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QUEENSLAND AGRICULTURAL JOURNAL

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Event and Comment.

The Current Issue.

Mr. Evans' report on the cotton experimental work in Queensland is one of the more important features of this issue and will be welcomed by all interested in the effective revival of cotton growing in this State. Mr. Gudge has a seasonal note on cotton classing, whilst Mr. Clydesdale describes his work in wheat and pasture improvement. Wilt resistant tomatoes and winter green feeds on the Atherton Tableland are discussed by Mr. Pollock. Mr. Rumball has a useful note on contagious catarrh in poultry. A further instalment of his observations on the several systems of marketing pigs in Queensland is supplied by Mr. Shelton, who also has some practical suggestions on pig sty and yard construction to offer. Other features cover a wide area of useful and interesting information.

Co-operative Marketing.

A lecturer in commerce in the University of London (Mr. R. B. Forrester) has prepared for the British Ministry of Agriculture a valuable report on the subject of co-operative marketing undertakings. In all co-operative marketing associations there are usually two contracts entered into by producers and members respectively. It is the membership contract which legally binds the members and the association. It is a means to an end—the efficient supplying of the maximum of marketing services at a minimum cost to the co-operative producers. Such contracts primarily ensure that volume of business which allows an association to build up its organisation and to face its business problems with foresight, such services including assembling, grading, processing, packing, and distribution of the product. Agreements of this kind strengthen the position of an enterprise requiring credit, and they furnish a basis for collective bargaining and for controlling the marketing of the output. Secondarily, according to the report under brief review, such agreements have a great psychological effect. Competitors are restrained from attempting to disrupt the organisation, the sense of loyalty of the members is strengthened, and the prestige of the association in its initial stages, when it has to encounter its chief difficulties, is enhanced.

Improving the Grade Cow.

The decision of the State Government to subsidise farmers' purchase of pure-bred dairy bulls on a fifty-fifty basis has met with widespread approval in dairying districts, and in this connection it is interesting to note the importance that is attached to the improvement of grade cattle in other countries. In the United States, for instance, they have raised the status of the grade cow to the extent of recognising a registry association for good cows of indefinite lineage, the object being to place the seal of merit on all grades having a production of at least 300 lb. of butter fat per year. It is argued that by thus acknowledging its virtues the sale value of the grade cow will be increased, and its owners will give more consideration to the selection of sires to head their herds. A separate register is kept for the grades of each breed. Simple rules govern the registration, the chief of which are:—No males shall ever be registered; the cow must have been sired by a purebred registered bull; the cow must conform in markings to the same requirements as are necessary under the rules of the association which registered her sire; the cow must have a record of 300 lb. fat in a year, and this record must have been made in a regularly organised herd-testing association. Provision is also made for the tentative registration of heifer calves out of standard-bred registered cows. A certificate covering a full description of the cow and her production is issued to the owner. As time goes on pedigrees of grade cows will be made available. The scheme has in it every element of success, and as the question of general herd improvement is receiving closer attention in Queensland and other States (our average production of butter-fat per cow is as yet anything but satisfactory), it is worth the consideration of all engaged or interested in the dairying industry.

Meat Inspection—Australian System Commended.

In the course of a recent lecture the Health Officer of the Port of London (Dr. W. J. Howarth), who is in charge of the inspection of all imported meat sold in the City of London, said that he placed Australian meat first so far as the efficacy of meat inspection was concerned. The favourable opinion of such an authority is very gratifying seeing that he has to deal with importations from the United States, Argentine, Canada, Denmark, Holland, and other countries.

Australia's New Rival in Wool Production.

In commenting on samples of wool from South Africa, the Bradford "Wool Record" states that they indicate that the best of the Cape clips is quite equal to the best of the Australian merinoes. One sample of Cape combing wool was good 70's quality, was estimated as a 51 per cent. yield, and should make an excellent top full of spinning value. A second sample was Grassveldt wool from the coast, 70's quality, and 52 per cent. yield. The third sample was heavier in condition, should give a clean yield of 47 per cent., and the quality was 70's. This comment is significant in view of the fact that the most productive South African flocks have been founded on some of the best blood from Australian merino studs.

The Farmers' Feathered Friends.

Birds are one of our most valuable and least valued possessions was the general opinion expressed at a recent farmers' gathering. The conclusions reached after a lengthy discussion were very interesting, and a summary of them is worth setting out. Birds, it was held, help the farmer to an incalculable extent in keeping insect pests, disease carriers and others, under control. In Australia there are about 800 distinct species of birds, and while some might be considered destructive, all have an economic value. Magpies are very valuable ground feeding birds, devouring, as they do, immense numbers of grubs. Swallows work from dawn to dark destroying insects. Swallows are natural enemies of the weevil and should be encouraged to nest about farm buildings. Quail eat the seeds of many useless plants and weeds growing among cultivated crops. Laughing Jacks live principally on rats, mice, centipedes, and other vermin. Native turkeys make constant war on grasshoppers. Crows, though destructive to poultry and sheep, are valuable scavengers, and destroy the breeding grounds of blowflies. Small hawks prey on rats, mice, and young rabbits. The mopoke is a night worker, and lives chiefly on insects and mice. Tomtits, wagtails, robins, and many other small native birds perform untold services to the farmer. Pigeons consume vast quantities of weed seeds. Generally it was decided that it was not possible to estimate the true value of birds in our economic life. Nature is beautifully balanced, and it is obvious that if we upset that balance compensation in one way or another will be demanded. This is seen in districts, in the south particularly, where poison has been systematically laid for rabbits and birds of prey, friendly bird life has been almost exterminated. This has been

followed by insect plagues with disastrous local effect. If insectivorous birds are destroyed thoughtlessly and in a wholesale way the disturbance of the balance of nature that results will have to be paid for in devastated crops, fly-infested flocks, and in other obvious ways. Bird life does not belong to the individual, but to the country, and is one of our great national assets. Birds are for the use and benefit of man and to preserve nature's delicate balance. Like other national and natural assets we merely hold them in trust. Farmers have now come to realise that birds in the main are their friends and allies and that we must give them every protection.

The Corriedale—Oversea Interest in the Breed.

The representatives of the Corriedale breed of sheep exhibited at Wembley attracted a lot of attention in Britain, and since their purchase by a Scottish breeder live stock journals on the other side have given much space to descriptions of the breed. In noting the characteristics of the Corriedale the "North British Agriculturist" remarked recently that their wool was naturally not as fine as that of the merino, but it was very much finer than any wool produced in Scotland. In recent years much interest has been taken in the question of improving the wool of native breeds, and as the New Zealand sheep purchased are the sole representatives of the breed in the British Isles their buyer will hold a monopoly, and not only possess a unique breed, but he may lead in a concerted movement for the improvement of British wool. Corriedale sheep have done extraordinarily well in South Africa and in North and South America. The originator of the breed, Mr. James Little, conceived the idea that if he could only grow merino wool on the carcase of a good mutton sheep he would have the ideal sheep for New Zealand. His first experiments were made by crossing the Merino with various English longwool breeds, in particular the Lincoln, the Romney Marsh, and the Leicester. The present-day Corriedale was apparently evolved from the Lincoln-Merino foundation, with perhaps just a trace of the other breeds named. The breed type is now thoroughly fixed. At first the sheep were known as the "inbred half-breds," but after they had survived the initial prejudice the breed was accepted by a breed society, and named the Corriedale from the station on which it was founded.

An American View of the Corriedale Fleece.

American sheep men who know the Corriedale speak with appreciation of the breed. Describing its wool, Professor Ritch, of the Wisconsin University, states that the Corriedale fleece is, like the sheep that produce it, a thoroughly assimilated and evenly-balanced combination of the best characteristics of the longwool and Merino breeds. It comprises much of the fineness and density of the Merino and length and weight of the Lincoln, with the lustre and elasticity of the Leicester. It is absolutely free from kemp, has no inclination towards harshness or the least tendency to "fuzziness"—regrettable characteristics very frequently found in ordinary crossbred wool of a similar grade. The best Corriedales, particularly those from flocks originally founded on a certain proportion of Leicester blood, are noted for the regular and sharply defined "saw-tooth" crimp in their fleeces. This highly desirable crimp was produced by careful selection, scientific breeding, great patience, and steady perseverance. The successful accomplishment of such a valuable characteristic cannot be too highly commended. Some of the chief advantages of the "saw-tooth" crimp are: More elasticity, greater length when combed, increased density at the roots of the fibres, and more compactness at the tips. The latter advantage prevents the fleece from being readily parted by keen, cold winds, which chill the sheep and make it less thrifty, in addition to the fact that it causes the limited amount of yolk necessary for nourishment to rise evenly and regularly without the least clogging or running into congealed "waxy" looking streaks. The compactness of the whole fleece, due to this particular crimp, prevents the dust and alkali from sinking down into the wool and causing it to become "mushy," weak, and brittle over the loins, with the additional disadvantage of heavy shrinkage when the wool is scoured. This "saw-tooth" crimp is such a pronounced feature of the Corriedale that when halfbred ewes are bred to a registered Corriedale ram, the offspring rarely reveals conspicuous traces of weak, "wasty" wool over the loins, even when subjected to unfavourable climatic conditions. Another reason for the compactness of the Corriedale fleece is the natural inclination of one fibre to cling close to its neighbour, and thus resist separation by dry, cold winds. This is not due to the crimp alone, but also to the uniformity of the natural binders and the wonderful regularity of the scales of the fibres and their uniform pointed edges. When washed fibres of Corriedale wool are examined under a powerful microscope the uniformity of the scales not only surpasses that of most other breeds, but reflects great credit on New Zealand breeders for their scientific study of the fine points of profitable wool production.

Bureau of Sugar Experiment Stations.

FIELD REPORTS.

The Southern Field Assistant, Mr. J. C. Murray, reports (9th December, 1925):—

Mount Bauple.

The season has been a good one, high commercial cane sugar values being obtained by the farmers. Q. 813 has averaged over fifteen c.c.s. throughout the season. The majority of growers are now making Q. 813 a staple variety, the cane being approved of not only for its good striking qualities and freedom from disease. The seedling under discussion can rank with Badila as being one of the best canes distributed by the Bureau of Sugar Experiment Stations. All, however, in what might be termed the principal Q. group, are good varieties. These are Q. 813, Q. 855, Q. 970, Q. 1121, and Q. 1098. This is a very gratifying feature as it removes any danger of the growers being without suitable varieties. Outside this group, the imported Java canes E.K. 1 and E.K. 28 are giving good results, as well as the Hawaiian variety H. 227.

Growers' losses from cane pests have been negligible, and very slight from bacterial diseases. Farmers are careful in plant selection.

Good results have been obtained by the application of filter press refuse. The writer is not greatly in favour of the use of this, however, and thinks that scientific fertilizing and green manuring are more preferable than the application of filter press cake, as well as involving less labour.

There is no way to obtain correct results, like local experiment. This is a simple matter and can be carried out by any farmer on his own property, and an absolute determination as to the best fertilizer to use obtained.

Bundaberg.

Plant cane has "struck" splendidly and the ratoons are distinctly good.

The mills have had an excellent run, with no serious labour troubles. Losses from gumming disease have been reported. The cane principally affected is the M. 1900 Seedling and Badila. The latter is showing in all the southern districts a marked susceptibility to this disease. When gumming is present, farmers are advised under no circumstances whatever, to allow the plants to drop directly into a bag, after cutting, but to spread them in the sun for an hour or so before bagging, so that any discoloration on the cut ends can be noted. There are still some farmers who are losing considerably through Mosaic disease, particularly on the Burnett River. The losses observed here would in some cases, to put it in round figures, amount to half a crown in the pound, while past losses through this disease were in most instances due to unconscious selection of bad plants—future losses can only be attributed to indifference. The Bureau will always assist growers, if required to do so, in matters of plant selection, the writer during the past year having carried this out for a great many farmers. In the case of a number of growers on the Burnett River, serious losses will be occurring in a few years if the farmers do not take a very keen interest at next planting period.

WILT RESISTANT TOMATOES.

COMPARATIVE TRIALS OF VARIETIES, BOWEN DISTRICT.

N. A. R. POLLOCK, H.D.A., Northern Instructor in Agriculture.

In continuation of the procedure adopted by the Department in improving the varieties, both in disease resistance and productiveness, stud plots of each of the six varieties of tomatoes that have proved so satisfactory in their resistance to damage from "wilt," caused by the fungus *Fusarium Lycopersici*, were planted upon Mr. J. T. Moore's farm, Bowen, for the purpose of obtaining supplies of pure seed for sale by Mr. Moore, and in the selection of particular plants showing the most desirable characteristics, from which seed would be secured for the stud plots next season. Each of these plots was about one-sixth of an acre in extent, the plants being set out at the rate of 520 to the acre or 9 ft. apart each way.

A line of ten average plants was taken in each plot, from which each picking was carefully weighed and recorded by Mr. Field Assistant Hamilton in order to compare the yielding capacity of each variety.

The rainfall during the period was: April 40 points, May nil, June 203 points, July 43 points, August 83 points, September 97 points.

A fertiliser composed of 40 lb. superphosphate, 35 lb. sulphate of ammonia, 15 lb. sulphate of potash, and 10 lb. carbonate of lime for each 100 lb. of the mixture—practically equivalent to the commercial 777 (three sevens) sold by fertiliser dealers—was applied to each plot at the rate of 195 lb. per acre. This was applied by broadcasting 6 oz. of the fertiliser over a circle 6 ft. in diameter, of which the plant would form the centre, and working it in with the cultivating implements prior to setting the plants out, which latter was accomplished between 1st and 5th April. Beyond a watering of each plant, as it was set out, the only moisture the plants received was from the rainfall as shown in the table previously.

During the latter part of April and the whole of May no rain fell, while heavy winds prevailed, so that growth was retarded and the first picking not made until the 27th June; the last picking was on 26th September.

The result of the picking from each plot of ten plants is as follows:—

Variety.	27th June.	4th July.	11th July.	18th July.	25th July.	1st Aug.	18th Aug.	12th Sept.	19th Sept.	26th Sept.	Total.
	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.
Denisonia ..	15	13	17½	20	15	30	124	182	108	120	644½
Bowen Buckeye ..	8	13	16½	12	7	39	112	145	59	153	564½
Norton	7½	10	12	8	4	19½	45½	73	71	167	417½
Norduke	4	6	14½	14	5	14	59	84	61	112	373½
Roselawn Buckeye	2	1	1½	7½	10	*34	84½	92	60	79	371½
Columbia ..	5	3½	2	7	1	12	42	67	58	121	318½

Worked out to acre yields for each variety and allowing 24 lb. as the average weight of fruit per quarter case, the results would be—

Variety.	Lbs. per Plant.	Lbs. per Acre.	Cases per Plant.	Cases per Acre.
Denisonia	64·45	33,514	2·68	1,396
Bowen Buckeye	56·45	29,354	2·35	1,223
Norton	41·75	21,710	1·74	904
Norduke	37·35	19,422	1·55	809
Roselawn Buckeye	37·15	19,318	1·54	804
Columbia	31·85	16,560	1·33	690

* After the fifth picking, one plant of the Roselawn Buckeye died, the pickings thereafter being from nine plants only. Between the 1st and 18th August, pickings were not made owing to Mr. Moore being away at the Brisbane Exhibition, while between the 18th August and 12th September pickings were not made owing to the railway strike. It is possible a little more fruit might have been secured had this irregularity in picking not occurred.

Of the varieties under trial, Denisonia, Bowen Buckeye, and Roselawn Buckeye are departmental selections, while Norduke, Norton, and Columbia were originally imported from America.

An interesting feature in connection with the wilt resistance of these varieties was the recovery of odd plants of each variety, which, during the adverse weather conditions after they were planted out, developed a mild attack of the fungus.

As soon as rain fell in early June, these plants made vigorous growth and completely threw off all signs of the disease, bearing equally as well as the others, to the conclusion of the trial. This incident gives emphasis to the contention that a lowered vitality in plants or animals contributes very largely to the prevalence of disease.

Throughout the trial, the varieties Denisonia, Bowen Buckeye, Norton, and Roselawn Buckeye made the most prolific growth, the varieties Norduke and Columbia being slow of growth and inclined to make a denser bush. This was particularly

noticeable in the latter. Possibly these two varieties might have succeeded better had they had more rain.

The quality of the fruit of each variety was particularly good, the percentage of blemished fruit being very low, for which some credit as well as for the high yields must be given to the fertiliser used.

Generally, the yield of any variety must be looked on as particularly good, while those of Denisonia and Bowen Buckeye are of exceptional merit. The production of these varieties at each picking, as shown in the table, stamps them as especially suitable to the Bowen district.

WINTER GREEN FEEDS ON THE TABLELAND.

N. A. R. POLLOCK, H.D.A., Northern Instructor in Agriculture.

In continuation of the policy of the Department of Agriculture in stressing the advisability of supplementing the pasturage by the provision of succulent green feed, as far as possible all the year round, but more especially in the winter and succeeding months when the pasture is scanty or at its lowest value in milk production, demonstration plots were again arranged for the past winter on the tableland.

Seed was distributed to farmers for plots at Tolga, Atherton, Kairi, Kulara, Yungaburra, Peeramon, Malanda, Moregatta, Millaa Millaa, Ravenshoe, and Evelyn.

With a view to demonstrating the additional value of the cereal crops if fed in the young stages of growth when the nutritive ratio is narrowest, and thus of more value as an addition to the pasturage in promoting the flow of milk, growers were advised to cut and feed or to graze off the crops, periodically, as soon as a sufficient growth allowed.

As a consequence of this, it was not possible to record the yields in every centre. Seasonal conditions were not very favourable in the Tolga, Atherton, Kairi, Kulara, and Yungaburra districts owing to a lesser rainfall in the latter part of April, the whole of May, and the early part of June, while July was also a very dry month. In the other districts where the rainfall average is much greater, very fine results were obtained.

The following are amongst those estimated on various farms:—

	T.	Cwt.	Q.	Lb.	
Florence wheat	9	3	0	24	per acre
Three Seas wheat	6	10	0	20	„
Waterman wheat	7	7	3	12	„
Skinless barley	9	3	0	24	„
Skinless barley and legumes (dun and partridge field peas, golden and dark vetches)	5	6	3	5	„
Waterman wheat and peas	9	14	1	24	„
Partridge field peas	10	2	2	0	„
Dun field peas	8	7	16	0	„
Golden vetches	6	15	0	0	„

During a visit to the farms on which the demonstration plot work was carried out, an inquiry, as to the effect of the feeding of the young growth, elicited the response in every instance that it had just about doubled the milk yield.

Messrs. Lowry Brothers at Malanda, who evince a commendable keenness in all matters that will tend to increase production on their farm, kept an accurate record of the influence of this feeding by noting the returns from the butter factory before, during, and after the periods in which the green stuff was fed. The same fifty cows were fed during the periods.

First two weeks of August—pasture only. 300 lb. Daily average, 21 3/7 lb. butter.

Balance of August—pasture and green feeds. 550 lb. Daily average, 32 6/17 lb. butter.

First two weeks of September—pasture and green feeds. 462 lb. Daily average, 33 lb. butter.

Balance of September—pasture and green feeds. 536 lb. Daily average, 33½ lb. butter.

Factory payment was at 1s. 6½d. per lb. of butter.

It may be noted that the majority of the herd were approaching the end of their milking period, which fact further stresses the value of the fodders.

Messrs. Lowry Brothers' plots were of 5 acres, comprised in 1 acre each of Florence, Three Seas, and Waterman wheats and skinless barley, and ¼ acre each of golden and dark grey vetches, Dun and Partridge field peas.

These crops were cut and fed to the cows in the paddock. Taking the average daily gain over the period from 15th August to 3rd October—fifty days—during which the feeds were supplied, as 12 lb. of butter per diem, the extra amount of butter received, allowing the herd to have maintained the same average as before, which is unlikely, works out as 600 lb. butter, worth, at 1s. 6½d. per lb., £46 5s., a profit of £9 5s. per acre, a result well worth while.

In addition to the extra amount of butter received during the period, allowance must be made for the beneficial effect of the feed beyond the period mentioned which dairymen will recognise.

In writing, under date 15th October, Messrs. Lowry Brothers state: "We have, since the 3rd October, ceased to feed the herd on green stuff from the plots, and have five fresh cows in. We have a real tip-top paddock with three mixed grasses, viz., Couch, Panicum Muticum, and Paspalum. This paddock has been spelled for over six months, and the grass is 6 to 8 in. high all over 75 acres, on which the cows have been running since 3rd October. On 5th October they dropped 15 gallons of milk per day, and by the end of the week 25 gallons per day, despite the five fresh cows that came in. We consider we are losing 25 gallons of milk per day since we left off feeding from the plots. One particular cow we have had tested for show purposes; her test, when on good grass pastures, went 4.2; her test when fed on skinless barley, peas, and vetches went 5.3, with a daily average increase of 10 lb. of milk over five days. We can assure you that these figures are correct."

(Variations of 1 per cent. or more in the tests of dairy cows are common, and are not ascribed to be due to the quality of the fodder, which latter is responsible, however, for the increase in milk.—N.A.R.P.)

It is pleasing to note that the success, attendant on the first and subsequent series in plot work of this description on the Tableland, has resulted in more attention being paid each year to the provision of succulent feeds to supplement the pasturage during the period of extreme shortage. Where in past years the pasturage alone was considered to be sufficient, the opinion, influenced by increased returns such as those shown by Messrs. Lowry Brothers, is becoming more universal, that judicious feeding of cultivated crops is not only advisable but necessary for successful dairying, proof of which is evidenced by the increase in cultivation paddocks on the farms. The Department advises that more profit can be made by growing fodder crops and legumes in summer as well as in winter, whereby the desirable qualities of the ration in palatability, digestibility, and nutritive ratio, so necessary for the greatest production, can be maintained during the whole year. From the data obtained from plot work of this description it is proposed shortly to publish an article dealing with the various fodder crops suitable for all times of the year, with cultural notes giving rate of seeding and times to sow for all districts in the Northern division.

THE DIAGNOSIS OF DISEASE IN POULTRY.

Numerous inquiries are received as to the cause of deaths in poultry, but unfortunately through the inquirer not supplying sufficient particulars a correct diagnosis is exceedingly difficult and in many cases impossible. With a view to facilitating this work and incidentally enabling the Department of Agriculture to be of greater service to poultry keepers, it is suggested that information on the following lines should accompany inquiries:—

> How long have poultry been kept on the site? How birds are housed? Number of stock and ages? New purchases and date of purchase? Particulars of feeding and water supply. How many birds have died, their ages, and the period over which deaths occurred? What symptoms are shown by affected birds such as general action, comb, discharge from nose, eyes, and general condition of droppings. What are the general appearance of the internal organs of dead birds and have any recovered?

Generally speaking, diseases in poultry are preventable by correct housing and feeding, while wrong methods render them more susceptible. In all cases of outbreaks the cause needs to be ascertained and remedial measures adopted, but while this process is in operation affected birds and contacts should be isolated with the object of arresting any spread of the infection, and the quarters thoroughly cleaned and disinfected.

WHEAT AND PASTURE IMPROVEMENT.

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

During the season under review, wheat propagation plots, fertiliser and variety trials were carried out on the farms of Messrs. O. Hentschell and H. Geitz, Allora; E. M. Larsen, Campbell Plains, near Warwick; and E. Rowlings, Inglewood.

The trials conducted at Messrs. Hentschell's, Allora, and E. Rowlings', Inglewood, were a continuity of the work that has been carried out at Mr. Geitz's farm, Allora, for the past three years. The system in vogue is the testing of Roma crossbred wheats, under field conditions, and the elimination of any undesirable variety from the $\frac{1}{80}$-acre plots, and extending those varieties which have proved suitable to the district.

The result of the work was that nineteen new varieties were transferred to propagation plots in areas ranging from ¼ to 1 acre. These varieties have been named and are now known as—

Watchman (Soutter's Early x Warren 79);
Three Seas (Cretan x Comeback x Cretan);
Waterman (Soutter's Early x Warren 8);
Redman (Bunge x Manitoba 10);
Redchief (Bunge x Manitoba 22);
Florida (Bobs x Florence 9);
Warrior (Soutter's Early x Warren 6);
Marco (Bunge x Marquis 1);
Bindii (Bunge 2 x Florence T 5);
Buffalo (Bunge x Florence 2);
Ringer (Bunge x Manitoba 12);
Pinto (Bunge x Florence T 4);
Pilot (Bunge x Florence T 2);
Radio (Bunge x Manitoba 29);
Redskin (Bunge x Manitoba 16);
Amber (Bunge x Amby 22);
Amberite (Bunge x Amby 22 Sel. 1);
Beewar (Bunge 2 x Warren 2);
Polo (Bunge 2 x Florence T 1).

Planting was carried out on the 10th May at Mr. Rowlings' farm, and on 17th, 18th, 19th May, 1924, at Mr. Hentschell's property. As good moisture was present an excellent germination resulted.

Seed, which was treated with carbonate of copper at the rate of 1 oz. per bushel as a bunt preventive, was sown at the rate of 30 lb. per acre, and the resultant crops were free from bunt. Good conditions prevailed up till the 5th August, 1924, when a heavy frost was experienced, and considerable damage was done, which was estimated at approximately 30 per cent. loss. Considering the amount of damage sustained by the frost, all the varieties made a wonderful recovery.

