, tobacco, sugar, sisal hemp, cassava, and maize culture, and every type of tropical agriculture. Moreover, almost every known mineral is found in those latitudes, unavailable and undeveloped owing to the lack of transport facilities.

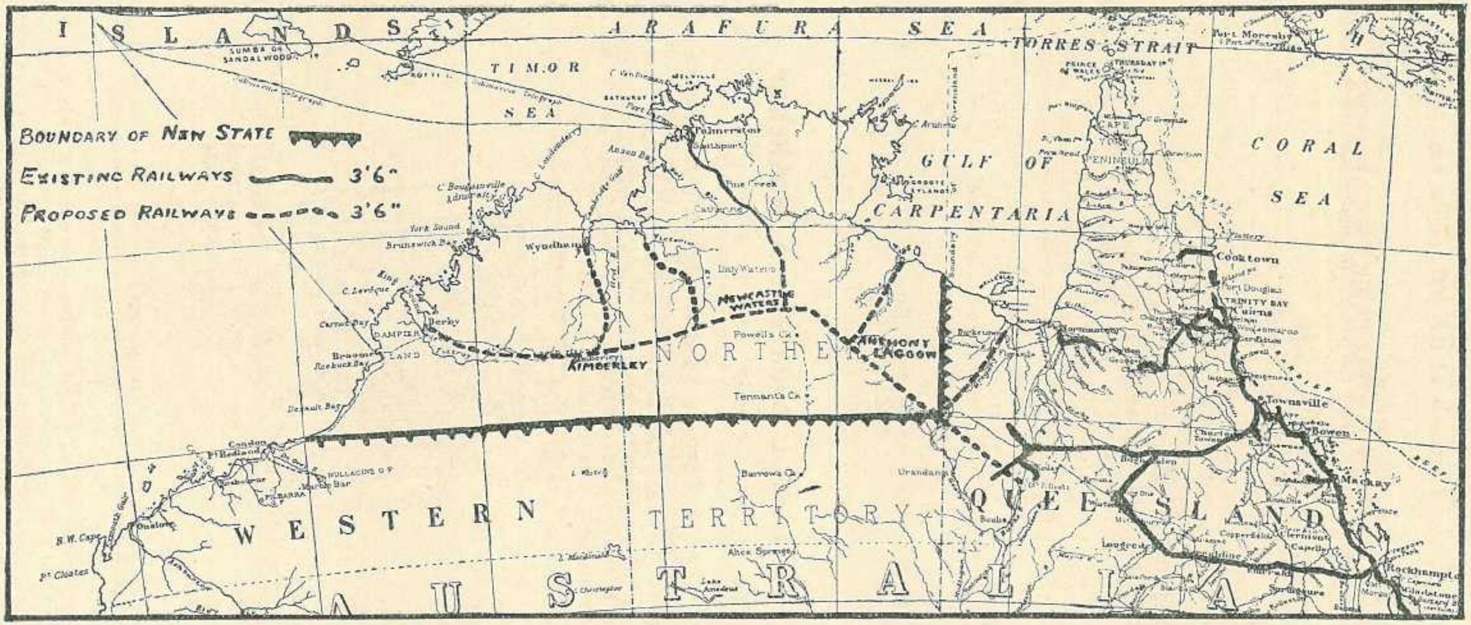
In this immense virgin and potentially rich region, embracing 200,000 square miles within the 25-in. rainfall belt, only 4,000 or 5,000 whites reside.

A Challenge.

Its very richness makes it a source of danger to Australia while it remains unoccupied. It is a constant challenge to the "White Australia" policy. The right of use and occupancy are the only inviolable rights any people have to a territory. How can we deny the claims of an overcrowded country unless we ourselves make a show of settling this fertile and spacious area and developing its resources?

Hence the importance and urgency of the problem. There is no insuperable difficulty in the way. Money is required and a vigorous administration. Harbours, roads, and railways are essential. Land required for close settlement must be

* In "The Home" for June.


BOUNDARY OF NEW STATE
EXISTING RAILWAYS 3'6"
PROPOSED RAILWAYS 3'6"
ISLANDS
ARAFURA SEA
TORRES STRAIT
TIMOR SEA
GULF OF CARPENTARIA
CORAL SEA
NEWCASTLE WATERS
ANTHONY LAGOON
KIMBERLEY
NORTHERN
WESTERN
TERRITORY
QUEENSLAND
AUSTRALIA
Wyndham
Derby
Broome
Cooktown
Townsville
Bowen
Mackay
Rockhampton
Cairns
Port Douglas
Powell's Ck.
Tennant's Ck.
Daly Waters
Pine Creek
Palmerston
Onslow
Condon
Urandangi
Charters Towers
Hughenden
Longreach
Winton
Cloncurry
Normanton
Burketown
Clermont
Capella
Springsure
Emerald
Barcaldine
Pt. Hedland
Marble Bar
Alice Springs

resumed from the pastoralists. Migrants with agricultural experience must be introduced into the country, the ports developed, and factories to process, treat, and manufacture the primary products of the soil must be provided.

One has but to consider the nature of the task to realise the futility of attempting its management from a place so remote as Melbourne. The authority and resources of a Government are wanted to formulate the policy, to plan the development, to establish the organisation, to raise the funds, to administer the multifarious departmental activities and functions as they arise; but it must be a Government on the spot, not a Government 3,000 miles away.

That is the justification for the creation of a new State in Northern Australia. The new State should embrace the northern part of Western Australia and the Northern Territory, and if necessary a small portion of Queensland to give unity to the scheme of development of the Barkly Tableland.

No Constitutional Difficulty.

A Provisional Government should be appointed to administer this State, and the authority of the Government should be as full as that of the existing Governments in the other States. The Provisional Government would have charge during the developmental stage. Within a few years there should be sufficient permanent residents in the State to elect a Parliament and constitute a responsible Government.

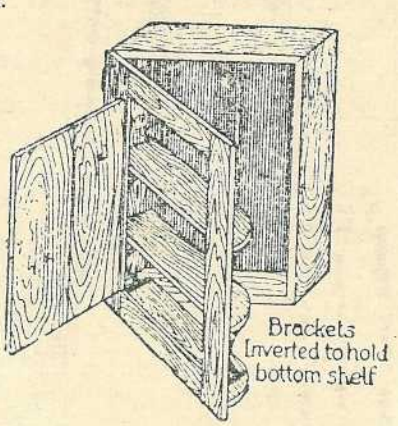
There is no constitutional difficulty in the way of this proposal. The Federal Parliament may erect a new State and grant it a Constitution, subject to the concurrence of the States whose territories are affected.

Nor would the Commonwealth be answerable for the actions or policy of the Government in the new State. The State would have its sovereign Government, which would be accountable to its own citizens. The Commonwealth would be rid of an intolerable burden, and Australia of an ever-increasing anxiety.

A USEFUL DOOR FOR A WORKSHOP.

A workshop cupboard or locker that is recommended for the easy access afforded to its shelves from front or back is shown in the accompanying illustration.

The box, or cupboard proper, minus the shelves, is first mounted upon the wall of the shop. A frame to fit is then hinged to this, in the manner shown, and brackets placed on the inside of the frame in such a position that the rounded shelves will clear the inside of the cupboard when the frame is opened or closed. Within this frame a door is hung, and after latches are provided for both frame and door the cupboard is completed.



In use, anything at the front of the shelves may be easily reached by opening the door; but, if desired to gain access to the rear of the shelves without disturbing or moving the contents, the door latch is left closed and the frame swung open.

Such a cupboard must, of course, be constructed with a sturdy door frame, but its convenience and time saving feature, when small articles are to be found, or when the shelves are to be cleaned, will repay one for the extra trouble in making.—"New Zealand Farmer."

SOFTWOOD PLANTATIONS—II.

By V. GRENNING, Rhodes Scholar, Working Plans Officer, Queensland Forestry Service.

Australia imported softwood in 1920-1 exceeding £5,000,000 in value Industrial expansion and increasing population is strengthening the demand for softwood supplies. The world's stocks of over-mature softwoods are being rapidly depleted, and already the rate of utilisation exceeds greatly the rate of increment. On account of excessive local demand exports from softwood exporting countries must diminish inevitably, and in thirty years, it is estimated, they will have reached the vanishing point. Australia's softwood resources are very limited. Queensland alone can almost meet her home requirements, but when all her over-mature pine has passed through her mills, the increment of under-girth pine will supply but a small percentage of her demands. There is only one solution—plantations of softwoods. That is Mr. Greening's opinion, and his views on this and other phases of our forestry problem will be read with interest by all concerned in Queensland's timber future. The first instalment in the June issue covered an explanation of planting systems and some points in forestry practice.—Ed.

Forest Finance.

In the establishment of plantations forest finance is a chief consideration. Suppose, *firstly* that a plantation produces 50,000 super. feet log measure per acre on a rotation of fifty years, *secondly* that it is established in an accessible locality, and *thirdly* that the royalty per 100 super. feet is 15s.; then the gross return will be £375 per acre. In other words, if money can be loaned at 5 per cent. then the present value of establishment and maintenance costs in order to clear expenses should not exceed £33. But the present value of these costs should not exceed £10, which in fifty years at 5 per cent. compound interest amount to £115. The net profit then equals £260. But £10 amounts to £260 in fifty years at approximately 7 per cent. compound interest. Therefore after paying 5 per cent loan on money a profit of 7 per cent. would be realised.

From the above example, it is obvious that—(*a*) The nearer the plantation to the market, (*b*) the shorter the rotation, (*c*) the lower the establishment costs, and (*d*) the higher the value of the timber, the greater will be the profit derived from the plantation.

It is therefore most important—

(1) To establish plantations close to the market.

(2) To shorten the rotation by selecting rapidly growing species, adopting correct thinnings methods, and planting suitable localities.

(3) To reduce costs of formation by improving nursery and planting practice and by selecting areas where the cost of clearing is low.

(4) To select the most valuable species.

Before a country can lay down a sound forest policy the following points must be carefully considered:—

(1) What are the country's present timber resources and what will be the future requirements?

(2) What is the present and prospective world situation?

(3) How can the present and future generations be provided for most economically?

The World's Softwood Consumption.

What timber does the world utilise to-day? Softwoods comprise over 80 per cent. of the total consumption. In short, the available timber resources of the world consist chiefly of softwoods. Were hardwoods obtainable in greater quantity, then the percentage consumption of softwood would undoubtedly be reduced, but would always exceed that of hardwood. In America, India, and Europe softwoods are used for railway sleepers, poles, posts, and rails, for which purposes hardwoods are used in Australia. However, even in a country rich in hardwoods the consumption of softwoods per head exceeds that of hardwoods.

Provision for the Future.

Having completed a survey of the present timber resources the question arises: How can provision be made for the future requirements of the country most economically? Might it not be advisable to import timber rather than to invest in extensive plantations? Perhaps! if the world supplies of softwood were inexhaustible.

Great Britain, situated close to apparently inexhaustible supplies of softwood in Russia, Scandanavia, and North America, adopted this policy in the past, but the world situation is now too serious to delay, so she has undertaken a very extensive plantation scheme. Every country should be self-supporting in timber, if economically possible.

Then how can this most desirable state of affairs be brought about? In the first place, the indigenous forests should be put under intensive management so as to obtain the maximum increment per acre. This should be brought about as far as possible by the natural regeneration of the indigenous forests.

The skill of the forester lies chiefly in his ability to so engineer the removal of a mature stand of timber that it is replaced by a completely stocked young stand regenerated naturally. A careful study to determine the optimum conditions of heat, light, and moisture required by the species during germination and establishment is first necessary to ensure the success of the operation. The overwood is removed in one or more fellings extending over a period of years. The admission of light to the ground floor is so regulated as to give the young seedlings all the protection needed during the precarious period of germination and establishment. But such an operation pre-supposes a condition of affairs ardently desired by all foresters, a condition existing only in the well managed forests in France and Germany, where the forests have been under systematic management for some centuries. It pre-supposes the existence of well stocked mature forests, of one or not more than three valuable timber species and no other vegetation of any consequence. There the many systems of natural regeneration with their adaptations can be applied with success. There every forester can evolve his own special modification of a sylvicultural system and secure results.

Unfortunately, these conditions very rarely obtain in other countries. As a result of the destructive selection system applied in the younger countries, *i.e.*, the removal of the better trees of the most desirable species, the inferior species, which are invariably the most prolific regenerators, predominate. The problem becomes complicated. Will it not be cheaper to create plantations than to attempt to regenerate naturally the better species when the removal of the inferior species is very expensive? In short, regenerate the forest naturally when a stand of the desired species can be obtained at a less cost than by planting. In all other cases, plant!

Even this cannot be rigidly adhered to. The financial aspect must be given full consideration in all forest problems, but it is not paramount. The experience of Saxony must not be forgotten. Forest finance proved that it was cheaper to clear all the mature forest and to plant the quickly growing spruce. The balance of nature was upset. The forests were even aged and of one species. Buds disappeared. Insect pests increased and the nun moth wrought such havoc that natural regeneration, uneven aged forests, and a mixture of species were adopted. Large areas of one species, which does not occur alone in the locality, naturally should be avoided.

If a deficiency of either softwoods or hardwoods or both occur in a country, and this cannot be remedied by natural regeneration, plantations must be laid down. Not only can the most desirable species be introduced, but the factors of the locality can be utilised to their utmost to produce the maximum yield per acre, the right spacing can be adopted and the forests can be created close to the market.

Consider the situation briefly elsewhere.

Forestry in Europe.

In France, Germany, and other continental countries the forests are in such a state that they can be regenerated naturally without difficulty. Recourse to planting is now only had where blanks occur and waste land is to be afforested. The foresters of the Black Forest point with pride to their nurseries filled with cabbages.

In the early part of the 18th century the landowners of England appear to have turned their attention from arboriculture to sylviculture. By 1730 extensive planting was general throughout the United Kingdom, while the formation of large nurseries to supply young trees for planting appears to have become an established business between 1730 and 1750. For a century and a-half it was generally supposed that imports from abroad supplemented by private enterprise would always be able to meet the increasing demands for timber. The consumption per head increased rapidly. The imports of timber, wood manufactures, and pulp of wood over a period of ten years (1913-1922) attained an annual average value of £55,000,000, reaching a maximum of £120,000,000 in 1920.

The lack of adequate forest resources was acutely felt during the war, so much so that the Forestry Act of 1919 provided for the planting of 1,180,000 acres of conifers in forty years. For the first ten years the Forestry Commission was charged with the afforestation of 150,000 acres of new lands by the direct action of the State, and the assistance of Local Authorities and private owners, for the afforestation or reafforestation of 110,000 acres at a total cost of £3,450,000.

The Union of South Africa.

Owing to the very restricted natural forest resources of the Union of South Africa and the great necessity of augmenting the timber supplies, afforestation of vacant waste lands is the main channel along which the activities of the Department are directed. Numerous exotic species are employed, these yielding the ordinary softwoods of commerce and the durable hardwood, such as species of Eucalypts, the selection differing in various parts of the country according to the factors of locality. It is estimated that it will be necessary to plant 300,000 acres of conifers if the country is to become independent of imports. The present policy provides for the establishment of 8,000 acres per year.

New Zealand.

New Zealand, unlike South Africa, which imports both hardwoods and softwoods, shows an excess of softwood exports over imports. The softwood resources are, however, nearing exhaustion, and there are little prospects of the natural regeneration of these forests providing more than a small percentage of the future softwood requirements. Exotic conifers, which grow more rapidly than the indigenous species, are therefore planted on a large scale. The afforestation policy adopted by the State in 1896 has resulted in the planting of some 60,000 acres to the present date. The State has rightly, however, planted mainly species requiring a rotation up to forty years or more. Eucalypts occupy only 7 per cent. of the area, with softwoods covering 73 per cent., only 8 per cent. of which consists of the inferior Pinus radiata (or insignis). Two County Councils have planted extensive areas—Selwyn having 7,000 acres of established plantations and Ashburton 4,500 acres. Other Councils and private companies are operating in a smaller way, whilst a larger company proposes to operate on a large scale.

Australia.

Returning to Australia, we find the position equally serious, but less is being done to meet the situation. Australia is fortunately placed with regard to hardwood forests, and granted the general rules of forest management are applied to the eucalypt forests, there will be no shortage of hardwoods. The natural regeneration of the existing hardwood forests, assisted in certain cases by plantations, will provide for future requirements.

In the case of softwoods, however, the situation is different. Australia imported softwoods in 1920-21 exceeding £5,000,000 in value. She will require more in the future, owing to development of industry, increasing population, and administering home supplies. The world's supplies of over-mature softwoods are being rapidly depleted. The rate of utilisation greatly exceeds the rate of increment. In thirty years' time little softwood will be exported from Canada, United States of America, and Scandinavia. The softwood resources of Australia are very small. Queensland alone can almost supply her requirements, but when the over-mature pine is removed the increment of the undergirth pine will supply but a small percentage of her

demands. There is only one solution—plantations of softwood. The natural regeneration of the present pine forests in Queensland will prove costly, if possible and, even if successful, the consequent increment will supply but a small part of the State's requirements. *Queensland requires 5,000 acres per annum to meet her minimum requirements in the future.*

Conclusion.

To the tourist, who has no interest in forestry, there is nothing more picturesque on the Continent, and in Germany in particular, than the beautiful forests which surround the majority of the towns and villages. These forests are, as a rule, owned by the community. Forty per cent. of the total forest area of Hesse Darmstadt and 46 per cent. of Baden consists of communal forests. Of 1,350 towns and villages in Hesse Darmstadt 722 possess forests, the average area of which is 330 acres. These town forests not only add greatly to the beauty of the town and its environments, purify the atmosphere and afford free recreation grounds, but assist a great deal in reducing taxes.

The gross income of the communal forests of Hesse Darmstadt in 1911 was £250,000. Some communities are so fortunately situated that, after the returns from the communal forests have paid the income tax, a credit balance remains. Moreover, labour is required for the forests in the winter time when unemployment is prevalent. Finally, it is considered that one of the chief values of such a forest lies in the fact that it prevents speculators from buying up land around the town as an investment. There are few more beautiful cities than Gympie, if any, in Australia. By virtue of its situation and surroundings it possesses a natural beauty which it will always retain. But could a town forest be created to cover the vacant land around the town and hide the unsightly mullock heaps, the beauty of the town would be enhanced, and I would urge the Town Council of Gympie and other municipal centres to give this proposal serious consideration.

POULTRY IN LONDON—A TRIAL SHIPMENT.

The New South Wales Minister for Agriculture (Mr. Chaffey) has received through the Agent-General a report from Messrs. Sproat and Co., of Smithfield, London, on the 300 pairs of chickens shipped from Sydney last January.

After commending the way in which the birds were graded and packed, Messrs. Sproat and Co. pointed out that, as the chickens are required as a substitute for either petits poussins or English spring chickens, the sizes should range from 1 to 2 lb. This size should suit local breeders, as it is recommended that the birds shall be shipped during November and December, just when breeders are becoming pushed for room and the glut of small-sized birds is setting in.

The report compares the Black Orpington with the other chickens (White Leghorn), and says that the "Blacks" were of good quality, but too dark in appearance, and recommends white-fleshed milk-fed birds. Messrs. Sproat and Co. consider that the financial results from the latter would well repay for the extra preparation.

It is mentioned that the birds should be killed by bleeding, instead of dislocation of the neck. This was understood here, but difficulty was met with in getting them killed in this way. Fifteen and a-half pairs of the birds are reported as bruised in the killing, and in consequence were sold at 2s. per pair. After stating the table birds of the larger class (weighing 3½ lb. and upwards) would meet with ready sale, it is pointed out that in this larger class White Leghorns would not be suitable.

The report adds that there is a fair prospect for the chickens of 1 to 2 lb. weight if the suggestions are carried out. Market rates for this class of chickens at the time were 2s. 6d. to 3s. 6d. per pair. The net result, after expenses, is 3s. per pair for the birds other than those reported as bruised.

In comparing this with the market price at the time, it should be borne in mind that the average of 2s. 6d. and 3s. 6d. per pair would be 3s., but, as it costs 6d. per pair to market them locally, there appears a gain of 6d. per pair.

EGG-LAYING COMPETITIONS.

MOUNT GRAVATT.

During May the laying was very satisfactory, an average of 15.8 eggs per bird. Two deaths occurred—C bird of Mrs. Hutton's White Leghorns and D bird of Messrs. Hindes's Black Orpingtons.

Individual scores:—

SECTION 1.

White Leghorns.

Name.	A.	B.	C.	D.	E.	F.	Total.
W. E. Woodward	44	40	48	31	37	28	228
B. Driver	39	27	45	33	38	43	225
E. J. Stilton	44	38	36	38	43	19	218
John J. McLachlan	41	38	36	37	38	26	216
Eclipse Poultry Farm	48	42	36	37	43	3	209
W. and G. W. Hindes	34	40	35	31	33	32	205
Mrs. R. E. Hodge	34	28	29	44	25	39	199
J. Harrington	29	27	32	37	33	35	193
W. Wakefield	37	37	20	39	34	19	186
J. Hutton	33	28	26	14	36	45	182
M. F. Marsden	36	21	24	18	40	42	181
J. E. G. Parnell	30	22	35	38	25	28	178
R. C. J. Turner	34	31	48	34	16	35	178
Jas. Earl	40	39	9	31	22	34	175
L. Bird	43	29	3	23	45	25	168
G. W. Cox	29	23	25	29	28	21	155
M. F. Newbury	19	32	35	37	10	21	154
E. Anderson	9	31	15	20	37	40	152
S. L. Grenier	38	28	39	4	20	22	151
H. Fraser	10	28	36	25	22	10	131
Mrs. H. P. Clarke	9	28	25	31	30	7	130
A. S. Walters	22	34	9	19	8	35	127
T. W. Honeywill	21	1	38	18	29	18	125
H. P. Clarke	3	33	5	10	36	31	118
Chris. A. Goos	33	3	20	24	..	24	104
George Marks	15	28	20	3	32	6	104
T. H. Craig	5	27	17	32	3	16	100
W. D. Melrose	24	37	4	..	15	15	95
Mrs. C. Lindley	4	6	9	35	8	13	75

SECTION 2.

Black Orpingtons (except where stated).

Name.	A.	B.	C.	D.	E.	F.	Total.
Eclipse Poultry Farm	37	38	48	35	33	29	220
J. Potter	47	22	36	32	41	41	219
H. Cutcliffe	45	29	31	25	34	30	194
W. and G. W. Hindes	50	15	18	26	29	44	182
E. Walters	25	27	17	33	40	34	176
G. E. Rodgers	10	33	38	27	39	27	174
E. W. Ward	22	27	34	30	31	29	173
Thos. Hindley	38	21	40	7	39	11	156
Carinya Poultry Farm	33	32	5	20	37	16	143
J. Pryde (R.I. Reds)	4	35	11	36	22	29	137
J. Hutton	37	7	37	38	1	16	136
R Burns	28	16	9	23	42	15	133
Mrs. A. E. Gallagher	14	22	29	6	15	33	118
C. Dennis	20	14	29	19	16	19	117
W. D. Melrose	2	25	24	34	26	1	112
E. C. Stead (Wyandottes)	..	3	..	..	25	..	28

N.U.P.B.A.—TOOWOOMBA SUB-BRANCH.

Single Test Egg-laying Competition—Scores to 31st May, 1925.

WHITE LEGHORNS.

Pen No.	Name.	May.	Total.	Pen No.	Name.	May.	Total.
42	Dipple, D. H.	22	46	23	Everlay P.F.	25	27
41	Dipple, D. H.	21	45	38	Fallon, P. J.	13	27
8	Wagner, H. S.	23	44	58	Chapman, S.	20	27
11	Hutton, Jas.	24	44	62	Goggins, J.	21	27
40	Cole, R. C.	22	43	36	Turner, R. C. J.	12	26
29	Jones, J. H.	25	42	57	Chapman, S.	22	26
21	Rogers, G. E.	22	40	45	Frawley, M. J.	11	22
50	Keena, C. A.	21	40	1	Taylor, Jas.	21	21
60	Murphy, M.	19	40	61	Goggins, J.	14	21
14	King, J. E.	20	39	22	Rogers, G. E.	17	19
39	Cole, R. C.	20	39	20	Dibbs, C. H.	12	17
54	Howe, E. W.	21	39	44	Sharkey, S. B. V.	11	17
7	Wagner, H. S.	17	38	56	Dalheimer	14	17
27	Short, J. W.	20	37	59	Murphy, M.	11	17
35	Turner, R. C. J.	18	37	4	Parker, E.	15	16
48	Stilton, G.	19	37	10	Horne, A. C.	5	16
52	Howard, R. B.	23	36	37	Fallon, P. J.	5	15
9	Horne, A. C.	24	35	30	Jones, J. H.	8	13
43	Sharkey, S. W. V.	22	34	51	Howard, R. B.	13	13
53	Howe, E. W.	21	34	3	Parker, E.	9	12
28	Short, J. W.	13	33	12	Hutton, Jas.	3	12
17	Williams, W. D.	18	32	13	King, J. E.	4	11
26	Harper, W. C.	19	32	34	Manning, H. G.	2	8
32	Newport	20	32	15	Grant, W.	5	5
33	Manning, H.	23	32	55	Dalheimer	0	4
19	Dibbs, H.	18	31	18	Williams, W. D.	1	4
24	Everlay P.F.	20	30	6	Maurer, G.	2	4
47	Stilton, G.	12	30	25	Harper, W. G.	2	2
46	Frawley, M. J.	12	19	31	Newport, J.	0	0
2	Taylor, J.	10	28	15	Grant, W.	0	0
49	Keen, C. A.	16	28	5	Maurer, G.	0	0

BLACK ORPINGTONS.

130	Neul, R.	27	52	125	Stephens, H. B.	16	24
117	Hindley, T.	28	48	114	Williams, D. W.	17	24
131	Rogers, G. E.	28	47	123	Hopkins, P.	0	22
132	Rogers, G. E.	25	46	129	Neil, R.	21	22
128	Short, J. W.	24	46	102	Carr, T. J.	14	21
120	Hutton, Jas.	24	45	109	McBean, S.	19	20
107	Graham, C.	19	44	113	Williams, W. D.	7	20
89	Le Pla, A. W.	22	44	96	Burns, R.	0	19
121	Brock, E. W.	23	43	122	Brock, E. W.	17	18
116	Everlay P.F.	25	43	88	Head, J.	17	17
106	Maund, L.	21	43	91	McFarlane, K.	17	17
99	Petty, A. R.	25	42	85	Kelly, —	9	16
119	Hutton, Jas.	22	42	115	Everlay P.F.	12	12
105	Maund, L.	20	40	104	Adams, W. S.	5	8
98	Rye, V. J.	18	39	118	Hindly, T.	5	7
108	Graham, C.	24	36	83	Wilson, W. R.	6	6
100	Petty, A. R.	23	36	86	Kelly, —	6	6
111	Walters, A. E.	18	33	126	Stephens, H. B.	5	5
112	Walters, A. E.	18	33	101	Carr, T. J.	1	5
97	Rye, V. J.	22	30	92	McFarlane, K.	4	4
127	Short, J. W.	29	29	84	Wilson, W. R.	2	4
124	Hopkins, P.	4	26	103	Adams, S.	0	3
95	Burns, R.	17	26	87	Head, J.	1	1
93	Ollier, T. C.	13	26	110	McBean, S.	0	0
90	Le Pla, A. W.	6	25	94	Ollier, T. C.	0	0

N.U.P.B.A.—TOOWOOMBA SUB-BRANCH—*continued.*

OTHER VARIETIES.

Pen No.	Name.	May.	Total.	Pen No.	Name.	May.	Total.
80	Everlay P.F. (W. W'dotte) ..	24	36	76	Badcock, — (R.I. Red) ..	3	12
71	Dibbs, H. (Lang.) ..	25	36	78	Maund, L. (Col. W'dotte) ..	12	12
77	Maund, L. (Col. W'dotte) ..	18	32	82	Brand, V. (B.L.) ..	7	9
75	Badcock, — (R.I. Red) ..	16	28	66	O'Connor, K., Mrs. (B.L.) ..	7	7
64	Chapman, S. (B.L.)	11	22	65	O'Connor, K., Mrs. (B.L.) ..	6	6
73	Le Pla, A. W. (R.I. Red) ..	2	18	67	Parker, E. (B.L.) ..	0	3
63	Chapman, S. (B.L.)	12	17	68	Parker, E. (B.L.) ..	0	3
79	Everlay P.F. (W. W'dotte) ..	11	17	81	Brand, V. (B.L.) ..	2	2
74	Le Pla, A. W. (R.I. Red) ..	6	14	72	Dibbs, H. (Lang.)	1	1
				69	Badcock, — (Lang.)	0	0
				70	Badcock, — (Lang.)	0	0

JOSEPH GARNER, Government Supervisor.

SILOS AND SILAGE.

BY A. E. GIBSON, Instructor in Agriculture.

In a recent letter directed to the Department of Agriculture and Stock, on the subject of silos and silage, the correspondent mentioned that he had taken considerable interest for some time past on subjects likely to benefit the man on the land, and incidentally matters relating to silage; but mentioned that certain items which have occurred to him have either been insufficiently dealt with or totally ignored. Consequently, with a view of clearing up the several matters in connection with silos and silage on which he desires information, the following questions submitted by him are dealt with seriatim:—

Question 1.—What is the best form of silo?

Answer.—A properly roofed and watertight cylindrical structure of reinforced concrete built overground and having an internal shute for emptying purposes in preference to doors.

Question 2.—Which is the better plan? Having the height greater than the diameter or *vice versâ*?

Answer.—Silage rapidly depreciates when exposed to the atmosphere; consequently in order to reduce surface exposure to a minimum the diameters of silos are reduced as much as possible, whilst the height is increased in order to give a greater pressure to the silage for the purpose of compaction and consequent exclusion of air from the silage. Usually the proportion of height to diameter is 2 to 1 respectively, and is found to be economically preferable to those in which the height compared to the diameter is at a higher ratio, say, 2½ or 3 to 1.

Silos which are excessively high require greater strength in foundations and walls, apart from which higher power and more expensive machinery is necessary for the filling.

Question 3.—Or is there any specific proportion between diameter and height?

Answer.—This question is really answered under Answer 2, but, whilst there is no distinct or specific proportion between diameter and height, it must be clearly understood that as the diameter increases to the ratio of the height so is the density of the silage decreased unless some form of artificial pressure is used.

Question 4.—Which is the best silo? Above ground level, below ground level, or half and half?

Answer.—Although it is admitted that the filling of a pit or underground silo is extremely economical and can be effected with a minimum amount of machinery and labour, the process of emptying the silage therefrom is the most costly and strenuous of all forms of silos. The overhead silo, whilst requiring a little more power and machinery for the filling, is the most economical of all when it comes to the operation of emptying. The silo which is half above and half below ground level has all the drawbacks of the pit and overhead silo, whilst only possessed of half the benefits of the latter.

Briefly, the merits of the three silos may be summed up as follows:—

Pit Silo.—Economical in filling, expensive in emptying (it requires the services of two operatives to empty a pit silo).

Overhead.—Slightly more expensive, due to increased power and machinery in the process of filling, but is decidedly economical in the process of emptying.

Half aboveground.—Costs practically the same to fill as an ordinary overhead silo, and is as cheap to empty down to ground level. From that on the cost of emptying becomes greater with the depth below surface.

Question 5.—Give dimensions for building a 50-ton silo.

Answer.—Silo internal diameter 11 ft. 6 in.; height, 23 ft. 3 in.

Question 6.—Give quantities for making same.

Answer.—For a 50-ton silo, using a 4-2-1 mixture—*i.e.*, four parts of broken stone, two of sharp sand, and one of cement—you would require:—Cement, 70 bags; stone aggregate (¾-in. gauge), 14 2/5 cubic yards; sharp sand, 8 cubic yards; reinforcement, 2 coils 36-in. K-Wire netting, 10 gauge; rendering, 1 in. inside and out, 2½ cubic yards sand; 36 bags cement. Roof specifications depend on style adopted (gable or octagon).

Question 7.—How would you work out the necessary information from Answers 5 and 6 to enable one to build (*a*) larger silo, (*b*) a smaller silo?

Answer.—Diameter 2 × .7854 × height ÷ 48 = tons capacity. Diameter × 3 1/7 × height × thickness of wall in feet ÷ 27 = cubic yards contents of wall.

Based on the proportions of 4-2-1—*i.e.*, four of stone, two of sand, one of cement. To each cubic yard of concrete 540 lb. of cement are required (4½ bags). Of aggregate (stone) broken to gauge (in this instance ¾ in.) nine-tenths of one cubic yard are required and ½ cubic yard of sharp sand.

The cement and sand together do not appreciably increase the bulk of the concrete, as they fill up the interstices in the aggregate.

Rendering (inside and out) is calculated at 2 to 1 (2 of sand and 1 of cement). This will give a sufficiently watertight job without the addition of water-proofing material.

Question 8.—What acreage of maize will fill a 50-ton silo?

Answer.—This, of course, depends on the crop; also the manner in which it was sown—*i.e.*, broadcast or drilled. Under ordinary circumstances the quantity required should be easily obtained by the cultivation of 5 acres of maize sown in drills—which method is recommended at all times in preference to sowing broadcast.

Question 9.—How is a silo filled?

Answer.—By a power-driven elevator of a similar pattern to that used on chaff or grain elevators, slats of timber being substituted for cups, or by blower—the latter being simply a fan blast driven at a high rate of speed with delivery pipes of 6 in. and upwards led directly into the silo at the top. More power is required to a "blower" than an elevator. Whatever system is adopted for the purpose of conveying the chaffed green material from the chaff or silage cutter to the silo must make provision for its equal distribution. Where chaffed maize is indiscriminately fed into a silo, the tendency will be found for the heavier (stalk) portions to lodge in the centre, whilst the lighter (leafy) class of material accumulates around the walls.

Unless this is thoroughly incorporated with the heavier class of fodder in the subsequent fermentation which takes place, uneven settlement results. The centre, by reason of its greater solidity, does not settle to the same extent as the outside or lighter material; consequently a shrinkage from the walls occurs, admitting air, which, once fermentation has lessened, brings about a gradual decay of all the exposed surfaces of the silage.

To overcome this, all material fed into silos must be evenly incorporated and tramped tightly along the walls, and around all doors of internal chutes. To do this thoroughly necessitates the presence of a competent and reliable operative in the silo during entire filling operations. Note that all doors that come in contact with the silage must be rendered airtight. This can be effected by covering them with tarred brown paper.

Although the question was not asked by the correspondent, it is thought that a few points on emptying will not be amiss.

When emptying use a strong-toothed rake, and rake evenly from the top the amount of silage required for the daily ration. At all times avoid digging into the bulk of the silage. Remember that the more even and level the surface of the silage is left after each daily ration is obtained, the less decomposition and consequent waste will occur. If your silo has doors fitted to it, keep them closed; there is then less strain on the hinges and the doors (which are weighty) would fit more snugly when refilling, apart from which there will be no chance of rain destroying the silage, for nothing tends to bring about the decomposition of silage quicker than the admission of either air or water.

THE AUSTRALIAN STUD PIG BREEDERS' SOCIETY.

NOTES ON ITS ACTIVITIES.

E. J. SHELTON, Instructor in Pig Raising.

As far back as the years 1900 to 1910 breeders of stud pigs throughout Australia realised the desirability of establishing a Stud Pig Breeders' Society to control their interests and to publish a Herd Book, but it was not until the year 1910 that a definite move was made in this direction. During that year a society known as the Berkshire and Yorkshire Society of Australasia was founded, with Victorian breeders as its executive, and with offices in Melbourne. The society published its first Herd Book during 1911, the editor being the first secretary of the society, Mr. Arthur Beale, a gentleman now known favourably by the whole of the breeders of stud pigs throughout the Commonwealth. Mr. Beale piloted the society through many difficult stages, and it is to his untiring efforts that the ultimate success of the society is attributed.

The first Herd Book contained the registered pedigrees of 217 Berkshires and 192 Yorkshires (practically all Middle Yorks), the pedigrees and verifications being compiled from old records that existed through the Royal Agricultural Society of Victoria. It is worthy of note that, in the year 1911, out of a total membership of sixty-six breeders all were Victorians, with one exception, that veteran old breeder, Mr. Luke Williams, of "Claremont," Moonah, Tasmania.

The first Queenslander to join the society was Mr. C. H. Grove, of Kelvin Grove, Nanango, whose membership records date back to 1912. During the following year Mr. W. J. Warburton, of Northgate Junction, became a member and had a number of pigs registered.

Interstate representatives were elected by the society in the year 1914, Queensland then being represented by the assistant secretary of the Royal National Agricultural Association. It was during 1914 also that the first entries of Tamworth pigs were accepted for registration. The following year the breeders of British Large Black pigs joined up and had their animals recorded, whilst in 1916 the Poland-China enthusiasts also added their support.

The present secretary, Mr. R. G. Watson, was elected in 1922, and it was through his efforts that the first meeting of the members of the society resident in this State was called, this meeting being held during the currency of the Royal National Show, 1922.

At this meeting it was resolved to apply to the main body in Melbourne for representation in the conduct of the affairs of the society, and Mr. Watson was deputed to attend the annual general meeting in the Southern State to forward Queensland interests. It was at this latter meeting that the constitution of the society was rearranged to allow of each State having its own representatives. A Federal General Council was also elected as the permanent administrative body.

Objects and Methods of the Society.

The principal objects of the society are:—

(*a*) To maintain the purity and promote the improvement of all recognised pure breeds of pigs in Australia.

(*b*) To collect, verify, preserve, and publish a Herd Book with the pedigrees of the abovementioned pigs and other useful information concerning them.

(*c*) To investigate suspicious or doubtful pedigrees of pigs and other alleged misrepresentations relating to them and to publish the results of such investigations at the discretion of the Federal Council.

(*d*) To increase the educational value of agricultural shows and to encourage the exhibition of representative and typical animals of the various pure breeds of pigs by offering trophies or cash prizes for competition thereat, and endeavouring to have competition limited to registered pigs and the exhibits judged by competent judges included in an official panel drawn up and published by the society.

(*e*) To promote fellowship amongst the pig-breeders of Australia and to further their mutual interests generally in so far as the breeding of stud pigs is concerned.

(*f*) To establish relations and encourage exchanges with other societies having similar objects throughout the world.

(*g*) To do all such other lawful things as are incidental to the attainment of the above objects.

In 1924 new rules were adopted placing certain rights and duties on branches with their representation on the basis of membership; thus it is that Queensland

now has one representative member on this Federal General Council. Each State now has its own executive for the conduct of its own affairs. The name of the society was also altered to "The Australian Stud Pig Breeders' Society."

Duroc-Jersey and Gloucester Old Spot pigs were accepted for registration in 1925, the former being entered by a Queensland breeder, and now, after an elapse of several years, Large Black pedigrees again find a place in our records.

Up to the issue of the Herd Book, Volume 15, in 1925, the registrations accepted numbered—Berkshires, 6,180; Yorkshires, 2,992; Tamworths, 405; Poland-Chinas, 164; British Large Blacks, 38; Duroc-Jerseys, 7; Gloucester Old Spots, 4.

On the first day of January, 1925, the following new rules governing registration came into operation:—

Rule 51.—All applications for registration must be made on printed forms supplied by the society and lodged, together with the prescribed fees, with the secretary of the branch in the State in which the entrant resides. When the entries are in order the branch secretary will forward them to the Federal secretary, who will record the registrations and allot the Herd Book numbers. If the Federal secretary should question the eligibility of any animal submitted for registration, the matter shall be referred to the Federal Council. The onus shall rest with the entrant in all cases of satisfying the Federal Council of the undoubted purity of animals submitted for registration and as to the correctness of any additional information required, and the Federal Council shall have discretionary power to accept or reject any pedigree without giving any reason for so doing.

Rule 52.—Every member shall be required to register a separate stud prefix for his exclusive use in connection with the names of animals bred by him. (Fee 10s. 6d.)

Rule 56.—The name and address of the breeder of each animal must be given. The breeder of an animal is the owner of its dam at date of farrowing.

Rule 57.—The sire and dam of each animal submitted for registration must be already registered in the society's Herd Book or in a Herd Book recognised by the society, or applications for the registration of sire and dam must be accepted before the registration of such animal can be considered. The fee for the registration of each animal shall be 7s. 6d.

Rule 58.—On and after 1st January, 1925, it shall be compulsory for every breeder to record the date of farrowing of each litter from registered sows, giving particulars as to the number of each sex living and dead, such notification to be given on forms supplied by the society and to be furnished to the branch secretary within twenty-one days of the farrowing of the litter. (Fee 1s.)

Rule 59.—No boar or sow born on or after 1st January, 1925, will be accepted for registration, except at the discretion of the Federal Council, unless it is from a notified litter and is submitted for full registration before it is fifteen months old.

Rule 60.—It shall be compulsory for the vendor to officially transfer every registered boar or sow sold on or after 1st January, 1925, also every animal sold out of a notified litter. Such transfers must be made on the society's official forms and be lodged with the branch secretary within sixty days from date of sale, together with a fee of 1s.

Rule 62.—The prefix "champion" may be put in front of the name of any animal after it has won at Royal Shows two championships in one State and one championship in another State.

Rule 63.—All deaths of eligible stock owned by members must be registered within sixty days of death. (No fee.)

Rule 64.—The purchaser of a stud shall have no right to the previous owner's stud prefix except with the sanction of the previous owner and with the approval of the Federal Council.

Rule 65.—It shall be the duty of all members to keep proper records of their stud-breeding activities, such records to be open for inspection by any person appointed by any branch and approved by the Federal Council.

It will be observed that several of these new rules provide a distinct check on breeding and age.

Inter-society Co-operation.

The society is now co-operating with various Agricultural Show Societies with a view to forwarding the interests of stud pig breeders and of the pig industry in general. It is also constantly in touch with the British Berkshire Society and the National Pig Breeders' Society of England, and other overseas pig breeders' associations, and is at present co-operating with the Department of Agriculture and Stock, Brisbane, in endeavouring to make arrangements for the importation of fresh strains of stud pigs from England.

Membership.

In 1922 Queensland had only five financial members of the society. To-day there are twenty-six members on the roll, all active breeders who take an interest in the affairs of the society. These breeders realise the importance of the work being done and appreciate the status it gives them as breeders of pure-bred pigs.

The hon. secretary's address is Inns of Court, Adelaide street, Brisbane, and he will be pleased to assist prospective members with any information to enable them to become breeders of pure-bred pigs, while the Instructor in Pig Raising, Department of Agriculture and Stock, stands prepared to assist breeders also.

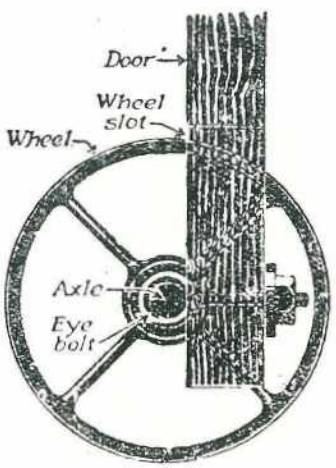
The office-bearers in Queensland are:—Committee: J. H. Whittaker, Broxburn Stud, Darling Downs (chairman); W. J. Warburton, Northgate Stud, Brisbane; J. W. Handley, Bonvale Stud, Murphy's Creek; E. J. Shelton, Instructor in Pig Raising, Brisbane; R. G. Watson, Inns of Court, Brisbane. Hon. secretary and treasurer and representative on Federal General Council, R. G. Watson, Inns of Court, Adelaide street, Brisbane.

The Queensland members are:—Jos. Ashford, Ashley Stud, Curra; C. Behrendorff, Inavale Stud, Bunjurgen, *via* Boonah; Brown Bros., Mooroombin Stud, Toogoolawah; E. Burton, Oxford Stud, Wanora; P. V. Campbell, Lawnhill Stud, Lamington; Dr. F. Glynn Connolly, Wilton Stud, Welleamp; The Benevolent Asylum, Dunwich; J. C. Davey, Abbeystead, Gatton; P. P. Falt, Ryfield Stud, Tingoora; W. H. Foote, Rockton Stud, Harrisville Line; A. Haly, Wadhurst Stud, Radford; J. W. Handley, Bonvale Stud, Murphy's Creek; Hospital for Insane, Goodna; J. S. Jacobsen, Louisiana Stud, Mount Larcom; Jack Lawrence, Elton Stud, Peeramon; J. Naylor, View Farm Stud, Cambooya; M. Porter and Son, Roseloch Stud, Wondai; Queensland Agricultural High School and College, Gatton; State Farm, Hermitage; State Farm, Kairi; State Farm, Warren; F. Wallison, Kunioon Stud, South Nanango; W. J. Warburton, Northgate Stud, Northgate; R. G. Watson, Inns of Court, Brisbane; J. H. Whittaker, Broxburn Stud, Broxburn; W. C. Zerner, Cooroy Stud, Cooroy.

Membership forms and all other information may be obtained from the secretary at any time.

SUPPORTING SWINGING DOORS.

Wide, heavy swinging doors have a way of sagging to the ground and becoming hard to open and close. Procure a light wheel, twelve or fifteen inches in diameter and having a fairly wide tyre. Cut a slot at the lower edge of the door, and near its outer end, large enough to accommodate the wheel and give it fairly free play.



Block up the door to the desired height from the ground. Fit the wheel with an axle of proper length, so that there will be some bracing strength beyond the eyebolts, one on each side of the wheel, with which it is attached to the door. Roll the wheel into position and assemble as shown. This is the best means for handling wide doors satisfactorily.

THE FRUIT FLY.

REPORT ON MEASURES OF POSSIBLE CONTROL, 1924-25.

By H. JARVIS, Entomologist, Stanthorpe.

FRUIT FLY—*Chaetodacus tryoni.*

The Control Measures.

Special efforts were made this season, 1924-25, by the Department of Agriculture and Stock to control the fruit fly, *Chætodacus tryoni* Froggatt, in the Stanthorpe district.

These endeavours embraced the following procedures:—

1. The interruption of the alleged continuous persistence locally of the fruit fly as a pupa in the soil.
2. The enforcing (by an increased inspectorial staff) of the picking up and destruction of all fallen or infected fruit in every orchard.
3. The cold storage of and embargo on unrestricted importation, and check-inspection at Warwick, of every case of fruit consigned to the Stanthorpe district.
4. The destruction of the adult fruit flies by means of traps baited with "Harvey's Lure."

1. Clearance Out of Fruit Fly by 7th April, 1924.

It having been stated that "The origin of the fruit fly each season was bound up with the hibernation of the pupa in the district," the Department of Agriculture secured, on 1st March, 1924, a Proclamation of a special Regulation, under "*The Diseases in Plants Act*, 1916," compelling all fruit (except grapes and tomatoes) to be sent out of the Granite Belt district by 7th April, as a measure for ensuring the prevention of the occurrence of the fruit fly within that area in the spring.

In an official report at this time I stated that I could not support this Regulation in its relation to fruit fly control, as all my experiments had up to this time indicated that the fruit fly did not winter as a pupa in the Granite Belt district.

This Regulation was enforced with great thoroughness, fifteen temporary inspectors being added to the staff for that special purpose.

The fruitgrowing area was, accordingly, "cleaned up" on or before the date mentioned.

However, "fruit fly" appeared by the second week in November all through the district, and by the end of the month much of the early fruit was "fly-stung" as in earlier years.

The Department, meanwhile, was carrying out experiments to test this fact of hibernation (a presumed fact, certified to on very slight evidence). There were placed out in various orchards large quantities of maggots and pupæ, in various situations, both sheltered from frosts and otherwise; and they in each case were kept covered in with fly-proof frames. In some cases the fruit harbouring maggots was buried a few inches under the soil, and in other cases it was just placed on the surface; pupæ were also buried at various depths from 1 to 12 inches.

Result.—Fruit flies failed to occur in any of these cages at the date for their usual appearance, or at any time subsequently. This, of course, is only negative evidence. However, there has been no requisition for the renewal of this Regulation this April. [The Department of Agriculture is now prosecuting a final test bearing on this over-wintering question, in two cages erected over fruiting trees. These cages are ample ones, being 8 feet long, 6 feet wide, and 6 feet high. At least 4 cwt. of maggot-infested fruit is now placed on the ground in each of the cages. This fruit harbours every stage of living fruit fly maggot and should prove a conclusive test of the hibernation or otherwise of the pupa in the district. In view of the possibility of the over-wintering of the adult fruit fly, rolled sheets of woolly bark tied tightly at the top have been placed in these cages, one end each of these bark shelters rests in the soil and the other end is supported by the branches of the tree. Fruit flies will thus be enabled to find shelter, secure from all frost and cold winds and thus survive the winter, if it be usual with them to do so. I am greatly indebted to Mr. J. W. Barlow, of Applethorpe, he having kindly placed two of his trees at my disposal, and given me otherwise very great assistance in this experiment.

(*Note.*—It is also hoped with some foundation that these cages will prove invaluable in the forthcoming season in supplying other data, not already secured, relating to fruit fly, and also in testing lures (under control conditions), repellents, &c.)]