Heavy rain fell when the plots were ready for harvesting, which delayed operations in this respect. This resulted in the grain becoming bleached, and a small percentage "shot," which also reduced the yield.

Rust was very noticeable in the majority of all varieties grown throughout the district, and in some instances losses were reported. The new varieties withstood the test to a certain degree, but were not altogether clean. All varieties showed a certain amount of flag and stem rust, but not sufficient to cause any serious damage.

* Abridged from the Annual Report of the Under Secretary for Agriculture and Stock (Mr. Graham) to the Minister (Hon. W. Forgan Smith) for presentation to Parliament.

The following list shows the yields per acre:—

Variety.	Yield per Acre. Bus.	Lb.
E. Rowlings, Inglewood—		
Three Seas	16	31
Waterman	17	55
Watchman	6	47
O. Hentschell, Allora—		
Amberite	17	8
Amber	15	32
Florida	17	46
Warrior	19	44
Buffalo	20	48
Pilot	25	36
Pinto	27	4
Redman	19	36
Redskin	20	40
Marco	23	54
Polo	22	36
Bindii	22	44
Ringer	20	20
Redchief	26	36
Radio	22	12
Beewar	26	4

In addition to the above propagation plots of 8 acres of C.C.C. 3 (Three Seas), 50 small variety plots of $\frac{1}{80}$-acre, 35 single drills of wheat, and 21 drills of barley were carried out on Mr. Geitz's farm, Allora. These did remarkably well.

The outstanding varieties in the $\frac{1}{80}$-acre plots were three crossbreds, viz., Cretan x Bunge 2 d x Gluyas 1, 2, and 3. These varieties withstood the adverse conditions that prevailed, and were practically free from rust, also showing an erect habit of growth, and held grain well.

The yields from the $\frac{1}{80}$-acre plots are as follow:—

Variety.	Yield per Acre. Bus.	Lb.
Cedric	29	20
Florence	24	20
Gluyas	30	40
Pusa 4	25	20
Bel. x Flo. 10	28	40
Bel. x Flo. 13	23	0
B. x Flo. 1	33	40
B. x I.P. 20	28	40
B. x I.P. 25	26	40
B. x I.P. 28	27	20
B. x I.P.T. 2	28	20
B. x I.P.T. 4	34	0
B. x Man. 30	31	20
B. x Marq. 2	27	20
B2 x War. 3	33	20
C. x B12	33	20
C. x B13A	29	20
S.E. x War. 7	21	20
Bobs x Flo. 3	38	40
S.E.S. 10	28	0
S.E.S. 11	22	0
B1 x Man. 32	24	40
B1 x Man. 33	30	0
B1 x Man. 35	28	0
C. x B2d x Gluyas 1	31	20

Variety.	Yield per Acre. Bus.	Lb.
C. x B2d x Gluyas 2	39	20
C. x B2d x Gluyas 3	32	30
B2 x Flo. 4	30	0
B2 x Flo. 5	25	20
B2 x Flo. 7	28	40
B2 x Flo. 8	32	40
B2 x Flo. 9	32	40
B2 x Flo. 10	28	0
B2 x Flo. 11	26	40
B. x I.P. 30	28	0
B. x I.P. 31	28	40
B. x I.P. 33	28	40
B. x I.P. 34	27	20
B. x I.P. 35	27	20
B. x I.P. 36	26	0
C.C.C. 4	27	20
C.C.C. 5	19	40
C.C.C. 6	34	40
C.C.C. 7	19	20
C.C.C. 8	33	40
C.C.C. 9	26	20
B.M. x Flo. 1	24	40
B.M. x Flo. 2	31	20
B.M. x Flo. 3	30	0
B.M. x Flo. 4	26	40

The variety C.C.C. 3 (now known as "Three Seas")—8 acres—suffered the effects of the frost on the 5th August, 1924, and considerable damage was sustained. Notwithstanding this, the variety turned out well, and gave a yield of 15 44/60 bushels per acre.

Keen interest was manifested in the trials conducted at all centres, especially at Allora, where a field day was inaugurated by Mr. Geitz, and over 100 visitors inspected the trials conducted at his farm.

WHEAT VARIETY AND FERTILISERS TRIALS.

Mr. E. M. Larsen wrote to the Department of Agriculture and Stock on 11th February, 1924, and in part of his letter says: "For a few years after my ground was cleared and broken up it yielded record crops, but for several years past I have been unable to grow even a fair crop regardless of good rainfall and cultivation, so I have come to the conclusion that my soil is deficient in some particular plant food." Mr. Larsen further stated that he "had tried superphosphates for wheat, applying up to 1 cwt. per acre, following it up the next year with ½ cwt., but the crop did not show up to any better advantage." Mr. Larsen asked for advice, and stated that he would like the Department to carry out an analysis of the soil.

Subsequent to the analysis being made, which showed that phosphoric acid, nitrogen, potash, and lime were present and available in sufficient quantities for the requirements of an ordinary crop, arrangements were made respecting fertilisers and variety tests on 19½ acres.

Fertiliser Tests.

Variety of wheat used—"Three Seas" (C.C.C. 3) produced at Roma State Farm. The seed was treated with carbonate of copper for bunt and smut prevention, at the rate of 1 oz. per bushel, and drilled in on 10th May, 1924, on well-prepared land, at the rate of 45 lb. per acre.

Plots each one-sixth of an acre were laid out and fertilised as follows:—

No. 1—Control (unmanured).
No. 2—Superphosphate, 1 cwt. per acre.
No. 3—Nauru phosphate, 1 cwt. per acre.
No. 4—Nauru phosphate and superphosphate, 1 cwt. per acre.
No. 5—Complete manure, 1½ cwt. per acre.
No. 6—Complete manure, 3 cwt. per acre.
No. 7—Control (unmanured).
No. 8—Superphosphate, 1 cwt. per acre.
No. 9—Nauru phosphate, 1 cwt. per acre.
No. 10—Nauru phosphate and superphosphate, 1 cwt. per acre.
No. 11—Complete manure, 1½ cwt. per acre.
No. 12—Complete manure, 3 cwt. per acre.
No. 13—Control (unmanured).

The complete fertiliser was composed of 113 lb. superphosphate, 68 lb. sulphate of ammonia, 113 lb. Nauru phosphate, and 27 lb. sulphate of potash.

The harvesting of these plots took place on 13th and 14th November, the results being as follows:—

Variety.	Yield per Acre. Bus.	Lb.
No. 1	30	24
No. 2	29	30
No. 3	28	12
No. 4	27	36
No. 5	25	48
No. 6	30	18
No. 7	27	0
No. 8	26	4
No. 9	24	54
No. 10	27	36
No. 11	26	26
No. 12	27	54
No. 13	27	24

From the above it will be seen that the highest yield was obtained from the unmanured plot No. 1, whilst Nos. 6, 2, and 3 were next in order, clearly demonstrating in this particular instance that, given a proper system of early and thorough cultivation and a sufficiency of moisture, no need exists as yet for fertilisers on this particular class of country.

Variety Tests.

Varieties used—Cedric, Roma Red, Amby, Flower (Bobs x Flo. 9), Three Seas, and Novo. Dates of sowing—12th and 13th May, 1924. Rate of seed—45 lb. per acre, drilled in. Seed previously treated with carbonate of copper at the rate of 1 oz. per bushel, as a bunt preventive. The resultant crops were bunt-free.

A comparative test was made with six different wheats representing promising departmental varieties, for the purpose of determining their value under local conditions. No fertilisers were used other than those applied for observation and comparative purposes in the form of a complete manure to strips of crop the width of a seed drill running through the centre of each plot. The fertiliser was of a similar composition to that used in the fertiliser tests, and applied with the seed at the rate of 1½ cwt. per acre, but proved to have no influence whatsoever on plant development or on the resultant yield.

Progress reports were from time to time submitted, and are summarised as follows:—

5th June, 1924.—Very little rain experienced since planting, viz., 15 points on the 15th May and 44 points on 2nd June. Plenty of soil moisture present, due to good cultivation. Seed germinated well, and coming along nicely. No oats or foreign growth present. Frost has been severe since wheats sown; up to present no difference was to be observed in any of the plots.

10th July, 1924.—159 points of rain recorded. Wheats doing very well. Heavy frosts experienced on the 2nd July which cut the wheats badly. No perceptible difference in any of the fertiliser plots, or where a complete fertiliser was used in the variety tests.

29th August, 1924.—A month's dry weather experienced since 10th July. Heavy frosts on the 5th August (11 degrees) caused considerable damage to the wheat plots generally. No noticeable difference in the fertiliser plots.

Reported 123 points over a space of three days, with prospects of continuance.

30th September, 1924.—Rainfall, 247 points.

31st October, 1924.—Seven wet days for a total of 253 points.

November.—Rainfall to date of harvesting, 180 points. Harvesting was completed by 18th November, 1924. The results obtained were—

Acres.	Variety.	Yield per Acre. Bus.	Lb.
3	Cedric	29	0
3	Amby	28	21
3	Roma Red 2	24	34
3	Flower	16	34
3	Novo	24	28
3	Three Seas	10	56

Wheat Plots.

Further arrangements have been made with Mr. H. Geitz, of Allora, for an area of land for the continuation of propagation and variety trials during the coming season, 1925-6.

Plots were sown from 29th May, 1925, to 30th May, 1925, and included 2½ acres C.C.C. 11 (now known as Pacific) and ½ acre each of Pusa 4, C x B2d x Gluyas 1, 2, and 3; twenty-three $\frac{1}{50}$-acre plots, sixty-five single drills of wheat, and twenty-one of barley.

In addition to the above trials, the extension of wheat propagation plots and variety tests have been established in the following districts:—Inglewood, Pittsworth, Jandowae, Kaimkillenbun, Pratten, Southbrook, Allora, and Murgon; the object being to further test these varieties with the view of obtaining pure seed, so that they may be maintained in general cultivation.

The variety tests being carried out at Southbrook, Inglewood, Jandowae, Kaimkillenbun, Pratten, and Murgon comprise the following:—Waterman, Radio, Bindii, Beewar, Warrior, Canberra, Watchman, Redskin, Pilot, Polo, Florence, Amby, Redman, Florida, Buffalo, Ruby, Cedric, Bunge No. 1, Redchief, Marco, Amber, Three Seas, Pusa 4, Ringer, Pinto, Amberite, Pacific, Gluyas; which were planted in drills, 1 chain long, with a roadway of 2 feet between each variety.

Potato Variety Trials.

These trials were carried out on Mr. A. Ernst's farm, Bollier Plains, Kandanga, Mary Valley line. The land selected was of a medium heavy black loam, rich in organic matter, and had been lying fallow for twelve months, being previously cropped with maize.

The varieties comprised Manhattan, Scottish Triumph, Earliest of All, Carmen No. 1, Carmen No. 3, Up-to-date, Beauty of Hebron, and Brownell's Beauty.

The seed, with the exception of Brownell's Beauty, was in nice forward condition for planting; being above medium size, it was cut into suitable sets with two and three eyes to a set, and planted out, under favourable conditions, on the 21st August, 1924. Drills were run out 3 feet apart with the plough, the potatoes covered with 3 to 4 inches of soil by a single-horse scuffler, and the land harrowed immediately after.

During the growing period the soil between the rows was kept in good condition by frequent cultivation. Towards the latter end of the season heavy rains induced an excessive growth of weeds, which had an effect of slightly reducing the yields.

Potato plots were approximately one-fifth of an acre each in size. Yields were worked out on an acre basis, with an allowance of 18 inches on both sides of each individual plot.

Harvesting was commenced on the 9th and completed on the 13th December, 1924.

The variety Earliest of All matured a week previous to Beauty of Hebron, which in this respect was a few days ahead of the other varieties.

Details of the yields are as follows:—

Variety.	Yield per Acre. T.	Cwt.	Qr.	Lb.
Manhattan	4	13	3	14
Scottish Triumph	5	6	1	15
Earliest of All	4	4	3	21
Beauty of Hebron	3	19	0	19
Carmen No. 3	4	4	0	19
Brownell's Beauty	2	10	1	19
Carmen No. 1	4	2	0	18
Up-to-date	4	3	0	1

Renovation of Paspalum Pastures.

Within the immediate coastal districts, more particularly where dairying is one of the principal primary industries, a considerable area of land sown down with paspalum has seriously depreciated in its stock-carrying capacity. It is generally recognised also amongst stockowners that the pastures in certain localities are deficient in mineral matter, essential for building up the structural framework of animals.

Where practicable, the breaking-up, by ploughing, of the old root-bound paspalum pastures is undoubtedly the quicker way to give them a new lease of life; however, this does not go far enough where lime and other plant-foods are deficient.

With the object of giving effect to a combination of the two methods of renovating pastures, experiments are designed and are being carried out at Maleny and Cooroy. For the purpose of the experiment the plots were securely fenced in to permit of observation work when being grazed off by cattle; small special stock-proof enclosures being erected at the intersections of each set of four plots, from which regular cuttings of grass are to be taken during the period of the tests.

In this way knowledge will be gained of the effect of the several fertilisers in the matter of fodder yields. This, in conjunction with the analytical work being carried out by the Agricultural Chemist, should provide valuable data for the guidance of stockowners.

KILLING OF WEEDS WITH ARSENICAL SPRAYS.

By J. C. BRUNNICH.

Enquiries are frequently made about the use of arsenical sprays for the killing of weeds. There are several arsenical weed killers on the market, which can be used for this purpose, or anyone can make his own solution by the following method:—

Mix 4 lb. of grey arsenic with 1 lb. of caustic soda in the dry state, and slowly add water to make 4 gallons of a concentrated solution. Sufficient heat is generated in the process to bring the solution almost to boiling point. If washing soda is used instead of caustic soda 4 lb. are required, which are dissolved in about 3 gallons of water, which is brought to the boil and the 4 lb. of arsenic are added, and the solution kept boiling until all the arsenic is dissolved, which generally takes about half an hour, when sufficient water is added to make 4 gallons.

For the spraying dilute 1 pint of this concentrated solution with 4 gallons of water. From 75 to 100 gallons of the spraying solution are required per acre. The spray is only successful for the destruction of succulent weeds in their early stages of growth.

The Bureau of Sugar Experiment Stations made experiment with arsenical sprays in the Mackay Sugar Experiment Station in 1915, and found that weeds like pigweed, billy goat weed, asthma weed were practically killed with one spraying; grasses like couch grass and cocksfoot could not be killed even with repeated sprayings at short intervals. The cost of one spraying was about £1 per acre on the headlands, and nearly £2 per acre amongst the cane rows.

When preparing and using arsenical sprays, great care must be taken that the fumes when boiling the solution should not be inhaled, and allowing boots, socks, and clothing generally to become sodden with the arsenical solution will lead to serious illness. Before taking any meal the hands must be carefully washed, and also the whole body should be washed as frequenty as possible in intervals between the spraying operations, as the poison is readily absorbed through the open pores of the skin.

The risks of using such poisonous sprays in banana plantations and sugar-cane fields are so great that the Department of Agriculture and Stock does not recommend the general use, and only in a few exceptional cases the use of arsenical sprays is justified and economic.

AUSTRALIAN PRODUCE AT WEMBLEY.

Even Australians who visited the Empire Exhibition at Wembley were astonished with the extraordinary range, variety, and value of Australian products as represented in the exhibits, and it is interesting to note that suggestions are being made to education authorities in Britain to secure samples of our produce, wool particularly, for permanent display. In submitting such a suggestion the Bradford "Wool Record," in a recent issue, declared that the Australian, New Zealand, and South African sections of the Exhibition constituted the best and most representative collection of Empire produce ever seen.

PLATE 8.—MR. ROBERT VEITCH, B.Sc. (Agr.), B.Sc. (For.), F.E.S.,
Who was recently appointed Chief Entomologist, Department of Agriculture and Stock.

THE CHIEF ENTOMOLOGIST.

Mr. Robert Veitch, B.Sc. (Agr.), B.Sc. (For.), F.E.S., has recently been appointed Chief Entomologist of the Queensland Department of Agriculture and Stock.

Mr. Veitch was born in Edinburgh, Scotland, and educated at the Royal High School there and afterwards at the Edinburgh University. Later he went to the Imperial College of Science, London, subsequently taking a post-graduate course in Science in Germany. He was appointed Demonstrator in Botany at his old Alma Mater in Edinburgh, and also conducted a course in Zoology at the Veterinary College in that city. Then followed an appointment as assistant entomologist in the Imperial Bureau of Entomology at the British Museum. He then entered the service of the Colonial Sugar Refining Company, and was engaged for eleven years in field scientific work as entomologist in Fiji, New South Wales, and Queensland. He was also associated with pathological control problems. In the course of his connection with the Colonial Sugar Refinery, Mr. Veitch visited and worked in some of the principal experiment stations in the United States and Hawaii. Mr. Veitch is the author of a number of scientific publications, and is a valued contributor to numerous scientific journals.

PROFITABLY FEEDING IODINE TO SWINE.—III.

By JOHN M. EVVARD.*

The first of this series appeared in the November Journal, and the second in last month's issue.

In the last two months we have been discussing the question of iodine feeding, and have shown that it is good insurance to feed iodine, particularly in the northern States.

Recently I was up in Canada, way up in the country where twilight ceases about 10 o'clock or later, and where the twilight begins again about 1.30 o'clock or 2 o'clock, thus leaving about a four-hour darkness period. Farther north it gets lighter and lighter, there being six months day and six months night well up within the Arctic circle.

Well, up in that country I found that it was absolutely essential on practically all of those ranches to feed iodine, because the lambs came with goitre and practically all died—in some cases, 100 per cent. being afflicted; then, too, the pigs would come hairless. Of course, the cattle were fed iodine, too, to keep the calves from becoming hairless and goitrous, and the mares were fed iodine to help keep their colts' legs straight, to prevent goitre and associated conditions. The feeding of this iodine, of course, to all classes of stock is good insurance, not only for the birth of the young, but also because it protects the health of the growing and mature animals.

We have an experiment to discuss, after which we will tell more about the use of iodine and whether or not we can depend upon our feeding stuffs to carry it.

In the winter of 1923-1924 we fed in Experiment 255 two lots of six pigs each from 28th December, 1923, until the pigs reached an approximate weight of 300 lb., and then we continued the experiment for a full 180 days, or until 25th June, 1924. When the experiment started these pigs were better than three months old, and weighed on the average practically 67 lb. per head.

The allotment and rations fed were as follows:—

Lot A—Dry lot. (Check). Shelled corn grain, mixed colour, yellow and white, self-fed; plus supplemental protein feed mixture (cotton seed meal, 30; corn oil cake meal, 20; linseed oilmeal, 15; standard wheat middlings, 10; soybean oilmeal, 14; peanut meal, 7; and alfalfa meal, 4 lb.; total, 100 lb.), self-fed; plus Simple "Back Bone" mineral mixture A, potassium iodide omitted ('flake salt, 20; high calcium limestone, finely ground, 40; and spent bone black, 40 lb.; total, 100 lb.), self-fed.

Lot B—Dry lot. (Iodide fed.) Same as Lot A excepting that .05 lb. potassium iodide was added to 99.95 lb. of mineral mixture A. The mineral mixture B resulting had the following composition:—Flake salt, 19.99; high calcium limestone, finely ground, 39.98; spent bone black, 39.98; and potassium iodide, .05 lb.; total, 100 lb.

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* A prominent American authority on pig breeding and feeding and a well-known contributor to the "Chester White Journal."

The Lot A pigs reached 300 lb. in 170 days, whereas the Lot B pigs took only 150 days' time, or 20 days less. The feed requirement for 100 lb. gain for Lot A was 485 lb., and in Lot B only 446 lb., a saving of 39 lb. of feed due to the use of less than a thirtieth of a grain of potassium iodide per hog daily.

The iodine intake per pig daily averaged for the 180 days of feeding approximately one-thirty-third of a grain, which was rather a small intake. The consumption in this experiment shows a very small iodine intake; perhaps this is accountable for the fact that the iodide-fed pigs in this experiment did not take the lead in liveweight until about the seventieth day, whereas in the first experiment the iodide-fed pigs took the lead in about forty days, and in the second experiment the iodide-fed pigs took the lead early. In both the first and second experiments the iodine consumed daily was much in excess of the intake in this third experiment.

The average iodine consumption in grains for the 140 days of the first experiment was .5 per pig daily; in the second experiment, or for a period of 110 days, it was .65, about 11 per cent. more; and in the third experiment it was .03 for a period of 180 days, or about one-seventeenth of the daily ingestion in the first experiment. Of course, the quantity of iodine in the particular feeds as used and water may greatly affect these relationships, these depending on the amounts of iodine present in the feeds, particularly as consumed.

The growth of the pigs receiving iodide was considerably better, not only from the weight, but also from the dimensional viewpoint. The measurements of the pigs as taken throughout the experiment demonstrate clearly the truth of the above statement of superiority on the part of the iodide-fed pigs.

In every instance the growth (dimensional) of the iodide-fed Lot B was greater than in the no-iodide-fed Lot A. This is true whether the comparison is made on the absolute or on the percentage basis.

In body length as well as in height at shoulder the iodide-fed lot clearly excels the check, no-iodide-fed lot, the increased growth being respectively 3.9 and .8 inches, but iodide feeding appeared to be beneficial; this by a tenth of an inch.

Summarising, it appears that young swine fed in this, the third iodide experiment, 255, in dry lot, showed beneficial results from iodide feeding. The average daily gain was greater when potassium iodide was fed by 13.05 per cent., and the feed requirement for the unit gain was lessened by 8.04 per cent. The iodide-fed pigs showed a marked increase in dimensional growth. The results of this third experiment are in practical accord with the results of the first two, this being all the more interesting, particularly in that the iodide addition, quantitatively speaking, was about a seventeenth of the ingestion in the first experiment, and a twenty-secondth of the allowance in the second experiment.

Inasmuch as the results were positive in three successive experiments under different conditions of feeding and management, one of the three comparisons being made on pasture wherein the animals are supposed to gain a store of iodine, the evidence is quite in favour of the conclusion that iodide feeding was beneficial to young swine under the conditions of our experiments.

The positive results secured in the three experiments in favour of iodide feeding suggest the wider and more general use of iodide in animal feeding practice, particularly in those goitrous regions wherein the water carries a low percentage of iodine. The two samples of water, one from Ames, and the other from Iowa City, analysed by Drs. McClendon and Hathaway, showed respectively 1.2 and 1.5 parts of iodine per hundred billion parts of water. If the spring pigs of Ames consumed on the average 10 lb. of water per day (a rather high estimate), it would take them 119,048 days to secure a single grain of iodine from their water supply. If these pigs averaged 300 days on the farm they would, in that time, on the basis of this maximum consumption of 10 lb. of water, get approximately one-four-hundredth of a grain of iodine in their drinking water. Surely the drinking waters of Ames and Iowa City supply but a very insignificant part of the needed iodine.

Furthermore, since it is to be considered that the work of Forbes, Bohn, and others, in regard to the quantitative presence of iodine in feeding stuffs, shows its occurrence to be very erratic and apparently accidental, and also because Cameron and Von Fellenberg conclude that the foods in a goitrous region or environment are likely to run lower in iodine than in those sections where there are non-goitrous conditions, there is indicated an inadequate supply of iodine for live stock under conditions at Ames. The assurance of the iodine supply can be made certain by adding the potassium iodide to the ration; this insures the pigs against an iodine deficiency which, if experienced, may be costly of feed, time, loss, and labour. The air source of iodine to the animal is considered a negligible factor. The feed, the water, and the soil or "licks" sometimes are the potent and practical iodine sources; the feed and water are the primary sources.

Inasmuch as swine may be handicapped because of a deficient supply of iodine, and yet show no gross or unusual signs of goitre or other iodine deficiency troubles, it appears to us that it is good practice in goitrous regions, such as Iowa and practically all of the northern half of the United States, to use iodine in the feeding

ration. This iodine, fed in the form of iodide, may be put in the drinking water, or with the feed; in the latter case we believe that it is sound practice to use from one-third to an ounce of either sodium or potassium iodide to the 100 lb. of mineral or salt mixture, which is kept before swine at all times. Our experiments have indicated that one could add one-tenth pound (1.6 oz.) of potassium iodide to the 100 lb. of mineral mixture without causing any noticeable untoward effects; we have added three-tenths pound (4.8 oz.) to 100 lb. of mineral mixture without noting any unfavourable developments, but would much prefer the small allowances of from one-third to an ounce.

Common salt, being one of the most important mineral substances regularly needed by live stock, suggests itself as a splendid carrier for iodine and provides a way for the practicable administration of iodine in sufficient and adequate amounts.

To recapitulate: The extra gain resulting from iodide feeding in the three Ames experiments was, respectively, 8.4, 8.3, and 13.1 per cent. For the three experiments there was a greater average daily gain of 9.91 per cent. (based on a straight average) due to the iodide feeding.

The feed required for 100 lb. of gain was reduced by iodide feeding in three experiments respectively, as follows:—12.5, 9.4, and 8.0 per cent. On the average, 10.00 per cent. less feed was required with iodide feeding.

And say, iodised salt is fine for table use. It can be purchased from most grocers nowadays at a moderate price. This salt for human consumption carries one-fiftieth of a pound of the iodide per 100 lb. of salt. To have healthy pigs and healthy folks it is highly essential that the intake of consumption of iodine be sufficient.

They say that "an apple a day will keep the doctor away," but that is better rhyme than sense; however, the use of iodine in the home and in the barnyard is good insurance against the thyroid troubles and the development of goitre and allied ailments.