2. The Gathering and Destruction of Fallen and Infected Fruit.

A special effort was made to enforce this (the most important means of local fruit fly control hitherto favoured). On the recommendation of Professor E. J. Goddard six additional temporary inspectors, under the Diseases in Plants Act, were added to the six already on the permanent staff, thus making twelve in all. These temporary inspectors commenced duty on 17th November, and completed it on 4th April, the systematic inspection of every orchard at frequent intervals thus being made possible. This work was directed by the Chief Inspector, Mr. T. W. Lowry, and was undoubtedly of the greatest assistance in preventing to some extent the local increase of fruit fly, and in accounting for its comparative absence during the months of December, February, and March. Throughout the district the large majority of orchardists enjoyed more freedom from "fly" than was the case last year. There were, however, a few orchards on which the fly was fairly plentiful and active all through the season. At the end of it what seemed to be a wave or army of flies appeared suddenly in almost all orchards at the same time, totally destroying late peaches and apples, irrespective of the use of traps and lures or repellants. *Vide* "Influence of Season" (meteorological p. 52).

(*a*) *Difficulties attaching to this proceeding.*—In so large an undertaking as that involved in the frequent inspection of 700 or 800 orchards, it is difficult to account for the destruction of every individual maggot-infested fruit; hence a small leakage is unavoidable.

The principal causes of such leakage are:—(i.) The overlooking when picking of one or perhaps two fruits—leaving them on a tree. (ii.) The presence of weeds and grass in the orchard under the trees, making it possible, and, in fact, easy to miss individual fruits when gathering windfalls, &c. Both these happenings are responsible for a good number of fruit flies being bred in the district, more especially towards the latter end of the season.

(*Note.*—The extent to which the fruit flies (so bred) are responsible for fresh local infestation is a point not yet ascertained. It is, of course, quite possible, and in my opinion, probable, that these locally-bred flies are not ready to oviposit even perhaps, say, for many weeks. It is hoped that definite information on this point will be secured next season.)

(*b*) *Efficiency in inspection.*—The systematic inspection of orchards carried out this season has been a difficult undertaking requiring great tact and industry; and credit is due to the Chief Inspector, Mr. T. W. Lowry, and also to every member of his staff for the manner in which they have carried out the work.

The majority of orchardists in the district have willingly complied with the regulations this season, realising that the Inspector was their best friend.

When once the importance of this unremitting cleanliness from the beginning to the end of the season is realised fully by all orchardists, frequent visits from an inspector should be unnecessary.

3. The Cold Storage Embargo and Check-Inspection at Warwick.

The check-inspection at Warwick (by Inspector C. G. Williams) of all fruit consigned to the Stanthorpe district, combined with the added precaution of subjecting such fruits to a cold storage temperature prior to their being despatched from Brisbane, has undoubtedly proved an important means of preventing a large number of living fruit fly maggots and puparia from being imported, as happened before the above precautionary measures were instituted, in the Stanthorpe area.

(*Note.—Uncontrolled entry of fruit fly.* I consider, however, that the most important factor contributing to our annual fruit fly infestation is the migration or immigration of the adult fly into this district from outside areas of Queensland, and possibly of New South Wales also. This possibility was recognised and pointed out by me in my earlier reports and is one now, I believe, generally accepted.)

4. Destruction of the Adult Fruit Fly by Trapping with "Harvey's Lure."

With a view to controlling the fruit fly, a special effort was made this season to distribute, at a more reasonable cost than hitherto, both glass fruit fly traps and also "Harvey's Lure."

Owing to this lure being considered efficient by Professor E. J. Goddard, suggested conclusive local tests (of its efficiency or otherwise) on a large scale recommended by this office were postponed.

I understand, however, that a number of tests were carried out with "Harvey's Lure" by Mr. A. T. Perkins, B.Sc., University Research Fellow, and that a very large number of fruit flies were trapped.

One test only was carried out by me with "Harvey's Lure." This was at the orchard of Mr. J. Smith, of Applethorpe. In it twenty "Granny Smith" apple-trees were chosen, each carrying a good crop of fruit; moreover, special care was exercised to ascertain that, at the time of setting the traps, none of this fruit had been already stung. One trap containing lure was placed in each tree, and this lure was renewed twice weekly. The lure used was that known as "Brew 5." Result, thirty-six flies were caught up to 1st March, when it was realised that, notwithstanding the presence of the traps and lure, all the apples were becoming badly stung. The main crop was accordingly gathered, one tree alone being left with a trap still set in it; but, in spite of the presence of this trap, every apple on this tree was badly stung also.

It will be seen, from the above experiment, that the placing of one trap baited with "Harvey's Lure" in a fruiting tree will apparently not prevent the fruit from being "stung."

The Chief Inspector, Stanthorpe district, Mr. T. W. Lowry, recently furnished each inspector under him with forms, one to be filled in by each orchardist, stating particulars *re*—(1) The use, or otherwise, this season of traps, lure, &c., and (2) the results in marketing, &c. These, that constitute most interesting reports, have now come to hand. It is shown by their reports, that about 50 per cent. of the orchardists used traps and lure this season; a few, systematically right through it, others just one or two traps at the beginning of the season. The remaining 50 per cent. of orchardists used no lure or traps. Some (very few) of these used repellents: Carbolacene (recommended by this office as "worth trying"). A few again used poison bait sprays. It is also evident, from these reports, that those using "lure," and those, not using "lure," shared the same comparative freedom from "fly" this season.

Many growers using traps and lure lost more heavily than last year, but again many not using lure lost more heavily than last year. As already stated, however, throughout the district the large majority of orchardists this season enjoyed more freedom from "fly" than was the case last year.

In spite of the partial freedom from fly experienced this year by most growers, there were a few orchards in which the fly was fairly plentiful and active all the season through. In such orchards (generally in very sheltered situations), whether luring was carried out or not, the loss was fairly heavy.

Conclusion.

I consider it only logical to conclude from the foregoing facts that the comparative absence of fruit fly during the months of December, January, and February was in no way due to the use of traps baited with "Harvey's Lure." The same applies also to the use of repellents by some, and these I must consider—for the time being—are of little or no use.

It is, of course, possible that both "lures" and "repellents" may in future yet play an important part in fruit fly control, if it be found possible to make them efficient agencies.

The inefficiency of the "Harvey Lure" was very noticeable towards the end of the season, when, as above stated, what appeared as a wave, or army of flies appeared suddenly in almost all orchards at the same time, totally destroying late peaches, pears, and apples, irrespective of traps, lures, or repellents.

It is still my opinion, based on observations and experiments during the last three seasons, that "Harvey's Lure" *as it is at present constituted* is of very little value in controlling the fruit flies *C. tryoni* and *C. jarvisi*.

It must not be forgotten, however, that there are orchardists who, from their own point of view, consider "the lure" really efficient, and attribute their partial freedom from fruit fly this season to its use; nor must it be forgotten that it will undoubtedly catch what may be regarded as very large numbers of "flies," many thousand fruit flies having been caught by "lure" this season, one orchardist alone accounting for 2,000 fruit flies.* But the whole object of luring—*i.e.*, the prevention of the fruit fly ovipositing on the fruit is not generally accomplished when the "fly" is *present* in an orchard in any numbers, especially as was the case toward the end of this season; and such as has often been the case in previous years.

It is a curious fact that "Harvey's Lure" if placed outside an orchard in the bush timber, high up or low down, will catch exceedingly few if any fruit flies. This fact would seem to indicate that either fruit flies travel at a very high altitude, out of reach of the scent of the lure, or that "Harvey's Lure" has very little attraction under this circumstance for them. Possibly if a poisoned fly-food

* This number little exceeds what might have been reared from 200 maggot-infested fallen apples only, and accounted for by their earlier destruction.—H.T.

could be used in combination with an efficient lure as a spray, better results might be obtained.

Fruit flies have been caught in the Stanthorpe district this season with several different lures, in addition to "Harvey's Lure," with varying, but no special success.

Seasonal Origin of Fruit Fly: (A concluding note).—As I have before stated, I consider that the migration or immigration of the adult fruit fly from outside areas into the Stanthorpe district is the principal source from which our yearly infestation of fruit flies (*in greater or lesser numbers according to climatic or seasonal conditions*) is derived.

Fruit Flies and Native Fruits.

In the last of my periodical reports I stressed the danger of native fruits (*i.e.*, fruits of native plants) in contributing countless numbers of fruit flies, *C. tryoni* and *C. jarvisi*, and I mentioned then—25th January, 1925—that certain fruit flies visiting this district had been bred and identified from their respective native host-fruits.

I have now to record this of three other species of fruit flies, two of them known to be injuriously related to cultivated plants, viz.—*Dacus cucurbitæ*, *Dacus cucumis*, and *Chætodacus latifasciatus*, Tryon and Jarvis Mss. These three fruit flies were, in March, bred by me from material supplied by Dr. T. Bancroft, of Eidsvold, Queensland, whose reputation as a scientist and as one of the foremost workers in fruit fly research is of fifty years' standing.

(*Note.*—I am very greatly indebted also to Dr. Bancroft for bringing to my notice many new host-fruits of *C. tryoni*, the "Queensland Fruit Fly," and also several new and interesting fruit fly parasites, and for very much valuable information on the biology of fruit flies in relation to Queensland.)

In April, 1924, I bred from infested pears and quinces a number of a light-coloured fruit fly that I had previously noted always made its appearance towards the end of each season and that I recognised as a species distinct from *C. tryoni*. Bred specimens of this fly were at this time forwarded to the Entomologist in Chief, who also concurred in regarding it as a distinct species, and he also named it after me.

On receiving some fruit fly specimens from Dr. Bancroft in January last, I was surprised to find a fly identical with this light-coloured fly—*C. jarvisi*. Dr. Bancroft had bred this fly from the fruit of the native Cockatoo Apple (*Careya australis*) in 1922, approximately two years before I had bred it from cultivated fruit.

Dr. Bancroft, at my request, kindly made arrangements that some of this native fruit should be sent to me, and in due course it arrived and was found by me to be very badly infested with fruit fly maggots. Specimens of these maggots were kept in fluid for reference, and eight fruits were put in a breeding jar in the Departmental Insectary. On 3rd March, 1925, the flies began to emerge, and after feeding them for a few days in order to let them attain their full colour and shape, they were carefully compared with our local species and proved identical with the species *C. jarvisi*, Tyron Mss.—The "Jarvis Fruit Fly" of orchardists.

A sample of the fruit was sent to the Government Botanist, Mr. C. T. White, for identification, and from him I learnt that the range of this fruit (*Careya australis*) was from Wide Bay to Rockhampton.

This fly is exceedingly plentiful in this native fruit, and I succeeded in breeding out 342 from nine fruits. The fruit is no bigger than a small-sized hen's egg.

As an experiment thirty of these fruit flies (equal sexes) were liberated on 14th March in one of the department's cages, over a fruiting Granny Smith apple-tree, in the orchard of Mr. Barlow, at Applethorpe. Some are alive and active to date—18th April, 1925—in spite of continued cold bleak weather. Several of the apples of this tree, moreover, have been recently stung and these are under observation in the Insectary. I consider that this very important finding is a strong link in the chain of facts supporting migration.

It is remarkable that only three parasites (*Opius tryoni*, *Silvestri*) were bred from the above material, and, in fact, parasites seem to play a very unimportant part in controlling the Queensland Fruit Fly so numerous in many of its native host-fruits, especially if they be of any size.

The following native host-fruits of the Queensland Fruit Fly have been made known to me by Dr. T. Bancroft—*Solanum aviculare*, *Murraya exotica*, *Carissa ovata* (*?Melothrix cunninghamii*), *Opuntia* (*Ficus indica*), and Wild Kumquat (*Atalantia*).

Specimens indeed of the fruit flies, bred from these fruits by Dr. Bancroft, have been received by me and the flies identified—with an exception—as *C. tryoni*. In many cases Dr. Bancroft was kind enough to supply me with the fruit, thus enabling me to secure both the maggot and the adult fly.

We cannot do otherwise than consider that native fruits play a very important part indeed in fruit fly propagation, breeding as they undoubtedly do incalculable numbers of fruit flies.

As early as 1864, as I learn, deciduous fruits grown in Brisbane were infested with fruit fly maggots, necessitating at that time their total destruction; as at this time there were very few deciduous fruits grown and certainly no large commercial orchards, and there is only one source then from which these infestations could have come—*i.e.*, native fruits.

Influence of Season (meteorological).—We must not overlook the fact that seasons, almost if not quite free from fruit fly infestation of the growing fruit crops, have been experienced in this district during the last twenty-five years.

Fruit flies, like all other insects, have their cycles marked by periods of increase and of decrease, as also their annual periods of principal oviposition—"stinging" certain fruits at certain times each season—and the greater or lesser degree of our yearly infestation of fruit flies in this district is very largely due to climatic and other conditions affecting biologically the increase or otherwise of fruit flies.—HUBERT JARVIS, 15th April, 1925.

CITRUS FRUIT IMPROVEMENT.

R. L. PREST, Instructor in Fruit Culture.

Citrus orchards in this State call for much improvement in fruits, standards, and variety of trees. The conservation, standardisation, and stabilisation of these varieties should receive most careful consideration by citrus propagators and growers.

The deterioration of these varieties through the unintentional propagation of undesirable strains is responsible for a large percentage of inferior fruits and low yields in many citrus orchards. The establishment of new varieties requires long periods of time to prove their value to the grower and to introduce them in the markets. In this State we have too many varieties in our orchards, many of them unsuited to the local conditions under which they are grown. This calls for much reconstruction in the orchards, by top-working inferior trees in established orchards with buds selected from productive trees of desirable strains on the basis of their records for a series of years.

The introduction of individual tree records will help the grower to determine the value of his trees, and point out the inferior ones to be top-worked with selected buds from the desirable and proven strains.

The importance of individual tree performance records as a basis for measuring the effects of cultural or other tree treatments, both in investigational and commercial work, has become so evident that such records are now regarded as of great value in all orchard work. When making changes in methods of tree culture, it is the way to determine the definite value of the new treatment.

Bud Variation.

Bud variation is of more or less frequent occurrence in trees of all varieties. It may show itself in the habit of growth of the trees, the size, form, texture, or colour of the foliage, or form, colour, texture, abundance, or scarcity of the fruit. Trees grown from a single bud will develop several distinct strains of fruit, frequently a single branch bearing fruits having different characteristics from the remainder of fruit borne by the tree. Thus it will be seen individual tree records show the extent trees differ from one another in regular bearing, and in quality and quantity of fruit produced, and enables citrus growers to have reliable information with regard to their orchards.

Citrus bud-wood should be cut only from the best trees, and should be selected on the basis of tree records from intimate knowledge of tree. Only fruit-bearing wood should be used for propagation. Bud-sticks should have one or more of the fruit attached when cut from parent tree. Such bud-wood will produce trees of satisfactory growth as well as regular yields of fruit.

Bud-sticks when cut should be heeled in in moist sand in a cool place. Under proper storage conditions it can be kept in good condition for several months.

Growers will readily recognise the importance and field for improvement if orchards are to be built up on a firm commercial basis.

BREEDING POULTRY.

By P. RUMBALL, Poultry Instructor.

In selecting a breeding pen several features have to be considered, but primary importance must be given to the results that are likely to be secured from the resulting progeny. To reproduce the species is not sufficient. Every effort must be made to increase their producing capacity. That it is possible to improve the egg yield of our fowls is being demonstrated by the increasing numbers of birds that score 300 eggs or more in our yearly egg-laying competitions, but there is still room for a general improvement in the general average production. If this is possible with breeders who may be classed as specialists in their line, how much more so is it with the stock that are kept on the average farm?

Mendelian students have demonstrated that the character for high egg production is hereditary and that, if your breeding stock do not carry the character, it is not possible to make any definite improvement. Australian breeders of poultry, by working on the lines of selection and breeding from only tested stock, have secured results that have made our strains of Black Orpingtons and White Leghorns world famed.

Inheritance of Egg Production.

Dr. Raymond Pearse, who did considerable work in this direction, states that the male bird dominates in the transmission of the character of high egg production in the pullet progeny, and that if a male bird bred from parents carrying this character is mated with poor laying hens, the pullets from the mating will be good layers, but that the sons will only sire indifferent or poor layers.

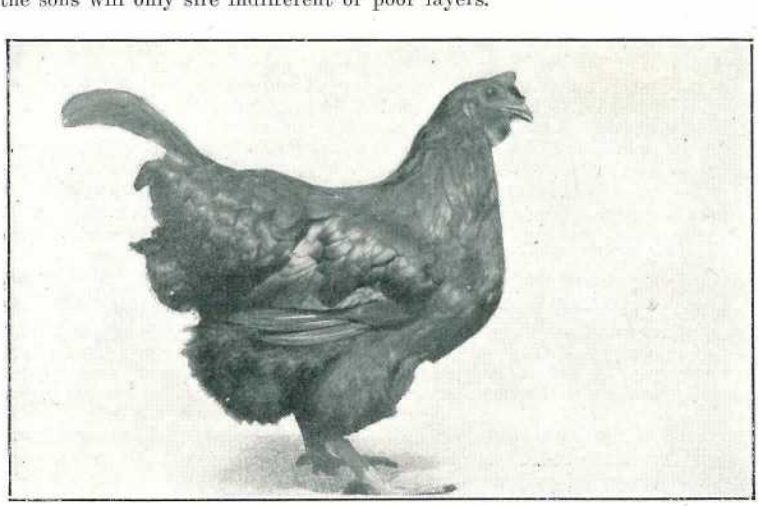


PLATE 16.

This hen laid 287 eggs in the Mount Gravatt egg-laying test, 1924-25. The loose appearance of feathering is due to the fact of a moult.

Inheritance of Size of Egg.

This is a most important feature from a commercial point of view, and in an earlier issue of this Journal I illustrated that in the last egg-laying test held at Mount Gravatt £17 less revenue was received over a period of twelve months from 270 hens due to undersized or second-grade eggs, than would have been the case if all eggs were of a standard weight. Many breeders are content to only use for hatching purposes eggs of a standard weight, with the hope of keeping up the size of egg. This is perfectly correct as far as the cockerels are concerned, but it has been found in practice that the sire has to be the progeny of a hen that laid large eggs, owing to the fact that he transmits the quality of size of egg to his pullet progeny.

Inheritance of Size of Bird.

The lack of size in some of our laying breeds is becoming a serious defect. In many cases it is due to the unsatisfactory methods of feeding and rearing the young stock, but it is more commonly due to the undersized specimens of the breeding stock used. It is an old opinion among breeders that the female influences size. Mr. Laurie (South Australian Poultry Expert) found that large and small hens when mated with male birds which were as much alike as it is possible to get two birds, bred true to size.

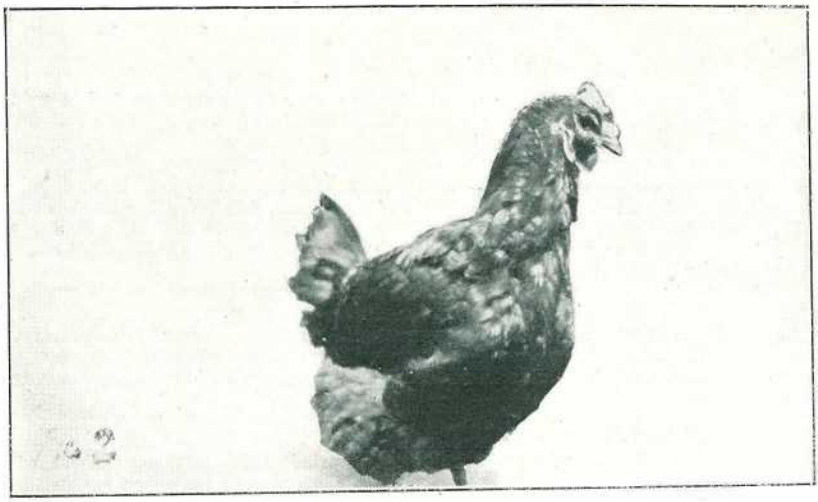


PLATE 17.

A Black Orpington which laid 113 eggs in the same test. Note the general coarseness of her head, sleepy appearance, and sunken eye.

Broodiness.

This is more common among the heavy varieties than our leghorns, although in some strains of the latter breed it is a serious defect. Among heavy breeds it causes untold work and serious losses in the egg yield. Various breeding experiments have been carried out with the idea of tracing the source of transmission, but the character of broodiness appears to be carried by both sexes, and the only way to eliminate the character from the flock is to breed from only non-broody hens and males the progeny of non-broody stock. The elimination of the character is difficult owing to the fact that a hen may not brood during her first or second year's laying season; she is used for a breeder and then causes trouble by brooding in her third season.

Age of Maturing.

It is frequently noticed that the age at which stock matures varies considerably even when reared and fed under the same conditions. The constitution of the parent stock no doubt plays an important part, but still some of it must be an hereditary feature, and from a commercial point of view, birds that take two or three weeks or even longer to mature than others are not the most desirable to use for the propagation of stock.

From the foregoing it will be seen that it is desirable to have some knowledge of the ancestry of the breeding stock, and more especially that of the male bird. It is impossible for every person to pay the necessary attention to the production of stud stock, and to them I recommend the purchase of suitable male birds every year or so, and their mating with the best females kept. As has already been pointed out the male bird plays a most important part both in the numbers and size of eggs.

The female mainly influences size and in most breeds type, and as already stated she transmits through her sons certain characters. Owing to the numbers of females needed for breeding purposes it is almost an impossibility to test all females, and resort has to be made to selection on the general appearances that have been noted in connection with high egg production.

It is better not to use a hen as a breeder until she has gone through her first laying season. During this period any bird that becomes sick, broody, or develops any other undesirable quality, or has any hereditary defects such as blindness, feathered leg or sprigged comb, should be marked and not used as a breeder. Do not wait until you are selecting your breeding stock to do this, for if you do some will slip by. From the eligible stock selection may then be made by working on the following points:—

Vigor and Constitution.—This is of primary importance and a somewhat difficult quality to guage. Viewed while yet on the ground she should be bright, active, healthy, of the type desired, and well developed.

Head.—Moderately long in light breeds, but not having a snaky appearance. In heavy breeds slightly shorter, but not coarse. Fineness in skull generally goes with a good layer.

Eyes.—Round and prominent. Colour, in Leghorns, rich orange red; Black Orpingtons, dark brown, so much so that they appear black. Round, prominent eyes generally indicate a layer and a bird with vitality. The eye should be set high and not too far back.

Face.—Clean, free from feathering or wrinkles. Experience has shown that the best layers are clean in face and the bright red faced bird is of good constitution and sound in health.

Comb and Wattles.—Thin and fine in texture. Excessive comb should be avoided. It is a drain on the system, and in the hens an impediment in feeding. In practice it is found advisable to remove excessive combs from the male birds, and it is as well to avoid breeding stock handicapped in this manner.

Neck.—Moderate in length. A long-necked bird is invariably weak, while an excessively short-necked bird is coarse. Egg production and coarseness do not go together.

Body.—Long, wide, and deep. The length as taken from the base of neck to tail, width as viewed across the shoulders and saddle, and distance apart of legs. Depth as viewed from the pelvic bones to end of keelbone and deep in chest.

Breastbone.—Straight and fairly long. With a short keel or breastbone the abdomen is liable to sag, and, consequently, the capacity for the digestive organs misguaged. Crooked breasts are liable to be due to perching, but it may be a constitutional weakness.

Pelvic Bones.—Little importance can be attached to pelvic measurement. The distance between the bones varies with laying, and some of the best laying hens that I have handled have had anything but long fine pelvic bones. The distance, however, between the bones and keel indicates capacity for the reproductive organs, although this measurement varies with the general condition of the bird.

Skin.—The texture of skin varies with laying, but it should always be thin and fine and velvety.

Legs.—Not too high, wide apart, good bone, with toes well spread. Long-legged birds generally lack constitution, and excessive leg has no relation to high egg production. In Leghorns and other yellow-legged varieties the colour fades with egg production, but returns during the moult. I would not, however, use an exceptionally white, shrunken-legged bird as a breeder.

Tail.—Not set too high. Tail carriage has no relation to egg production, but detracts from the general appearance.

Feather.—Depends upon the time of selection. The best of layers are generally well provided with feather which is close and flat on the bird. The close-feathered bird is warmer than the loose-feathered one, and consequently her digestive organs can turn more food into egg production.

General.—When you have satisfied yourself on the general type of the bird and catch her for examination, you may judge by the weight what her condition is. If she is either too light or too fat discard her, for neither condition is good for breeding purposes. Next examine her vent and feet. If her vent is at all fouled and offensive discard her. It may only be due to ovarian strain, but on the other hand it may be due to some bowel trouble. The feet should be examined for bumble foot or abcesses. I am confident that certain forms of bumble foot are hereditary.

A study of the accompanying plates should help in the general selection of a good laying bird.

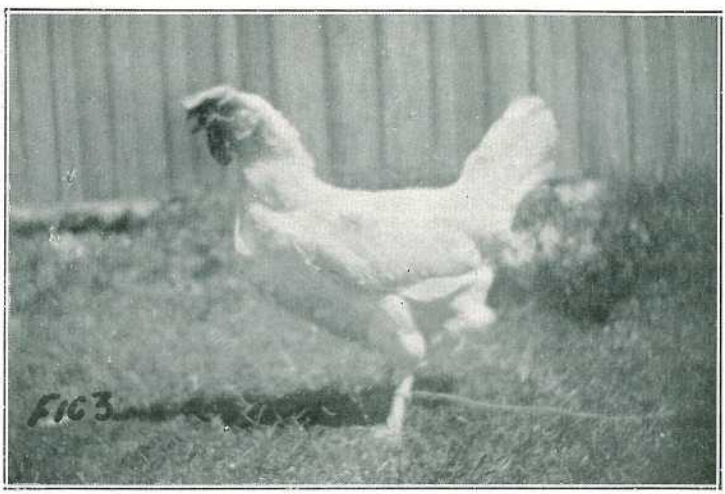


PLATE 18.

A White Leghorn which laid 276 eggs in twelve months. Note the bare head, closeness of feathers, and length of body.

ABSTRACTS AND REVIEWS.

All foreign agricultural intelligence in this section, unless otherwise stated, has been taken from "The International Review of the Science and Practice of Agriculture," published at Rome by the International Institute of Agriculture.

Potato Production under Irrigation.

RAMSAY, J. T. "The Journal of the Department of Agriculture," Victoria, Australia, Vol. XXII., Part 7, pp. 355-360, Fig. 4. Melbourne, 1924.

The peculiarities of soil environment and climatic conditions demand variation in methods of irrigation and cultivation. The author bases his statements on normal conditions and prevention of excessive moisture. In this case, irrigation one month from the date of planting has been found effective.

Instructions are given as to the advisable methods to follow prior to irrigation:—Date of planting; preparation of land for planting; manuring; cultivation. The weight of seed per acre recommended is from 12-16 cwt. preferably sprouted, and early varieties.

In practice, from 5-8 chains has been found the most satisfactory length for water to run, and on clay loams irrigation should be at a slower rate than on light soils.

The importance of cultivation after each irrigation is accentuated. The danger of excessive application of water is shown by the liability of low quality tubers to rot.

Size of Potato Sets : Comparisons of Whole and Cut Seed (1.)

STUART, W., LOMBARD, P. M., VOSBURY, M. C., CORDER, G., EDMUNDSON, W. C., CLARK, C. F., and DEWEY, G. W. (Office of Horticultural Investigations, Bureau of Plant Industry). United States Department of Agriculture, Bulletin No. 1248, pp. 1-43, figs. 12, tables 15, bibliography. Washington, D.C., 1924.

Although reports from various quarters are somewhat conflicting as regards the yield of potatoes from whole and cut tubers, the data obtainable as a result of experimentation in the States permit certain practical conclusions. Where there is a deficiency of moisture and plant food, medium-sized cut sets are advised, as the relative number of tubers produced will have a chance to reach a marketable size. A study of stem frequency correlation shows that, as the weight of the whole seed increases from 2-6 oz. the stem frequency varies from 3 to 7 stems respectively. Halved sets show a variation from 2 to 4 stems, and quartered sets from 3 to 6 oz. tubers average 2 stems.

The authors review the causes for disagreement as to the practicability of planting whole or cut sets and draws attention to the varying climatic and soil conditions, and more especially to the spacing of the sets to allow the maximum development. A comparison is made of the experiments carried out by numerous investigators and a detailed description is given of the tests made in recent years in the States.

Sex of Long-Carried Calves.

HOOPER, J. J. (Kentucky Experiment Station). "The Breeders' Gazette," Vol. LXXXVI., No. 13, p. 281. Chicago, Ill., 25th September, 1924.

It is a widespread belief among farmers that male sex is predominant among long-carried calves. In order to reach a definite opinion on this point the author has studied the records of the Kentucky Station herd with respect to about 500 pregnancy periods noted during the last thirty years; forty-four cases out of this number exceed the normal period of pregnancy (283 days), by 7 to 17 days, and of the forty-four long-carried calves born, twenty-five, *i.e.*, 59 per cent., were males, and nineteen, i.e., 41 per cent., females. This would, therefore, be a ratio of four females to six males.

Cross-Breedling of the First Generation in Poultry Rearing.

LEGENDRE, G. "La Revue de Zootechnie" (Stock Breeders' Review), Year 3, No. 8, pp. 144-148. Paris, 1924.

In poultry farming it is not the laying of eggs alone that provides profit. Numerous factors contribute to it, amongst which should be named, besides abundant egg-laying during the winter season, early development, sexual precocity, size of

eggs, vitality of embryos and young birds, adaptability to various external conditions, ability to obtain nourishment from the food supplied, &c.

Mixed breeds, therefore, undoubtedly possess valuable qualities, especially in regard to the last features.

In order to bring about an equal distribution of the qualities pertaining to pure and to mixed breeds, cross-breeding in the first generation has been resorted to, known as "industrial breeding."

In the case of poultry, the results shown by such first cross-breeding are as follows:—

Egg-laying:—

(1) The hybrids obtained by crossing two breeds often prove more prolific than their parents, an increase of ten eggs per head per year can be attained.

(2) Whatever may have been the vitality of the breeds crossed, the hybrids' eggs show better fertilisation and less waste. There is also a decrease in the death rate during rearing.

(3) Precocity is greater; young cocks reach market weight a week earlier than those of pure breeds, which results in greater economy of time, labour, and food.

(4) It is understood that owing to their greater vitality and greater fecundity, hybrid hens can be kept to advantage for longer periods; hence a further economy is effected as regards egg-laying and the care of birds reserved for reproductive purposes.

(5)—

	Cross-breeding of Pure breeds. Per cent.	Cross-breeding of First generation. Per cent.
Fertility of eggs	80-85	85-90
Hatching as per fertile eggs	70-75	75-85
Death rate during rearing, up to period of egg-laying in relation to birth rate ..	25-30	15-20

(6) In some cases, in special crosses, it is possible to select, with a fair degree of accuracy, the male and female birds at the time of hatching. This allows of immediate treatment according to their different requirements, fattening for the market, or egg-production.

However, the crossing of breeds of the first generation also presents serious disadvantages; this has been proved in actual practice.

(1) The tendency of hens to sit is greatly increased. In order to obtain a regular output of eggs it is important to prevent them from sitting immediately the tendency is shown.

(2) It is necessary to keep two pure-bred pens, of which one should be larger than the other; the one for the cocks should be the smaller as very stringent selection cannot be so easily followed.

(3) The only remunerative sale is that of selected fowls or sittings of eggs from the two pens of pure-bred fowls.

In practice crossing can be effected by three different methods:

(*a*) *Cross-breeding of two light breeds*, producing hybrid hens of maximum sexual precocity, that may hatch late in the season, when egg-laying is abundant and temperature favourable to rearing. This method is best suited to specialised production of eggs.

(*b*) *Cross-breeding of a light breed with a heavy breed.*—In this case, the cock is taken from the light breed, so that the hens are not injured. A special feature of this form of breeding is the particularly rapid development of the young cocks, which inherit the mother's strength; the young hens will on the contrary, inherit from the cock's side. The young birds in this case will be heavier, and will require more feeding than in the first instance, but will possess the maximum of qualities sought for in poultry farming.

(*c*) *Cross-breeding two heavy breeds.*—Minimum advantages to be obtained.

After study of the practical effects of the second method of crossing, the author is of opinion that it is too complicated, entailing considerable expenditure for installation, labour, &c.

In short, in spite of the real advantages to be derived from the crossing of the first generation, it would seem that the actual money return is higher from well-tended pure breeds.

Pig Feeding Experiments Involving the Use of Self-Feeders.

LAGO, F. P. (Department of Animal Husbandry). "The Philippine Agriculturist," Vol. XIII., No. 1, pp. 29-44, 5 Fig., bibliography. Los Baños, Laguna, 1924.

The author refers to former experiments that have proved the economic value of self-feeders in pig feeding.

Details are then given regarding experiments carried out with the following aims in view:—

(1) To determine the relative values of sweet potatoes, cowpeas and mangoes, together with concentrated food such as maize, rice-bran, and cocoanut-cake, placed in a self-feeder and at the disposal of the animal;

(2) The relative value of maize, cocoanut-cake and rice-bran placed in the self-feeder at the disposal of the animal, with roots in both cases;

(3) The relative advantage of self-feeders and hand feeding, using maize, rice-bran, and cocoanut-cake in the self-feeder, at the disposal of the animals, and that of the same concentrated foods fed by hand according to the modified Wollf-Lehmann standard;

(4) To ascertain if the addition of dried shrimps, as animal protein in the rations, is advantageous in fattening pigs, with sweet potatoes as vegetable feed.

In order to carry out these experiments the author used Berkshire-Jalajala cross-breeds and three Berkshire-cross pigs. In forming the groups for experiments, the greatest possible uniformity was obtained with respect to age, weight, sex, breed, development, &c.

The animals were weighed separately for three consecutive days at the start and at the end of the experiment, as well as every ten days during its course, between the hours of seven and ten. The animals were constantly and amply provided with water.

The author gives details of the experiment grouped in five tables, from which the following conclusions are drawn:—

(1) Under the conditions of the test, for fattening pigs for the market, which received by means of self-feeders a ration of maize, rice-bran, &c., cocoanut-cake, potatoes and cowpeas proved to be of about the same value.

(2) As basic foods for fattening pigs for market, maize proved of greater advantage than rice-bran. In both cases the feed was supplemented by cocoanut-cake and sweet potatoes.

(3) The results obtained favour the use of self-feeders in place of hand-fed rations based on the modified Wollf-Lehmann standard.

(4) The addition of shrimps to rations, in order to provide animal protein has not proved advantageous for fattening of pigs for market.

DOES FALLOWING PAY.

E. A. SOUTHEE, Principal, Hawkesbury Agricultural College.*

If there still be any farmers who are disposed to ask whether fallowing pays, they have the answer in the testimony of scores of successful men in all parts of New South Wales. Positive evidence is welcome, however, and we have it in figures kept since 1903 by Mr. W. W. Watson, of Tichborne, near Parkes. During almost the whole of that time Mr. Watson has consistently adopted fallowing as a cultural method, omitting to do so only for a couple of years early in his farming career, and he has separately recorded each year the yields from fallowed and non-fallowed land on his farm.

* In the "Agricultural Gazette" of New South Wales.

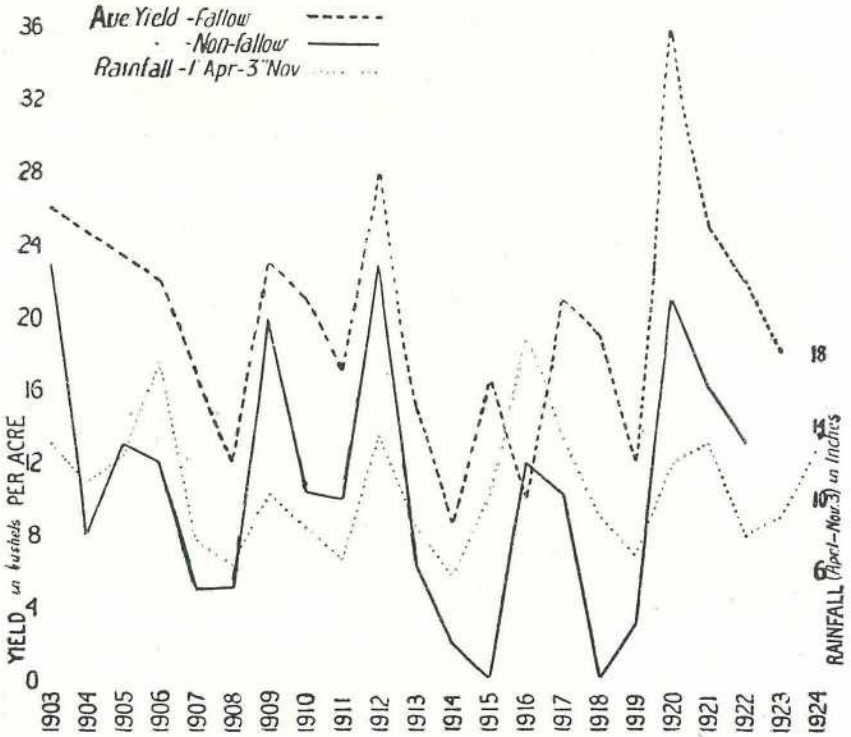


Chart No. 1.—Comparing yearly productions per acre from fallowed and non-fallowed land, and showing the total rainfall for the period 1st April to 3rd November in each year.

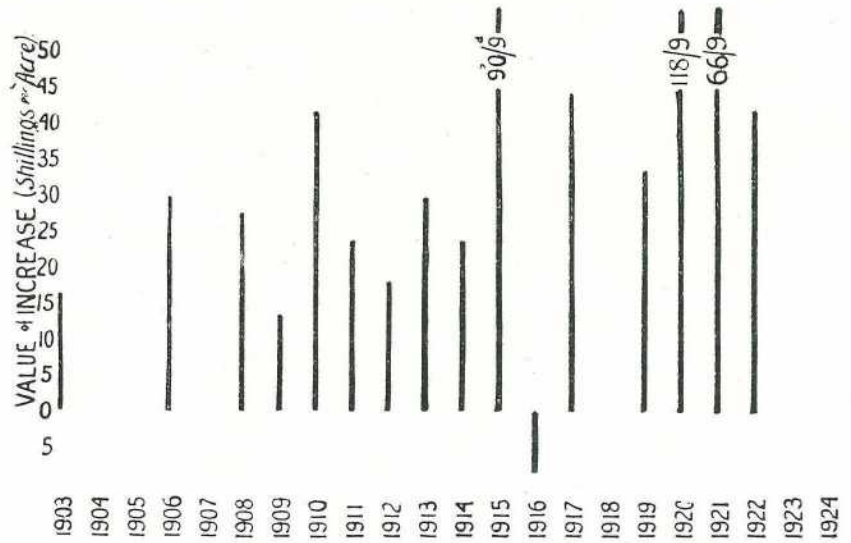


Chart No. 2.—Showing the value of the increased yield each year resulting from the practice of fallowing. In one year the return from the fallowed land was a little less per acre than that from the non-fallowed.

The figures were given a few years ago in the "Agricultural Gazette" by Mr. H. Bartlett, Senior Agricultural Instructor, but just lately Mr. Watson was good enough to supply the records of his operations for the seasons 1921 to 1923, and charts have been prepared for use at the College expressing the results in such an effective form that it was thought they would also interest readers of the "Gazette."

For the harvest just completed the average yield on the farm was 30 bushels per acre—all being on fallow, so that had the line that indicates the yield from fallowed land been extended to represent 1924 it would have terminated in a sharp rise. The rainfall for 1924 was 25.77 inches, of which 8 inches fell within four weeks of the first week in November.

It will be observed that the chart shows no return from stubble land for the past two years. This, says Mr. Watson, is intentional, as he does not consider it pays to grow wheat on stubble land in districts like Parkes.

It will also be observed that the average yields for the past four years have been far above any other period. This Mr. Watson attributes in the first place to the adoption of improved cultural methods, and in the second place to the use of superphosphate.

Chart No. 1 shows the average yield in each year from the fallowed land on the farm, the average yield from the non-fallowed land, and the rainfall for the period 1st April to 3rd November in each year.

Chart No. 2 expresses the difference between the value of the yields from non-fallowed and fallowed land. To arrive at this comparison the price per bushed quoted in the Official Year Book for each year has been taken. It will be seen that in some years the difference was very substantial, reaching 118s. 9d. per acre. Only in one season (1916) was the difference between the two methods of cultivation in favour of non-fallow, and that was due to excessive rain (13 inches between September and December) causing the very heavy crops on fallow land to lodge. It is estimated that, including interest on the land for the whole period, a fallowed crop costs about 6s. 3d. per acre* more than a non-fallowed crop, so that (apart from other respects in which fallowing is undoubtedly the best method) fallowing has paid Mr. Watson very handsomely in the twenty-two years.

* These costs, of course, refer to only classes of soil met with in the wheat areas of New South Wales, and can only be an approximate guide for the information of Queensland wheatgrowers.—Ed.

FRUIT FLY INVESTIGATION.

ENTOMOLOGIST'S REPORT.

Report of the Entomologist, Stanthorpe District, Mr. H. Jarvis, April-May, 1925.

Fruit Fly Emergence under Laboratory Conditions.

Throughout the months of April and May fruit flies (*C. tryoni*) have been emerging in the Insectary from maggots infesting late pears and quinces. The following is a record of hatchings for these months from both cultivated and wild fruits:—

Date.	Species of Fly.	Number Hatched.	Fruit.
7 April	*Chætodacus tryoni* ..	10	Pear
9 ,, ...	,, ,,	5	,,
16 ,, ...	,, ,,	20	Pear and quince
23 ,, ...	,, ,,	2	Pear
27 ,, ...	,, ,,	5	,,
28 ,, ...	,, ,,	6	Pear and quince
28 ,, ...	,, ,,	2	Quince
5 May	,, ,,	20	Pear and quince
6 ,, ...	,, ,,	20	,, ,,
13 ,, ...	,, ,,	6	Pear
14 ,, ...	,, ,,	3	,,
20 ,, ...	,, ,,	14	,,
28 ,, ...	,, ,,	4	Pear and quince

* On 15th April Mr. H. Jarvis, in compliance with specific instructions, submitted a report "On the results of departmental measures in controlling the fruit fly in the Granite Belt area during the season," a document that includes valuable data of public interest. *Vide* Report poster, pp. 48-52.—H.T.

Fruit Flies Bred from Native Fruits.

Date.	Species of Fly.	Number Hatched.	Fruit.
17 April	*C. tryoni*	2	*Opuntia* (*Ficus indica*)
16 ,, ...	*Dacus cucumis* ..	2	*Bryonia* sp.
16 ,, ...	*Dacus cucurbitæ* ..	1	,,
16 ,, ...	*Chætodacus* sp. ..	4	,,
28 ,, ...	*C. tryoni*	6	*Carissa ovata*
6 May	,, ...	20	,,
14 ,, ...	,, ...	10	,,
16 ,, ...	,, ...	5	,,

On the 23rd, 24th, and 25th of April severe frosts were experienced, with ground temperatures registering 12 deg. F., 10 deg. F., and 16 deg. F. respectively.

Field Experiments.

On 18th March, 1925, thirty specimens of *Chætodacus jarvisi* were liberated in one of the departmental cages at Applethorpe. This cage enclosed a Granny Smith apple-tree carrying fruit. This experiment was kept under observation at intervals of every few days, until 20th April, on which date, apparently, only one fly (a female) remained. No examples of this fruit fly were seen in this cage after this date. These flies had lived just one month, and during the whole of that time cold and inclement weather was experienced. This experiment will probably have to be repeated earlier next season.

On 16th April twenty-four newly emerged fruit flies (*C. tryoni*) were liberated in cage No. 2, enclosing a quince tree, carrying fruit; much of this fruit was, unfortunately, at this time attacked by *Monila fructigena* (Brown Rot). On 5th May twenty additional specimens of *C. tryoni* were liberated in this cage. These fruit flies have been kept under observation to date (2nd June) but have failed to oviposit.

A large quantity of maggot-infested fruit has been placed in each of these experimental cages, in order to finally test the possibility of the fruit fly over-wintering as a pupa in the Granite Belt.

Local Native Fruit as Fruit Fly Host.

On 27th April a visit was made to the *Notoelæa longifolia* trees growing on the property of Mr. W. Townsend (Severnlea). In the fruit of these trees last season fruit fly maggots were discovered, and numerous fruit fly puparia secured in the soil underneath the trees. A careful search this season, however, failed to bring to light any fruit on these trees or on the ground underneath them.

Fruit Fly Parasites.

Five interesting and apparently new fruit fly parasites have been secured from materials sent from Eidsvold by Dr. T. Bancroft, viz., two Ichneumons, one Braconid, and two Chalcids.

Throughout the months of April and May much valuable material also has been received from the same source, and so we have been able to breed the fruit fly *C. tryoni* from several native fruits—notably, from that of *Carissa ovata*—from the berries of which forty-eight specimens of *C. tryoni* were reared by Mr. S. M. Watson (assistant).

We are also fortunate in possessing (through the courtesy again of Dr. Bancroft) the maggots and puparia of most of the fruit flies associated with native fruits in his district.

Visit of New South Wales Inspector.

On 14th May, Mr. E. J. Lindsay, Fruit Inspector, New South Wales, called at this office, and a visit was made in his company to the departmental cages at Applethorpe. Mr. Lindsay was much interested in the over-wintering experiment, and concurred in considering this test would prove a fairly conclusive one; and also, insisted on the value these cages should prove in securing future data on important biological points relating to fruit flies. A search was made under the infested fruit in them for fruit fly puparia, and many were found in a few minutes. It is, of course, possible that many of them at present in the soil in these cages will hatch before mid-winter.

Useful Insects.

During the months of April and May the cold and inclement weather throughout these months proved a check to the activities of the introduced Woolly Aphis parasite *Aphelinus mali*. There is, however, every likelihood of the parasite over-wintering in every orchard where it has become established.

A large stock of parasitised aphids have been secured and placed in the Insectary, and an abundant supply should be available for distribution about September next.

Woolly Aphis Control by "Carbolacene."

A very interesting experiment was carried out by Mr. G. Ross, of the Summit, with "Carbolacene" as a possible control for woolly aphis. Mr. Ross's method of using this chemical substance is as follows:—A hole ⅜ of an inch in diameter and about 2 inches in depth was bored downwards, at an angle of about 60 deg. into the trunk of the tree; this hole was then filled with "Carbolacene," and a little added each day for a week to replace amount absorbed; the hole was then plugged up. Mr. Ross is hopeful of good results and intends persevering with this experiment next season, when a test-tree or trees can be arranged for, and some definite information on his assumed effective method of control obtained.

Official Staff.

For some time past the need for additional assistance has been felt, the care of the Insectary, field cages, and the distribution of the Woolly Aphis parasite all requiring more time than could be conveniently devoted to them.

On 1st April this need was well met, Mr. S. M. Watson being seconded to this office as Assistant.

Mr. Watson has proved himself both painstaking and industrious, possessing, too, an aptitude for the technique of entomology and the arrangement of insects.

Field Day.

After conference with the Chief Inspector, Mr. T. W. Lowry, it was decided, during the winter months, to institute an occasional field day in order to enable the members of the inspectorial staff to become familiar with some of the economic insects likely to be met with in the course of their official duties.

The first of these days was held on 15th May, and was found to be of mutual benefit to those concerned.

Fungus Diseases, &c.

Several valuable reports have been recently received from the Government Entomologist and Pathologist, Mr. H. Tryon, on specimens submitted.

All such reports of the Pathologist are now filed, under there respective headings, and are accessible to every member of the official staff. (H. Jarvis, 6th June, 1925.)

NOTES ON THE OVIPOSITION OF THE BEAN FLY

(AGROMYZA PHASEOLI Coquillet).*

By F. G. HOLDAWAY, B.Sc., Entomological Assistant.

This insect commonly causes considerable damage to beans of several varieties, including French, Lima, and Madagascar, particularly during the late summer months.

The adult is a tiny metallic black fly, 1½-1¾ mm. in length, with maroon coloured eyes.

Records of its distribution include localities ranging from Gosford in New South Wales to Cairns in North Queensland. (It has recently been recorded attacking French and Canadian Wonder beans in the new Callide Valley settlement.)

The symptoms of attack are fairly well known. The stems of the badly affected plants become flabby and brown just above the surface of the soil, and eventually the plants wither and fall over. This final stage of the damage seems to have been responsible for the opinion held by many people that the female Bean Fly deposits its eggs in the main stem close to the surface of the soil.

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* *Vide* Jarvis, E., "Notes on the Bean Fly," "Queensland Agricultural Journal," xxx., pp. 124-125 and 192-195, Pls. 30 and 31. These notes are a restatement of the facts recorded in 1913 (without reference to those since elsewhere published), rendered necessary by the erroneous account given by Froggatt ("Agricultural Gazette," N.S.W., xxxiii. (1922), p. 552).