CONTAGIOUS CATARRH IN POULTRY.

P. RUMBALL, Poultry Instructor.

Contagious catarrh with its complications is one of the most wide-spread contagious diseases met with in poultry. It is caused by an ultra-microscopical or invisible organism. Some outbreaks are very mild, while others again are very virulent. In many cases the disease organism is on the premises and its presence

Plate 9.—Roup in Early Stages.
The dirty patch on the wing is a warning of eye trouble.

is only manifested when depressing conditions, such as wet, chilly changeable weather, overcrowded, draughty, or insanitary houses, worm-infested stock, incorrect feeding, render the birds more susceptible to outbreaks. The disease usually attacks young stock but old birds are not exempt.

The mildest form of roup is generally shown by a watery eye, one or both, and a discharge from the nostrils, after a few days this discharge invariably thickens and one or both eyes are swollen. Where the disease is very virulent in the early stages the eye is much inflamed, and as it advances the head becomes swollen, due to the collection of mucous in the orbital or ocular sinus or space. This swelling forces the mouth to be continually held open. There may or may not be diphtheritic lesions in the throat or mouth. In an effort to clear its eye from the obstruction the bird wipes its head on the wing, shakes its head, sneezes, and frequently scratches its eye.

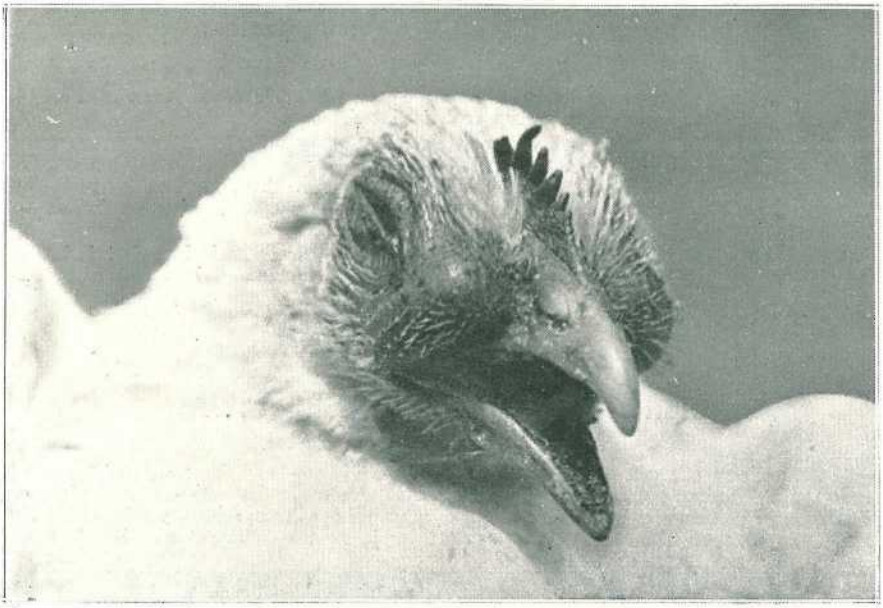


PLATE 10.—ADVANCED STAGE OF ROUP.
Collection of mucous forcing mouth open.

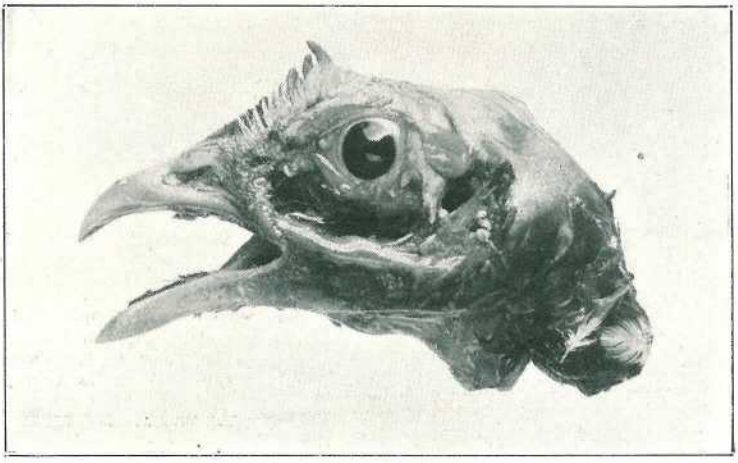


PLATE 11.
Showing orbital or ocular sinus under eye where mucous collects.

Treatment.

With roup there is generally fever which causes the birds to drink excessively, they also rinse their mouth with the object of cleansing it, at the same time fouling the water. Owing to the contagious nature of the disease the water vessels can be considered one of he principal methods by which the trouble is spread from bird to bird, and to avoid this the medicating of the drinking water should be practised. Copper sulphate (blue stone) is both economical and effective. A stock solution should be made of 3 oz. to the gallon of water. This could be used for the cleansing of the drinking vessel, and a cup full can be added to every 4 gallons or kerosene tin of water.

Birds severely affected should be destroyed, and treatment only practised on cases which are mild or in the early stages. The disease being of a contagious nature, however, any birds kept for treatment should be isolated and the premises they came from thoroughly cleansed.

A teaspoonful of oil (cotton seed) containing 3 drops each of kerosene and eucalyptus oil could be administered daily to each bird. Eyes and nose treated by swabbing or by means of a syringe or small machine oil can with either—

(1) Equal quantities of hydrogen peroxide and water;

(2) Ten grains of silver nitrate to the ounce of water; or

(3) Blue stone as recommended for medication of drinking water.

Any lesions in the throat could be painted with tincture of iodine or dusted with powdered blue stone.

Preventive measures, however, should be adopted, avoid the causes mentioned which predispose birds to infection. Only use sound and healthy breeding stock, and exercise due care when bringing fresh birds on to your premises.

THE CONSTRUCTION OF STIES AND PROVISION OF PADDOCK ACCOMMODATION FOR PIGS.

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

From the point of view of the Queensland pig farmer it is indeed fortunate that over the greater area of this State climatic conditions are such that there is little or no occasion for heavy expenditure in the construction of pig sty buildings, and there is certainly no need for elaborate or expensive accommodation-houses such as are practically a necessity in those countries where the winter season is a long and sometimes a very harsh one, and where it is essential that special provision should be made first and foremost for keeping the animals—the young ones especially—from freezing, and for providing warmth over a period extending sometimes to nine months out of the twelve. Queensland's climatic conditions are exceptionally favourable to keeping the animals out in the open as much as is possible all the year round, for even our worst winters are very mild in comparison with those overseas. The fact that the great bulk of the modern bungalows, villas, and cottages in the residential portion of our principal cities and suburban areas have no open fireplaces, and in many instances no fuel (wood, coal, or coke) stoves at all, indicates that we human beings do not suffer very much as a result of long cold winters.

So it is that in stock raising in this State the prime necessity is to provide for comparatively long and warm spring and summer months, and to so arrange accommodation that additional comforts may be provided at very little expense for the cooler months of the year.

All this, however, does not suggest that accommodation is unnecessary or that the tumbled down, insanitary, and inconvenient (so-called) pig sties one sees on so many farms are good enough for the purpose. It will be the objective in this series of articles on "The Construction of Sties and the Provision of Paddock Accommodation for Pigs" to supply detailed information that can be applied by those interested in pig raising in the "lay out" of their pig sties, pig paddocks, &c., to supply plans of suitable structures such as it would be possible for farmers to provide; and where possible to illustrate the different types of houses suggested as suitable for the purpose on different types of farms.

It will not be difficult to understand that the farmer engaged in fattening pigs on the surplus buttermilk, whey, or skim milk from butter or cheese factories or large dairies, and who at certain seasons of the year has an abnormal quantity of these products to handle, must of necessity have more extensive and more expensive feeding and housing arrangements than, say, the dairy farmer who keeps a few pigs

as a side line, or purely as an adjunct to dairying. The suburban pig farmer who utilises the waste food from hotels, cafés, and similar establishments, the sweepings from flour and grain mills and stores, waste fruit and vegetables from the markets and possibly some meat products, must also in order to conform to municipal or shire regulations and to provide for the requirements of a large number of fattening pigs, have ample, convenient, and permanent accommodation.

The suburban farmer is usually, owing to higher land values, somewhat cramped for space, hence he cannot give his breeding stock the benefit of a pig paddock, one or more acres in extent. He also has to provide a plant for cooking most of his refuse food, meat, &c., and he must have a permanent and very liberal water supply. The butcher, whether in a large or a small way, who slaughters his own cattle, sheep, and pigs, and who also keeps a number of pigs as part of his stock in trade has of necessity to provide special accommodation not only for the preparation and distribution of his food supplies but he must have accommodation that will satisfy the slaughtering inspector or other official charged with the responsibility of inspecting his slaughtering and boiling-down premises. The regulations under the Slaughtering Act or other legislation bearing on this aspect of the business demand that the pig sty accommodation and the environment generally be brought up to the standard required by these Acts, which nowadays includes the provision of concrete *feeding* floors, &c., as will be referred to when dealing with legislation later on in this series of articles.

The farmer who intends specialising in stud pigs and whose main source of income is to be derived from the sale of selected boars and sows, say, from two to twelve months old, will find that he requires a very much superior type of accommodation in comparison with the dairy farmer, feeding a few bacon pigs. He will find that he requires a goodly number of pens, small yards, shelter sheds, and pig paddocks. The bacon factory itself must provide up-to-date accommodation, even though they only provide for resting the bacon pigs for twenty-four hours or more before slaughter. They require numerous specially constructed water troughs, and will spend more money in the provision of these than on the provision of food troughs or feeding accommodation.

The farmer who intends raising pigs on the "paddock" system—or as it is commonly referred to overseas the "open air" system—with all its advantages in our genial climate, will require a special type of accommodation to which extensive reference will be made as we proceed with this important topic. In this case the principal expenditure will be in the direction of providing posts, rails, wire netting, barbed wire, nails and staples, straining posts, cap rails, shelter sheds, food and water troughs, carts or wagons, in addition to special accommodation for farrowing sows, fattening pigs, &c.

The gentleman farmer who keeps a pig or two on the farm at his country or seaside residence will require something more elaborate and showy, as also will the larger agricultural societies, with whom we are taking up the matter of providing better accommodation both for stock and for exhibitors at their annual exhibitions. Finally, boy and girl members of School Pig Clubs will have their own special type of accommodation to provide, in this instance a comparatively small pen and a roomy grazing area in which they can house their pigs whilst they are competing in the club.

The subject of piggeries at Government institutions will be dealt with in this series also, for here again a special type of accommodation has proved advantageous, though at most of the institutions the area available for grazing purposes, pig paddocks, &c., is far too limited. Thus it will be seen that the subject opens up a wide field for study—a field in which thousands of farmers in this State are intensely interested, for every farmer realises the need for better accommodation. The principal difficulty farmers have had to contend with in the past is that to a very large extent it has been a very difficult contract hunting up suitable plans and specifications or estimates of costs such as are absolutely essential in every class of building construction.

The illustrations accompanying this, the first of the series of articles on the subject, are of a simple type of shelter shed for use on almost any pig farm; they are simple in construction, yet are convenient and roomy, and could be larger or smaller as occasion requires. The building material could be either sawn hardwood palings, or second or third grade sawn timber, such as would be suitable for outhouses generally. The roof should, for preference, be corrugated iron, though the handy farmer will probably work his spare motor spirit tins into this job. They certainly can be used to advantage, provided they are well beaten out and laid in such a position that they will ensure the building being as waterproof as possible. Lapped sawn hardwood palings can also be utilised, but bark roofs are not to be recommended, as they usually prove unsatisfactory, and are, in the long run, more expensive than the iron roofs.

The shelter sheds illustrated (Figs. 1 and 2) were first tested out under actual pig-paddock conditions during the writer's term as Pig and Bacon Expert at the Hawkesbury Agricultural College, Richmond, N.S.W., where these sheds are still in use. The illustrations also appear in Mr. H. W. Pott's book on "Pigs and their Management."

The illustrations and plans give complete details as to the layout of the building, its length, breadth, height, &c. Fig. 2 shows several pedigree Berkshire sows in occupancy. The plans of shelter sheds are shown on p. 113.

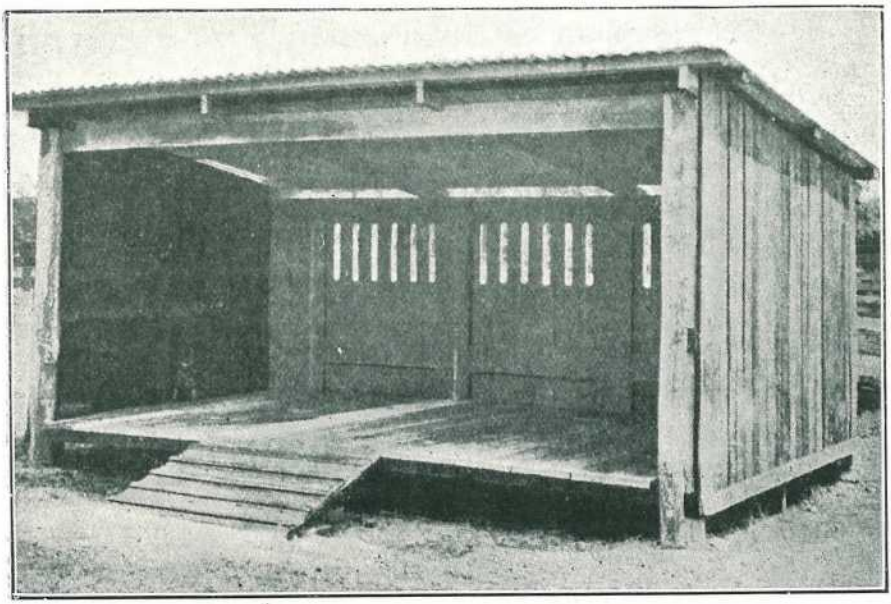


Plate 12 (Fig. 1).—Open-Fronted Shelter Shed (See also Fig. 2).
This type of accommodation adds value to the farm, and is not only convenient, but attractive and useful, yet inexpensive.

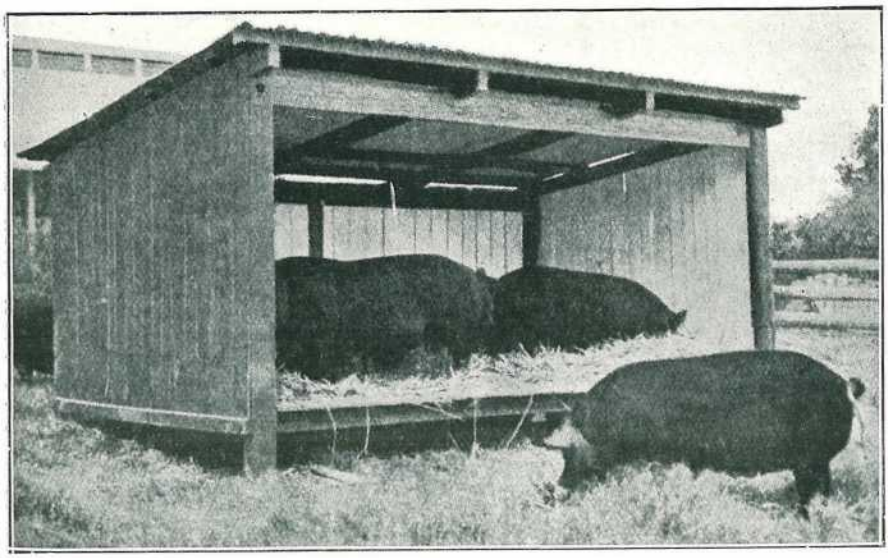


Plate 13 (Fig. 2).—Open-fronted Shelter Shed at Hawkesbury Agricultural College, N.S.W.
Berkshire Sows enjoying the advantages of a simple yet convenient Shelter Shed such as is recommended for Queensland Farms.

Fig. 3. An attractive shade and shelter; Berkshire sows at the Farm Home for Boys, Westbrook, *viâ* Toowoomba. These sows appreciate the shade and protection provided by the Budelia shrub, a most useful addition to the shade around the piggery buildings.

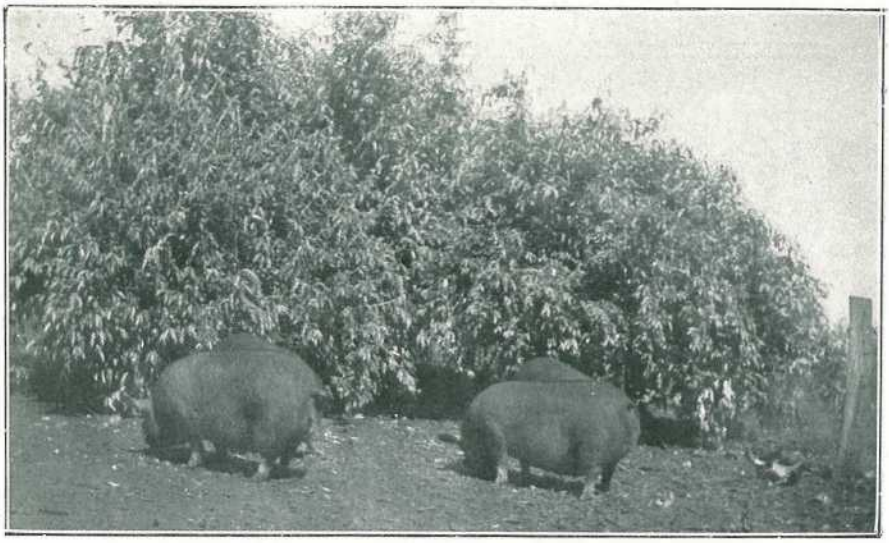


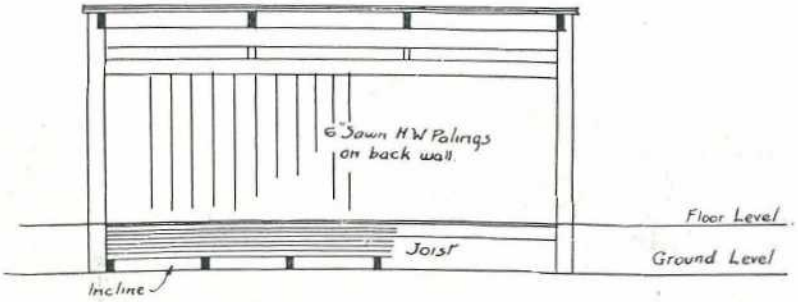
PLATE 14 (Fig. 3).—HOUSING THE PIG.

Berkshire Sows at the Farm Home for Boys, Westbrook *viâ* Toowoomba. These sows appreciate the shade and protection provided by the Budelia Shrub, a most useful addition to the shade around the Piggery.

Fig. 4, though not a local view, shows the layout and arrangement of paddocks and shelter sheds on a noted English stud pig farm.

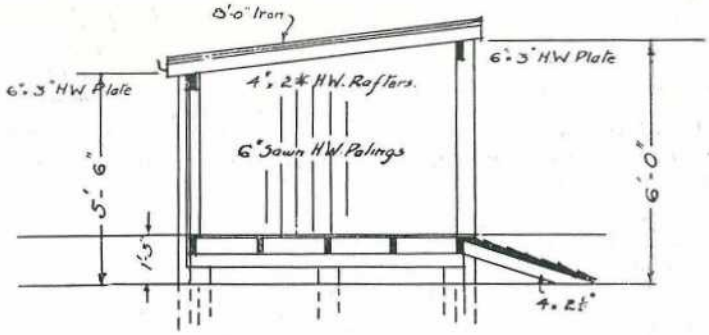
PLATE 15 (Fig. 4).

Showing the lay-out and arrangement of Paddocks, Shelter-sheds, &c., on a noted English Stud Farm.



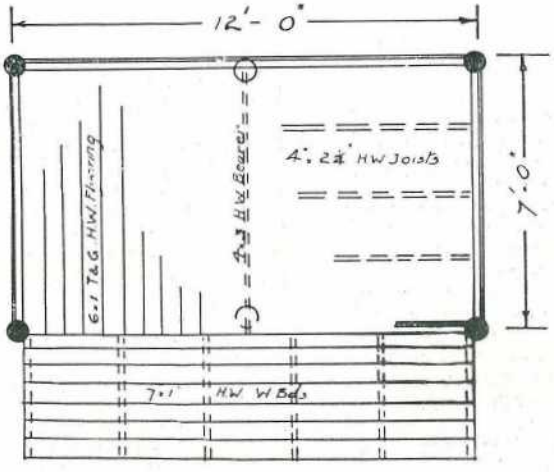
FRONT ELEVATION

Fig. 5.



SECTION

Fig. 6.



PLAN

Fig. 7.

Fig. 8 illustrates a useful type of fence for pig paddocks, small yards, &c.

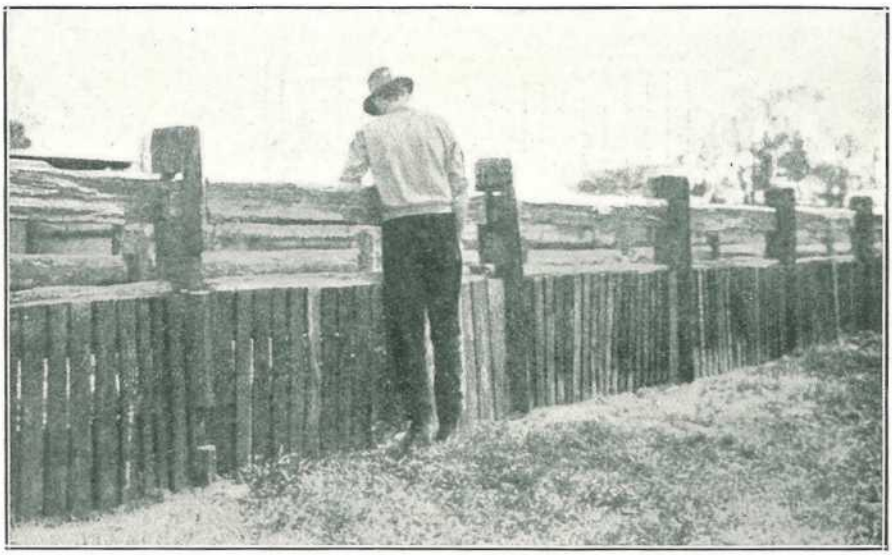


PLATE 16 (Fig. 8).—A USEFUL TYPE OF FENCE FOR PIG PADDOCKS, SMALL YARDS, &C.

This type of fence, though somewhat expensive in the first instance, is undoubtedly of such solid construction that it will prove satisfactory for at least twenty years. Pig fencing requires to be of a permanent and efficient nature, otherwise a great deal of expense will be incurred in repairing and keeping the fence in order, for pigs are severe on fencing, and if it is not of solid construction they will soon root or force their way through, under, or over. Post, rail, and picket fencing of the type illustrated is recommended particularly for pig yards and small pig runs, as well as for pig paddock purposes generally. The photograph is sufficiently clear to provide all the details necessary as regards construction, though it might be noted that the pickets should be inserted into the ground to the depth of at least 3 inches below the ground level. The height of the fence will depend entirely on local conditions; it should be sufficiently high not only to keep the pigs in but to keep horses and cattle out. The fence needs to be higher if it forms part of the boundary fence of the farm than if it forms part of a subdivision fence inside the ring fence.

QUEENSLAND SHOW DATES, 1926.

Warwick: 9th to 11th February.
Allora: 17th and 18th February.
Clifton: 24th and 25th February.
Newcastle (N.S.W.): 23rd to 27th Feb.
Killarney: 10th and 11th March.
Milmerran: 31st March.
Sydney Royal: 29th Mar. to 7th April.
Herberton: 5th and 6th April.
Miles: 7th and 8th April.
Pittsworth: 8th April.
Chinchilla: 13th and 14th April.
Kingaroy: 15th and 16th April.
Toowoomba: 20th to 22nd April.
Nanango: 29th and 30th April.
Dalby: 29th and 30th April.
Taroom: 3rd to 5th May.
Oakey: 6th May.
Toogoolawah: 6th and 7th May.
Murgon: 6th and 7th May.
Goombungee: 13th May.
Boonah: 12th and 13th May.
Kilkivan: 12th and 13th May.
Roma: 19th and 20th May.
Wondai: 19th and 20th May.
Ipswich: 19th to 21st May.
Wallumbilla: 25th and 26th May.
Esk: 26th and 27th May.
Maryborough: 25th to 27th May.
Childers: 29th to 31st May and 1st June
Marburg: 2nd and 3rd June.
Bundaberg: 3rd to 5th June.
Gin Gin: 8th to 10th June.
Woombye: 16th and 17th June.
Lowood: 18th and 19th June.
Gatton: 30th June and 1st July.
Kilcoy: 1st and 2nd July.
Laidley: 7th and 8th July.
Biggenden: 1st and 2nd July.
Woodford: 8th and 9th July.
Wellington Point: 10th July.
Maleny: 21st and 22nd July.
Rosewood: 23rd and 24th July.
Royal National: 9th to 14th August.
Crow's Nest: 25th and 26th August.
Coorparoo: 28th August.
Wynnum: 3rd and 4th September.
Zillmere: 11th September.
Rocklea: 25th September.

COTTON CLASSING.

By L. L. GUDGE, Chief Government Cotton Classer.

In explaining the system of cotton classing, a record of the history and events leading up to the present sets of Universal standards for Upland cotton will be of interest.

The earliest records of cotton classing date back to the year 1800, when in Liverpool the various qualities of cotton imported were called by various terms. At a later date America had terms and standards for cotton grown within the United States. There were several different sets existing, each specialising on cotton grown within a certain area or State. These different standards were gradually merged into the one single set, covering the various qualities and growths of American Upland cotton. This set did not correspond with the set in use in Liverpool, England. The different grades did not correspond with each other, the grade of Middling in the American standard was higher than the grade Middling in the Liverpool standard, and so with all the other grades. The terms used to differentiate the grades were also different; the grade above Middling was known as Strict Middling in the United States standards and as Fully Middling in the Liverpool standards. This state of affairs went on for a number of years, but it was not in the best interests of the trade, and efforts were continually being made to standardise and make universal the grades for all growths of American Upland cotton, which culminated in the present form of Universal grade standards. These standards are adopted by all the principal Cotton Exchanges and Spinners Federations in the world. They form the basis for all arbitrations, disputes, sales, and purchases and classing of American Upland cotton.

There are seven different classes of standards, and each class deals with a certain quality of cotton, and in all they cover the various qualities which are produced in different areas under varying conditions. The different sets are as follows:—

GRADES AND COLOURS OF THE UNIVERSAL STANDARDS FOR AMERICAN UPLAND COTTON.

Standards for Grades of Upland White Cottons.	Blue Stained.	Grey.	Spotted.	Yellow Tinged.	Light Stain	Yellow Stained.
1 or Middling Fair	..	..	..	..	..	..
2 or Strict Good Middling..	..	..	..	**2 S.G.M.**	..	..
3 or Good Middling ..	**3 G.M.**	*3 G.M.*	*3 G.M.*	**3 G.M.**	*3 G.M.*	**3 G.M.**
4 or Strict Middling ..	**4 S.M.**	*4 S.M.*	*4 S.M.*	**4 S.M.**	*4 S.M.*	**4 S.M.**
5 or Middling	..	*5 M.*	*5 M*	**5 M.**	*5 M.*	**5 M.**
6 or Strict Low Middling ..	..	..	*6 S.L.M.*	**6 S.L.M.**	..	..
7 or Low Middling	..	..	*7 L.M.*	**7 M.**	..	..
8 or Strict Good Ordinary..	..	..	..	..	..	..
9 or Good Ordinary ..	..	..	..	..	..	..

NOTE.—Symbols in heavy type denote grades and colours for which practical forms of the official cotton standards are prepared. For the grades indicated by symbols in italics no practical forms will be furnished. Gray cotton is between the White and the Blue Stained in colour, Spotted between the White and the Yellow Tinged, and Light Stained between Yellow Tinged and Yellow Stained.

The grades shown above the horizontal lines are deliverable on future contracts made in accordance with section 5 of the United States Cotton Futures Act. Those below the line are untenderable on such contracts.

These standards are revised every year, and, if necessary, any slight alterations are made and fresh standards are formed. The cotton produced in Queensland is from the American Upland type of seed, and so we are directly concerned with those

standards, as all our cotton is sold and valued in accordance with them, and our seed cotton is so graded that the resultant lint will correspond to certain classes of the said standards. Of all these different standard grades of cotton, the ones we are mostly concerned with are those of the white and spotted standards. We do not as yet produce cotton falling under the other types of standards. Of these different standards of cotton the white cottons are the best quality, and the more valuable according to their grade.

The function of segregating cottons according to quality is known as classing, and this term embraces two separate functions—one is determining the grade, and the other the length of staple. Grade itself is a term denoting the colour, lustre, and brightness of the cotton, also the amount and nature of foreign substance present, such as leaf, sand, trash, &c., and the nature or preparation of the ginning. The staple length of cotton is the length of fibre, taking into account also the character, body, and strength of the fibre. By the classification of cotton it is possible to determine its comparative value, to facilitate the sorting out of individual bales into even running lots of the same grade and staple, and to expedite trading by affording the purchaser means of buying cotton on description without the examination of the actual or type sample.

The utilisation of cotton in spinning depends largely upon its class and in the manufacture of yarns and fabrics, for which all but a negligible portion of the world's cotton is used, cotton of certain definite qualities is ordinarily selected for certain kinds and qualities of goods, and spinners require cotton that has been classed into uniform lots both in grade and staple.

As numerous grades and staples are found according to the different conditions, &c., under which the cotton is grown, classification or grading is obviously essential in the operations which attend the movement of cotton from the farm to the mill.

The spinning value of cotton can be expressed to a certain extent in terms of grade and staple length. The longer staples and better grades are, as a rule, used in the production of finer and stronger yarns and fabrics. A high-grade cotton is of more value than a low-grade cotton for this reason, and also because it contains less waste and does not require as severe a cleaning process as a low-grade cotton. This cleaning process is apt to damage the fibre to a certain extent according to the amount of cleaning the cotton requires, and if the cotton is not cleaned the subsequent yarn is affected adversely according to the amount of trash. Moreover, the higher grades give more satisfaction in the bleaching and dying process. Generally speaking, the longer staples go into yarns of greater strength and higher "counts" or fine size. The term "count" expresses the number of hanks of yarn that a pound of lint cotton will produce. A hank is 840 yards of yarn; so it will be seen that a cotton which will yield 70 to 80 hanks to the pound is of greater value than a cotton which will yield only 30 or 40 hanks, and usually the longer and finer the staple length, so the greater number of counts one is able to spin. There is, however, an additional factor to be considered which is known as character, which embraces the strength, body, uniformity, and smoothness of the fibre. These qualities have an important bearing on the value of the lint.

The grade of cotton is governed to a large extent by the weather conditions in the period intervening between the opening of the bolls and the time of picking. Cotton which is picked while the leaves of the plant are still green, and which matures under bright sunlight, should be comparatively free from leaf and should also be of a good bright colour. On the other hand, bolls which are left open in the field for a long period tend to lose their lustre and become dull in colour or even blueish. Low grades are produced, however, under favourable weather conditions by deferred or careless picking, or the exposure of cotton to excessive moisture before being ginned. When several pickings are made in the same field the grades usually vary, as weather conditions might have altered between the times of the different pickings, and it usually happens that a considerable number of grades can be found in the crop off a certain field, and in this instance it is useful to point out the advisability of packing the different pickings separately. This will ensure the farmer getting the highest premium possible for his better grades, but if this is impossible, care should be taken to see that the cotton is thoroughly blended or mixed before packing into the sack or wool pack. This will then ensure that the contents will be of a uniform grade and so assist us in our endeavours to produce bales of lint which are of a uniform quality throughout.

The length of the cotton fibre is dependent on the quality or type of seed planted, and the character of the soil on which it is grown and the climatical conditions under which it matures.

These methods of classing cotton deal with the lint or ginned cotton, which is the final process before being handled at the mill. In America the cotton is not

graded in the seed, and the Universal standards are for lint cotton. The production of cotton there is on a very large scale, and ginneries are very numerous and handy to the farmer who brings a sufficient amount of cotton to the ginnery to make a bale of lint, which is, roughly, about 1,500 lb. of seed cotton. The seed cotton from which the bale is produced is generally from the same field, and is composed of one or two pickings, and if there is any difference in grade between these pickings, it gets blended as it is taken from his wagon, since the American farmer brings his cotton loose in the wagon and not in sacks as we do here. Then, too, his cotton gets blended as it goes up the suction pipe, and this blending ensures that the bale will be of uniform quality. It will be seen, therefore, that in the United States there is no need for grading the seed cotton. Here in Queensland, where production is on a small scale warranting only a small number of ginneries, the seed cotton is sent by rail in small containers to the nearest ginnery, and farmers' consignments are not sufficient to make individual bales of lint from the one farm; and even if it were possible to regulate consignments of cotton from individual growers in multiples sufficient to make a complete bale (*i.e.*, 1,300 to 1,500 lb. seed cotton), the cost of storing and handling, &c., at the ginneries would be too expensive a proposition. In view of these conditions some means had to be devised in order to obtain uniformity of grade, staple, and value throughout the individual bale of lint. To this end a system of grading the seed cotton was devised, such grades to correspond when ginned to certain grades of the Universal standards of Upland cotton. This system ensures the uniformity of the class of cotton contained throughout the bale of lint, and if it were not done our bales of lint would contain layers of different grades and staple lengths, and the value of the bale would be based on the lowest grade and staple length represented, and the cotton would not be in demand by spinners of good quality yarns. Such bales are known by the trade as mixed packed cotton. The following is taken from Regulation 6, Section 5, under the United States Cotton Standards Act:—

> "If a sample drawn from one portion of a bale is lower in grade or shorter in length than one drawn from another portion of such bale, except as otherwise provided in these regulations, the classification of the bale shall be that of the sample showing the lower grade or shorter length."

The standard grades of seed cotton which this coming season's crop will be classed into have been reduced from last year, and instead of ten grades we will have seven. Four of these grades are to cover all the standards of white cottons, and three are to cover the spotted cottons, and briefly described they are as follows:—

A Grade seed cotton embraces last year's A, B, and top side C grades, and cotton of this grade will be of good bright colour, fully matured, and can contain a small portion of leaf. Care should be taken to keep cotton of this nature free from coloured or immature locks when packing for delivery to the ginnery. The lint cotton from this grade will range from Middling Fair to top side of Good Middling, and from last year's crop of Durango cotton 41.55 per cent. of the receivals were equal to this grade.

B Grade seed cotton embraces last year's grades of C and D, and cotton of this grade will be of good colour, and practically free from immature locks and containing a fair proportion of leaf or other trash. The lint cotton from this grade will range from the grade of Good Middling to Middling. The proportion of last year's Durango receivals, which were of this grade, amounted to 27.35 per cent.

C Grade seed cotton embraces last year's E grade, and cotton admissible into this grade will be of dull colour with a large amount of trash, dirt, broken stem, &c., and can contain a small percentage of immature locks; the resultant lint grades will be Strict Low Middling and Low Middling. The proportion of last year's Durango cotton which came under this character was 3.41 per cent.

D Grade seed cotton embraces last year's grades of F and G, and will be comprised of cotton very dull to blueish in colour, containing an abundance of dirt, trash, broken leaf, stem, &c., and can contain a fair percentage of immature locks, but, generally speaking, very trashy cotton of this nature does not contain many immature locks. The lint grades of this cotton are from Strict Good Ordinary to Good Ordinary, and the amount of cotton which is put into this class is very small indeed, and out of the whole of the Durango receivals last year only .4 per cent. was graded as such.

This completes the grades of the principal cottons of white colour. We have now three grades of cotton—X, XX, and XXX. These are known as the immature grades, and are types of seed cotton containing immature locks. These locks have a serious deteriorating effect on the lint, inasmuch that the fibre is extremely weak and tender and cause the lint to be very wasty. Also the majority of these locks

are quite brown in colour, and when ginned the appearance of the lint is spotted, and so fall out of the standard of white cotton and come under the class of spotted cotton. This mainly applies to the first and second immature cottons. The description of these grades is as follows:—

First immature, Grade X, comprises seed cotton containing the same amount of trash and of equal lustre as the A Grade, with the addition of immature locks to the amount of, roughly, 15 per cent. The resultant lint grade will be Good Middling spotted to a top side Strict Middling spotted.

It has been reported that the Durango cotton is more susceptible to producing immature locks than the ordinary mixed seed is, but this report is quite out of keeping with the grading figures for last year, as the percentage of Durango seed cotton which was put into this grade was less than the average of the ordinary mixed seed cotton received and graded "X" at Whinstanes and Rockhampton. These percentages were Durango seed cotton, 21.27 per cent.; mixed Queensland seed cotton, 21.79 per cent.

Second immature, Grade XX, comprises seed cotton containing the same amount of trash and of the same lustre as B Grade, with the addition of immature locks to the amount of, roughly, 25 to 30 per cent. The resultant lint grade will be Strict Middling spotted to Middling spotted.

As in the case of the X Grade, the percentage of Durango cotton graded XX was smaller than that of the ordinary mixed seed cotton graded XX at Whinstanes and Rockhampton. The percentages are as follow:—Durango XX 5.68 per cent.; mixed seed cotton, 9.4 per cent.

Although these percentages of immature cottons are high, it is due to a large extent to the hot dry spell which occurred in February and caused a large number of the bolls to burst open before fully maturing. The plants did not possess a deep tap root system, which was caused through slight rains falling shortly after the majority of the Durango cotton was thinned out, and, not penetrating far into the soil, caused the root system of the plants to spread laterally and not downwards. It is thought that this season's conditions have been more favourable, and that we are not likely to be troubled to such an extent with immature cotton in an ordinary season.

The third immature grade, or XXX, comprises seed cotton of a very inferior character, containing a very high percentage of immature locks, usually about 60 to 75 per cent., and also containing a lot of trash; the lint grade produced varies according to the quantity of trash contained. Usually it grades out a badly coloured Strict Good Ordinary to Good Ordinary or a higher grade in the yellow stained class. We are not troubled much with cotton of this class; it is very low indeed in grade, and is not usually picked and sent in to the ginnery.

Only .26 per cent. of the Durango seed cotton was graded XXX last season, against .56 per cent. of the mixed Queensland seed cotton.

These facts regarding the various grades of cotton emphasise the importance of segregation of the different grades before ginning in order to produce bales of lint cotton of uniform grade throughout, and we have not only to take into consideration the grade of the cotton but also the staple length. It is even more important that the length of fibre composed in a bale of lint be as uniform as is possible.

It was not feasible to class the product of the old seed cotton for staple length for obvious reasons, mainly for the lack of uniformity and character, which could only be expected from seed of such a mixed variety as the old seed represented. With the advent of pure seed which has been available to the farmers for this season's planting, we will produce a much finer quality of cotton both in length of staple, character, and uniformity. The length of the staple will, of course, depend upon growing conditions, soil, &c., besides the type of seed, so in order to obtain this desired uniformity of length of staple within each individual bale of lint, all seed cotton on arrival at the ginnery will be classed for length of staple in addition to the grade. There are only three classes of staple length, and they are as follows:—

Class I., comprises short staple cotton up to 1 inch in length.

Class II., comprises medium staple cotton from a full 1 inch up to and including cotton of 1⅛ inch in length.

Class III., comprises long staple cotton from a good 1⅛ inch up to 1$\frac{3}{16}$ inch or 1¼ inch, which is practically the longest staple length which the seed planted will produce.

It will be seen that each of these classes embrace a very liberal range and will allow for any variation which may occur in the contents of any one container of seed cotton.

The bulk of Durango seed cotton will be equal in staple length to Class III. (the premier class). This has been proved in observance of the quality of the Durango cotton which has been grown in Queensland during the last three seasons, and last season we had Durango cotton from all parts of the cotton-growing area.

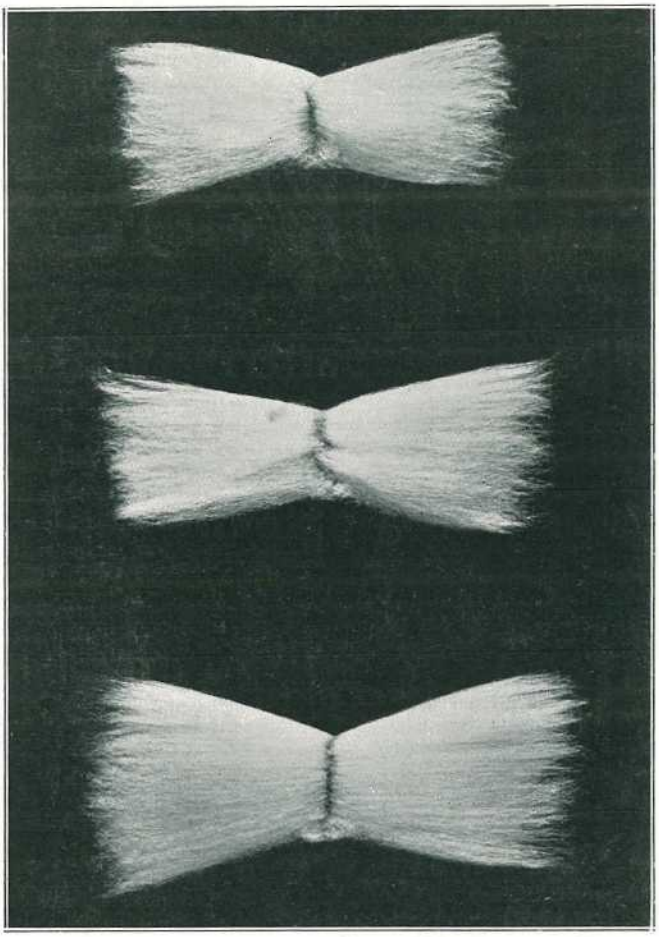


Plate 17.—Combed Fibres of the Three Classes of Staple, showing Maximum Length in each Class.

Class I., Top specimen, short staple cotton 1 inch in length.
Class II., Middle specimen, medium staple cotton $1\frac{1}{8}$ inch.
Class III., Lower specimen, long staple cotton $1\frac{3}{16}$ inch.
The length is determined from the parting of the fibres to the end and not right across.

This system of classing for grade and staple length will ensure that all cotton, irrespective of its growth, will be paid for according to the quality and merits of the seed cotton. Containers of seed cotton should not be branded with the character of the growth, such as ratoon, &c. The only marking required will be the address of the consignee and the ginnery to which it is to be forwarded.

MARKETING PIGS IN QUEENSLAND.—VIII.

E. J. SHELTON, H.D.A., 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 pigs are handled at the selling end. In previous instalments several marketing systems with which Queenslanders are familiar were reviewed, and in the eighth article are many points of equal interest to the wide-awake pig-raiser.—ED.

Extensive reference has been made in previous articles dealing with the marketing of pigs in Queensland to the more important aspects of the selling end of the business, with a view to emphasising the need for a more detailed and intensely practical knowledge of marketing and of the markets through which the pig farmer hopes to find a profitable outlet for the animals he has to dispose of.

In their widest sense, the terms marketing and markets as used in these discussions are intended to include the sale direct to bacon factories—whether co-operative or proprietary—of bacon pigs of varying ages, weights, and condition, as well as of the other grades of pigs which for various reasons are not classified as "prime baconers."

Unfortunately, there are but few buyers for pork pigs and but a very limited demand, at Southern prices, for choppers and backfatters in this State, hence the markets for live pigs at porker age and weight and for the very heavy fat pigs as well as for carcase pork are not sufficiently attractive or reliable enough to warrant our recommending farmers to go in for raising and selling porkers or heavy baconers and backfatters as a separate and distinct proposition to raising and selling prime bacon pigs. The market for very heavy fat pigs is an extremely variable one in all the States, and it certainly is not a market outlet to be specially catered for, but in both New South Wales and Victoria, and certainly at the Sydney (abattoir saleyards at Homebush Bay) and Melbourne markets (Corporation Markets, Elizabeth street North), there are very extensive sales of porkers; up to 2,000 head per week at each of these markets is not unusual, and at very profitable prices into the bargain. Whether with the rapid growth and development of Greater Brisbane and of our numerous cities and country towns there will come an increased market demand for fresh pork and for fresh pork delicacies (pork sausages, &c.), sufficient to warrant farmers catering specially for these markets, remains to be seen. The great bulk of our pig farms, mixed and dairy farms are situate at some distance from reliable local pork markets and from the larger cities, so that for the time being we are endeavouring to concentrate on the production of more and better bacon pigs and to devote more attention to the efficient marketing of these than of pigs specially suited to the fresh pork trade.

An endeavour has been made to carefully study some of the more important leakages, or losses from which the individual farmer and the industry as a whole suffers. There yet remains several of these to be dealt with.

Losses Due to a Lack of Knowledge in so far as Actual Marketing is Concerned.

A sound knowledge of the markets and of market requirements is a necessity if the farmer hopes to succeed in his venture into pig raising. The farmer should become a personal friend of the factory manager or of the pig buyer, in much the same way as has proved of advantage with bankers, storekeepers, auctioneers, and other business men. The factory manager, board of directors, and others associated with the marketing and manufacture of pork and bacon pigs are by reason of their business in an ideal position to give the farmer the latest advice in regard to market prospects, market requirements, and any other information required, and their services should be availed of at every opportunity, for it is only by placing before consumers the article they require that satisfaction can result to the industry.

Quite recently many very soft and oily "peanut" fed pigs have reached several of the bacon factories. These pigs had evidently been fed on peanuts as part of their ration right up to the stage at which they were marketed. Their carcasses have proved extremely unsatisfactory and unprofitable, the flesh and fat are very tough, yet so soft and oily that the carcasses failed to "set" or firm up, even after several weeks in the curing cellar. Peanuts, whilst of value as a food for pigs,

should not be used at all during the last two months' feeding; some factory managers advise cutting out the peanuts from the ration three months before marketing.

The American people have for years past had tremendous difficulty with this peanut fed, soft pork. It has become quite a problem with them, and they have had to adopt drastic measures to force farmers to abandon fattening pigs on peanuts or peanut meal or cake. The whole subject of marketing is indeed one of the very greatest importance both here and abroad.

Losses Due to Lack of Proper Exercise during the Fattening Period and to Lack of Sufficient Green Food during this Period.

This is a question which will be fully dealt with in the pamphlet dealing with the construction of pig sties. It is unfortunate that many farmers still hold to the opinion that to fatten a pig satisfactorily, the animal must be shut up or confined in a small (and sometimes a dark) sty, their contention being that the pig will "run all the flesh off its body" and will fail to fatten at all if allowed liberty. This "fad" must be discarded; all our factories and pig buyers in these days are asking for light to medium weight fleshy bacon pigs in preference to the fat and heavy pigs so much in demand in the years gone by.

The altered requirements of our markets necessitate an alteration in the method of handling bacon pigs, for there is no call now for a "fat" pig, though our markets certainly require "prime" pigs—pigs with a liberal proportion of lean to fat; long, deep, fleshy sides and plump fleshy hams—pigs comparatively light in the head and forequarter, light in the bone, and pigs that will mature as bacon pigs in from five and a-half to six months from date of birth.

Losses Due to Overfeeding, &c.

Losses due to overfeeding shortly before despatch have proved disastrous on many occasions; farmers should not under any circumstances whatever feed their pigs heavily immediately prior to despatch. The death of pigs which actually take place under the eye of the buyers at saleyards and trucking stations chiefly arise from overfeeding in this way. These losses are exaggerated also where the animals have not had proper exercise during the fattening period or where, owing to the absence of proper loading facilities at the farm and to bad handling during unloading, they have been needlessly knocked about and overheated. Pigs in such a condition, being excited, frequently fight among themselves at the yards and become exhausted; this particularly where the water supply is insufficient or where no supply exists at all.

Losses in transit are, fortunately, not as heavy now as they were in former years. Of course, they are greater with pigs trucked from a long distance than from a short trip, greater during hot weather than during the cooler months of the year, greater with weighty, fat pigs than with small or porkers, and greater with crowded trucks than with uncrowded. This subject is now being closely investigated.

Loss of Weight in Animals during Transit.

Animals that travel, whether on foot or per rail or steamer, suffer loss to a greater or less degree owing principally to the decrease in the contents of the digestive tract which gradually becomes empty as they remain without food. The live weight, it has been found, is the first to be affected to any extent; in ordinary journeys of average length or of short duration, little difference is noticeable in the actual dressed weight. If, however, the animals have to make a long or a very trying journey, the loss in net weight is very marked. The evacuation of the solids and liquids which causes the fall in weight takes place chiefly on the first day, excretion being diminished subsequently. This question of shrinkage in weight during transit has proved to be a very difficult one to definitely estimate. It was, until recently in Queensland, the practice of the proprietary bacon factories to deduct 30 per cent. as representing the approximate shrinkage in weight of pigs coming forward to their factories from various parts of the State, this deduction being made at the time the pigs were weighed "over the scales" at country saleyards and trucking stations. Some slight variation of this system has, however, become necessary, as it has been found in actual practice that a deduction of 30 per cent. on all grades of pigs is by no means a permanently payable proposition to the buyer. Under the new system now in operation the deductions vary from around 25 per cent. in the case of the heavier weight pigs to 32 per cent. or so in the case of very light weights and pigs that for one reason or another are not classed as prime. The factory buyers carry the chart with them on their visits to saleyards, hence farmers may in this way become acquainted with the details.

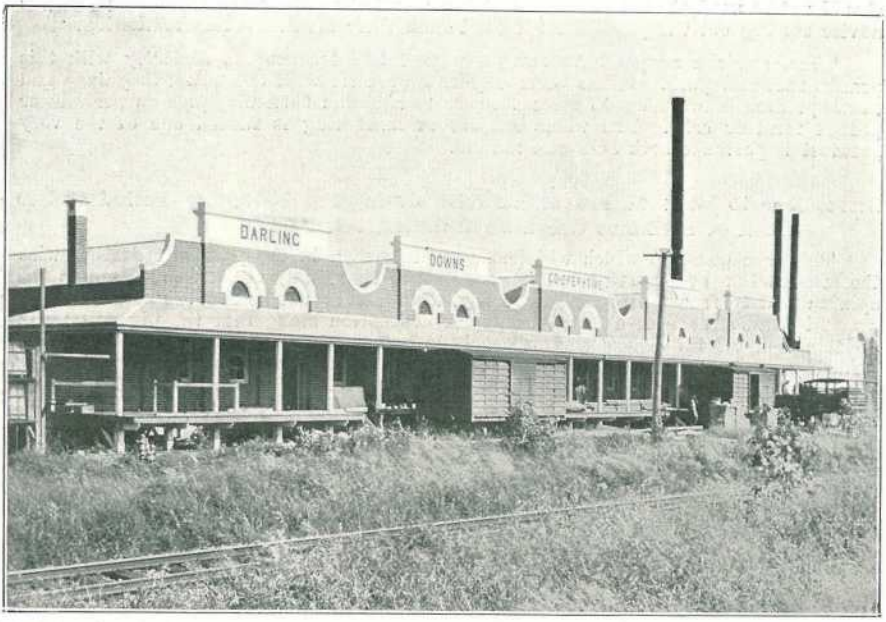


Photo. by M. McLeod.