The following observations were made at Brisbane on 17th February, 1924:—

As far as could be seen the eggs were only laid in the leaf tissue, oviposition taking place on the upper leaf surface in direct sunlight and during the warm parts of the day.

The female fly walks about on the upper surface of the leaf, occasionally stopping and apparently searching for a suitable place in which to lay. This act takes place by the female inserting her ovipositor vertically into the leaf and then working it round through an angle under the epidermis posterior to the point of insertion. By this movement the mesophyl tissue is broken down and a cavity, roughly elyptical in outline, is made under the epidermis, with the hole through which the ovipositor is withdrawn situated excentrically. After its withdrawal the fly walks backwards and appears to suck up any sap which may have exuded as a result of damage to the leaf.

The whole process from start of insertion to withdrawal of the ovipositor takes from four to ten seconds. Eggs are not laid every time the leaf is punctured. In one young leaf 111 punctures were counted and a large percentage did not contain eggs.

PLATE 19.—EGG IN SITU. COVER OF CELL REMOVED.
(*Agromyza phaseoli*).

Eggs deposited in the cavities are invisible until brought to view by removal of the upper epidermis. The epidermis covering the cavities eventually turns yellow, so that a leaf which has been attacked shows numerous yellowish-green patches marking the position of the punctures.

The egg is elongate, being .3 mm. long and .14 mm. in diameter. The ends are rounded and there is a short projection on one end. In colour the egg is white and its surface is smooth and opalescent.

On hatching from the egg the tiny larva mines in the leaf and eventually finds its way to a vein and thence downwards in the stems. Pupation usually takes place in the main stem on a level with and just above the surface of the soil, but sometimes in the lateral stems.

These observations confirm those made by Mr. E. Jarvis some years ago, and that were interesting in view of the fact that had been stated that the Bean Fly laid its eggs in the main stem.

The full realisation of the manner and place of oviposition suggests many lines of investigation which may lead to the control of this serious bean pest.

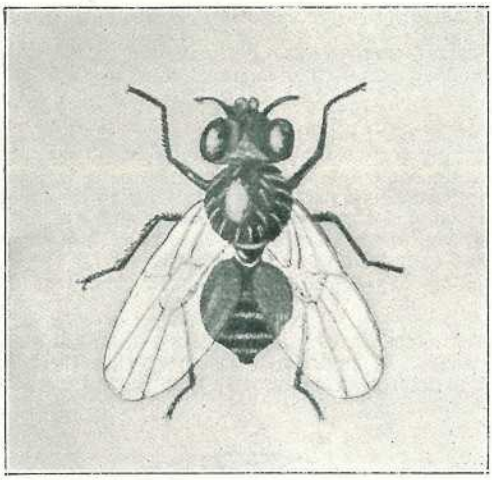


Photo.: Department Agriculture and Stock.]

PLATE 20.—BEAN FLY x 15.

From drawing by E. Jarvis, "Queensland Agricultural Journal," xxx., Plate 31.

Photo.: C. R. Harrison.]

PLATE 21.—"A LONG, LONG TRAIL A-WINDING."

Running one of the spurs of the Macpherson Range.

FLOWER GARDENING FOR AMATEURS.

By MAJOR A. J. BOYD, F.R.G.S.

In our sunny Queensland, where all the flowers of tropical, sub-tropical, and temperate climates can be grown out of doors, few people realise to what perfection the extensive cultivation of flowers has been brought in some countries which would scorn to be debarred by their climate from such an enjoyment. No doubt, in years to come, when civilisation is more advanced, and there will be more leisure than is usually available to the pioneer in a new land, an ennobling taste for flowers will also develop in our midst, and, in addition to the simple delight of beautifying the home, a lucrative trade in cut flowers and pot plants will arise. Meanwhile, let everyone blessed with the possession of a home make it homely and attractive by surrounding it with a few of the less exacting flowers. Our opportunities in that direction are, perhaps, unique in the world. Then let us rise up and be equal to them. A few small beds of flowers around the family home are a constant source of pleasure, enjoyment, instruction, recreation, and in years to come, when we are wandering through the world, of the most pleasant recollections connected with our childhood.

When we look round the suburbs of Brisbane and compare the tasteful adornment of some of the residences of city workers with others adjoining them, where no attempt has been made to beautify even the piece of land in front of the house, we cannot fail to be surprised at the neglect of so charming a relaxation after a day's work in the hot city offices and shops as gardening affords.

Horticulture is a most delightful hobby, and may, by its absorbing interest, become something more than a pastime. He who would lay out for himself a rural paradise here below, cannot do so more successfully than by planting trees and flowers. But how do many people set about this work?

Some plant trees merely to shut out their neighbours. There is another class who set apart a small plot of ground near the dwelling, and lay it out with a dash of so-called architectural skill, mostly of a varied and severe type, the beds diversified in form and size like a collection of animals in a zoo. Into these beds are jammed as many plants as the superficial area will accommodate, no allowance being made for future development. Could anything be more out of tune with Nature?

But even this is better than the condition of many of the back yards, where the picture usually presented to one's view is:—A washing boiler standing sad and lonely on three bricks, half buried in a healthy patch of *Sida retusa*. A few kerosene tins in various stages of decay; numerous variegated jam tins, intermixed with unchoppable blocks of wood from the wood heap. A few tired-looking clothes props; a consumptive-looking peach-tree that does duty as a hen roost or supports a clothes line; and a rickety tumble-down fowlhouse.

How to alter the picture is the next question. The first thing asked by those who have determined to make a garden is: "What will it cost?" That is a very natural and important question. To make a garden properly, you must take an active hand in the work yourself, remembering always that with ordinary commonsense any kind of soil can be converted into a garden for the production of flowers and vegetables.

The great secret in successful horticulture is a perfect knowledge of the seasons, so as to adapt each variety of cultivated flowers to the needful temperature and rainfall. Seasonable sowing, transplanting, and pruning, and seasonable working are the elements of success.

Laying Out the Garden.

There are two ways of laying out a flower garden, the "formal" and the so-called "landscape" or "natural" style. I will at once discard the formal garden as being quite unsuited to horticulturists, whether amateur or professional. In a garden, which is man's work, man's hand should be visible, showing some object in view. The garden should be designed with some apparent relation to the external shape of the house, and the beds so arranged that only portions of the garden can be seen at once from different points.

If the grounds available for the formation of a garden will lend themselves to the creation of a grass lawn in front of the house, so much the better, for nothing sets off a garden so well as a well-kept lawn, laid down with couch grass. If space will permit, the lawn should be circular, with a gravel path running round it, but, if not, the gravel path should lead from the front gate to the house. A flower border right round the house, or at least in front, should never be omitted. After the lawn has been marked out, flower beds corresponding to its shape may be cut out. But, before anything is done in this way, the soil must be thoroughly broken up, trenched, drained, manured, and levelled. It will then be ready to be laid out in beds.

The laying-out of the beds is a matter depending on the good taste and very often on the eccentricity of the gardener. Some prefer a rigidly geometrical appearance, like the formal Dutch garden. Others delight in irregular, scattered beds, traversed by winding grass or gravel paths, bounded by privet or Duranta hedges, with here and there light bamboo trellises and pergolas supporting flowering climbing plants. With the addition of a few shade trees, such as jacarandas, poincianas, albizzias, magnolias, and other flowering trees, such a garden, well cared for, is a never-ending source of pleasure and provides enjoyable employment for the owner. Wherever a plentiful supply of water is available, a small pond and one or two fountains will lend additional beauty to the natural garden. There are many beautiful aquatic plants which will thrive in the pond, and others which can be grown to best advantage around its edge in the soil. In this climate, a bush-house is almost indispensible for shade-loving plants, such as orchids, many varieties of ferns, caladiums, primulas, gloxinias, calceolarias, cinerarias, and others. Rockeries, again, afford ample scope for further beautifying the garden.

Hedges.

A well-trimmed hedge round a garden is always more pleasing to the eye than a paling or wire fence, and, with ordinary care and forethought, there is no difficulty in quickly producing a handsome and, at the same time, an impervious hedge. In ordinary good garden soil, it will suffice to dig a trench about 2 feet wide and from 12 to 15 inches deep along the fence, breaking up the soil well before returning it to the trench. Of the several kinds of plants suitable for hedges, the two best for the climate of Queensland are the privet and the *Duranta plumieri*, both blue and white. The latter makes the most rapid growth. It strikes freely from cuttings, is seldom touched by wandering stock, and forms a dense growth. In less than three years after rooted plants are put in, it will make a good hedge 4 to 5 feet high. If rooted plants are used, plant them about 15 inches apart, and cut down to about 6 inches. Cuttings should be placed at about half the distance apart (6 to 8 inches). These latter should be 12 inches long, and only two buds should be above the ground. See that the soil is pressed close to the base of the cutting. The operation should be performed in damp weather. Failing this, attention must be paid to watering until they have taken hold of the ground.

Evergreen hedges, such as the above, should be regularly pruned, preferably in the spring, and kept at a breadth of about 18 inches.

Lawns.

The land having been prepared as directed, the next thing to do will be to form the lawn. The ground must be well ploughed or dug during the summer, if possible, and allowed to lie for a short time exposed to the action of the sun, wind, and rain, before being harrowed down. The more the soil is worked, whether ploughed or dug, harrowed or raked, the better it will be for the future grass, since the more plant food is thus rendered available. All the grass, weeds, and other rubbish gathered by the harrow or rake may be burned either on the ground or close to it, and the ashes scattered over the surface of the worked ground. The latter has to be reduced to as fine a tilth as possible to enable it to slightly cover such small seeds as grass seeds. In order to give body to the soil for the establishment and maintenance of the grass, bonedust should be applied to the soil at the rate of about 5 lb. per square perch before the seed is sown. When sowing grass seed, it is well to mix it with fine ashes, by which means the small seed is more evenly distributed than if it were sown alone. To make a good lawn, thick sowing is imperative—1 lb. per square perch is quite little enough to produce a close, springy turf. As soon as the seed is sown, harrow in with a light brush harrow, which is preferable to using the rake. Then roll the ground with a heavy roller, to give firmness to the soil, and to prevent evaporation in dry weather and the scorching up of the young plants before they have become firmly rooted. During such weather, water frequently, both before and after the plants are up.

As soon as the grass is high enough to catch the scythe it must be closely mown, then rolled, and the process continued every week, because it ensures a close bottom being obtained.

Top-Dressing.

Whether the soil be rich or poor, the lawn will always benefit by an occasional top-dressing with bonedust, wood ashes, or other fertilisers. A good liquid top-dressing consists of fine mould, mixed with 1 oz. of nitrate of soda and 1 oz. of potash sulphate, dissolved in 4 gallons of water. Give a good watering with this solution immediately after top-dressing with solid fertilisers. Never use any chemical to destroy weeds on the lawn. They should be taken out by the roots by hand.

A Cheap and Effective Roller.

As already stated, a lawn requires a good deal of rolling, and a roller is a rather expensive garden appliance.

To those who do not wish to invest in the expensive article, the following description of one made by the writer may be useful. It has long been in use, and has worked admirably. Get a galvanised-iron cylinder made by your plumber out of not less than 22-gauge iron, about 24 inches long and 15 inches in diameter, with the seam of same made on the inside; into each end fit two wooden circles out of 1-inch thick timber, exactly the same diameter—viz., 15 inches. Perhaps a shade more would be better, so as to make them fit tighter. In the centre of each of these wooden ends bore a ¾-inch hole, to take an iron bar (round), to act as the axle of the roller. Then get half a barrow load of fine screenings, the same quantity of clean sand, and about 2 buckets of cement, the proportions used to make a good solid binder being 1 part of cement to 2 parts of sand and screenings mixed. Of course, charges can be made stronger as desired. It might be as well to get a bricklayer's advice as to the proportions in making the cement. To fill your cylinder, insert one of the wooden ends into same, allowing it to stand flush with the outside edge; then stand on its end, inserting the bar of round iron (axle) in the hole already bored, allowing it to project about 2 inches through, to allow for a handle to be fastened on. Then get ready the cement, turning the mixture over well, and using it fairly wet, so as to fill up all crevices; fill up cylinder as quickly as possible, ramming the mixture well down. See that you have sufficient to fill the cylinder at one charge. Fill up to within an inch of the top; then put on the other wooden end, and allow the roller to stand until the cement is thoroughly set. For the handle, the same shape as that of an ordinary lawn mower, on a large scale, acts very well. Fit same on, and the roller is ready for use.

Laying Out the Beds.

Whatever may be the style of the beds, they should be symmetrical; they should not be too large, and sufficient space, whether of turf or gravel, should be left between them. The figures should be simple and without acute angles; complex figures are especially to be avoided, as they are difficult to plant effectively, difficult to keep neat and clean, and hence cause an increase of labour, with corresponding extra expense. The best way to lay out the beds is to first make a plan on paper, and then transfer the design to the ground, the paper plan having been drawn to scale.

Having this plan to go by, the gardener will have no difficulty in laying out the beds symmetrically, as the garden line will enable him to strike circles on the ground as correctly as the compasses will on the paper.

Before a figure is begun, the ground must be trenched, levelled, raked, and rolled hard and smooth; a pointed stick will then make all the mark that is required, and a number of pegs to place in the portion of the figure that is to be preserved will suffice for the rest.

The walks should be laid out and formed with a rise of 2 inches at the centre, to prevent the lodgment of water. The surface gravel need not be deeper than 3 inches, as it may be practicable to add a little annually, so as to maintain a fresh appearance. Walks seldom require a foundation of metal, unless the soil be soft or moist.

Arrangement of Plants.

Plants may be arranged in either of two different modes—one in which each plant stands singly; the other in which a number of plants of the same species are arranged in a group. The adoption of either of these styles depends upon the size of the garden. Where the area of land is small, the single-plant or "dot" system must be chosen, otherwise there might not be room for the number of sorts it is desired to plant. But where the area of ground is larger, then the grouping system should be followed, in order that the same species or variety may not have to be duplicated.

The grouping style consists in planting a given number of plants of each species in a mass, of a size proportionate to the extent of ground, allowing each plant just as much space as, when grown up, will cause the group to appear as a whole, without being overcrowded. The strict rule of having only one group of each kind may, in certain cases, be departed from, as when it is desired to brighten parts of the plot by lilies or other gay flowering plants. The plants should be arranged according to height and colour, the dwarfest in the front and the tallest at the back, for, though a slope perfectly level on the surface is not desirable, plants vary in height and bulk from one year to another to such an extent that there is little danger of perfect uniformity being produced. Of course, the groups should be irregular in

form and size. The arrangement of colour is, however, of extreme importance, for, unless it is carried out in a scientific manner, the collection will fail in attractiveness. There should be no violent or jarring contrasts, and the season of flowering of each kind must be taken into account, so that there may be an equal proportion of flowers throughout the plot at all seasons.

Watering Plants.

Of all the processes in gardening, watering is the one that is most frequently ill-performed. It is customary with amateur gardeners to wash the dust off garden plants by watering overhead. The idea is to clean the leaves, open the pores, and so give the poor plants a new lease of life. But this overhead watering is a great mistake. A too-common method is to water little and often, by which the soil is hardened and the roots brought so near the surface that, in the event of the soil becoming dry, they are likely to perish. Many do not commence to water sufficiently early in the season until the plants show that they are suffering from the want of it, whereas watering should be commenced as soon as the soil begins to change from wet to dry, so as to keep up a full supply of moisture and enable the plants to take advantage of the high temperature, which they cannot do unless fully supplied with liquid food. When the flowers are out, care should be taken that too much water does not get on them, or they will be bleached by the sun, especially if watering is done in the morning. At any time water on the flowers is not good. The best time to water is in the evening. Give the plants water at the roots—as much as they will take up—and the tops will look after themselves. In order that the water may pass freely downwards, the soil should be loosened with a fork to as great a depth as can be done without coming in contact with the roots. The more water you give plants, the more they require. This is especially the case with the annuals. Take two of the same kind, stand one in water and just keep the soil of the other moist; the one in the water will flag more in the sun than the other.

Mulching.

Watering should be followed or preceded by mulching, which has a most beneficial effect in retaining moisture in the soil. Mulching checks the fierceness of the sun's rays during the hot months, thereby keeping the surface cool, retarding the evaporation of moisture, and protecting the surface roots. The operation of mulching consists in spreading on the surface of the soil around plants, shrubs, or trees (so as to entirely cover the roots) any light material that will sufficiently shade the ground without preventing the passage of rain into the soil. Various materials may be used as a mulch, such as rotting straw, decayed leaves and weeds, leaf mould, fine top soil, spent tan, and well-decayed manure. As neatness is requisite in a flower garden, the four latter materials will be found the best to use.

FORTHCOMING SHOWS.

July 1–2 —Gatton.
2–3 —Biggenden.
2–3 —Kilcoy.
3–4 —Proserpine.
3–4 —Sandgate.
7–9 —Townsville.
7–11—Gayndah.
8–9 —Laidley.
9–10—Woodford.
11—Wellington Point.
15–16—Charters Towers.
16–17—Caboolture.
22–23—Ingham.
24–25—Rosewood.
24–25—Ayr.
24–25—Ithaca.
28–29—Barcaldine.
29–30—Bowen.
29–30—Nambour
31, Aug. 1 } Pine Rivers.
Aug. 1 —Mount Gravatt.
Aug. 5–6 —Redcliffe.
10–15—Royal National.
22—Belmont.
26–27—Crow's Nest.
29—Coorparoo.
Sept. 2–3 —Esk Bushmen's Carnival.
4–5 —Wynnum.
12—Zillmere
16–17—Imbil.
19—Stephens.
23–24—Gympie.
24–25—Beenleigh.
26—Maroochydore.
26—Rocklea
Oct. 1 —Kenilworth.
2–3 —Toombul.
9 —Southport.
10—Enoggera.
16—Nerang.
17—Balmoral.
Nov. 25–26—Pomona.

Photo.: C. R. Harrison.]

PLATE 22.

RUNNING CREEK FALLS, MOUNT GIBSON, MACPHERSON RANGE.

Photo.: C. R. Harrison.]

PLATE 23.

A FAVOURITE CAMPING GROUND ON RUNNING CREEK, MOUNT GIBSON, MACPHERSON RANGE, NEAR THE NEW SOUTH WALES BORDER.

A party of Campers from around Beaudesert.

PLATE 24.—TYPICAL DURANGO COTTON PLANT, CHARTERS TOWERS.
Note the size of the bolls and the way in which they are opening.

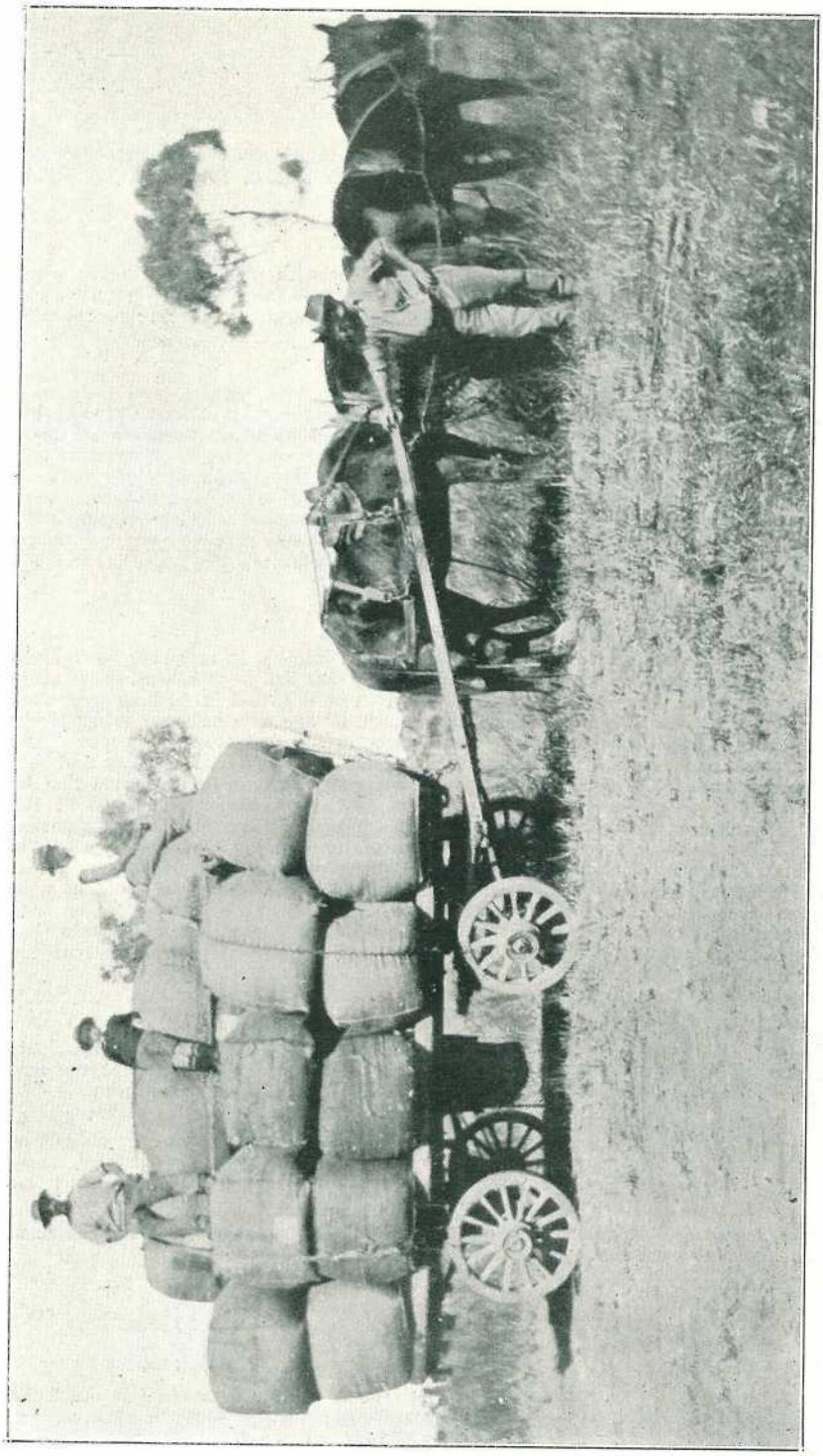


PLATE 25.—A CONSIGNMENT OF COTTON GROWN BY THE CHARTERS TOWERS COTTON COMPANY.

General Notes.

Wheat Pool Act.

The provisions of "*The Wheat Pool Act of* 1920" have been extended, by Proclamation, to include wheat harvested during the seasons 1925-1926, 1926-1927, and 1927-1928.

Atherton Pig Pool.

The period during which the Pig Pool, dealing with pigs grown in the petty sessions districts of Atherton, Herberton, and Chillagoe, shall be in operation has been extended to the 31st December, 1925, and the members of the present Pig Board will hold office until that date.

Fruit Marketing Organisation Act.

Regulation 70 of the regulations made under the Fruit Marketing Organisation Act has been altered. The old regulation provided that all members of local associations would be entitled to attend the annual conference of fruitgrowers convened by the Committee of Direction. The new regulation provides that all members of local associations are entitled to attend the conference, but each local association must appoint a delegate to speak at the conference, which delegate shall exercise the one vote to which each association is entitled. The delegate mentioned must be supplied with a certificate signed by the secretary and chairman of his association.

Sugar-cane and Power Alcohol.

The Minister for Agriculture (Hon. W. Forgan Smith), in referring recently to a Press telegram from Cairns respecting a meeting that had been held at Gordonvale in connection with power alcohol, pointed out that it is stated in that message that "The figures prepared by Mr. Howe in support of the scheme were exhaustively checked by the chemists present, all of whom were satisfied from the power spirit point of view as to their correctness, and were submitted to Mr. De Bavay and met with his approval." With regard to the foregoing Mr. Forgan Smith stated that he had received a telegram from Mr. McWalters, the chief chemist in charge of the Sugar Experiment Station, Innisfail. In this telegram Mr. McWalters reported that he had attended the conference at Gordonvale on Monday at the request of the local Power Alcohol Committee, that he had disagreed with Mr. Howe's and Mr. Hunter's figures, and that Mr. Howe had finally stated that only 25s. could be paid for cane if converted to alcohol with molasses included. It will therefore be seen that the message, as wired from Cairns, is misleading in so far that it indicates that all the chemists present at the meeting were satisfied as to the correctness of the figures submitted.

The Budget and Income Tax.