PLATE 18 (Fig. 1).—THE DARLING DOWNS CO-OPERATIVE BACON CO., LTD., NEW FACTORY AT WILLOWBURN, NEAR TOOWOOMBA.

This factory caters largely for pigs produced on the Darling Downs and adjacent districts. It is now a most up-to-date factory, having a capacity of more than 1,000 pigs per week.

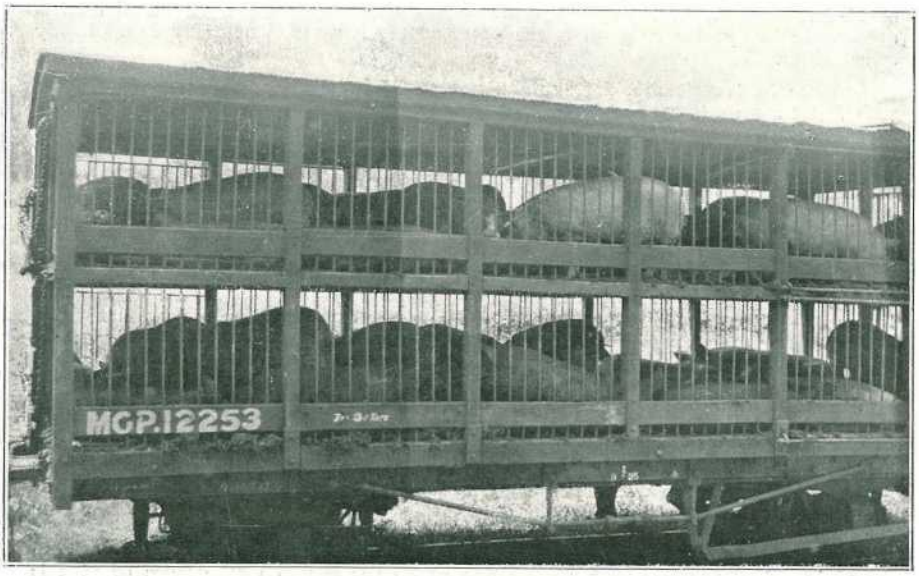


PLATE 19 (Fig. 2).

M.G.P. type of Pig Wagon in use on Queensland Railways. These wagons have a carrying capacity of 45 bacon pigs per deck or, approximately, 90 baconers to the full truck. They are roomy, well ventilated, and convenient, having roomy entrance and exit doors.

The matter of the provision of a water trough in these Pig Wagons is being carefully investigated though, up to the present, experiments in this direction have been unsuccessful.

Plate 20 (Fig. 3).

L type of Pig Wagon in use on Queensland Railways. The carrying capacity of an L wagon is approximately 30 pigs per deck, or 60 pigs for the wagon when full.

When fewer pigs are to be loaded the wagon known as Half L, 4-wheeled van, or more commonly known as an F.P. Van is used. This has but one deck; it is a small L Van with a carrying capacity of about 30 bacon pigs. These vans would, of course, carry more porkers or small pigs as also would the M.G.P. wagons.

The Half L = F.P. Van, the L Pig Wagon, and the M.G.P's are the three principal types of railway wagon in use in this State.

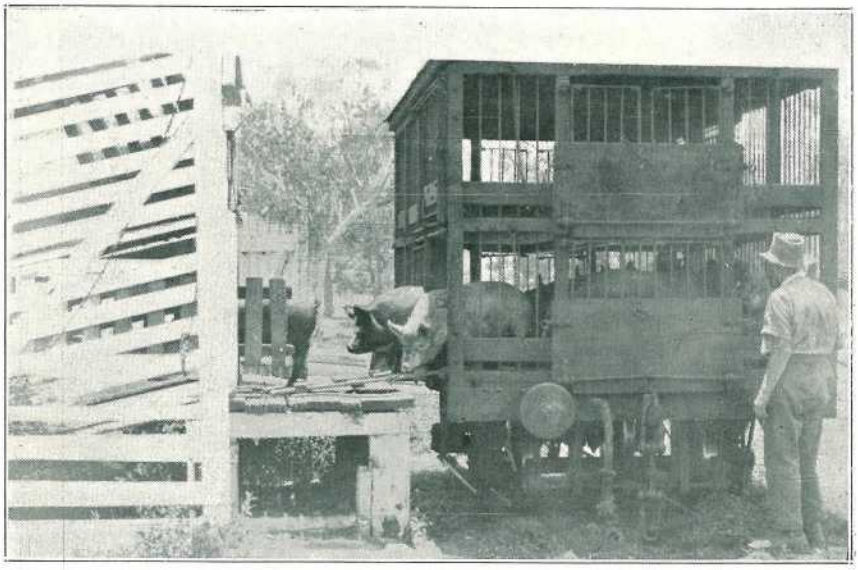


Plate 21 (Fig. 4).

Unloading Pig Wagons at the Factory receiving yards. The moveable race gates leading from the race to the wagon have been thrown back to admit of a better view of the unloading operations. Pigs from the upper deck of the Pig Wagon enter the upper deck of the race as they leave the rail conveyance for the factory.

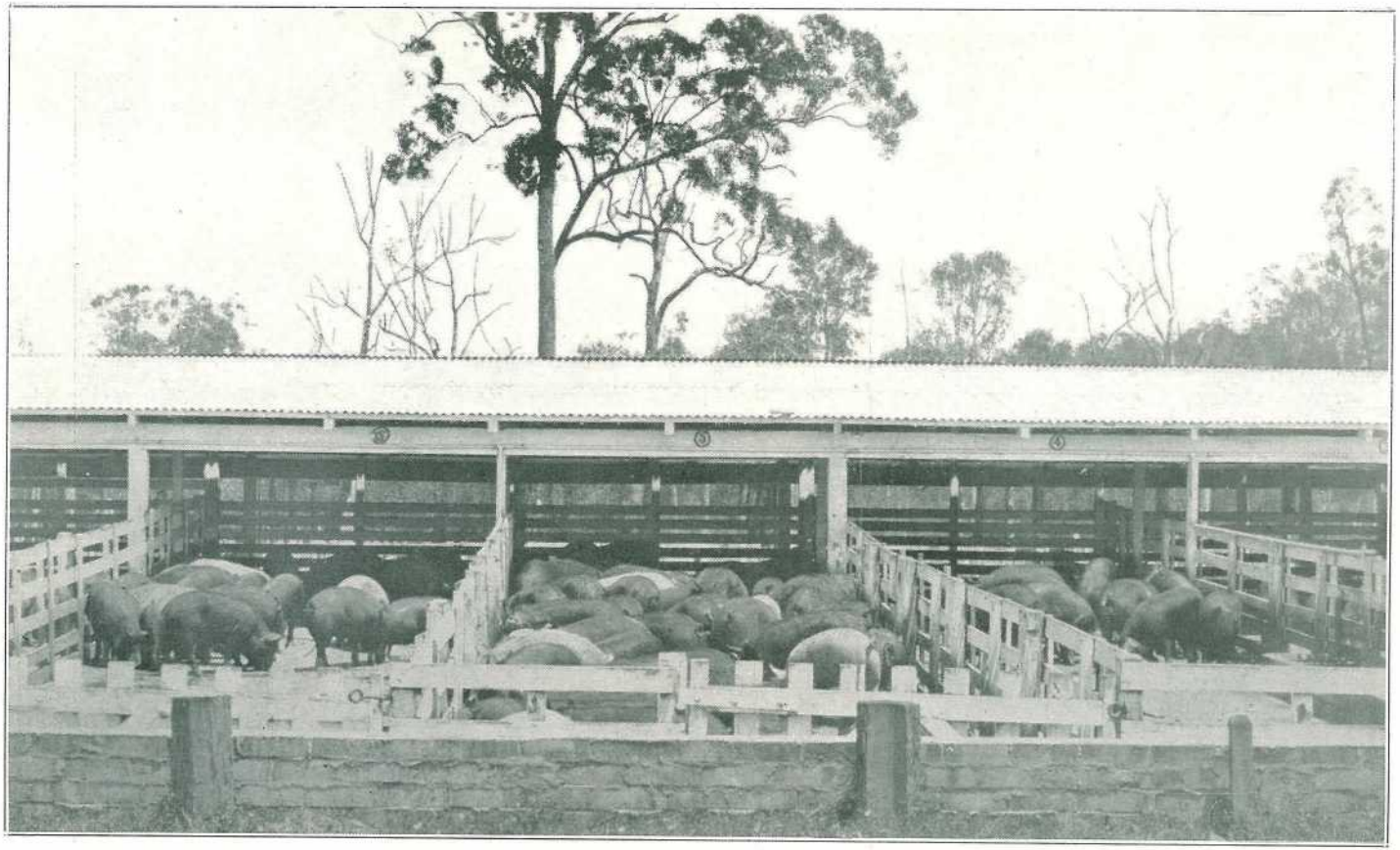


PLATE 22 (Fig. 5).—PORTION OF THE RECEIVING AND RESTING YARDS AT THE QUEENSLAND CO-OPERATIVE BACON ASSOCIATION'S FACTORY AT MURARRIE.

The pigs, ex the Railway Wagon, are penned here, and are rested for from twelve to twenty-four hours or more before slaughter. They have an abundant water supply and cool comfortable accommodation. If being held over the week end or over public holidays they are also fed in these pens. The pigs from each wagon have a separate yard, and it is from these yards that the pigs are driven to the slaughtering pens on Killing Day.

The Frozen Pork Market—Facts and Figures.

Some prominence has recently been given in the daily Press to the export of pork as a new industry. These reports were based on a special report made by the veterinary officer attached to the High Commissioner's Office in London, a copy of which has been received by the Minister of Markets and Migration (Senator R. V. Wilson). In this special report it is stated that should Australia wish to enter into the export of frozen pork to the United Kingdom, the following points should be noted:—Exposure of the lymphatic glands in the head and pharyngeal region: This is best done by means of a strong skewer across the throat, and a small hardwood skewer to indicate the position of the glands themselves. The glands, it is stated, should not be incised more than is necessary, for, if too much incision is made the glands are apt to break off when frozen.

The report adds that frozen pork of excellent quality is exported to the United Kingdom from New Zealand, and that the following particulars relating to the range of prices may be of interest:—The killing season in New Zealand is from November to May, and shipments arrive in England usually during the period January to September. Prices realised, ex store, during the past two seasons have been—

1923-24—Light weights, average 100 lb., 7¾d. to 9d. per lb.

1923-24—Heavy weights, average 120 to 180 lb., 7d. to 8¼d. per lb.

1924-25—Light weights, as above, 8d. per lb.; a few to 10d. per lb.

1924-25—Heavy weights, as above, 8½d. to 9¾d. per lb.

All the above prices being ex store.

The position in regard to the export of frozen pork is certainly worth investigation, particularly if a suitable market outlet can be secured for heavy weight pigs such as those referred to above, viz., pigs weighing 120 to 180 lb., dressed weight, and realising from 8½d. to 9¾d. per lb., ex overseas store.

New Zealand is certainly finding an outlet for quantities of frozen pork, and there is no reason why this market should not be catered for by the trade in this State.

Bacon for Export.

In the report of the Imperial Economic Committee on Marketing and Preparing for Market of Foodstuffs produced in the overseas parts of the Empire, some very interesting details are given in regard to pig products, pork, bacon, and ham. Bacon is one of the staple articles in the diet of the British people, and a review of the sources of importation of this and other pig meats will make very evident the dependence of the United Kingdom upon foreign supplies. In 1924 the United Kingdom imported 9,502,000 cwt. of bacon and hams, as compared with an import of 5,713,000 cwt. in 1913, but the statistics are not comparable since the latter figure does not include imports from the Irish Free State. These amounted in 1924 to 595,000 cwt.

One set of figures published in this report (viz., Table 5 on page 8 of the report) are of special interest.

MEAT IMPORTS, ACCORDING TO WHOLESALE VALUE, FROM EMPIRE SOURCES AND FROM FOREIGN COUNTRIES IN 1924.

(These figures were supplied by the Board of Trade in anticipation of the publication of the Annual Statement of Trade of the United Kingdom for 1924.)

Class of Meat.	From Irish Free State.	From Canada.	From Australia.	From New Zealand.	From Other Parts of the British Empire.	Total from British Empire.	Total from Foreign Countries.
Pig Products—	£	£	£	£	£	£	£
Bacon and Ham ..	3,240,000	6,177,000	3,000	1,000	1,000	9,422,000	35,638,000
Pork (fresh, salted, frozen, and other descriptions)	1,153,000	130,000	1,000	22,000	..	1,306,000	4,482,000
Total Pig Products	4,393,000	6,307,000	4,000	23,000	1,000	10,728,000	40,120,000

These figures, if they do nothing else, emphasise the wonderful opportunity there is in the markets of the United Kingdom for the disposal of Australian pig products; they show how large a part bacon plays in the national meat bill and the extent to which it is obtained from non-Empire sources. Out of £105,447,000 spent in 1924 on imported meats of all classes, no less than £50,848,000, or 48 per cent., went to purchase pig products, and of this sum £40,120,000 went to foreign countries. The bulk of the expenditure was for bacon and hams, although there was an appreciable import of fresh pork amounting, in 1924, to 279,000 cwt. from the Irish Free State, and 534,000 cwt. from the continent.

Market Requirements.

In the bacon market of the United Kingdom a very high standard of quality is generally asked for. The demand is principally for bacon in the form of whole Wiltshire sides. These must satisfy certain requirements as to weight, conformation, and thickness of fat; and must, in addition, be mildly cured. Although there is a market for a wide range in weights and qualities, nevertheless the great bulk of the demand is for sides weighing from 55 to 70 lb.; a 60-lb. side which is the product of a pig 200 lb. live weight, being most in favour. Further, the majority of the consuming public prefer bacon that is not too fat; so that sides carrying 1½ inch to 1¾ inch of fat evenly distributed along the back are most in demand. This requirement forms the basis upon which Wiltshire sides are graded, and although the grades may differ in name, according to the country from which the product originates, nevertheless they are all established on the same basis and are well understood by the trade. Furthermore, as the retailer of bacon in the United Kingdom buys the whole side, which he then cuts up and distributes to his customers, he is very desirous of securing Wiltshires with a long middle and a thick streak, thus obtaining the maximum weight in the most valuable part of the carcass. To ensure the fulfilment of these requirements as to weight, finish, and shape or conformation, a pig of certain definite proportions and finish known as a "bacon pig" is needed.

Danish Supplies.

The Imperial Economic Committee devoted a good deal of time to investigating possible sources of supply of pig products to the United Kingdom. They were, for instance, much impressed with the steadily increasing quantity of pig products obtained from Denmark. Danish supplies have largely increased annually during the past five years. In 1924 they reached 3,978,000 cwt., which was nearly 60 per cent. more than the previous record of 1914. The by-products of the Danish dairy industry, with other home-grown feeding stuffs supplemented by imports of small grains (cereals like barley and wheat) furnished a satisfactory ration for bacon pig production. Furthermore, through the highly developed Danish system of agricultural and co-operative organisation, a uniformly high standard of product is maintained. Proximity to market is also a decided advantage, as the bacon can be mildly cured and distributed regularly to customers in the United Kingdom in a fresh condition. It should also be noted that since Denmark is a very small country bacon production is there a specialised industry concentrated in a comparatively limited area, and that in consequence the details of production, manufacture, and selling can be, and are well organised.

United States Supplies.

The United States is now the second largest source of supply to the United Kingdom market, although prior to 1924 imports from this quarter exceeded those from any other. Imports during 1924 amounted to 3,310,000 cwt., a figure which is in excess of the average pre-war shipments from the United States. The class of product received from this source differs somewhat from that received from Denmark, in that while the latter country is chiefly concerned in the trade of whole Wiltshire sides, the cheaper class of product, such as Cumberland cut, picnic hams, hams and cut meats, is obtained from the United States. The supplies sent across the Atlantic constitute only a very small percentage of the total United States production, and from the American point of view their chief importance lies in the fact that by the variation of their amount they can be used to steady prices in the large home market.

Bacon is also imported from other foreign countries, principally from Sweden and the Netherlands, but the quantity is comparatively small.

The imports of pig products from the Empire come mainly from the Irish Free State and Canada. In 1924 the supplies from this source were 595,000 cwt., being 6¼ per cent. of the total imports. During the first six months of 1925 supplies decreased by 26 per cent., as compared with the same period in 1924. This drop is attributed to the fact that during the second half of 1924 Irish farmers generally did not regard pigkeeping as remunerative, and the view was then current that there

was a probability of a world surplus of bacon. Consequently the general tendency, as in other countries, was towards a reduction in breeding stocks, with the result that Irish farmers are not now in a position to take full advantage of the improved prices prevailing in 1925. It was the Committee's opinion, as a result of careful investigation and the evidence tendered by witnesses, that there appeared to be some lack of uniformity in the weight and finish of Irish pigs which makes it difficult to turn out a uniformly graded product. They considered it would be advantageous if the farmer could somehow be paid for his pigs on the basis of grade. This would tend to encourage a wider use of the pure-bred boars now available as a result of various schemes for the improvement of live stock.

Comparative Landed Values.

It is interesting to glance at the table giving figures relative to the landed values of the pig products ex Canada, and those of the goods from other sources of supply.

The following table gives the figures for bacon, but not hams, during recent years:—

Comparison of Landed Values of Bacon from Chief Sources of Supply to the United Kingdom.

Bacon From—	1909-13. (Average).	1922.	1923.	1924.	1925 (Half-year).
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Irish Free State	..	..	£5·39*	£5·30	£6·09
Denmark	£3·42	£7·05	£5·56	£5·10	£5·61
Canada	£3·11	£5·86	£4·61	£4·65	£4·94
United States	£3·01	£4·95	£4·07	£3·91	£4·62

* Based on imports from April to December.

The Imperial Economic Committee point out that the above figures, which have been calculated from the customs returns of the United Kingdom, are based upon values given by importers and must not be taken as necessarily indicating market prices. The values returned by importers may be based on long-standing contracts or out-of-date market conditions. They suffice to indicate that Irish bacon commands a higher price than other imported bacons.

It is interesting to note that during 1921 Danish bacon realised 35s. 8d. per cwt. more than Canadian, in 1922 23s. 8d. per cwt. more, in 1923 19s. per cwt. more, and in 1924 only 9s. 11d. per cwt. more. In the first half of 1925 there was a slight change in tendency, but at that time not enough to seriously modify the general trend of prices. The recent improvement in the Canadian situation is due to an organised effort on the part of the producers, the packers, and the Government in Canada. This has resulted in the improvement of the pigs themselves, a greater uniformity of the product, a milder cure, and a quicker distribution, so that Canadian bacon now reaches the consumer in the United Kingdom in a fresher condition. The Canadian product is shipped for the most part in the form of whole Wiltshire sides and now competes more directly with the product from Denmark than with that from the United States. By virtue of her proximity, Denmark can market bacon in the United Kingdom within two weeks of slaughtering, while from Eastern Canada it takes four weeks, and from Western Canada five or six weeks to reach the market. In view of the very decided preference of the British consumer for a fresh, mild-cured bacon, this is a heavy handicap, as the Canadian product must necessarily be cured so as to carry for a longer time. It would appear, therefore, that only a more rapid transit or a more satisfactory method of long-period cure would put Canada on a par with Denmark. Research it is suggested should be directed to the latter end. The whole question of transport is a very important one demanding the closest attention of those concerned.

Methods of Curing—Research.

The two principal difficulties in the way of export of pig products from one country to another are freight, whether overland or overseas, or both, and the proper method of curing. The Committee referred to, after discussing fully the matter of freights between Canada and the United Kingdom, stated that there yet remained another method of overcoming the present handicap of time and distance under which not only the Canadian but other Dominion producers suffer. This is the discovery of some new or improved way of curing which will enhance the keeping qualities of the bacon and still maintain the mildness of flavour so much desired by

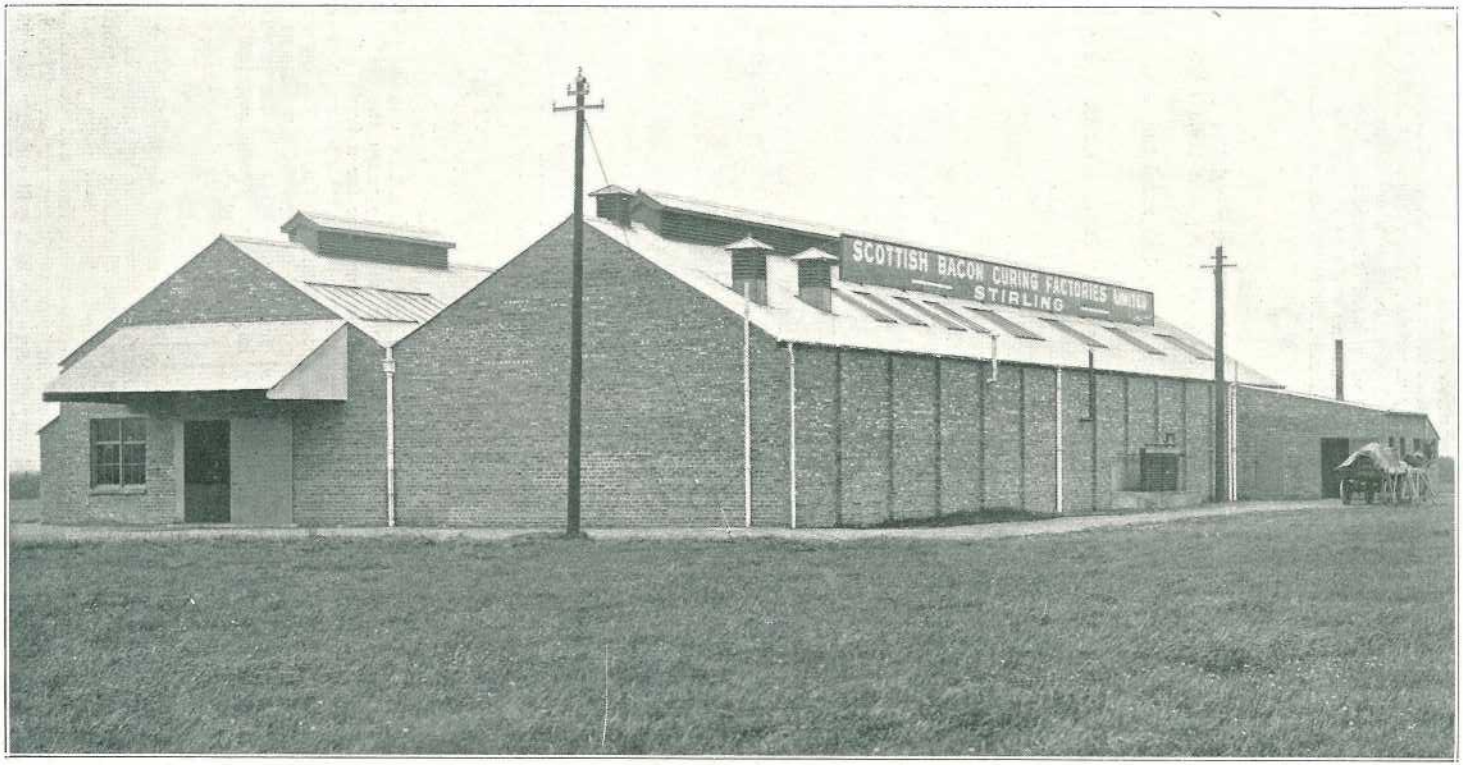


PLATE 23 (Fig. 6).—A SCOTTISH BACON FACTORY, STIRLING, SCOTLAND.

the British consumer. This would open up possibilities for the bacon trade in the distant parts of the Empire, such as Australia and New Zealand. Scientific research, possibly on a large scale, will be necessary, and although private firms are continuously endeavouring to effect improvements in cure, their efforts are inevitably limited. With a problem of this nature, a solution of which would be of the utmost

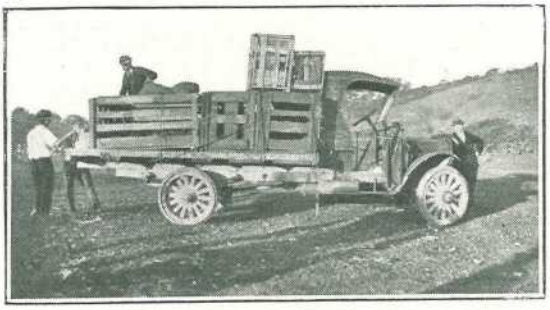


Plate 24—Mr. L. S. Ducat's Berkshire Team leaving the Stud at Waterview, Tweed Heads, for the 1925 Royal National Show.

value to Empire trade, provision for research should be made outside the industry itself.

Pork Supplies.