Wilfred T. Fry, Buckingham Palace Gardens, London, S.W. 1, writes:—Residents in Australia deriving any income from Great Britain will be delighted at the new Budget, as the income tax remissions are very real. Briefly, they are as follows:—

> Reduction in the standard rate of tax from 4s. 6d. to 4s. in the £1. Relief to "earned" incomes increased from one-tenth to one-sixth. Treatment of all income of persons over sixty-five years of age as "earned" where total income does not exceed £500. In the case of married persons this applies if either spouse is of the age stated.

The following instances will show the reductions more clearly. It is assumed in each case that a married couple without children is concerned:—

Income.	Last year's tax.	This year's tax.
£	£ s. d.	£ s. d.
300	5 1 3	2 10 0
400	15 3 9	10 16 8
1,000	126 11 3	99 3 4

Primâ facie it would not appear that in the case of income "earned" in Australia the amount of repayment on the British "investment" income would be affected, but, owing to the peculiar nature of the rebates allowed, extra relief is, in fact, given to persons not resident in the United Kingdom.

A School of Co-operation.

Everyone who had experience of the organisation of new and improvised army formations in the course of the world war appreciates the value of courses of intense technical training. In the back areas in France Schools of Instruction were established, not only in the handling of modern weapons, but also in the more prosaic arts, such as field cookery. Officers and men were selected from time to time to enter these schools of intense training, with the result that the all-round efficiency in the several arms and services increased tremendously. Something of the same kind has been introduced by Mr. Murray, the Principal of the Agricultural High School and College at Gatton, in his tractor schools for farmers. In the United States a School of Co-operation has been established with the motto: "Co-operation at better farming together, better business together, better living together—a prosperous agriculture and a high standard of living for farmers without loss to the nation." Before us is the prospectus of the institute, which offers—"A source from which members, employers, and officers of co-operative marketing organisations, teachers of marketing universities and colleges, public marketing officials, and private and public research workers will be able to secure training. Practical experience and knowledge will be pooled for mutual benefit and the advancement of sound co-operation. The Institute will serve to clarify thought concerning the real goal of co-operative endeavour; to analyse the experience thus far accumulated, and to develop leaders and workers who can effectively serve the future needs of the movement. The whole spirit in which the Institute is conceived is that of the social and economical welfare of the nation."

A list of participating bodies includes some of the largest organisations in connection with the grain, cotton, dairying, fruit, and vegetable industries of the United States, as well as the American Farm Economics Association, the American Farm Bureau Federation, National Board of Farm Organisations, and the American Committee on the International Institute of Agriculture in Rome.

The syllabus given for each week of the first educational course of the Institute is:—

First week.—Economic Principles and Legal Structure of Co-operation: History of Co-operation; Ideals of the Movement; Development of Types; Possibilities and Limitations: Status of State and Federal Legislation; Education in Co-operation.

Second week.—Organisation and Membership Problems: Preliminary Market Surveys; Forms of Organisation; Organisation Finance; Patronage Costs; Educational Work with Members; The Co-operative and the Community.

Third week.—Operating Methods and Management Problems: Source of Personnel; Business Practices; Auditing and Accounting; Marketing Finance; Warehousing; Grading and Standardisation; Methods of Pooling.

Fourth week.—Sales Policies and Price Problems: What is Meant by Orderly Marketing; Selling Plans for Principal Commodities; The Development of Markets; Price Objectives of Co-operatives; Selling Problems; Credits and Collections; Effect of To-day's Price on To-morrow's Production.

Co-operative Marketing—Building from the Bottom.

A recent issue of "Hoard's Dairyman" contains the following suggestive references to the principles of co-operative marketing:—

Hon. Frank O. Lowden, president of the Holstein-Friesian Association of America, is devoting splendid services to the co-operative movement. He appreciates and understands the full meaning of co-operative marketing and why more farm products should be prepared and marketed by the farmers themselves. He recently made the following statements in an address before a meeting of co-operative marketing associations in Washington:—

"If you want to see the day when the grand old yeoman stock of our country shall be replaced by the peasant and all that the peasant implies, then resign yourselves to marketing conditions so unfair, so unscientific, so largely based on speculative greed that it makes a large crop worth less in the aggregate than a small crop. Take cotton as an example. Increase the yield less than 5 per cent. and you decrease the price 20 per cent. Is there any justification for such a system of marketing as that? Under any just, sane, or sensible system would that sort of paradox be possible?"

He recognises that the co-operative marketing movement has encountered discouragement and failures, "but failures are always," he declared, "an incident of progress."

President Coolidge agreed with him, saying: "Firmly as I believe in the broadest and soundest programmes of co-operative marketing, I want to make plain

that I am no blind believer in any magical attribute of the co-operative procedure. A good deal that is positively mischievous has been put out in this regard. There is a school of co-operators who seem to believe that the programme can be started at the top and built downward. They want the Government, or the banks, or philanthropies, or Providence to lay out a scheme big enough to cover the country, set its machinery moving, guarantee it all needed capital, and then invite the farmers to sit in the places reserved for them and proceed to project. I want to see society as a whole help, but I want to see the farmers do their share, and I warn them that this will be the lion's share."

"Let me illustrate," continued President Coolidge, "by the analogy of a great industrial organisation. The United States Steel Corporation could never have been started from the top, and all at once. It had to be started in hundreds of places and forms, and over many years. The industry had to come first, its consolidation afterward.

"Mr. Carnegie built one great section of it; other men, in all parts of the country, founded other sections of it. It is hardly conceivable that any of these men in the early and formative years could have visioned the enormous concentration to which their activities were tending. They were not thinking of that. They were founding the industry in all its branches and ramifications, in all parts of the country, in a vast variety of corporate forms.

"These widely scattered and seemingly unrelated units at last were brought together under a common control into a unity of management and policy."

The first steps the President thinks co-operators should take are—(1) Establishment of grades and standards, (2) encouragement of good and elimination of poor varieties, (3) increase in the efficiency of production, (4) provision of a unified product adapted to its market, (5) organisation of distribution, and (6) creation of confidence in products and methods.

Cotton-Growing—Experimental Work.

The Director of Cotton Culture (Mr. G. Evans, M.A., C.I.E.), in communicating to the Press an account of a recent tour in the Upper Burnett district, said that the chief work had been the selection of Durango pure seed cotton. The small demonstration farm on Monal Creek had served a very good purpose in showing the new settlers the best way to grow cotton. Having taken full advantage of the advice and experience of the farm manager (Mr. Clark), the cotton-growers in this area, many of whom had never grown cotton before, had been able this year to plant the right class of land, sow the seed at the right time, and space the rows correctly. They also had paid correct attention to thinning-out and after-cultivation. The result was that this year cotton from the Upper Burnett settlement was the best in Queensland. The season was very favourable for the thorough preparation of the land, and wide spacing enabled the cotton to weather the heat wave. Very little immature cotton, so much in evidence in other parts of Queensland, was to be seen in the product of this district.

Experiments had also illustrated the fact that Durango cotton, when thus properly cultivated, was an exceedingly heavy crop. The yield from 21 acres on the Monal farm, which included 3 acres of late-sown experiments, which would give no yield, owing to the frosts, had returned a total of 10 tons, or more than half a ton to the acre. In one experiment, for an acre planted in the first week in October, the yield was 2,200 lb. of seed cotton to the acre.

Equally good results were being obtained by some of the settlers, and there were some fine picking tallies. Two daughters of Mr. J. T. Clug, a selector near Monto, had picked 404 lb. of seed cotton in a day. Obviously this was from an exceptionally heavy crop. Some interesting results had also been obtained at the demonstration farm at Biloela (formerly the Melton demonstration farm), in the Callide Valley, although practically no rain had fallen since the new year.

Twelve acres on the last experimental farm were ploughed out last May and kept fallowed through the winter. In spite of the unfavourable season, this block had averaged over 1,200 lb. of seed cotton to the acre. An adjacent block, which could not be ploughed till August, because virgin land had been opened up, yielded little more than 650 lb. to the acre. A better demonstration of the value and necessity of winter fallowing could not be desired. Durango required proper cultivation to obtain the best results; but where it had the advantage over ordinary mixed cotton was that every plant in a row of Durango cotton gave an even yield, whereas from 15 to 20 per cent. of the plants of the ordinary varieties gave no yield at all.

The old Queensland mixed variety was becoming exhausted and was degenerating very rapidly. It was not only failing to yield heavily, but the quantity was most

unsatisfactory, and had been adversely commented upon by several prominent spinners in England, who had given our cotton an extensive trial last season. The only hope for the industry, therefore, was forthwith to raise cotton from a pure variety of good quality, and the only such seed they had at present available was Durango. Special care had been taken this year to keep the pure Durango seed from the various districts quite distinct, so that acclimatised seed will, as far as possible, be sent to the same districts again this year.

The department was experimenting with other varieties, including Acala, which seemed to be of great promise. Only a limited quantity of this seed was available this year, but it was proposed to arrange for isolated test plots of it in different parts of Queensland in the coming season, with the object of propagating the seed and introducing it into suitable areas in the future.

The Food we Eat—The Value of Vitamins.

The food we eat, and the selection which should be made, were amongst many matters dealt with recently in lectures by Messrs. J. B. Henderson, F.A.C.I., Government Analyst, and L. A. Meston, A.C.I., under the auspices of the Health Association of Queensland and the Australian Chemical Institute.

Both lecturers pointed to the care which should be exercised in the selection of food, especially for the infant, and to the need for choosing those diets which were rich in vitamins. Many popular diets which appealed so much to the palate were lacking in the nourishing properties so necessary for the health of the human body, and the lecturers gave valuable advice as to the best foods to be eaten, such as milk, fruit, eggs, and vegetables.

Mr. Meston, after pointing out that no nation in the world had a better food supply than Australia, asked whether it was being used to the best advantage. "Is there not," he inquired, "room in our wealthy Commonwealth for a National Board of Nutrition? Such a board would be composed chiefly of eminent biological and physiological chemists, whose duties would include research work in regard to nutrition, the framing and operation of food and drug standards, and the dissemination of accurate knowledge to the people relative to dietary problems. Someone shrieks that cancer is due to a deficiency of the 'B' vitamin, or the consumption of tomatoes, or deficiency of potassium and lime in the food, or the drinking of paraffin oil, or a surplus of cockroaches, and nervous people grow more nervous, and much harm is done. But the report is broadcasted without correction or contradiction from any authoritative source. We are called upon to gorge ourselves with this food and that food—food deficient in vitamins and more or less indigestible, and no competent voice is heard advising the nation not to make an ass of itself by bringing disaster on its beautifully adjusted and efficient internal laboratory."

Mr. Henderson dealt with the importance of milk in the feeding of the nation, the health of which, he said, also was affected by the absence of vitamins in its general diet.

"The institution of nutrition clinics in some American schools has been a great success," he continued. "Children not up to the standard of weight in relation to age and height, or otherwise showing signs of malnutrition, were given instruction in a special class as to the kinds of food to be eaten or avoided. They were also taught how to take care of their bodies. Their homes were visited and the parents similarly instructed. Fifty-seven per cent. of these children gained weight at 1.7 times the average rate, and 22 per cent. at about the normal rate. The children took a keen interest in their increasing size and strength, and the good results were obtained under most adverse conditions. If such results were obtained in America, surely there is room for improvement in Queensland. In spite of the wonderful climate and the ease with which fruit and vegetables can be grown, undeveloped and backward children, from the physical standpoint, are common. Certainly not so common as in the older countries; but we should be much further ahead of them than we are, considering what Nature has done for our environment."

The Town Beautiful and the Trader's Bank Book.

One of the ways in which a traders' association in any town can be most useful is for it to devote its energies collectively and individually to the making of the town so attractive that people will want to come and live in it and will not want to leave it. The creation of a strong civic pride, and such a strong attachment to the locality that people will get homesick when they leave it, means a big increase in the trader's turnover. The fostering of a pleasant social life, of home hospitality, the general introduction of sports and the pleasures of life, all mean a much wider

and more generous circulation of money, from which the traders of all classes must benefit. Individual business men should make their stores as attractive as possible with up-to-date fronts and artistic window and interior decorations, so that the people will feel proud of their shops.

A certain proportion of the population of any district desire to make as much money as they can and then leave the place. If an association were formed under some such title as the ——— Garden City Association, to keep always before the community the possibilities of beautifying the place and improving its facilities, it would not be very long before a great transformation in public opinion and civic pride would be effected. To begin with, if the whole of the streets were finely laid out with beautiful shade trees and lovely gardens, as is the case in some Australian and many American towns, it is certain that the value of property all round would increase. An association giving its attention to this subject would encourage the cultivation of flower gardens in front of every dwelling, and perhaps be able to arouse rivalry, not to have the most expensive plants, but the best-kept and the prettiest gardens. This association could work in this matter with the horticultural society and with the school committee. In the Seychelles one of the main streets is lined with a beautiful avenue. Bougainvillea growing up most of the trees makes a gorgeous sight when it is in flower.

A garden city association should study what is done in America by the Good Roads Associations, and in England by the Garden City Association, and it would soon get ideas which could be put into practice at very little cost, and which would in a few years make the place known all over Australia as one of the most attractive residential places. It is not suggested that the municipal council should undertake this work; the great thing is to create a personal and patriotic interest in the town itself on the part of the residents and of the association. This is an outline of one form of enterprise which would benefit every town in Australia if only people would take it up and consider it. To carry it out it is necessary to have public opinion. Acts of Parliament have no effect unless public opinion is behind them, and if public opinion has been aroused Acts of Parliament are not necessary.

Public parks and recreation reserves, well laid out and beautified, are an asset not properly valued. Proper accommodation at showgrounds for entries and visitors from other districts, a sufficiency of pavilions and courts, cricket pitches and other facilities for the holding of big tournaments, which bring many strangers to the town, and keep them there for many days, is a paying proposition, because of the money spent by the visitors and by the inhabitants eager to make a good impression. Indirectly the district is being advertised in the best way, and given that progressive, comfortable appearance that will influence families to come and live there.—In the "Australian Forestry Journal."

Success in Wheatgrowing—Some Essential Factors.

"What are the factors for success in wheat cultivation under such conditions?" asks Dr. A. E. V. Richardson, in the Journal of the Victorian Department of Agriculture, after traversing in brief the climatic features of the main wheat-growing districts of the Southern State. "From the point of view of maximum production of wheat per acre," he proceeds, "we may say the following are essential:—(1) Conservation of soil moisture by early fallowing and thorough working of the soil. (2) Liberal manuring. (3) Regular crop rotation and association of sheep with wheat-growing. (4) Rational use of seed." The following paragraphs are taken from the writer's comments on these points:—

Fallowing Pays.—It is a matter of common observation that well-fallowed land in our wheat districts will grow bushels more wheat per acre than land that has been merely stubble-ploughed. Various experiments in the drier parts of the wheat belt, as well as the practical experience of farmers, have both conclusively demonstrated that more wheat can be grown over a period of years on a given block of land by cropping it every other year than by growing wheat continuously on the same land every year.

It is often stated that the continual practice of bare fallowing deprives the soil of organic matter—the soil's most valuable constituent—and therefore it may be supposed that bare fallowing will gradually impoverish the land. If the land is impoverished, the fault lies not so much with the practice of bare fallowing as in growing too many grain crops and carting them off the farm instead of growing them in rotation with forages and pasture for feeding down by sheep and lambs.

With the adoption of judicious rotation there need be no fear that the practice of fallowing will ultimately result in soil depletion.

Summer Fallowing.—Summer fallowing has become a common practice in the Wimmera. The black clay loams, which constitute so large a proportion of the Wimmera, are well suited to the adoption of this practice. The land to be prepared for fallowing is skim-ploughed in February or March, or in some cases it is disced. A loose mulch is thus formed on the surface, which not only conserves the moisture, but assists the rapid germination of the weeds with the first rains. In July and August, after seeding is completed, this summer-fallowed land is re-ploughed or scarified. Such land as is ploughed late in spring is immediately worked down with a scarifier or harrows to conserve moisture and eliminate weeds. From spring until the following autumn the land is kept in a friable condition by scarifying or harrowing as often as is necessary to preserve the mulch.

Thorough tillage—which has as its aim: (1) Preservation of a loose mulch; (2) fining and firming the seed-bed; (3) destroying weeds; (4) promoting aeration and bacterial activity—is essential for successful cultivation in regions of low rainfall.

A fine illustration of the value of thorough tillage is shown in the results of the manurial tests at Longerenong. The unmanured plot at Longerenong for a ten-year yeriod averaged 29½ bushels, a yield more than double the average of the State of Victoria.

Humus.—The outstanding weakness in Victoria's system of wheat culture, Dr. Richardson goes on, is that in many cases little or no provision is made for the restoration of organic matter. It is well known that the losses of organic matter due to fallowing in an arid climate are very considerable. The fertility of the soil depends very largely on its organic portion. Deprive the soil of its organic matter, and you have rock dust.

Organic matter might be restored in three ways—(1) Application of stable manure; (2) ploughing in of green manures; (3) pasturing the land and feeding down forage crops with stock. The two former methods are impracticable on wheat farms. The introduction of pasture into the rotation or the feeding down of forage crops with sheep is, however, entirely practicable.

Crop rotation leads to more healthy crops. Take-all, flag smut, and other fungoid diseases are much less common on land on which a regular cropping sequence is maintained. It enables the farm work to be better distributed through the year, more sheep to be kept, and it assures a heavy wheat yield.

Sheep and Wheat.—The association of sheep with wheat-growing presents many advantages. The sheep utilise roughage on the farm which could not be otherwise used for profit. They do well in the stubbles of the wheat crop, utilise the herbage of the lay land, and keep the fallows clean and well consolidated.

They work in well with wheat, for the maximum demands of a flock of ewes with their lambs are made when there is a flush of spring herbage, and the lambs are usually sold before the grass begins to go off. They utilise the herbage on the fallows and assist in bringing about that consolidation of the seed-bed so necessary for a successful wheat crop. This is of importance in country which is light in character. They assist in maintaining the fertility of the farm, for much of the phosphoric acid, potash, and nitrogen found in the herbage is returned to the soil in the droppings of the sheep. This is especially true of a flock of mature animals.

With the establishment of the fat lamb industry on a sound and profitable basis, and the high prices ruling since the war for wool—both crossbred and Merino—the keeping of sheep on the wheat farm has become a matter of great importance.

Seed.—In order to get the best results from early fallowed, carefully worked, properly rotated, rationally manured land, the seed sown should be the best the farmer can secure.

The first requirement is to secure varieties suited to the district. The farmer has a large number of varieties to select from, and he should study carefully the yields of local experiment plots conducted by the Department of Agriculture, and even test a few varieties on a small scale. The experience of farmers in the district, and the results of district experiments, will be invaluable in arriving at a selection of, say, two or three types.

The farmer should endeavour to raise his own seed, and occasionally secure seed from the Department.

Experiments have shown that it pays to grade wheat for seed.

Finally, seed wheat should always be "pickled."

Fruit Marketing Organisation Act.

Regulations 73-77 of the Fruit Marketing Organisation Act have been altered in order to give more equable representation to fruitgrowing districts on the various Sectional Group Committees.

Cotton Standing Committee Dissolved.

The Cotton Standing Committee of the Council of Agriculture, consisting of Messrs. G. E. McDonald, R. J. Webster, J. McRobert, J. Hardcastle, and T. C. Hayes has been abolished, as from the 6th June, 1925.

Peanut Board.

An Order in Council has been approved authorising the Peanut Board to give security over any peanuts delivered to the Board in respect of any advances made to the Board for the purposes of the Primary Products Pools Act.

A Home-Made Dipper.

A dipper which will be found very useful for many purposes about a dairy may be made from a 2-lb. preserved fruit can. The lid should be carefully removed, and any rough edges left by the tin-opener carefully filed smooth with the aid of a half-round file. Care should be taken to preserve the rim round the outside top edge, as this adds strength to the sides. Afterwards the bottom and side seams might be lightly filled with solder and a handle attached. This may be made with a suitable length of tin, having the two edges lapped over a couple of pieces of wire of light gauge. The handle, after being given the desired shape, with the folded edges inside, should first be soldered near the top edge of the can and the lower end 1½ inches above the bottom edge.

Organisation—What Southern Citrus Orchardists Have Done.

Four years ago the citrus growers in New South Wales were entirely unorganised. During the coming season, stated Mr. H. R. Hallard, manager, New South Wales Central Citrus Association, Ltd., in an address before a conference of co-operative bodies held in Sydney recently, there will be eleven, or possibly twelve, co-operative packing-house companies operating.

The largest (at Gosford) packs over 100,000 cases, the smallest probably 10,000 cases, the average pack being in the vicinity of 30,000 cases. Until last year, all the companies were formed under the Companies Act, but since the passing of the Co-operative, Community Settlement, and Credit Act, 1923, new ones have registered thereunder, and practically all of the others are re-registering under the new Act. Membership is limited to *bonâ fide* fruitgrowers in the particular district in which the company is formed, and members on joining are bound for varying periods, usually two years, to send the whole of their production of citrus to the packing-house for grading, packing, and marketing. In the event of a member breaking his agreement, there is a penalty imposed for every case marketed otherwise.

Modus Operandi.—At the beginning of the season an estimate is made by the management of each member's crop, and during the season a system of picking orders obtains which ensures regular supplies in such quantity as may be required by the management for the economic running of the shed, though periodically, according to the state of the market, supplies are increased or reduced as circumstances show to be desirable. Where possible, this system of picking orders is made as elastic as possible to prevent individual inconvenience. The companies are absolutely democratic in character. Shares are allotted on a fixed basis according to the acreage, but voting is usually on the "one-man-one-vote" principle, though occasionally in some companies up to three votes are allowed in proportion to the acreage of individual members.

The control of a company is invested in the directorate, or, as it is sometimes called, committee of management, which is elected annually from the members, and this executive is responsible for the conduct of business. It appoints a proper manager and staff to carry on the work, but is itself responsible for the policy and the proper carrying out of the work. The whole of the capital is issued only to *bonâ fide* members—that is, no outside capital is permitted, as this might eventually result in the control of the house slipping into other hands.

Share capital is usually paid off over the period of membership in the initial stages, most of the money being borrowed from a bank (generally the Rural Bank)

on the security of the fixed assets, uncalled capital, and limited guaranties of members.

The fruit is transported loose by members to the packing-house, where it is graded, sized, packed, and marketed by the company under the packing-house label. Usually four qualities are made, the designations being—(*a*) Extra choice, (*b*) Choice, (*c*) Standard, and (*d*) Graded. In addition, the "count" in each case is noted, and thus on the label attached to one end of the case is shown the variety, the grade of the fruit, and also the number of pieces contained. Standardisation of pack is strictly enforced, so that the buyer knows that the quality of, say, "Choice" grade from a certain house remains the same throughout the season. Such standardisation of products is vitally necessary for the successful marketing of the crops, and all the existing houses watch this point very closely.

The Central Association.—During the first two years of the agreement the few companies that had pioneered it worked separately, but two years ago they formed the New South Wales Central Citrus Association, situated in Sydney, which is, in reality, simply a federation of the packing-house companies. Its members can be only co-operative citrus packing-houses or very large individual growers, who may have the quantity of fruit and plant which permits of their marketing up to similar standard to a packing-house.

The Citrus Association is, like the packing-houses, a truly democratic organisation, and non-profit in character. It is financed by a small levy—at present 2d. per case on the total production of each packing-house member. Briefly, its duties are to build up for its members a scientific system of collective marketing, supply regular advices from all markets, organise new packing-house companies, and watch matters generally affecting the citrus industry, with a view to such combined action as may be necessary for its defence. By co-ordinating the activities of the individual houses, it provides the power and efficiency in scientific marketing which would otherwise be lacking if all the houses were working separately. It does not control, but guides and directs, by accurate information and advice, the organised units in the disposal of their products in the various Australasian and oversea markets. In addition, it voices authoritatively the views of growers on all questions connected with their interests.

The total pack of the combined packing-houses for the season just coming on is estimated at from 350,000 to 400,000 cases.

Co-operation in the South—Farmers' Increasing Interest.

An increasing practical interest in co-operation is reported from New South Wales, and that the beginnings of an extensive rural co-operative development are widely apparent. Such a growth must inevitably be slow if it is to be sure, for the soundest and most durable co-operative organisations have been found by experience to be those which have been well considered and carefully constructed, following good models. It is, therefore, a favourable augury for the future of co-operation that, instead of a spectacular increase in the number of societies, there has been a sustained growth.