The foregoing paragraphs deal with the chief supplies of imported bacon and hams. Most of the fresh pork required in the United Kingdom and some of the bacon is produced at home. It has been estimated that about 34 per cent. of the total requirements of pig products are of home production. On the other hand, considerable quantities of fresh pork are imported, chiefly from the Irish Free State and the Continent. Any replacement of the freshly-killed foreign product must obviously come either from home or from the Irish Free State. Such a development must depend on the profits to be earned in pork production. New Zealand, Australia, and certain parts of Africa ship frozen pork for curing in the United Kingdom. Bacon is being shipped from New Zealand and Australia, but owing to geographical position and the present-day practice of bacon curing, their products are placed

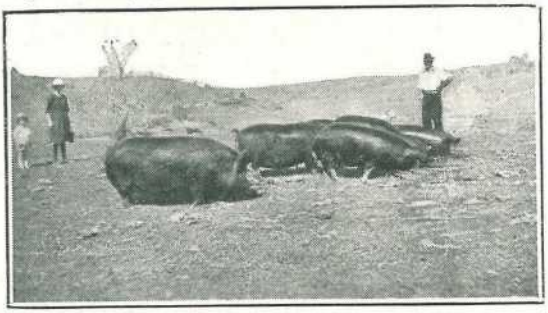


Plate 25.—The Team before being crated.

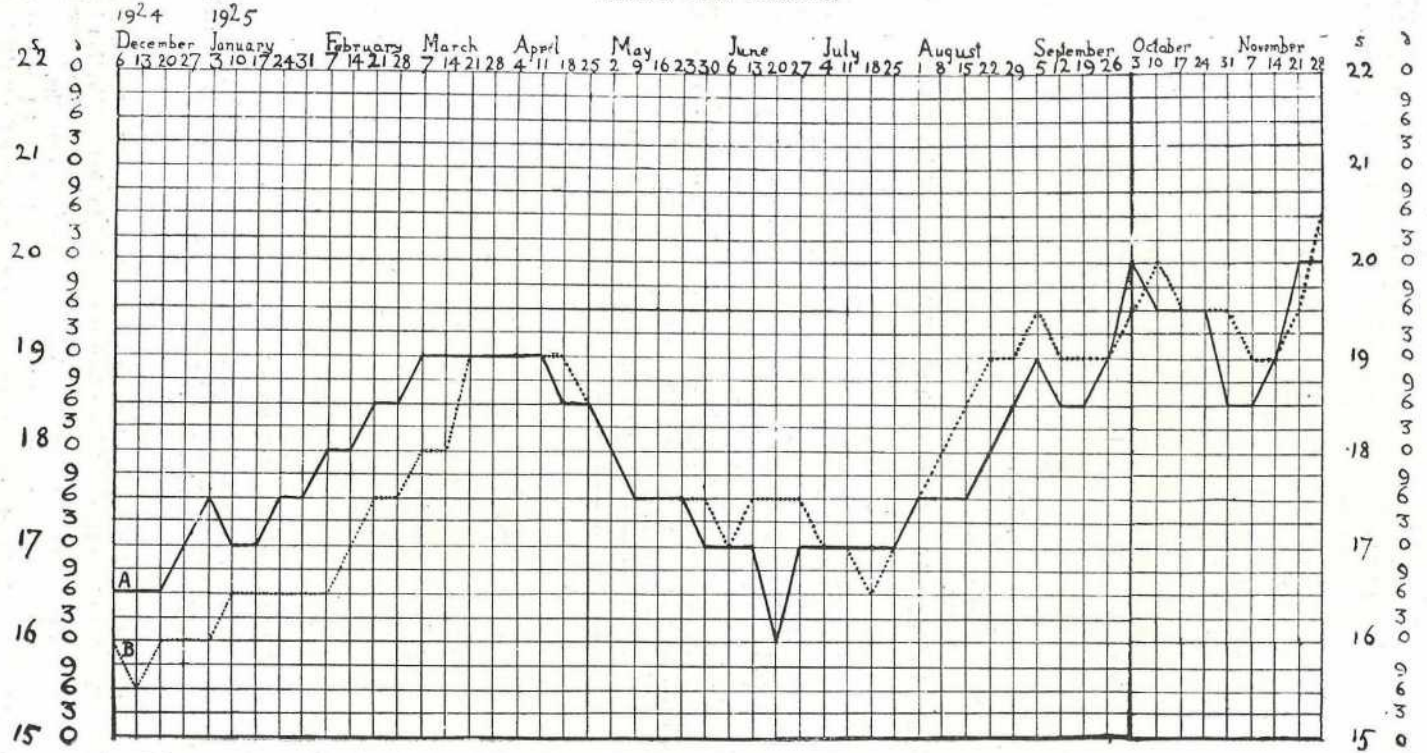
under a great disadvantage. Australia, New Zealand, and South Africa are all capable of developing a large export trade in pig products, provided that research can solve the transportation problem involved.

Smithfield Prices for Porkers, Sows, &c.

The following charts reprinted from the December issue of "Pigs," a noted English publication, have been prepared from figures supplied to that publication by Messrs. Game and Son. The figures are of interest, in that they indicate the general range of pig prices in the Smithfield market over a period of twelve months.

These figures do not read in conjunction with the report of the Imperial Economic Committee, but have been included for general reference *re* export, for the Smithfield market reports are recognised the world over as a reliable guide in the marketing of all classes of live stock in Great Britain.

BACON PIG PRICES.

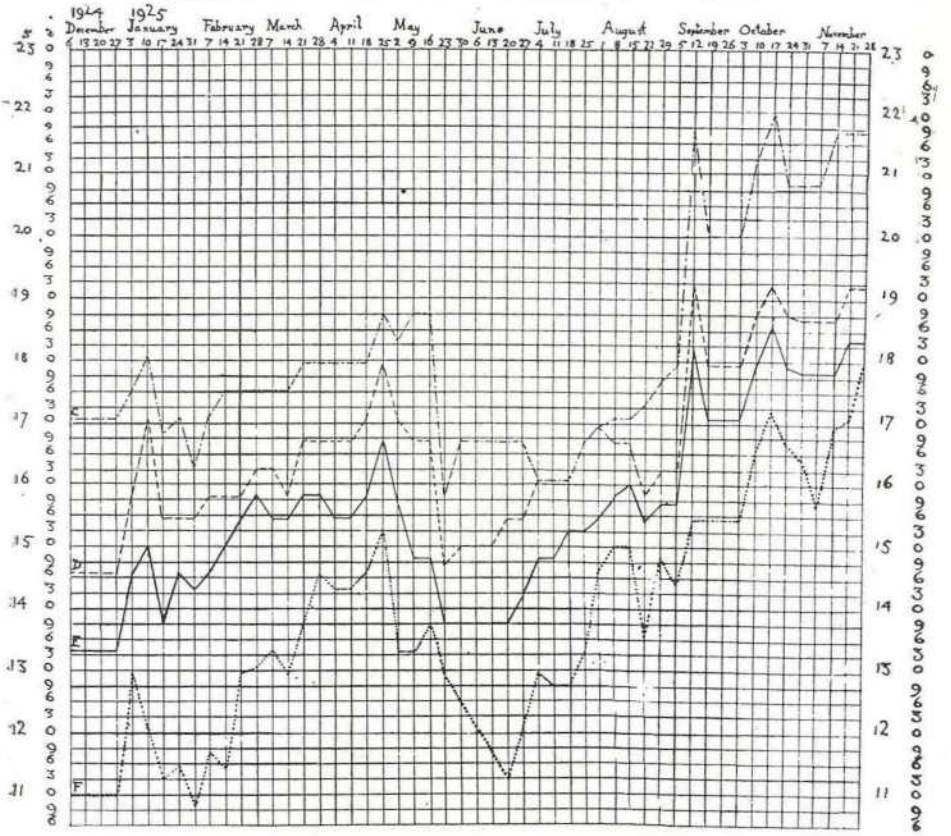


A.—Prices per score (dead weight) paid by Messrs. Marsh and Baxter, Ltd., for pigs, carriage paid to factory and at owner's risk.

B.—Prices per score (dead weight) paid by the St. Edmundsbury Co-operative Factory on rail. It should be noted here that a bonus was paid in addition for Grade A pigs, up to mid-March, now the price quoted is for Grade A, and pigs not reaching the standard are paid for 1s. a score less. Members also share in any profits on the year's trading.

(Compiled from prices supplied by Messrs. Game and Son.)

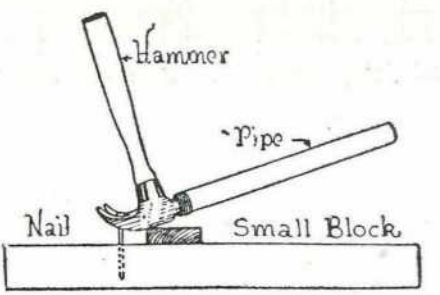
SMITHFIELD PRICES FOR PORKERS, SOWS, &c.



Prices per score (dead weight) of C Porkers, 60 to 80 lb.; D. Pigs, 80 to 120 lb.; E. Hogs, 160 to 200 lb.; F. Sows.

LARGE NAIL PULLER.

Pulling a long nail, especially from hardwood, is likely to break the claw end of the ordinary hammer head. Here is a method that makes pulling the nail easier and relieves the strain on the hammer. A piece of gas pipe is put over the



hammer head, and a block of wood put under it as shown in the sketch. The pipe gives greater purchase and the block of wood greater height so that the long nail can be pulled out.

PLATE 26.—G. EVANS, M.A., C.I.E., Director of Cotton Culture.

EXPERIMENTAL WORK ON COTTON

ON CERTAIN QUEENSLAND STATE FARMS DURING 1924-25.

[A REPORT.]*

By G. EVANS, M.A., C.I.E., Director of Cotton Culture.

During the past season it has been found possible to conduct some careful experimental work on cotton at three centres. These are—

(1) *The Callide Cotton Research Station at Biloela in the Callide Settlement;*

(2) *The Monal Creek Cotton Experimental Farm in the Upper Burnett; and*

(3) *The Gatton Agricultural College and High School.*

Grants in aid of cotton research work have been promised by the Empire Cotton Growing Corporation, London, and by the Commonwealth Government, and it has now been decided to concentrate on the Callide Farm and endeavour to develop it into an up-to-date and properly equipped station for cotton-growing research.

The Monal Farm has since been closed down mainly for financial reasons, but nevertheless this latter station has produced excellent results during its short existence. The work at Gatton has been made possible by the courtesy of the Principal of the Queensland Agricultural College and High School, who willingly co-operated by permitting us to use the College land and assisted us with the necessary implements and labour.

Mr. L. W. Ball, the manager of the Callide Station, is responsible for the report on this farm. Mr. H. Hamilton was the experimentalist. Messrs. S. T. J. Clarke and K. V. Henderson, who were manager and experimentalist respectively at Monal, supplied reports on the work done at this farm, and the report as printed has been compiled by Mr. W. G. Wells, the Cotton Specialist, from the material so made available. Mr. Anson is largely responsible for the Gatton report, but as he has now left this Department, its final revision together with a few additions was carried out by myself.

A perusal of this report will indicate that largely owing to the youth of these stations, and partly also to unfavourable weather conditions, many of the experiments have given inconclusive results. Nevertheless, many lessons have been learnt, and it has, therefore, been decided to print these reports in the hope that the conclusions arrived at and the experiences met with will prove of use to cotton-growers in Queensland and help them to solve some of their own problems.

* Also published in pamphlet form.

Callide Cotton Research Farm, Biloela, for the Year ending 30th June, 1925.

Situation—Description.

The Callide Research Station is a new one and is situated on the western side of Callide Creek in approximately the centre of the Callide Valley, 1½ mile distant from Biloela Railway Station. The area selected is fairly typical of large areas of country in this Valley, which has just been thrown open for closer settlement.

The total area of the farm is 417 acres, mostly ringbarked alluvial flats, lying between Washpool Gully and the Callide Creek. Of this area approximately 200 acres is composed of good agricultural flats, the remainder being excellent grazing country.

Timbers.—Chiefly broadleaf ironbark, gum, bloodwood, and Moreton Bay ash.

Grasses.—Kangaroo, wildoat grass, sorghum, blue grass, couch, wild panicum, and others, together with a good variety of natural herbage and legumes.

Climate.

The farm, in common with the rest of the Callide Valley, appears to be well suited for the production of good quality cotton. The climate is temperate; summer temperatures rarely exceeding 100 deg. F., while the distance from seaboard (60 miles) and altitude (530 feet) are together responsible for the relatively low humidity readings during the wet season.

The rainy season extends from November to March, which period coincides with the growth of the cotton crop. Fine dry weather usually prevails during April and May, during which months the bulk of the cotton crops are harvested. Light frosts occur from May to August. It is during this period that land intended for planting cotton on in the early spring is lying fallow.

Objective.

The Farm has been established with the object of carrying out experimental and research work with the cotton plant, also as a station where pure seed from improved strains could be raised for distribution.

Staff.

The staff includes a plant breeder, who is collecting data as to the habits of the cotton plant under conditions existing here, as well as plant improvement work and an entomologist, acting under instructions from the Commonwealth Cotton Entomologist, working on insect pest problems; and the manager.

Seasonal.

On perusing the rainfall chart it will be seen that this season has been anything but an ideal one for the cotton crop. The total precipitation during the growing period (October to March) totalled 18·32 inches.

The spring rains were good and occurred at frequent intervals, which resulted in the young plants growing rather sappy. Later in the season (February) we experienced a prolonged heat wave following on continuous showery weather in January. The cotton plants having practically no tap root, failed to stand up as they would have done had they had an opportunity of developing a better root system.

No rains sufficiently heavy to penetrate the subsoil fell at any period of the plants' growth which, together with the recurrent showery weather during early spring, caused the plants to develop superficial roots only. This was general all through the Callide Valley this season and was the main factor in reducing the yields below the estimate made early in the season.

Still, in spite of the adverse season, the crops on this settlement, generally speaking, have yielded well, yields up to 900 lb. of seed cotton per acre having been harvested, which is good considering the fact that all the farmers' crops were grown on new land that, in most cases, had been only hurriedly prepared. The variety grown, "Durango," has this season proved to be a good yielder of excellent quality cotton under conditions which were anything but ideal.

Climatological.

A climatological station has been established on the Farm in order to collect data as regards temperatures, humidity, rainfall, and soil temperatures. Samples of soil taken from the plots at bi-monthly periods are tested for soil moisture. This is giving useful information as showing the benefits derived from fallowing and improved cultural methods in connection with cotton-growing.

Experiment Plots.

Thirty-six acres of cotton experiments were laid down this season, the layout being as shown on the plan at the end of this report.

Effect of Fallowing.

Those plots which were fallow for some months prior to seeding have shown a marked increase in yield over plots which were not fallowed, but hurriedly prepared before sowing operations.

System of Cultivation.	Average Yield per acre Seed Cotton.	Gross Value per acre at 5½d.	Increase due to Fallowing.	
			Seed Cotton.	Value.
	Lb.	£ s. d.	Lb.	£ s. d.
Land fallowed through the winter ..	1,364	29 16 9	589	12 17 9
Land prepared in the spring	775	16 19 0		

PLATE 27.—VIRGIN COUNTRY ON CALLIDE RESEARCH FARM.

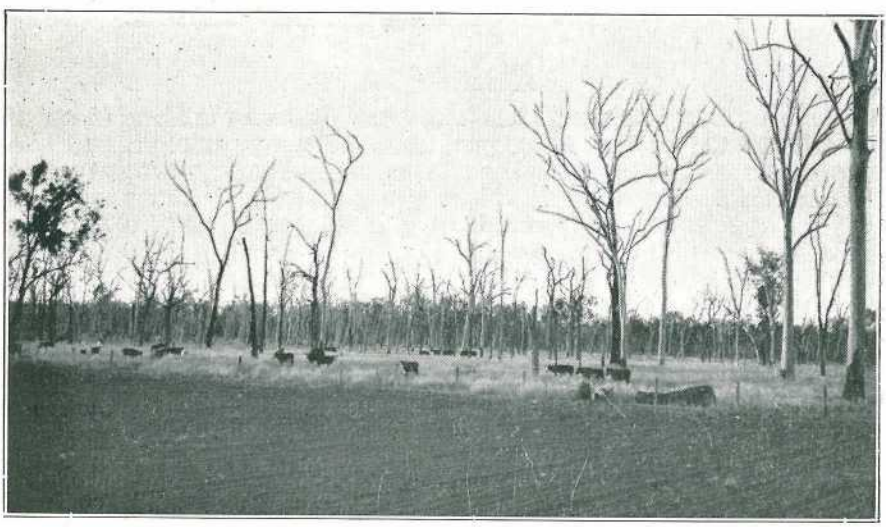


PLATE 28.—NEWLY BROKEN LAND ON CALLIDE RESEARCH FARM.

By the former method a good proportion of the winter rains are stored up for use of the subsequent crop, while the seed bed is compacted and left in a good mechanical condition, thus ensuring good even germination. With late preparation any moisture the land contains at ploughing time is lost, the seed bed is in a loose condition, making it a difficult matter to get a good germination. Where the latter conditions exist the farmer often has to wait for a good rain to sow on, which fact, if early spring rains fail, will probably make all the difference between a very good crop and a poor one.

Plate 29.—The Homestead, Callide Cotton Research Station.
The Manager, Mr. F. W. Ball, and Mrs. Ball in the buckboard in the foreground.

Cultivation and Thinning.

Another point our experiments have brought out clearly this season is the absolute necessity for early intercultivation and early thinning.

Cross Harrowing.

Good results were obtained by cross harrowing with lever harrows, the tines being set at not too great an angle so as to tear out as few plants as possible. This early cultivation is quickly and cheaply performed and should be carried out wherever possible. It will be found that early harrowing loosens the soil around the young cotton plants, making a good mulch, thereby conserving moisture. Another advantage is that young weeds are killed between the plants as well as in the rows, which saves considerable handwork with the hoe later on. In addition, early cultivation has a beneficial effect on the root system of the young plant, since the forming of a mulch on the surface forces the roots to penetrate more deeply into the subsoil and helps in the formation of a good tap root, which fact later on means a sturdy shrubby plant capable of producing good cotton and able to stand up under a dry spell.

Barring Off.

This season, as the result of showery conditions during the spring months, the cotton plants made rather sappy growth. To check this the "wiggletail" cultivator was put over some plots with discs set so as to throw the dirt away from the plants. This had the effect of drying out the surface soil immediately around the plants and checking growth. The plots were left in this condition for seven days, then

cultivated again, this time putting the dirt back again by lightly hilling up. The result was surprising. Following the slight check plants put on a big crop of squares, developing the fruiting habit to an astonishing degree. Had we had our normal wet season this year a bumper crop would have been picked as a result of this method. As it happened the season continued dry, making it impossible for the plants to bring to maturity such a big crop of bolls.

As it was, yields up to 1,450 lb. per acre were harvested from this section, which was highly satisfactory. This "barring off" (cutting the soil away from plants) took place sixty-four days from the date of planting (1st October), when plants were from 18 in. to 24 in. in height. Should the same conditions occur another year this method of checking the growth of crop will be tried at an earlier stage, which should have a beneficial effect on the root system as well as checking undue vegetative growth.

Monthly Sowings.

In the monthly sowings section it has been shown again this season that early planting is more likely to give heavy yields than a later plant. Plants grow more slowly early in the season, which helps towards the development of a sturdy plant; sun temperatures are lower, thus minimising the risk of scalding off the tender young plants, and insect pests are less active. In addition, the growing season is prolonged, giving the crop a longer period in which to bring to maturity the top or late crop. Later sowings often are frosted before the top bolls have matured sufficiently to produce cotton.

With regard to early planting, this again shows clearly the necessity for early preparation of the cotton land, for in the case of the spring rains failing it is only on well-prepared fallow that an early planting can be made.

YIELDS MONTHLY SOWINGS BLOCK PER ACRE.

7th October	912 lb.
10th November	885 lb.
19th December	220 lb.
15th January	Not picked; failed to mature.

Spacing Tests.

Some interesting results showed up this year in the spacing tests, with which may be grouped the paired row experiment and hill or check row planting. It will be necessary to carry these experiments over a number of years before any exact spacing can be stated as being correct for this district. The correct distance at which to space the plants depends to a great extent on the type of soil and season, but by experiment we can arrive at a distance that will give maximum results in the average season on average soil.

So far our experiments show that 4 ft. 6 in. to 5 ft. between rows with from 20 in. to 24 in. between plants can be taken as a standard. On light, sandy soils that tend to dry out quickly, rather more space could be given to each plant.

Good spacing is a deciding factor in determining yields and should be carefully carried out. Only one plant should be left to each hill.

Some farmers in this district, in spite of advice to the contrary, thinned their crops to two or more plants to the hill. This practice, judging by results, is not conducive to high yields. The growth is forced into the main stem in competing for supremacy, producing a spindly plant. The lower crop is in many cases a light one as a result, and later in the season plants tend to spread from the common centre and lie over, making the picking operations a difficult problem, while a proportion of the seed cotton contains trash and dirt through coming in contact with the ground.

Depth of Sowing.

Depth of sowing is an important factor in determining the percentage of germination. Cotton seed should not be planted too deeply. From experience gained this season from 1½ in. to 2 in. is a good depth to sow. Deeper sowings in every case gave a poor stand, in some cases failing altogether. Heavier seeding gave a better per cent. of germination for a given depth than a light seeding, the reason being that the seeds, being closer together in the row, help one another in forcing a way through the top crust.

Planting after a rain on ground harrowed before seeding will result in a better stand than planting just prior to a rain. After rain a light crust forms on the majority of the farm soils, making it difficult for the young tender plants to force a way through. A percentage usually fail to break the crust. Much depends on the type of soil and whether cloudy weather or hot sunshine follow the wet period. In the latter case the plants, being in a weak condition, after forcing the crust may be scorched off.

In order to ensure planting at an even depth it is important that the seed bed be as level as possible, well compact, and reduced to a good tilth. A well cared for fallow is usually in this condition. Where a good type of machine is used for seeding it is not so difficult to sow at a uniform depth as when the seed is hand sown and ploughed in. Where the seed is ploughed in, some of the soil moisture is lost, and through loosening of the seed bed the particles of soil are not firmed around the seed, resulting in a poor percentage of germination.

Trap Crop Experiments.

In the trap crop experiments an important fact was demonstrated here this season with regard to the control of one of the cotton pests—the cotton worm (*Chloridea obsoleta*). This will be reported on in detail by the entomologist.

Briefly, it has been proved that by planting successive monthly sowings of maize, starting with the first planting of cotton and continuing until January, a large percentage of the cotton worm larvæ can be destroyed which would otherwise infect the cotton. The rows of maize should be evenly distributed through the cotton field, and as they become infested by the larvæ removed and destroyed, either by burning or chaffing and feeding to stock. It is important that the sowings of maize be carried right through to January in order to trap each successive brood of the cotton worm as they appear.

PLATE 30.—COTTON RATOONED AT GATTON COLLEGE.

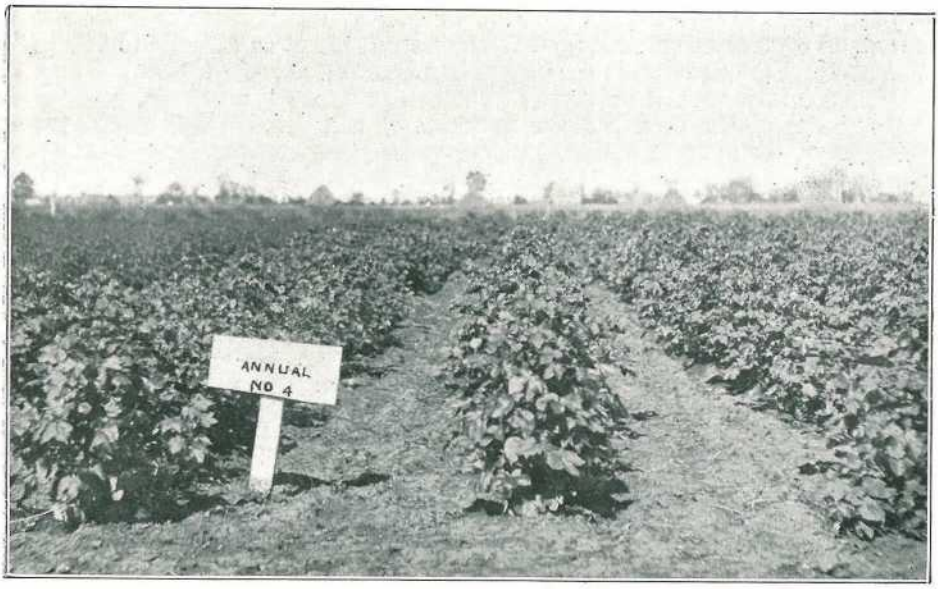


PLATE 31.—GATTON COLLEGE—ANNUAL COTTON.

Early Cleaning Up of Cotton Field.

An important point with regard to the production of good cotton is the early cleaning up of the cotton field by removing and burning the old cotton stalks. One advantage resulting from early cleaning is that the land can be ploughed up and left fallow for a reasonable period before the sowing of the next crop. Again, early cleaning is intimately bound up with the solving of the pest problem. At the end of the picking season there are usually small immature bolls remaining on the cotton bushes, which when examined are found to be a harbourage for the various pests. If these are burned up with the old stalks the pest population is considerably reduced, which will minimise the damage caused by pests the following season. It is important that the method of cleaning up should be one that will detach as few immature bolls as possible. Chopping the bushes out with a sharp hoe and raking up by hand is a good method.