In the five years preceding 1924 the average annual number of co-operative societies registered was thirteen. In 1924 there were registered twenty new societies, and for a period of less than three months in 1925 six were registered. These figures exclude companies reconstructed as co-operative societies. The greater part of the increase has been due to the formation of rural co-operative societies, twelve of the societies registered in 1924 and three registered in 1925 being of this class. But beyond this growth of registered co-operative organisations, quiet trading activity of a co-operatve nature is steadily increasing among men on the land. Pool buying, joint consignment of produce, organisation for the sale of produce direct to the consumer, the construction of group sheep dips, the joint purchase of utilities, such as machines or vehicles, and kindred activities are all becoming more and more popular. Success achieved by one little organisation is usually imitated by others, and so the benefit is distributed. This is excellently exemplified in the increase of group sheep dips. Thus, in many ways, the primary producer is learning the practical advantages of co-operation, and is gaining experience in the conduct and control of co-operative business ventures which will be of inestimable value when it is decided to embark on large-scale co-operative undertakings.

The success of co-operative organisation is being exemplified on many sides. It is being recognised that by this means farmers obtain greater bargaining power in their business dealings, and the use of utilities on their farms which they could not obtain by their individual efforts.

Fat Lambs for Export—The Supply Problem.

The first necessity to the proper development of a market for fat lambs from Australia, said the Hon. A. G. Manning, Chairman of the Australian Meat Council, recently, was continuity of supply. It was most disconcerting for the agents in London, who were endeavouring to develop a market there for Australian lambs, to find, after there had been a steady supply for some little time, that there were no more lambs coming forward, and that, in consequence of a dry season or something else, there would be no more for some months. It was absolutely essential to go in for fodder-crop growing and for the conservation of fodder with a view to ensuring regularity of supply.

In New Zealand the Meat Board had power to control the export, with the result that they were able to avoid periods of over supply on one hand and of insufficient supply on the other. Moreover, New Zealand lambs were largely exported on consignment, the grower retaining his interest in his lambs right up to the moment when they were sold to the retail shopkeepers. The consequence was the New Zealand farmers got the full advantage of a rise in the market. The Australian Meat Council had no such power, and the grower was dependent altogether on the speculator, who made all the profit by any rise in the market.

What had to be learned in Australia was to supply what was wanted by the market. He was no doubt treading on dangerous ground in making any forecast about primary products, but he believed there would always be a keen demand for lambs. Mutton was a necessity in Great Britain, and the price was low, but lamb was a luxury, and there appeared to be every reason to anticipate that the price would always be good, and also that the demand would be steady.

There were also serious handicaps to be overcome at the London end. There was the prejudice against frozen meat. He recalled a dinner given in London by a gentleman interested in Australian trade, who, in order to show the prejudice against frozen beef, procured the best Scottish beef for the table, but announced that it was Australian frozen. The guests considered that everything at the table was excellent except the beef, which they said had manifestly been driven a long distance to the killing works! Then there were the high prices demanded in respect of the whole cargo of frozen meat in the Port of London, once the ship's hold was opened, even though the quantity removed from the hold was small. On the other hand, lamb and mutton, being always frozen, had a great advantage over chilled beef, in that frozen meat need not go into consumption immediately as must chilled meat.

Feeding Calves—Three Prime Essentials.

In the feeding of young calves there are certain things to which too much importance can hardly be attached. The first is the need for scrupulous cleanliness with the feeding vessels. The buckets should be scalded thoroughly every time they are used, and so also any feeding apparatus used. The second is absolute regularity as to feeding time, and the third absolute uniformity as to temperature.

Neglect of these last two things has more to do with calves' troubles than many people have any idea of. Indeed, it is surprising how many farmers have never contemplated them as factors of any consequence in calf-rearing. A healthy regularity is likely to be promoted by feeding at the same time every day, while varying temperatures are obviously detrimental to the delicate tender organs of the alimentary tract. Attention to the last is most necessary where a number of calves have to be fed, or where the weather is particularly cold. Many very successful rearers of calves insist on having boiling water available during the whole time the calves are feeding, so that a little can be added as required to keep the milk ration up to blood heat. It is not necessary to use a thermometer to test the temperature, for a skilful feeder can tell by dipping his finger in the milk, although it must be remembered that on a very cold or frosty morning the milk will feel warmer than it really is if the fingers are very cold.

As the calves grow they should be encouraged to eat as much roughage, such as hay or chaff, as possible. The effect is to develop the barrel and increase the capacity of the digestive organs for dealing with large quantities of food and turning it into milk. This development of the digestive organs can be begun with little difficulty while the animal is young, but it is practically impossible to modify the shape and conformation of a heifer that has been neglected up to the time she is, say, twelve months old.

Treated on the above lines, little trouble will be experienced in the way of "scours."

Staff Changes and Appointments.

Constable D. J. Gavin, of Bell, has been appointed an Acting Inspector of Stock.

Messrs. K. Hunter, V. T. Barkla, and P. J. Richards, Prickly-pear Rangers, and Mr. J. F. G. Toft, Land Office, Bundaberg, have been appointed Inspectors, Agricultural Bank.

Mr. W. C. Roberts, late Lighthouse-keeper at Caloundra, has resigned his position as Officer under and for the purposes of the Animals and Birds Acts, and Mr. A. J. Gosling, the present Lighthouse-keeper, has been appointed in his stead.

Messrs. A. F. H. D. Singh and J. T. Smallhorn, Inspectors of Stock at Julia Creek and Caloundra, respectively, have been appointed Inspectors of Slaughter-houses.

Mr. F. C. Schubert, of Porter's Gap, Burrandowan, has been appointed an Acting Inspector of Stock.

The appointments of Messrs. L. W. Ball and S. T. J. Clarke, as Managers of the Cotton Experimental Farms at Melton and Monal Creek, respectively, have been confirmed, as from the 13th November, 1924.

The appointment of Mr. N. E. Goodchild as Senior Field Assistant, Cotton Section, Murgon, has been confirmed, as from the 2nd November, 1924.

The appointments of Messrs. M. D. O'Donnell, G. F. E. Clarke, and P. A. Kelly as Dairy Inspectors at Gympie, Ipswich, and Oakey, respectively, have been confirmed, as from the 1st November, 1924.

The resignation of Mr. F. G. Holdaway, B.Sc., as Assistant Entomologist, Cotton Section, has been accepted, as from the 20th June, 1925. Mr. Holdaway has been appointed to lectureship at the Adelaide University.

Constables B. F. Brennan and D. Ferguson, of Selwyn and Irvinebank, respectively, have been appointed Inspectors of Slaughterhouses.

The following have been appointed Assistants to Cane Testers at the Mills respectively set opposite their names:—W. J. Richardson, Millaquin; Miss M. Bennett, Nambour; T. V. Breen, Farleigh; Miss J. O'Flynn, Marian; Miss F. Foubister, Plane Creek; H. T. Witcher, Maryborough; W. B. Powell, Pleystowe; and Miss E. M. Boddington, Bingera.

Mr. C. H. Jamieson, of Tent Hill, Gatton, has been appointed the Chairman of the Butter Board until the 27th April, 1926.

Cotton.

Proclamations have been issued declaring that all cotton plants which are the first growth after planting shall either be destroyed or cut down to within six inches of the ground level, and that cotton plants which are not the first growth after planting shall be destroyed before the 1st September, 1925, and all debris of such plants must be burnt before the 15th September, 1925.

The Royal National Show.

For years past the Royal National Association has promised annually that their coming Show would be the best ever held, and it must be admitted that the forecast has invariably proved correct. This year a similar prophecy is made, and, as quite a number of novel exhibits are booked in addition to the usual attractions, no difficulty should be experienced in making good.

The leading feature of this year's Exhibition will be the displays made by manufacturers. Over thirty different factories have secured space and many of them will submit working exhibits. A whole section of the annexe at the end of the building nearest to the Museum has been assigned to the manufacturers, who will stage a display of such intense interest that it is hoped it will result in many Queenslanders learning that in their own State goods equal to the best manufactured in other places are available.

Applications for space, both inside the buildings and on the grounds, are so great this year that, although the Show is still nearly two months off, applications for over 40,000 square feet of exhibition floor space have been rejected, notwithstanding that a new building is being erected measuring 52 feet by 150 feet. This additional covered accommodation has been allotted to the One Man Farms, Rural Schools, Farm Produce, and Apiculture exhibits.

Since last year three cottages having a frontage to Water and Costin streets have been removed and the space occupied by them has been converted into accommodation for dogs, and visitors will have to admit that more suitable accommodation for such purpose does not exist in any other showground in the Commonwealth.

Another building measuring 30 feet by 100 feet has been erected for housing motor cars and lorries, and the bar under the Ernest Baynes Stand has been enlarged to provide practically double the accommodation available last year, together with much better storage space. The dining accommodation on the grounds is receiving special attention and many alterations of a minor but important nature to the caterers are being undertaken. Access to the dining hall under the Ernest Baynes Stand has been provided by means of a stairway from the main road, to enable the general public to use this dining hall as well as those visitors who patronise the grand stand.

Entries are coming in freely, particularly in the butter and cheese classes. Everything indicates that the entries will be the best ever experienced.

Milk Goats—The Poor Man's Cow.

The breeding of milk goats has for a great many years been an important feature of the live stock industry in many European countries, but it has never secured a very strong foothold in Australia. With us the goat has always been, more or less, a subject of ridicule, for most people do not realise the economic possibilities of certain breeds or types that have been bred for many years along definite lines. In continental Europe goats are largely used by families unable to keep a cow, and a great benefit is derived by having fresh milk at hand at a low cost. In those countries the goat is often spoken of as the "poor man's cow." Interest in goat breeding is growing in Queensland. The fact that the goat will supply sufficient milk for the average family and can be kept where it would be impossible to keep a cow is beginning to appeal to many people, especially those living in the small towns and the suburbs of the large cities. Types of goats, their general characteristics, and their value as a factor in domestic economy will be discussed in a special article in the August number of the Journal.

A Distinguished Queensland Student.

Mr. F. G. Holdaway, M.Sc., of the Division of Entomology, has been appointed to an important lectureship at the Adelaide University. Going up from the Brisbane Grammar School, Mr. Holdaway took the Science course at the Queensland University and graduated with honours in Biology in 1923. Entering the Department of Agriculture and Stock he served under Mr. Henry Tryon, chief of the Division of Entomology, and, later, under Mr. Ballard, Commonwealth Cotton Entomologist. Until recently Mr. Holdaway was carrying out valuable research work on insects injurious to cotton. This year he attained the degree of Master of Science. Mr. Holdaway is well known on the sporting field, but it is on the river that he won particular distinction as cox for three successive years of the 'Varsity crew and afterwards as an oarsman. At a valedictory gathering prior to his leaving for the South every branch of the Department was well represented. A fine momento of his association with his fellow officers was presented to him by the Under Secretary, Mr. E. Graham, who paid a graceful and well deserved tribute to their guest.

Cows at Milking Time.

Few farmers fully appreciate the importance and value of systematic treatment at milking time. Far too often the cows are herded up to the bails by dogs—a habit that is most pernicious by reason of its effects on the animal's nervous system, with which the secretion of milk is most intimately connected. In the bails, too, they are treated gently enough in many cases, no doubt, but without method.

To get the best results the herd should be quietly driven up to the yards and kept there with as little to disturb them as possible. They should be milked by the same man in the same order every day, and they should be thoroughly milked out every time, on the principle that the more milk that is drawn the more the milk-producing organs are stimulated. A gentle and expert milker is worth a good deal. He can clear the udder with greater ease than a rough or less experienced person, and he will do it with more comfort to the cow.

Of cleanliness we have heard a great deal, and it is not necessary to repeat it all here, but the importance of clean hands, kept clean throughout the milking, and of wiping the udder and teats with a damp cloth before commencing to milk, may be once more emphasised.

After being milked, the cows should be passed straight out to pasture, and not turned back into the yard to wait till the whole herd has been milked. The effect is to avoid loss of feeding time, thereby enabling increased production, and to reduce the likelihood of injury by horning in the yard.

A Purebred Bull's Arithmetic.

"I am not strong on arithmetic," said the purebred bull, "but I can add to the bank account of the man who owns one; I can subtract from the principal of his mortgage; I can multiply his chances for success; I can divide his cares and worries; I can give more interest to his work; and I can discount his chances for loss."—"Live Stock Bulletin."

Educating Bush Children.

The Minister for Education (Hon. Thomas Wilson) quoted some interesting statistics relating to tuition of children in isolated localities by correspondence in the course of a recent public address. Three years ago, he said, the department inaugurated a departure—a correspondence school for children in isolated districts. It started with 27 pupils and 1 teacher, and had now reached an enrolment of over 3,000 with a staff of 34. The results had been extremely gratifying. Out of 18 pupils presented at the last examination 16 had qualified for entrance to a high school.

Primary Producers' Levy Regulations.

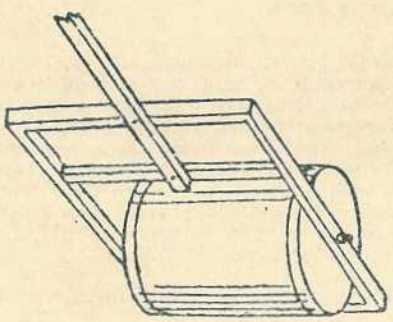
The Primary Producers' Levy Regulations empowering the Council of Agriculture to make levies on primary producers until the 30th June, 1925, have been extended to the 30th June, 1926. There is no alteration in the Regulations, but they will be known as "The Primary Producers' Levy Regulations, 1925."

Fruit Marketing Organisation.

The term of office of the present Committee of Direction of Fruit Marketing has been extended from June to August, 1925. Regulation 39 of the Regulations made under the Fruit Marketing Organisation Act has been altered. The regulation now provides for a fee of £1 1s. to be paid to Members of Sectional Group Committees for every day necessarily occupied in attending meetings or travelling to and from meetings, together with first class rail and coach fare instead of 10s. per day fee as previously provided.

HOME-MADE ROLLER.

The illustration herewith shows a handy roller. An empty oil drum was pierced in the centre at both ends, and a rod of half-inch round iron was driven through. The drum was then filled up with sand, and tightly corked. The wooden frame was made of 3 inches by 1½ inches hardwood, braced with hoop iron at the corners. At a little extra expense, a neat little roller can be made by cutting out the top of the drum, standing it on end, and inserting the iron rod in the centre of the bottom,



letting it run into the ground to keep it upright. The drum is soaped well inside, and then filled up with a mixture of one part cement, two parts clean sharp sand, and three parts gravel, mixed well, and moistened with water. This can be withdrawn from the drum, and will have a smooth outer surface, unlike the drum with its rims which mark the ground. A neat iron or wooden frame will make a very useful tool. The centre of the circular ends can always be found by taking one-half of the longest distance that can be measured across the circle.

Answers to Correspondents.

Care and Breeding of Pigs.

J.A.M. (Nambour)—

It is somewhat difficult to give advice unless an inspection of the stock and of the premises can be arranged. There are many causes for the troubles to which you refer, and to save repetition we are taking the opportunity to forward to you a number of pamphlets dealing with the subject. It seems that your system of feeding and handling the stock is more or less at fault, for there is no reason why pigs should suffer as yours have done if they are properly bred, fed, and handled.

Mr. Shelton, Instructor in Pig Raising, suggests that you cull out all your present stock and introduce new and better strains, and in this connection perhaps the Brisbane Show Stud Pig Sales would offer opportunity for purchase, but there will be a number of very useful breeding sows for sale by pig club members in the Nambour district, for some young sows were recently selected for this purpose. Of course, the trouble you will experience in securing suitable store pigs if you discontinue breeding must not be overlooked.

The Poland-China Pig.

C.H.S. (Murgon)—

The Poland-China breed of pig is one of which every breeder should know something. Mr. Shelton, Instructor in Pig Raising, is of opinion that the principal fault with this breed, if fault it can be called, is that it fattens so easily and on so small a proportion of food that, unless they are carefully handled and unless the breeder knows the type well, it is possible the breeding sows and boar will become overfat, and thus less prolific and profitable than they should be; but if we can feed two pure bred pigs on the same food as one mongrel or bush pig will eat, then that breed is worth while. We have not had sufficient experience of the Duroc-Jersey breed to make a fair comparison between them and the Polands, but from our experience the Poland-China can hold its own with any breed, and provided they are crossed with the Tamworth or some other flesh pig of similar type, good results may be expected at the bacon factory. We hope some day to be able to carry out experiments with these several breeds and their crosses, and to be able to publish results. The Duroc-Jersey is evidently destined to occupy a prominent place in our pig herds. We will be glad of your opinion later on, when you have had a fair chance to use your boar to advantage.

Sweet Potatoes as Poultry Food.

A.R. (Wondai)—

The Poultry Instructor (Mr. P. Rumball) advises:—From a comparison of the analysis of sweet potatoes, bran, and pollard, it will be readily understood that the former cannot displace bran and pollard as a poultry food, firstly because the proportion of carbohydrates to protein is too high; and secondly that the poultry would not consume a sufficient quantity, unless fed frequently, to obtain the necessary nutriment. They could, however, be used in conjunction with bran and pollard to the extent of 25 per cent. of the bulk of the mash, but slightly more meat meal should be added. In making the change, do so gradually and so accustom your birds to the change and the necessity for consuming a greater bulk.

ANALYSIS OF SWEET POTATOES, BRAN, AND POLLARD.

——	Water.	Protein.	Carbohydrates.	Crude Fat.	Ash.
Sweet Potatoes	71·1	1·5	24·7	0·4	1·0
Bran	11·9	15·4	53·9	4·0	5·8
Pollard	10·0	17·4	58·0	5·6	3·9

Sow with Milk Fever.

A.B. (Toowoomba)—

It is quite apparent that the sow referred to was not in nbrmal condition for farrowing, and that her milk flow did not develop in time to allow of the suckers receiving a supply soon after birth, hence the sow was in a high fever, and as the young pigs would suffer as a result, they gradually weakened and died. Mr. Shelton, Instructor in Pig Raising, advises that the treatment given to the sow subsequently, however, has evidently had a healing effect, and there should be no future trouble either with the milk flow or the sow's ability to reproduce and successfully rear her pigs in future. It would, however, be a wise plan to see that the sow is kept in normal breeding condition (not too fat or too thin) prior to next farrowing date and, as a special precaution, which, by the way, is well worth adopting with every sow that farrows, to ensure that the sow has a plentiful supply of green lucerne or other green stuff, that she takes liberal exercise daily, that her bowels are kept in normal condition, and that three days before she farrows she is given three fluid ounces of castor oil in a warm bran mash as the first feed of the day. The best way to prepare this is to first of all secure about 1 qr. of dry bran, have this placed in a bucket, then measure out three tablespoonfuls of castor oil (ask your chemist for Ol. Ricini Ital)—*i.e.*, three fluid ounces—pour the oil into the bran in the bucket and mix well, then thin the mash down with warm water or milk to the consistency of thick cream. Add half a teaspoonful of ordinary table salt, mixing this into the mash. This bran mash will relieve constipation, and put the sow's bowels in good order. The treatment may be repeated, if necessary, without harmful result. Also see that the sow has no food at all during the day she farrows, but allow a sufficient supply of clean drinking water. Care at farrowing time amply repays the additional attention, and will frequently result in the saving of one or more pigs from being overlaid. The sow should be fed sparingly for a few days after farrowing and until her litter is about ten days or two weeks old, then gradually increase the food until the sow is receiving her normal supply. Any further information will be gladly supplied.

Pig Feeding.

L.M. (Innisfail)—

Mr. Shelton advises:—Farm crops such as lucerne, sweet potatoes, corn, sugar-cane, waste bananas, &c., are all suitable additions to the feed list to the growth of which you are particularly urged to give special attention, as the secret of success in pig raising lies in the production of the food on the farm. Molasses may be used more as a condiment than as a special article of diet—like sugar added to porridge—it is a heat and energy producer, but is not a flesh former, hence should only be used in small quantities from ¼ to ½ or 1 lb. per day per pig from three months old upwards; its addition to coarse dry fodders is productive of much good. If no milk is available you may substitute cereal meals, barley meal, maize meal, &c., and water, but we would recommend you to consider dairying as well as pigs.

A.R. (Wondai)—

Mr. Shelton advises:—Sweet potatoes make an ideal pig food, particularly for use during winter months when other green foods are in short supply. They can be used in several ways, first by digging and feeding to pigs in conjunction with milk, and, in this case it is an advantage if possible to cook them. Secondly, they can be "fed off" by hurdling or temporarily fencing off a portion of the crop and turning pigs in, or you could arrange a combination of both methods. Jerusalem artichokes may also be used to considerable advantage in this way and these two crops with corn, pumpkins, and milk should supply a continuous rotation of food for use during the period stated. Dwarf Essex Rape and Skinless Barley we recommend as the most suitable green foods. If sown in February and March, or even up to the end of June, a good supply of green food will be assured for winter and spring months. Sow about 9 lb. of rape and 1 bushel of Skinless Barley.

Swamp Cancer.

A correspondent asks (1) The cause of swamp cancer; (2) is it contagious or infectious; (3) if either of the latter what remedy? Veterinary Officer, Mr. J. A. Rudd advises:—

(1) The cause is to a certain extent obscure, but is supposed in the first instance to be due to a small incised wound through the skin such as may occur when bullocks are running through the scrub, or small cuts from barb wire, &c. The irritation caused by flies, filth from muddy water holes, and other causes bring on proliferating growth of fibrous tissue, but there is little doubt that flies play an important part and are a factor to be reckoned with in the treatment.

(2) So far as is known at present it is neither contagious nor infectious provided it is as is described in reply to question No. 1.

(3) The affected animal if kept in a fly-proof stable and fed and regularly tended will in time make a good recovery with very little treatment. Actual cautery or searing with hot iron has been tried with a fair amount of success, especially if used in conjunction with a moderate amount of solution such as dipping fluids containing arsenic. But, so far, an application known as Sharp's Application, with directions for use as is sold by Surgical Supplies Ltd., has given the best results when applied as directed by the manufacturer, but would not be possible with wild bullocks running in the scrub.

Milk for Pigs—Is it Essential?

A correspondent writes:—I have a number of pigs of good quality. These I have been keeping in conjunction with dairying, but I have decided to devote my time to pigs and am anxious for advice as to whether pigs may be raised successfully without feeding milk, but by substituting farm produce and giving the pigs a good netted run. Peanuts, Jerusalem artichokes, and other crops of good-feeding value grow well in our district. The question is: Can I raise pigs successfully and profitably without feeding milk?

Mr. Shelton replied:—It is quite possible to successfully engage in pig raising without depending upon skim milk as a food for your pigs. Pigs can be maintained in good health and in satisfactory condition on cereals and cereal meal, root crops, greenstuffs (lucerne, &c.), and farm crops generally.

Pigs require ample supplies of good succulent food, a liberal supply of drinking water, and clean comfortable accommodation. The sties need not be expensive; as a matter of fact it would be well to devote the greater part of the cash available for this part of the farm to the provision of suitable pig paddocks and shelter sheds in preference to an expensive set of comparatively small sties. The type of shelter shed recommended was illustrated in the April issue of the Journal.

It is suggested that a list of questions on which special advice is required be supplied, when an effort will be made to give all the information available.

Pig Skin Trouble.

H.Y. (Wowan)—

Mr. Shelton, Instructor in Pig Raising, advises that it is apparent that the pigs are suffering either from the effects of infestation by hog lice, or from sunburn or sun scald, or some other skin trouble. Cocoanut oil is as good as any ointment for skin troubles, and if you ordered a 7-lb. tin from your storekeeper, this would give you a good supply for some time to come. Just render a small quantity down to soften same before use, and bottle as required. The other lice mixture we recommend is made up of ½ pint benzine, ½ pint kerosene, 7 pints fish oil. If this mixture is prepared as a standby, it will be found invaluable, and may either be sprayed on, or applied with a soft broom, or by hand. Another application should be given in about one week's time after first use, this to kill off the young lice that may have hatched out during the week. Flowers of sulphur and butter milk mixed to a semi-fluid paste is considered to be as fine a skin dressing as you could use. However, without an inspection of the stock affected, it is difficult to actually diagnose the complaint.

Re Green Bananas as a Food for Pigs.

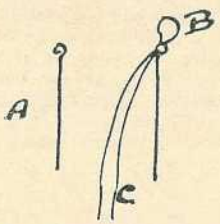
A.E.G. (Tandur)—

Mr. Shelton advises that waste bananas could be fed to advantage to pigs of all ages, but it is preferable in the case of immature fruit that they should be allowed to ripen somewhat before use, and that they should be cooked and fed in conjunction with some concentrated meal, say, like maize meal, barley meal, &c. They are too fibrous and indigestible if fed in the raw state, and whilst immature have little feeding value. We take it that the quantity available would be very limited, and that you would experience no difficulty in handling them to advantage. It would be preferable also to commence feeding them to mature stock, and to gradually accustom younger animals to them as opportunity offers.