Ratoon Experiment.

An interesting and instructive experiment was carried out this year with ratoon cotton. Four plots, each one half-acre in area, were laid down as follows:—

1. Plant cotton, sown in the ordinary way in October.
2. Ratoon, plant crop last year, bushes cut down in August.
3. Standover, *i.e.*, plant crop last year, but bushes left standing.
4. Plant cotton, sown October on well-prepared fallow.

The treatment each plot received and final yields are as under:—

Ratoon Plots.

Hilled to 6 in. during winter months. Rows 4 feet apart, plants 2 feet between plants.

Date.	Treatment.
18th August	Ratooned level with ground, bushes raked off and burned. Plot cross-harrowed.
28th August	Cultivated, 1 horse cultivator tines.
4th September ..	Hoed between rows.
5th September ..	Cultivated, 1 horse cultivator tines.
2nd October ..	Cultivated (disc) "wiggletail."
31st October	Cultivated (disc) "wiggletail."
10th November ..	Cultivated (disc) "wiggletail."
5th December ..	Hilled lightly and laid by.
16th February ..	First picking.
1st May	Second picking.

Standover plot, same treatment as ratoon plot except that old stalks were left standing.

Plant Plot.

Cotton last season ploughed out and burned in June. Plot ploughed up 14th August.

Date.	Treatment.
6th October ..	Harrowed and planted, rows 4 feet apart.
17th October ..	Cultivated (disc) "wiggletail."
24th October ..	Cultivated (disc) "wiggletail."
30th October ..	Thinned to 2 feet apart.
10th November ..	Cultivated (disc) "wiggletail."
23rd November ..	Cultivated (disc) "wiggletail."
5th December ..	Cultivated (disc) "barred off."
22nd December ..	Cultivated (disc) covered.
19th January ..	Cultivated, 1 horse cultivator tines.
30th January ..	Cultivated and laid by.
25th March	First picking.
20th May	Second picking.

Fallow plot ploughed up in May and harrowed. Disked and harrowed before seeding. After treatment same as plant block.

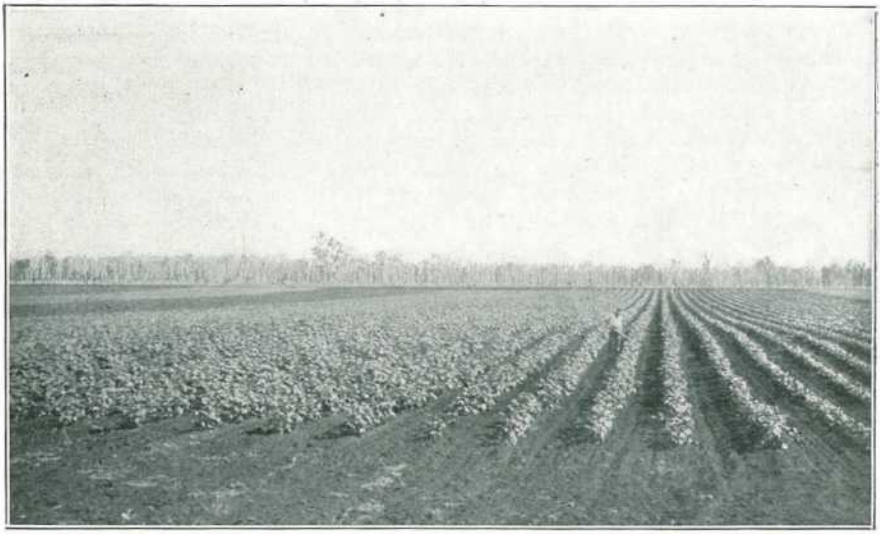


PLATE 32.—CALLIDE RESEARCH FARM—DURANGO COTTON CROP, 1924-25.

PLATE 33.—COTTON AT CALLIDE RESEARCH FARM—SHOWING CORRECT SPACING.

YIELDS OF ANNUAL AND RATOON PLOTS.

Growth.	Cultivation.	Yield per Acre of Seed Cotton.	Average.
		Lb.	Lb.
Annual	Winter fallowed	1,215	1,081
Annual	Spring prepared	947	
Ratoon	Pruned and cultivated	610	575
Standover	Not pruned and cultivated	540	

Judging by results this season there would appear to be several disadvantages in connection with the growing of ratoon cotton in this district.

One is the difficulty in keeping a ratoon area clean. The sprouts spread out in all directions from the old root stump, and early in the season lie over so much that cultivation with the horse-hoe has to be discontinued. This necessitates much hand work, which is a costly proceeding. If the weeds are left the quality of the lint and yield suffer, whilst picking operations are rendered more difficult.

Another difficulty is the picking problem. As a result of the spreading habit of the fruiting branches a large percentage of the ripened bolls are lying on the ground at picking time, and the bolls being smaller and weighing lighter than those of the plant cotton combine to make the harvesting of a ratoon crop a difficult proceeding.

We had to put wages men on picking our ratoon plot, as the contract pickers found it impossible to make reasonable tallies on this section. The average daily tally on the ratoon area was 40 lb. for an eight hour day compared with 84 lb. on the plant block. On a wages basis picking costs on the ratoon area worked out at 4d. per lb.—probably exceeding the total value of the crop.

Another disadvantage with regard to the growing of ratoon cotton in this district is the difficulty in getting a complete stand. Although our plot was hilled up well during the winter months a large percentage were killed by frost. Approximately 40 per cent. of the plants sprouted reasonably early in the season, another 8 per cent. coming away later, some of them as late as November, weeks after the plant block was well established. Below is shown the relative costs of producing a ratoon crop as against a plant crop and the net profits.

The following estimates were made up from our records this season:—

RATOON.

Average yield 575 lb. per acre.

	£	s.	d.
Hilling up old crop	0	2	6
Removing and burning old stalks	0	10	0
Horse cultivation (3 times)	0	7	6
Disc cultivation (3 times)	0	4	6
Hoed once	0	4	0
Picking 575 lb. at 2½d.*	5	19	9½
Bales, baling and cartage, &c	0	6	0
Total	7	14	3½
Gross profit, 575 lb. at 4d.	9	11	8
Net profit per acre	1	17	4½

PLANT.

Average yield 1,081 lb. per acre.

	£	s.	d.
Ploughing	0	12	0
Harrowing	0	2	0
Planting	0	2	6
Thinning	0	8	0
Cultivated, 6 times at 2s.	0	12	0
Picking 1,081 lb. at 2d.	9	0	2
Bales, baling and cartage	0	11	0
Total	11	7	8
Gross profit, 1,081 lb. at 5d.	22	10	5
Net profit per acre	11	2	9

* Cost of picking would probably exceed 2½d. per lb.

Where crops are picked by farmer and family total profit would be increased by 2d. per lb.

On observations made here it would appear that if ratooning is largely practised the damage caused by pests will develop serious proportions. Our ratoon plot proved to be a breeding ground for the various

pests early in the season, the plant blocks adjacent to the ratoon becoming infected at an early stage, then spreading by natural means to the plots further out.

Plant Breeding and Selection Work.

If our cotton is to bring a good price on the world's market and one that will ensure a reasonable profit to the growers, we must produce a good quality article. From the farmer's point of view the variety grown must be capable of giving a good average yield and able to withstand drought and disease as far as is possible.

Another feature of great importance to the farmer is ease of picking. A variety of cotton that opens out well and is easy to pull yet will not shed readily is very desirable. It is possible by careful selection and breeding up from select types to fix these desirable characteristics in the one variety. By selecting the best types over a number of years, yield and quality can be raised to a high standard. It will probably be found that a type suitable to one district will not do so well in another locality where different conditions exist, so we must produce types to suit our varied needs. This is the work of the plant breeder. A considerable number of selections were made this season on the Durango plots of types that showed all round excellence in the field. These will be tested in the laboratory and any showing bad faults, so far as the lint is concerned, will be culled out. The progeny of the best of these will be sown next year and propagated further to supply bulk seed for distribution. The raising of pure seed is the most important branch of our activities, and will do much towards putting the industry on a firm basis.

Rotation of Crops.

Twelve rotation plots were laid down here this season, the object being to determine just what crops are best suited for rotation with the cotton crop. On one plot, cotton will be grown continuously, the other plots having grain, hay, and fodder crops alternating with the growth of a cotton crop. Each plot has been laid out with a separate system of rotation from which costs, yields, and profits will be recorded.

In conjunction with this, soil samples are to be taken annually so that the effect of each system on the available plant foods can be noted. Obviously these experiments will have to be carried over a number of years before any definite rotation system can be recommended.

SYSTEMS OF ROTATION AS LAID OUT.

Year.	1.	2.	3.	4.	5.	6.
1924	Fallow	Fallow	Fallow	Fallow	Fallow	Fallow
	Cotton	Cotton	Cotton	Cotton	Sudan grass	Cowpeas-hay
	Fallow	Fallow	Fallow	Fallow	Wheat	Fallow
1925	Sudan grass	Sorghum	Millet	Maize	Sudan grass	Cotton
	Fallow	Fallow	Fallow	Fallow	Fallow	Fallow
1926	Cotton	Cotton	Cotton	Cotton	Cotton	Cowpeas-hay
	Fallow	Fallow	Fallow	Fallow	Fallow	Fallow
1927	Sudan grass	Sorghum	Millet	Maize	Sudan grass	Cotton
	Fallow	Fallow	Fallow	Fallow	Fallow	Fallow
1928	Cotton	Cotton	Cotton	Cotton	Cotton	Cowpeas-hay

Systems of Rotation as Laid out—*continued.*

Year.	7.	8.	9.	10.	11.	12.
1924	Fallow	Wheat	Wheat	Wheat	Wheat	Wheat
	Cotton	Cowpeas-manure	Peanuts	Sudan grass	Maize	Millet
1925	Fallow	Fallow	Fallow	Fallow	Fallow	Fallow
	Cotton	Cotton	Cotton	Cotton	Cotton	Cotton
1926	Fallow	Fallow	Fallow	Fallow	Fallow	Fallow
	Cotton	Cotton	Peanuts	Sudan grass	Maize	Millet
1927	Fallow	Fallow	Fallow	Wheat	Wheat	Wheat
	Cotton	Cotton	Cotton	Sudan grass	Maize	Millet
1928	Fallow	Fallow	Fallow	Fallow	Fallow	Fallow
	Cotton	Cowpeas-manure	Peanuts	Cotton	Cotton	Cotton

Yields from Rotation Plots—Season 1924-25.

1.	2.	3.	4.	5.	6.
Cotton, 1,186 lb.*	Cotton. 1,450 lb.	Cotton, 1,420 lb.	Cotton, 1,374 lb.	Sudan grass, 2 tons 9 cwt. hay	Cowpeas, ploughed in.

7.	8.	9.	10.	11.	12.
Cotton 1,392 lb.	Wheat, 30 cwt. Hay Cowpeas ploughed in	Wheat 30 cwt. Hay Peanuts 590 lb. nuts	Wheat 30 cwt. Hay Sudan grass 2 tons 1 cwt. hay	Wheat 30 cwt. Hay Maize 8 tons green fodder	Wheat 30 cwt. Hay Millet 15 cwt. hay.

* Six outside rows were on newly broken land.

Maize Improvement Work.

Maize will later on be an important crop on the settlement. This year a large area was sown with this cereal, both for fodder and as a grain crop. Ten acres were planted on the farm, the yield being good considering the fact that tasselling took place during the latter part of the heat wave. Plants were given plenty of room, being spaced 4 ft. 6 in. between rows by 2 ft. between plants, which fact saved the crop during the hot dry spell. The variety grown, "Star Leaming," appears to be a suitable variety for the district, and certainly is a good drought resister. Selections were made from some good plants to be sown in "Ear to row" plots next season.

Winter Fodder Crops.

In order to ensure a good supply of hay for our working horses and at the same time demonstrate the value of the various winter growing cereals for fodder purposes, a series of fodder plots have been laid down, each one-half acre in area. With the idea of increasing the nutritive ratio vetches and field peas have been added to some of the cereal plots. In addition to these, 10 acres will be put under wheat for hay purposes, the variety selected "Florence" having proved a good general purpose wheat, being highly rust resistant and a good yielder of both hay or grain. A number of other varieties are being tried out in small plots.

PLAN SHOWING LAYOUT OF FODDER PLOTS.

Florence Wheat	Florence Wheat and black vetches	Oats, Algerian	Skinless barley	Skinless barley, golden vetches	Cape barley	Rye	Rye, golden vetches	Florence Wheat and grey field peas

Analyses of Soils.

Samples of soil from the experiment plots have been forwarded to the Agricultural Chemist for analyses. Mr. Brünnich has been able to complete some of these analyses, which are appended, and it will be noticed that he remarks on a deficiency of lime. A portion of our cultivation area is possibly lacking in humus. This section will be improved next season by ploughing in two successive crops of cowpeas.

Improvements.

In June last there were 56 acres cleared and under cultivation, to which were added another 34 acres in July, making a total of 90 acres at the beginning of the cotton season. A further 27 acres, situated to the north of the present cultivation, has just been cleared, bringing the total area available for next season up to 117 acres. The old cultivation is rather uneven as regards quality of soil, the greater part of which cannot be used for experimental plots for this reason. The new area appears to be very uniform and will accommodate 25 acres of experiments. The cost of clearing this area worked out at £3 2s. 6d. per acre.

Fences.

The total length of fencing erected on the farm is 416 chains, of which 213 chains were erected this year at a cost of 9s. 8d. per chain. In addition, there is 70 chains of old fencing, also 25 chains of posts only erected this year. A uniform type of fence has been adopted throughout. Four wires, two barbed in centre, plain wire top and bottom, posts, 4 ft. 5 in. high, spaced 12 ft. apart. Main gate openings are 15 ft. in width, allowing ample room for teams and implements. Double four-barred gates made of hardwood are being used in the gateways. Five pairs of gates have been made and hung. More are to be erected next year.

Yards.

A substantial three-rail horse yard, 36 ft. by 36 ft., made from sound bush timber, was erected in February, on the bank of Washpool Gully. Some good shade trees were included in the yard, while a waterhole nearby in the Washpool provides drinking water for the horses. Cost of erecting yards, £16.

Buildings.

During the year five new buildings were erected on the farm. A hay shed, with a capacity of 12 tons, was built in the farm buildings reserve. This will be added to next year, which addition will double the capacity of the shed. It cost £18. A feed shed and harness room, dimensions, 26 ft. by 12 ft., has recently been erected adjacent to the horse yards at a cost of £39.

Men's quarters, comprising a three-roomed house, 36 ft. by 14 ft., with verandah 8 ft. wide, was built near the main water hole in Washpool Gully. This building will accommodate six men comfortably, and is much appreciated by the farm staff. A roomy galley is conveniently placed for cooking purposes, while a 2,000 gallon tank provides drinking water. Total cost of building, £93 15s.

Two 12 ft. by 14 ft. tent houses, together with temporary kitchen, were erected on the staff buildings site at the beginning of the year, for use of entomologist and plant breeder. A roomy bench, facing casement windows, were built into each house to enable indoor record work to be carried out under good conditions. The cost of tent houses was £84 2s. 8d.

Two temporary shelter sheds erected last year and used as implement sheds complete the farm buildings.

Additional buildings are urgently needed on the farm. A roomy implement shed, repair and tool shop, also barn for storage of produce are necessary if farm operations are to run smoothly.

Water Supply.

A bore was recently put down which when equipped with pump, piping, and tanks will solve the water problem. It is proposed to irrigate an area of about 4 acres, situated between the Washpool and the stock route, on our eastern boundary.

In addition to the bore there are two waterholes in Washpool Gully, which although not absolutely permanent are nearly so, the water drying up only after a long period of drought.

The major part of the Farm situated north of the stock route is still without water. A good site for a well is situated in the centre of this area at the intersection of the main cultivation and grass paddocks.

It is proposed to build lunch time yards at this point, which is a convenient position for working the new experiment area, also northern half of old cultivation.

Implements and Machinery.

The farm now possesses a good range of implements and vehicles. Some useful additions were made this year, namely, Fordson tractor, disc harrow, chaff cutter, corn husker and sheller, and another one-horse inter-row cultivator. The tractor has performed splendidly both on the road and farm, and is relieving the team horses of the heavier work—*e.g.*, fallowing and road haulage work. Some additions to the working plant would be appreciated. They comprise:—

(*a*) A two-furrow tractor plough fitted with 28-in. discs and having sufficient clearance to enable plough to handle trash such as ploughing under a green crop.

(*b*) An eleven-hoe seed and fertilizer drill fitted with grass seeder attachment. At present cereal and grass crops are sown by hand, which is not very satisfactory.

(*c*) A reaper and binder for making better quality hay with tall growing crops than is possible at present with mower and rake.

Stock.

The only stock kept on farm are the working horses of which we have seventeen team horses and eight buckboard horses and hacks. Five draft and two buggy horses have recently been added to the strength from Monal Creek Farm. On completion of the railway to our siding much road work will be saved, which will be very much appreciated.

COTTON YIELDS—SEASON 1924-25.

Total yield seed cotton	30,091 lb.
Area under cotton	35 acres.
Average yield per acre	860 lb.

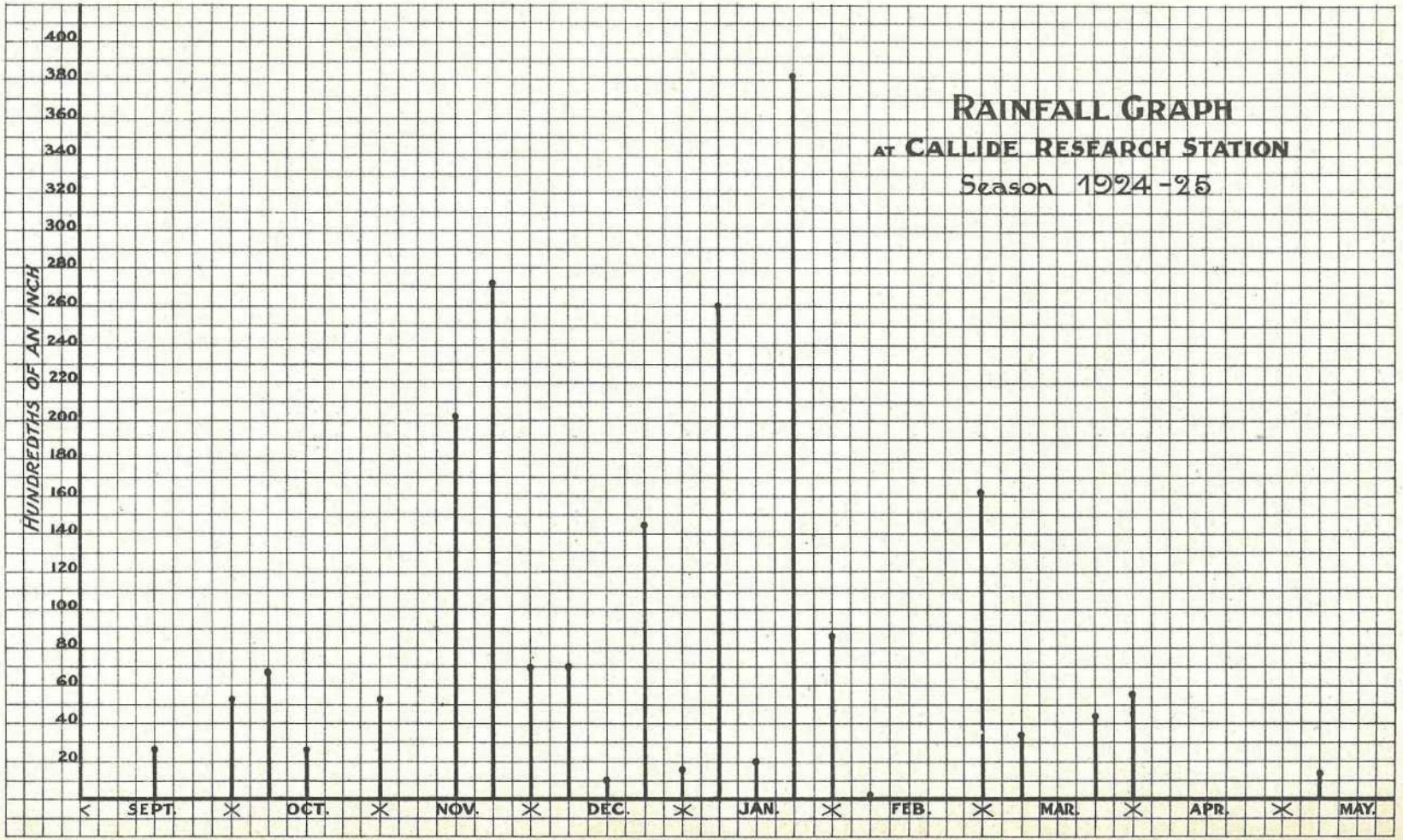
Distribution of rainfall at Callide Cotton Research Station, Biloela, Queensland.

RAINFALL CHART—CALLIDE RESEARCH FARM, BILOELA.

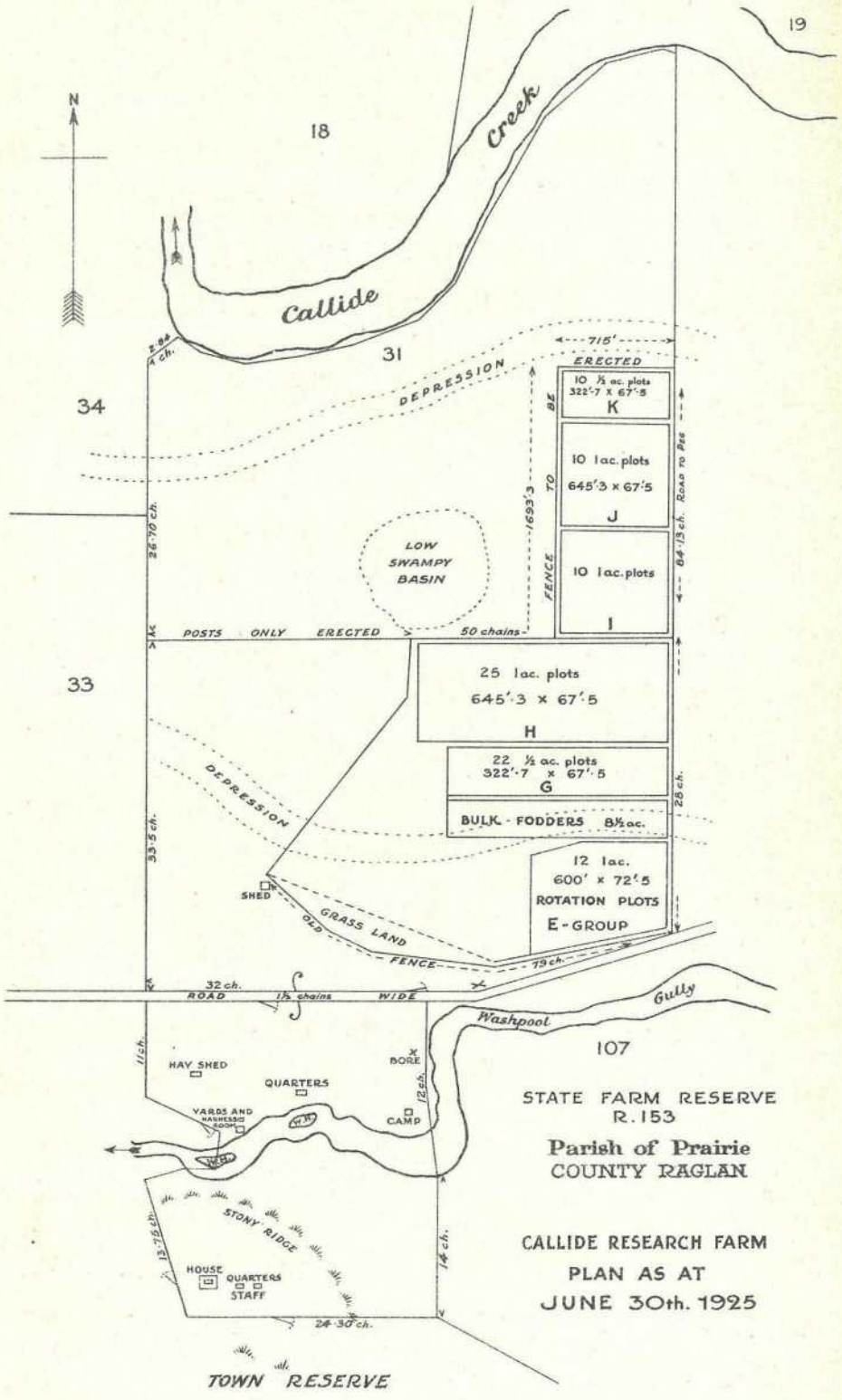
Date.	1924.						1925.					
	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June.
1	..	..	..	..	54	..	4	..	..	..	..	..
2	..	..	..	..	40	..	1	..	..	..	..	..
3	..	..	..	..	..	30	..	3	..	..	..	..
4	..	..	..	..	19	..	34	..	..	..	..	..
5	..	..	..	..	..	23	116	..	14	..	..	..
6	..	..	..	58	84	..	..		..	..	..	..
7	..	..	..	..	5	..	..		..	..	..	..
8	96	..	..	..	22	..	104		22	..	14	..
9	60	..	..	..	..	..	5		..	..	..	..
10	..	..	..	..	..	..	..		..	..	..	..
11	15	..	..	..	..	..	..		..	..	..	..
12	..	..	24	..	..	..	10		..	..	..	..
13	..	..	..	..	170	..	..	Heat wave.	..	..	..	..
14	..	..	..	..	..	12	..		..	..	..	..
15	..	..	..	..	..	..	4		..	..	..	..
16	..	..	..	..	..	..	..		..	..	..	..
17	..	..	..	..	..	110	..		..	..	15	..
18	..	..	..	..	..	5	..		..	..	46	..
19	..	..	..	..	..	11	..		4	..	..	270
20	..	..	..	30	..	30	63		..	..	..	78
21	47	..	..	50	..	..	191		3	..	..	..
22	..	..	..	12	..	..	2	..	..	..	..	..
23	..	..	..	..	..	..	106	75	..	..	..	..
24	..	..	..	..	..	..	21	22	40	..	..	..
25	48	..	..	..	..	..	..	..	..	..	..	..
26	..	..	..	..	..	..	..	22	..	..	37	..
27	..	..	..	..	..	..	..	42	..	..	..	..
28	..	..	..	..	..	..	..	..	15	..	..	..
29	..	..	52*	..	..	..	..	..	..	..	..	..
30	..	..	..	..	..	..	..	..	42	..	..	..
31	..	17	..	..	..	14	88	..	..	..	..	..
Monthly Totals	266	17	76	150	394	235	749	164	140	Nil	112	348

* Farm cotton planted after this rain.