Farrowing Difficulty.

"Pig Raiser" (Swan Creek).—No name and address given, otherwise a reply would have been given by return mail. Mr. J. A. Rudd, of the Veterinary Staff, advises:—

The sows in all probability were too fat and in addition suffering from constipation. Syringe out the lower bowel with a solution made up as follows:—One teaspoonful of salt, 1 pint of water (sterile rain water) bring it to a blood heat, and clear the lower bowel as much as possible. This will give the operator more room to work in. Flood the uterus with a solution of similar strength and temperature, and leave the sow alone for a few hours after having placed 7 grains of calomel (subchloride of mercury) on her tongue. The solution may be used to the extent of 2 or 3 gallons. If at the end of two hours there is no appearance of piglets, a blunt-ended instrument should be used, and in case of emergency such as this, a piece of No. 8 fencing wire with a small loop made at one end by bending the wire on itself may be used in conjunction with a loop of ordinary twine, which has been disinfected, which is passed through the loop thus—



A.—Loop of fencing wire.

B.—Loop of twine passed through the loop of A.

C.—Ends of the piece of twine.

The wire should be pushed gently into the uterus until the piglet's head is felt and the loop of twine passed over the head, the ends pulled tightly over the head, and the fœtus removed with the aid of gentle traction on the wire and the twine. This condition is always found in sows which are grain-fed or fed with boiled offal, and which are too fat and constipated for lack of exercise. If the sows were left running in the paddock they would have made their own bed, and farrowed normally. The sudden change from paddock to sties, especially if grain fed, will have the effect of bringing on constipation, and toxins loading up in the system will cause uterine inertia and difficult farrowing.

The following replies to questions on veterinary subjects were supplied by Mr. A. McGown, of the Veterinary Staff, in the course of the month:—

Blindness in Calves.

Case.—Two calves went blind. At first the eyes were very watery, and within a few days a bluish film formed over them. What is the cause and is there a remedy?

Reply.—The calves are suffering from ophthalmia, or inflammation of the eye, unfortunately too common in cattle. When first noticed it is always advisable to give a mild purgative to the affected animal; in calves such as those mentioned, 4 oz. castor oil should be given. The affected eye should be bathed daily with a tepid water for at least 15 minutes, and afterwards dressed with the following solution:—Nitrate of silver, 5 grains; distilled water, 1 oz. The best method for applying this lotion is to use a camel hair brush, but if this cannot be obtained a clean feather will do.

Ringing a Bull.

The actual ringing of a bull is a very easy matter, but he may be difficult to tie up securely, for a bull is a powerful beast. Some rope the bull by the horns to a fence or put him in a crush. There are two methods of ringing, one using a blunt copper ring, which is jointed in the middle and the ends are screwed together. In this case a piece of the cartilage of the nose is punched out by a special nose punch and then the copper ring introduced, and finally fastened by the screw. Or a trocar and canula may be used. The other form has pointed end for self-introducing—a practical but not so easy as the first method. The hole must be made in the septum of the nose where it is thin and not fleshy.

Castrating Bull Calves.

In general it is desirable to castrate bull calves as soon as the testicles are sufficiently developed to facilitate the operation. This may vary from a week old to two or three months. The most common practice is to do the work at from two to four months of age. A dry, cool day during a period when grass is plentiful should be chosen if possible, but the operation should not be delayed too long because of a lack of these conditions. A sharp knife (an ordinary pocket knife will do) and a bucket containing a 3 per cent. solution of some standard disinfectant are all the equipment necessary. The calf should be placed on his side, with an attendant holding him in position by placing one knee on the neck, one hand on the head, and drawing the upper hind leg forward with the other hand, so as to expose the field of operation. It is advisable for the operator thoroughly to cleanse his hands before beginning the operation, and frequently to immerse them in the disinfectant. The scrotum should be washed with the solution and the knife kept in it when not in actual use. There are two ways of making the incisions into the scrotum, but only the method advocated for commercial cattle will be described. It is as follows: Grasp the end of the scrotum with the left hand and pull it outward, so as to disengage the testicles, and then cut off a quarter or one-third of it by a single, clean stroke of the knife. This should expose the ends of both testicles. Now grasp each testicle in turn and gently but firmly pull it outward, so as to expose the attached cord for a few inches; then sever the cord by a scraping movement of the knife, removing an inch or more of it with the testicle, and the operation is complete. With older calves, where hemorrhage is more apt to occur, the use of an emasculator or an ecraseur for severing the cord may be justified. Ordinarily no after treatment is necessary, but the animal should be turned into a grass paddock or other nearby enclosure for observation during the first few hours. If the operation is performed during fly time, the application of pine tar around the wound will tend to keep the flies away.

Rickets in Pigs.

Rickets is a disease affecting the growing ends of the bones, and may be caused by a lack of lime or phosphorous in the ration, and also by a lack of a vitamine. Investigations have not yet shown whether the vitamine which prevents rickets is the fat soluble vitamine, or whether it is a fourth vitamine, the anti-rachitic vitamine. Young pigs fed on white corn and skim milk, without pasture, usually fail to thrive after a time, and many die from rickets or pneumonia. These troubles may be prevented either by feeding yellow corn or by including some well cured, green coloured lucerne hay in the ration. Henry and Morrison point out that the high value of lucerne hay for pigs not on pasture is due not only to its richness in protein and lime, but also to the fact that it is rich in the fat soluble vitamine. Hare and Steembock have shown that lucerne hay and cod liver oil will usually cure rickets in pigs if the trouble be not too far advanced. Whenever there is any evidence of this trouble 20 per cent. to 25 per cent. of choice lucerne hay should be included in the ration. In bad cases a teaspoonful of cod liver oil a head daily will usually be beneficial.

Mammitis

Prevention of mammitis is to be especially sought. In purchasing new cows dairymen should see that they come from herds where the teats and udders are sound. If a new cow, with unknown antecedents, comes from a public market, let her be milked for a week by a person who does not milk any other cows.

If unsuccessful in preventing the infection of cows in the herd, the next step is to treat the trouble on its first appearance. Directly the cows show any sign of congestion in the udder or any streakiness in the milk the udder should be massaged several times a day with warm soapsuds. The application of water, as warm as the

cow will stand, and the massaging are very effective. Some dairymen make a sheet to cover the udder, with holes cut for the teats. Soft rags are packed between the sheet and the udder and are kept warm by pouring hot water on to them for ten or fifteen minutes. When this has been kept up for an hour or two the bag may be well dried and rubbed with an ointment to close the pores of the skin. Many Queensland dairymen, amongst them many of the leading stud breeders, are loud in their praise of Bailey's Mammitis Cure. These breeders have had very little success with injections of boric acid solution into the teats, but there are some who say that they have never failed to cure a case of mammitis since they have had Bailey's Mammitis Cure on hand.

Rupture.

Case.—A draught stallion, six years, has a lump on the naval about the size of a hen's egg. When pressed it seems quite soft; it can be pressed with the palm of a hand so that it is almost level with the skin, and directly it is free it comes down again. (1) What is it; (2) what is the cause; (3) can it be removed?

Reply.—This is a rupture caused by the naval ring not closing up after birth. In most cases it can be cured by a surgical operation, but this should only be performed by a qualified veterinary surgeon. Unless the services of such can be obtained it will be advisable to leave well alone.

Bovine Tuberculosis.

Case.—A cow kept for household use has several lumps which appear to be abscesses, but it is thought that they might be tubers. The lumps are on each side of the cow's head, just below the ear, and they come and go periodically. The largest would be about the size of a pigeon's egg.

Reply.—In all probability this cow is suffering from tuberculosis, and as the milk from such an animal is dangerous as human food, particularly for children, it would be advisable to discontinue its use. As this disease is highly contagious and incurable it would be advisable to have the cow destroyed.

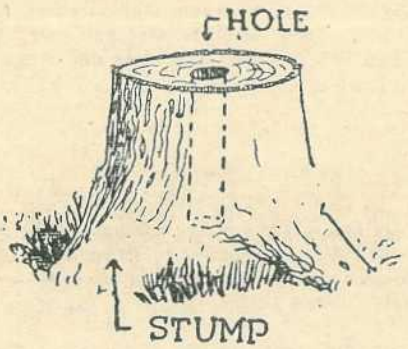
Udder Trouble Caused by Insect Bite.

Case.—A cow, a Jersey, calved fifteen months and still giving a fair quantity of milk. She commenced kicking at her udder. It was thought that she had been stung by an ant and little notice was taken. Next morning she was kicking continuously, was feverish, and the udder was a dark colour. The part was bathed and 1 lb. of salts administered. Each day she became worse. In four days her udder was almost black. Blood came through the skin of her teats during milking once a day. The milk, of course, was destroyed. The black skin then extended up the cow's tail. This lasted about a week, when the black skin commenced to lift. Another week went by and the cow became normal. Her milk throughout looked all right, and the beast was never really off her feed. The treatment given were several doses of Epsom salts, frequent bathing with hot water and Safonia, then a good greasing over the udder and teats. The cow, though it is fifteen months since she calved, is not yet in calf again. It is thought that the trouble was due to snakebite.

Reply.—From the symptoms described there is no doubt but that this cow was bitten by some insect. In such cases, as soon as such symptoms appear, the trouble will be relieved by applying household ammonia to the affected part. It might be necessary to repeat this treatment until the discolouration disappears.

BURNING STUMPS.

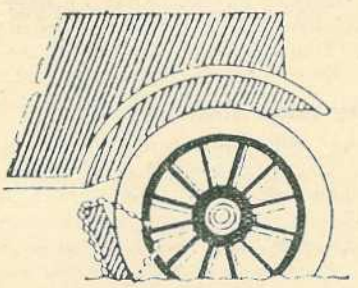
To remove stumps a good way is to bore a 2-in. hole 8 in. deep in the centre of the stump. This is best done in the spring. Fill this hole within 2 in. of the top with saltpetre. Cover the saltpetre with a light sprinkling of dirt, and fill the



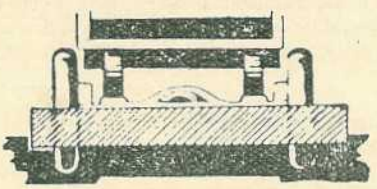
balance with water. Then forget the stump the next summer. Dig out the hole and fill with kerosene. Set fire to the oil, and the stump will burn out, even to the roots several feet under ground. I learned this trick from my father, and know that it will take out the stump, roots and all.

A BOGGED CAR.

The motor-car stuck deep into soft roads is a daily occurrence during rainy spells. A quick-moving method of removing the mired car from pits which are dug by the revolving wheels is shown in "Country Gentleman." A plank about six and



a-half feet long and two pieces of chain are all that is needed. Rope can replace the chains. Place this plank across the wheels, with a length of chain joining each end of the plank and the adjacent wheel. The wheels are locked to the plank, so



that these must revolve together, resulting in drawing the board under the wheels, and lifting them out of the deep recess. Even with the rear axle resting on the ground, this will lift the car out. The heaviest mud hooks cannot compare in effectiveness with this device.

Farm and Garden Notes for August.

Land which has been lying fallow in readiness for early spring sowing should now be receiving its final cultivation prior to seeding operations. Potato-planting will be in full swing this month, and in connection with this crop the prevention of fungoid diseases calls for special attention. Seed potatoes, if possible, should be selected from localities which are free from disease; they should be well sprouted, and, if possible, should not exceed 2 oz. in weight. Seed potatoes of this size are more economical to use than those large enough to necessitate cutting. If, however, none but large-sized seed are procurable, the tubers should be cut so that at least two well-developed eyes are left. The cut surfaces require to be well dusted with slacked lime, or wood ashes, as soon as possible after cutting. Where it is necessary to take action to prevent possible infection by fungoid disease, the dipping of potatoes in a solution of 1 pint of 40 per cent. formalin to 15 gallons of water, and immersing for one hour, will be found effective. Bags intended for the subsequent conveyance of tubers to the paddock should also be treated and thoroughly dried. After dipping, spread out the potatoes and thoroughly dry them before re-bagging. Where the tubers are cut, the dipping is, of course, carried out prior to cutting.

Arrowroot, yams, ginger, and sugar-cane may be planted this month in localities where all danger from frosts is over.

Maize may be sown as a catch crop, providing, of course, that sufficient soil moisture is available.

Sweet-potato cuttings may also be planted out towards the end of the month.

Weeds will now begin to assert themselves with the advent of warmer weather; consequently cultivators and harrows should be kept going to keep down weed growths in growing crops and on land lying fallow, as well as on that in course of preparation for such crops as sorghums, millets, or panicums, maize, and summer-growing crops generally.

Tobacco seed may be sown on previously burnt and well prepared seed-beds.

Kitchen Garden.—Nearly all spring and summer crops can now be planted. Here is a list of seeds and roots to be sown which will keep the market gardeners busy for some time: Carrots, parsnips, turnip, beet, lettuce, endive, salsify, radish, rhubarb, asparagus, Jerusalem artichoke, French beans, runner beans of all kinds, peas, parsley, tomato, egg-plant, sea-kale, cucumber, melon, pumpkin, globe artichokes. Set out any cabbage plants and kohl-rabi that are ready. Towards the end of the month plant out tomatoes, melons, cucumbers, &c., which have been raised under cover. Support peas by sticks or wire-netting. Pinch off the tops of broad beans as they come into flower to make the beans set. Plough or dig up old cauliflower and cabbage beds, and let them lie in the rough for a month before replanting, so that the soil may get the benefit of the sun and air. Top dressing, where vegetables have been planted out, with fine stable manure has a most beneficial effect on their growth, as it furnishes a mulch as well as supplies of plant food.

Flower Garden.—All the roses should have been pruned some time ago, but do not forget to look over them occasionally, and encourage them in the way they should go by rubbing off any shoots which tend to grow towards the centre. Where there is a fine young shoot growing in the right direction, cut off the old parent branch which it will replace. If this work is done gradually it will save a great deal of hacking and sawing when next pruning season arrives. Trim and repair the lawns. Plant out antirrhinums (snapdragons), pansies, hollyhocks, verbenas, petunias, &c. Sow zinnias, amaranthus, balsam, chrysanthemum, marigolds, cosmos, coxcombs, phloxes, sweet peas, lupins; and plant gladiolus, tuberoses, amaryllis, pancratium, ismene, crinums, belladonna, lily, and other bulbs. In the case of dahlias, however, it will be better to place them in some warm, moist spot, where they will start gently and be ready to plant out in a month or two. It must be remembered that this is the driest of our months. During thirty-eight years the average number of rainy days in August was seven, and the mean average rainfall 2.63 in., and for September 2.07 in., increasing gradually to a rainfall of 7.69 in., in February.

Orchard Notes for August.

THE COASTAL DISTRICTS.

The remarks that have appeared in these notes during the last few months respecting the handling and marketing of citrus fruits apply equally to the present month. The bulk of the fruit, with the exception of the latest ripening varieties in the latest districts, is now fully ripe, and should be marketed as soon as possible, so that the orchards can be got into thorough order for the Spring growth. All heavy pruning should be completed previous to the rise in the sap; and where Winter spraying is required, and has not yet been carried out, no time should be lost in giving the trunks, main branches, and inside of the trees generally a thorough dressing with lime and sulphur wash.

Where citrus trees are showing signs of failing, such as large quantities of dead or badly diseased wood in the head of the tree, they can (provided the root system is healthy) be renovated by cutting back the entire top of the tree till nothing but sound healthy wood is left. This should be thinned out, only sufficient main limbs being left from which to form a well-balanced tree, and the trunk and limbs so left should receive a dressing of lime sulphur, or Bordeaux paste.

Healthy trees that are only producing inferior fruit should be treated in a similar manner, and be either grafted with an approved variety direct or be allowed to throw out new growth, which can be budded in due course. The latter method is to be preferred, and an inferior and unprofitable tree can thus be converted in the course of a couple of years into a profitable tree, producing good fruit.

Where orchards have not already been so treated, they should now be ploughed so as to break up the crust that has been formed on the surface during the gathering of the crop, and to bury all weeds and trash. When ploughed, do not let the soil remain in a rough, lumpy condition, but get it into a fine tilth, so that it is in a good condition to retain moisture for the tree's use during Spring. This is a very important matter, as Spring is our most trying time, and the failure to conserve moisture then means a failure in the fruit crop, to a greater or lesser extent.

Do not be afraid if you cut a number of surface roots when ploughing the orchard, but see that you do cut them, not tear them. Use a disc plough and keep the discs sharp, and the root-pruning the trees will thus receive will do more good than harm, as it will tend to get rid of purely surface roots.

Planting of all kinds of fruit trees can be continued, though the earlier in the month it is completed the better, as it is somewhat late in the season for this work. The preparation of land intended to be planted with pineapples or bananas should be attended to, and I can only reiterate the advice given on many occasions—viz., to spare no expense in preparing the land properly for these crops—as the returns that will be obtained when they come into bearing will handsomely repay the extra initial expense. Growers of pineapples and bananas who send their fruit to the Southern markets should take more care in the grading and packing of such fruit, as their neglect to place it on the market properly means a big difference in price, and entails a loss that could be avoided had the necessary care and attention been given. The same remarks apply to the marketing of citrus fruits, papaws, custard apples, strawberries, cucumbers, and tomatoes, all of which are in season during the month.

The pruning of all grape vines should be completed, and new plantings can be made towards the end of the month. Obtain well-matured, healthy cuttings, and plant them in well and deeply worked land, leaving the top bud level with the

surface of the ground, instead of leaving 6 or 7 in. of the cutting out of the ground to dry out, as is often done. You want only one strong shoot from your cutting, and from this one shoot you can make any shaped vine required. The spraying of vines for downy mildew is not compulsory, but an application eliminates black spot.

Fruit-fly will make its appearance during the month, and citrus and other fruits are likely to be attacked. Every grower should, therefore, do his best to destroy as many flies as possible, both mature insects and larvæ, the former by trapping or otherwise, and the latter by gathering and destroying all infested fruit. If this work is carried out properly, a large number of flies that would otherwise breed out will be destroyed, and the rapid increase of the pest be materially lessened. The destruction of fruit-flies early in the season is the surest way of checking this serious pest.

Keep a careful lookout for orange-sucking bugs, and destroy every mature or immature insect or egg that is seen. If this work is done thoroughly by all citrus growers there will be far fewer bugs to deal with later on, and the damage caused by this pest will be materially reduced. Destroy all elephant beetles seen on young citrus trees, and see that the stems and main forks of the trees are planted with a strong solution of lime sulphur.

GRANITE BELT, SOUTHERN AND CENTRAL TABLELANDS.

The pruning of all deciduous trees should be finished during the month, and all such trees should be given their annual winter spraying with lime sulphur. The planting of new orchards should, if possible, be completed, as it is not advisable to delay. Later planting can be done in the Granite Belt, but even there earlier planting is to be preferred.

Peach trees, the tops of which have outlived their usefulness and of which the roots are still sound, should be cut hard back so as to produce a new top which will yield a good crop of good fruit the following season in from fifteen to eighteen months, according to the variety.

Apple, pear, or plum trees that it is desirable to work over with more suitable varieties should also be cut hard back and grafted. All almond, peach, nectarine, and Japanese plum trees should be carefully examined for black peach aphis, as, if the insects which have survived the winter are systematically destroyed, the damage that usually takes place from the ravages of this pest later on will be materially lessened.

Woolly aphis should also be systematically fought wherever present. The best all-round remedy for these two pests is spraying with black leaf 40.

In the Granite Belt the pruning of vines should, however, be delayed to as late in the season as possible, so as to keep the growth back and thus endeavour to escape late Spring pests.

Where orchards and vineyards have been pruned and sprayed, the land should be ploughed and brought into a state of as nearly perfect tilth as possible, so as to retain the moisture necessary for the proper development of the trees or vines and the setting of their fruit.

ASTRONOMICAL DATA FOR QUEENSLAND.

TIMES COMPUTED BY D. EGLINTON, F.R.A.S., AND A. K. CHAPMAN.

TIMES OF SUNRISE, SUNSET, AND MOONRISE.

AT WARWICK.

1925.	JULY.		AUGUST.		MOONRISE. JULY.	MOONRISE. AUG.
Date.	Rises.	Sets.	Rises.	Sets.	Rises.	Rises.
					p.m.	p.m.
1	6 43	5·7	6·34	5·22	1·2	1·57
2	6 43	5·7	6 34	5·22	1·42	2·56
3	6 43	5 8	6 33	5·23	2·28	3·59
4	6·43	5·8	6·32	5·23	3·19	5·5
5	6 43	5·9	6·31	5·24	4·15	6 14
6	6·43	5·9	6·31	5·25	5·18	7·22
7	6·43	5·9	6·30	5 25	6·25	8·26
8	6·43	5·10	6·29	5·26	7·32	9·27
9	6·43	5·10	6·29	5·26	8 38	10·26
10	6·44	5·10	6·28	5 27	9·42	11·23
11	6 44	5·11	6·27	5·27	10·42	nil a.m.
12	6·43	5·11	6·26	5·28	11·41	12·19
13	6·42	5·12	6·25	5·28	nil a.m.	1·14
14	6 42	5 12	6·24	5·29	12·35	2 6
15	6·42	5·13	6·23	5·29	1·32	2·59
16	6 41	5·14	6 22	5 30	2 26	3 48
17	6·41	5·14	6·21	5·30	3·20	4·35
18	6·41	5·15	6·20	5·31	4·12	5·19
19	6·40	5·15	6·19	5·31	5·3	6·1
20	6·40	5·16	6·18	5 32	5 52	6 39
21	6·40	5·16	6·18	5·32	6 38	7·16
22	6·39	5·17	6·17	5·32	7·21	7·50
23	6·39	5·17	6·16	5·33	8·2	8·26
24	6·39	5·18	6·15	5·33	8·43	9 1
25	6·38	5·18	6·14	5·33	9·15	9·37
26	6·38	5·19	6·13	5·34	9·48	10·16
27	6·37	5·19	6·12	5 34	10·23	10·59
28	6·37	5·20	6 11	5·35	11·0	11·47
29	6·36	5·20	6 10	5·35	11·37 p.m.	p.m. 12.38
30	6·36	5·21	6·9	5·36	12·19	1·40
31	6·35	5·21	6·8	5·36	1·5	2·43

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.

Phases of the Moon, Occultations, &c.

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

6 July	○	Full Moon	2 54 p.m.
13 ,,	☽	Last Quarter	7 34 a.m.
21 ,,	●	New Moon	7 40 a.m.
29 ,,	☾	First Quarter	6 23 a.m.

Perigee, 6th July at 12 16 p.m.
Apogee, 20th ,, at 12 30 p.m.

On 3rd July at midday the earth will be in the part of its orbit which is at the greatest distance from the sun, 94,360,000 miles. On 6th July at 10.25 p.m. Jupiter will be in conjunction with the moon, that is apparently so close to it as to appear less than four diameters of the moon south of it. Both will be high up in the sky nearly due north. On 10th July at 8 p.m. Jupiter will be directly opposite to the sun, rising soon after the sun sets. On 11th July about half-an-hour or a little more after sunset, if the western sky is clear, the three planets, Mercury, Venus, and Mars, will be seen apparently very close to one another rather low down in the west, while not far above them the the bright star Regulus of Leo will add to the beauty of the scene. An annular eclipse of the sun will take place on 21st July, but visible only as a partial eclipse throughout the greater part of Queensland. Venus will be occulted by the moon on the 23rd about midday in Northern Queensland, but appearing to be a little above the moon though very near to it in the more southern parts of Queensland. An interesting daylight spectacle will be somewhat marred on this occasion by its nearness to the sun. Mercury will be in conjunction with the moon at 4.30 p.m. on the 23rd and should be noticeable in the western sky at sunset. On the 28th Mercury will be at its greatest height above the horizon at sunset.

4 Aug.	○	Full Moon	8 59 p.m.
11 ,,	☽	Last Quarter	7 11 p.m.
19 ,,	●	New Moon	11 15 p.m.
27 ,,	☾	First Quarter	2 46 p.m.

Perigee, 4th August at 8 0 a.m.
Apogee, 17th ,, at 4 0 a.m.

A partial Eclipse of the Moon will take place on the 4th between the hours of 8.27 p.m. and 11.17 p.m., when the Moon will apparently change from full to a crescent shape at 9.53 p.m., and again become full.

THE PLANETS.

Jupiter will be in conjuction with the Moon on the 3rd. at 3.55 a.m. Venus will be in conjunction with the Moon on the 22nd at 3.46 p.m., when the planet will be about seven times the diameter of the Moon above it. Saturn will be in conjunction with the Moon at 5.46 p.m. on 25th, and will be well seen in the west soon after sunset.