The months are divided into four periods each, *vide* chart. The frequency of light precipitations in the months of October, November, and December, should be noted, as it is believed that such conditions were responsible for the development of the shallow root system which characterised the crops throughout this area in the past season. At other centres where the rainfall occurred with less frequency in the same months, the root system was of a far deeper development, and consequently the plants were able to withstand the droughty conditions of February to a far better degree than was the case at the Callide Cotton Research Station.


RAINFALL GRAPH
AT CALLIDE RESEARCH STATION
Season 1924-25
HUNDREDTHS OF AN INCH
400
380
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
SEPT.
OCT.
NOV.
DEC.
JAN.
FEB.
MAR.
APR.
MAY.

PLAN OF
CALLIDE COTTON RESEARCH STATION, BILOELA.



STATE FARM RESERVE
R. 153
Parish of Prairie
COUNTY RAGLAN

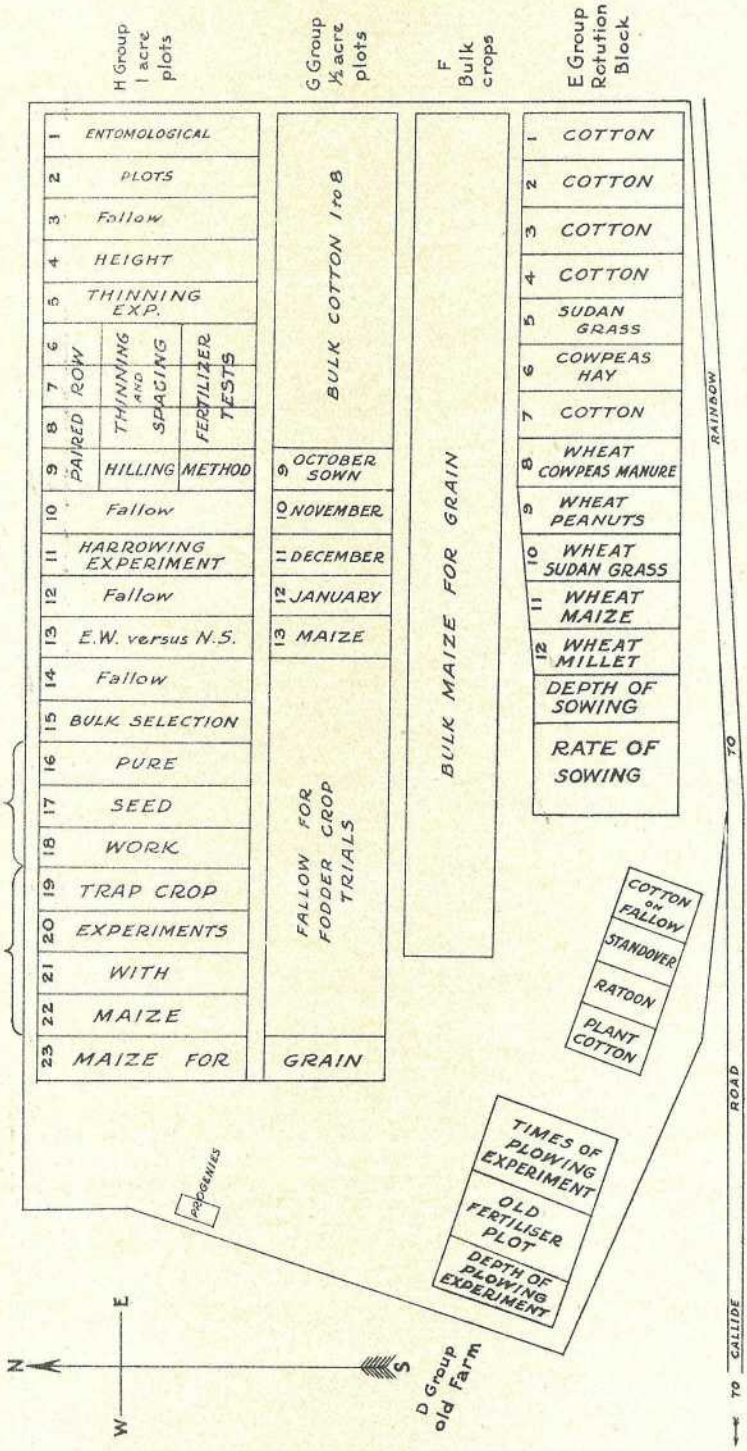
CALLIDE RESEARCH FARM
PLAN AS AT
JUNE 30th. 1925

— SKETCH · PLAN —

of a portion of Callide Cotton Research Station.

SHEWING

LAY OUT OF EXPERIMENTS 1924-25



A NOTE OF COTTON DEMONSTRATION WORK IN THE CALLIDE SETTLEMENT.

Approximately 1,000 acres of cotton were harvested on the settlement this season, of which 656 acres were of the Durango variety. The district will in the near future become a big cotton producing centre, both soil and climate favouring the production of good quality cotton.

Unfortunately, this season has been a rather unfavourable one as regards rainfall, but in spite of this fact profitable yields were obtained wherever good farming methods were adopted. Yields up to 900 lb. of seed sotton per acre were harvested, while the majority of the farmers' crops went over the 500 lb. mark. The "Durango" variety stood up well under what was a rather gruelling test, as the farmers without exception planted this year on new land which was in most cases ploughed just prior to planting, this being their first cotton crop. Next season better results may be looked for. The Research Farm is helping much towards the progress of the settlement. A number of settlers have had no previous experience with the cotton crop. These men appreciated very much the practical advice given them by the farm staff, while the farm crops served a useful purpose in showing just what could be accomplished by improved cultural methods.

The Durango seed was this season distributed from the farm in order to save trouble at the siding, as no shelter was available at the railhead. Settlers were put on the right track with regard to seeding operations and instructions given as to correct methods of thinning and cultivation. The majority of the crops this season were spaced well and with a few exceptions kept very free of weed growth. Later in the season the whole of the crops were inspected and coloured tags distributed to the growers of good Durango cotton. The seed from these crops will be held over to be used for planting the next crop. Unfortunately, three individual farmers planted ordinary Upland cotton with the Durango. This was not allowed to become mixed with the clean Durango. Durango showed good length of staple as compared with the ordinary Upland type, which is uneven and very short. This variety will not be distributed next season, sufficient Durango seed being available for the whole of this cotton area.

There is a very large area on this settlement suitable for cotton, the flats adjacent to the many creeks running through the area are particularly so, the soil being in most cases a rich loam overlying a clayey loam subsoil, the clay being at a sufficient depth to retain moisture while allowing the root system to penetrate a reasonable distance. On this type of soil the cotton showed good strength and staple. It is advisable to plant the cotton not too close to the creek banks, the soil in most cases being of a sandy nature which dries out quickly in a dry spell.

PLATE 34.—NEWLY-BURNT SCRUB PLANTED TO COTTON, CALLIDE SETTLEMENT.

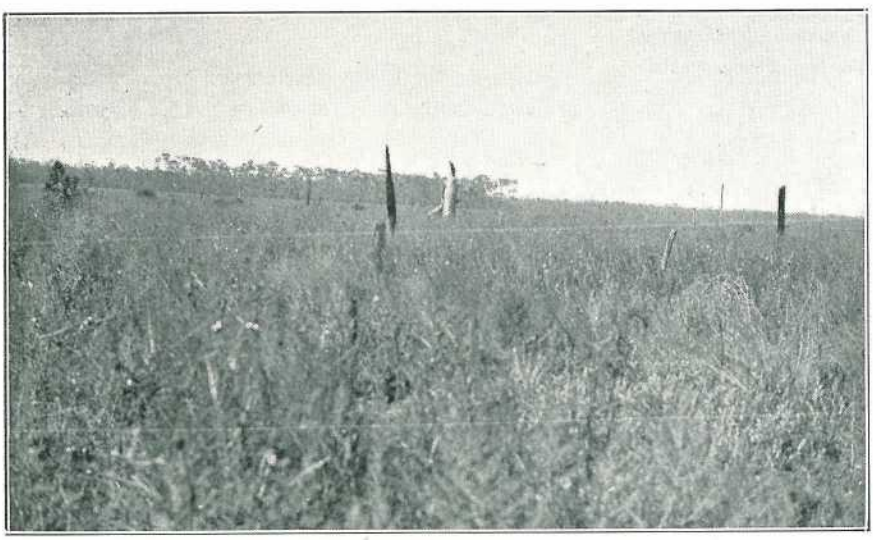


PLATE 35.—STANDOVER COTTON BEATEN BY WEEDS IN NEWLY-BURNT SCRUB—SECOND YEAR GROWTH—CALLIDE SETTLEMENT.

Owing to the stumps in the land, it has been impossible to keep the weeds down since the cost of hand labour is prohibitive. Crops such as this are a menace from the point of view of the spread of pink boll worm.

Some good crops were raised on the black soil plains bordering on the scrub areas. This type of soil is rather more difficult to handle, especially in a good season. Weed growth is difficult to control as these lands cannot be cultivated when in a wet condition.

The scrub areas, generally speaking, did not show up too well this season, the cotton bushes in most cases developing too much vegetative growth which resulted in much shedding of bolls and squares during the dry spell early in the year.

Owing to the difficulty in getting the fallen scrub burned during the spring months, most of these areas were planted late in the season, which fact tended towards lower yields than those secured on the forest lands.

In addition to cotton growing in the Callide area there would appear to be a great future ahead of the dairying industry, the grasses being of good quality and supplying sufficient feed in most years during the late spring, summer, and autumn months. During the winter and early spring the grasses being frosted are not succulent enough, nor do they contain sufficient nutriment to enable cows to milk well. If dairying is to be a profitable industry provision must be made for a regular supply of succulent fodder during these months. Wheat and skinless barley combined with either field peas or vetches will provide good fodder during the winter, the addition of the legumes making a better balanced ration by adding additional nitrogenous matters.

Sorghum planted late in February or March will provide succulent fodder well into winter when the cereal crop would be available.

A variety of fodders can be grown during the summer months and will prove a valuable addition to the pasture. Maize, sorghums, and cowpeas are all useful in this direction, while a lucerne patch, where available, will more than pay for the planting of the first season.

In addition to cotton-growing and dairying, which together will probably be the main source of revenue to the settlers here for some time to come, pig raising and maize growing should prove a profitable venture. Lucerne crops, potatoes, peanuts, and cereals for hay may be grown, while the raising of fat stock may prove a profitable side line.

Now that the railway has extended into the settlement there should be nothing to prevent the district going ahead and the farmers becoming a very prosperous community. The cotton industry is playing a major part in the settling of the Callide lands, as good returns are assured wherever the crop is intelligently handled.

The Callide Research Farm, besides doing valuable experimental work, is doing much towards raising the standard of farming in the district. A good deal of individual instructional work is necessary and should be carried out as far as is possible this coming season.

L. W. BALL, Manager, Callide Research Station.

PLATE 36.—SCORIA, CALLIDE SETTLEMENT.

An attempt at ratooning on ploughed land. The land is free of weeds and well cultivated, but only about 15 per cent. of the plants have survived the winter frosts.

PLATE 37.—SCORIA, CALLIDE SETTLEMENT.

Part of a 300-acre block of Durango, planted towards the end of September on winter-fallowed land and coming into square in the first week of December comparatively. The bare patches in the foreground are on the headland.

DESCRIPTION AND ANALYSIS OF SOIL, CALLIDE RESEARCH COTTON STATION, BILOELA.

	Sample No. 7.	No. 8.	No. 9.	Samples Nos. 34, 37, 40, 43, 44.	35, 38	36, 39, 41, 42, 45,
The analysis refers to	Soil No. 2284.	2285.	2,286.	Soil No. 2,287.	2,288.	2,289.
Properties of the Soil—						
Reaction	Acid	Acid	Neutral	Acid.	Acid.	Acid.
Apparent specific gravity of dry soil	1·29	1·35	1·18	1·23	1·24	1·23
Weight of soil per acre, 12 in. deep (tons)	1,566	1,639	1,433	1,493	1,505	1,493
Capacity for water (per cent.)	41	37	48	46	47	49
Absorbed weight per acre, 12 in. deep (tons)	642	606	688	687	707	730
Capillarity in inches after 3, 6, 24, and 48 hours	4½, 6, 9⅝, 11¾	3⅜, 5½, 11, 15	4⅜, 5⅞, 11, 14	5⅜, 6⅝, 9¾, 11¾	4¾, 6⅝, 10¾, 13	5¼, 6⅝, 10, 12
Mechanical Analysis of the Soil—						
Calculated on soil dried at 100° C.—						
Fine gravel, from 1 to 2 mm (per cent.)	·11	·06	·04	1·91	·10	·89
Coarse sand, from ·5 to 1 mm. (per cent.)	·41	·22	·37	2·94	·24	1·32
Medium sand, from ·25 to ·5 mm. (p.c.)	1·98	1·12	1·77	3·81	·68	2·67
Fine sand, from ·05 to ·25 mm. (per cent.)	21·10	32·72	18·49	20·19	19·96	14·49
Silt, from ·02 to ·05 mm. (per cent.)	13·88	14·39	12·42	11·48	16·01	6·83
Fine silt, from ·01 to ·02 mm. (per cent.)	12·69	9·63	10·95	7·81	11·25	5·01
Clay, under ·01 mm. (per cent.)	42·99	35·98	47·52	44·79	43·20	60·56
Organic matter (per cent.)	6·83	5·89	8·44	6·97	8·56	8·24

	Parts per Hundred.	Lbs. per acre 12 in. deep.	Parts per Hundred.	Lbs. per acre 12 in. deep.	Parts per Hundred.	Lbs. per acre 12 in. deep.	Parts per Hundred.	Lbs. per acre 12 in. deep.	Parts per Hundred.	Lbs. per acre 12 in. deep.	Parts per Hundred.	Lbs. per acre 12 in. deep.
Moisture in air-dried sample	3·12	..	2·50	..	4·54	..	3·74	..	4·44	..	4·12	..
Chemical Analysis of the Soil—(calculated on Soil dried at 100° C.)—												
Humus	2·22 v. fair	..	1·85 fair	..	2·46 v. fair	..	1·66 low	..	2·04 fair	..	1·67 low	..
Other organic matter and combin. water	4·61	..	4·04	..	5·98	..	5·32	..	6·52	..	6·57	..
Chlorine Cl	·005	..	·006	..	·007	..	·005	..	·007	..	·007	..
Nitrogen N	·109 low	3,719	·092 v. low	3,304	·147 low	4,493	·116 low	3,746	·135 low	4,350	·128 low	4,114
Agricultural analysis—												
Soluble in Hydrochloric Acid of 1·1 sp. gr.—												
Phosphoric acid P_2O_5	·10 low	3,508	·11 low	4,308	·14 low	4,172	·13 low	4,348	·14 low	4,384	·15 fair	4,683
Iron Fe_2O_3	11·89	..	10·93	..	13·66	..	14·01	..	14·46	..	15·13	..
Alumina Al_2O_3												
Manganese MnO												
Lime CaO	·97 v. fair	32,975	·96 v. fair	34,510	1·25 v. fair	31,890	1·12 v. fair	36,125	1·18 v. fair	38,105	1·17 v. fair	37,460
Magnesia Mgo	·70	..	·64	..	·83	..	·91	..	·98	..	·96	..
Potash K_2O	·57 v. fair	19,295	·54 v. fair	19,458	·66 v. fair	20,215	·67 v. fair	21,740	·63 v. fair	20,230	·68 v. fair	21,740
Insoluble in hydrochloric Acid of 1·1 sp. gr.	78·84	..	80·92	..	74·73	..	75·83	..	74·02	..	73·76	..
Readily available plant foods—												
Soluble in 1 per cent. citric acid solution—												
Phosphoric acid P_2O_5	·0137 low	467	·0204 fair	731	·0287 good	879	·0193 fair	622	·0242 fair	779	·0213 fair	682
Lime CaO	·1383 low	4,701	·1834 low	6,564	·1990 low	6,079	·1699 low	5,468	·1273 low	4,101	·1961 low	6,288
Magnesia MgO	·0595	..	·0543	..	·0975	..	·0499	..	·1009	..	·1022	..
Potash K_2O	·0122 fair	414	·0169 fair	606	·0245 good	751	·0118 fair	381	·0161 fair	519	·0146 fair	468
Lime requirements, cwt. lime carbonate per acre, 12 in. deep	..	38	..	4	..	neutral	..	17	..	15	..	19

REMARKS.—All the soils are practically alike—pure clay soils, closely resembling in many respects (chiefly mechanical analysis), some of the best Indian Cotton soils (Viridupatti), but containing much more phosphoric acid and potash, but much less lime. The capillarity is not quite so good, but will be improved by cultivation and green manuring, and very probably liming would have an immediate beneficial effect. No artificial fertiliser should be required at present; later on basic slag should be the most suitable fertiliser.

Annual Report of Monal Creek Cotton Experimental Farm for 1924-25.

This farm was established in the season 1923-24 under the direction of the Director of Agriculture as a demonstration area for the Upper Burnett land scheme. Mr. L. W. Ball was appointed manager, with Mr. K. V. Henderson, as assistant.

On 1st July, 1924, the farm was transferred to the Cotton Section, and Mr. S. T. J. Clarke was made manager, with Mr. Henderson as assistant and in charge of investigations in cotton experiments.

Much valuable development work was done during the time while the farm was under the supervision of the Director of Agriculture, with the result that the activities of the staff during the past season could be devoted to investigations.

The farm is composed of 720 acres of which, approximately, 120 acres are of a fine type of alluvial flats. The Monal Creek forms the boundary on one side, and the soil along the banks shows a depth of from 25 to 30 ft. of loam. As is usual with most of the inland creeks, the soil adjacent to the creek is of somewhat a sandy nature and during dry spells shows a tendency to lose moisture. The soils increase in heaviness away from the creek as a result of the depositing of the washings from the adjacent slopes, and are of a very fertile nature, being full of humus and, after a thorough cultivation has been established, are of good moisture-retaining properties.

The slopes are covered to a good depth with loams overlying clay and warrant careful testing as to suitability for cotton growing. The timbers on these slopes are comprised of bloodwood, apple tree, broadleaf, ironbark, Moreton Bay ash, and patches of box towards the top of the slopes.

The distances from markets of any size make this area primarily a dairying section, and any system of farming evolved should take into consideration the growing of fodder crops. As the climatic and soil conditions appear to be very favourable for the production of profitable crops of cotton, the growing of this crop also should be included in the system of farming, especially as this crop can stand the costs of transportation better than most of the agricultural crops grown in the inland cotton belt. The activities of the staff therefore have been devoted to studying the problem of evolving a proper system of crop rotation in addition to cotton problems.

Winter Fodder Crops.

When the cotton section took over the management of the station, a 10-acre plot of Florence wheat for hay and a series of tests with fodder crops had been planted under the direction of the Director of Agriculture on well fallowed seed beds. The yields obtained from the plot of

Florence wheat averaged 30 cwt. per acre of excellent hay. A strip of this plot was left to mature and well filled grain was obtained from plants, which were free of rust.

The fodder plots were planted at the rate of 1 bushel of grain and 30 lb. of grey field peas per acre, and an excellent growth was obtained on all plots. The yields of hay from these plots were obtained by means of cutting three "one-yard-square" measured areas from average sections of each plot and taking the mean of the three weights, which were as follows:—

Crop.	Green Weight.	Dry Weight.
	Tons cwt.	Tons cwt.
Rye	12 1	3 12
Rye and grey field peas	12 8	3 14
Cape Barley	16 2	4 16
Cape barley and grey field peas	16 13	5 0
Skinless barley	17 16	5 6
Skinless barley and grey field peas	13 10	3 11
Florence wheat	16 14	5 0
Florence wheat and grey field peas	17 5	5 3
Algerian oats	17 15	5 6
Algerian oats and grey field peas	18 4	5 9
Huban clover	9 5	2 5

All hay was dried under cover to obtain the dry hay weights.

NOTE:—It is recognised that this method of computing the yields of test plots is not the most accurate one, but, unfortunately, the tests were harvested in such a manner through a misunderstanding. The results are published, therefore, not as accurate yields but as relative yields so as to give some idea of the growth obtained.

Sudan Grass.

Two acres of Sudan grass were planted at the rate of 20 lb. of seed per acre, to test out this grass as a possible hay crop for the district and excellent results were obtained. Unfortunately, the stalks grew to such heights, 6 to 8 ft., that the crop lodged badly in places, and with the very wet period at the time of ripening much of it was lost. Test plots of average growths yielded at the rate of 4 tons per acre of dry hay on the first cutting and 30 cwt. on the second cutting.

Lucerne.

An area of 3 acres was fallowed for nine months for a plot of lucerne, which was planted on the 7th of April with the Hunter River Broadleaf variety. No rain of any importance fell for two months after planting, but an excellent stand was obtained which made a very rapid growth of fine quality.

This demonstrates the advantages to be obtained by thoroughly fallowing the soil. The area was ploughed four times and then harrowed after each rain to retain the moisture.

Such a system of fallowing also is of the utmost advantage to the cotton-growers, as it ensures ample subsoil moisture and enables a strike to be obtained on the first light rains falling after the danger of frosts is past.

Maize.

As the seasons in this district have a somewhat erratic rainfall and a tendency towards early frosts in the autumn (as early as 21st April has been the experience of the last two season—7.2 degrees of frost having been received this year), the growing of maize for a grain crop was watched with particular interest. A 2-acre plot of Funk's Yellow Dent was planted on 7th October and yielded approximately 75 bushels of unshelled grain to the acre. The cobs were of excellent type and some averaged about 1,440 grains. This variety was harvested and stored just five months from the date of planting, so it appears to be well suited to the locality.

Another plot of 2¼ acres on heavy soil was sown with the Star Leaming variety at the end of December, and excellent results were obtained. Unfortunately, severe attacks by the crows spoiled a fair percentage of the crop, as they picked the ends of the ears sufficiently to allow the rains to enter and cause rotting of the seed. This variety tasselled seven weeks from the time of planting, and should prove to be a very good maize for the district for late planting.

Both plots of maize were planted in drills 4 ft. 6 in. apart at the rate of 10 lb. per acre. Thinning was done when the plants were small and was followed by hilling up as the plants developed. Suckering was necessary and was performed when the plants were 1 ft. in height. Cultivations with a scuffler were effected every two weeks.

Cow Peas.

As the Upper Burnett Settlement is composed of virgin country the influence of green manure crops is of the utmost interest, and accordingly 1 acre of cowpeas (variety Black-eye) was planted for a green manure experiment. This variety proved to be well suited to the area and made a splendid growth. A portion of the plot was allowed to mature seed, which was of good sound quality, and the rest was ploughed under for green manure for the coming season.

Peanuts.

One acre of the large Spanish variety was planted, but only returned a fair yield. The rows were spaced 3 ft. apart and the plants 15 in. Four scufflings and hillings were effected before the plants spread too much to allow further cultivation. Unfortunately, as the young plants were coming through the ground, heavy rains were received which nearly drowned the plants, a setback from which they never properly recovered.

Ensilage was made of the crop and proved to be very palatable to the stock, so that this crop may be of value to the dairyman. A small section was harvested and yielded at the rate of 9 cwt. per acre.

Potatoes.

In order to provide a food crop for the settlers a plot of 1 acre was planted on 12th September, to a variety test of potatoes, which included the following:—Brownell Beauty, Coronation, Carmen, Up to Date, Earliest of All, and Mantanese.

All of the varieties yielded good crops, the Brownell variety giving especially good potatoes which showed excellent keeping qualities throughout the summer.

The total yield from the plot was 8 tons, and the above-mentioned order indicates the relative value of the varieties.

Cotton.

The cotton crop occupied the major part of the activities of the staff—some 21 acres of this crop having been grown.

The seasonal conditions under which the crop was grown increased the difficulties of maintaining a proper state of cultivation over the whole of the area. Heavy rains in early November partially swamped some of the experiments, and frequent rains in the latter part of this month and early December necessitated constant cultivation whenever the conditions were suitable, in order to check the weed growths.

The implements used in cultivating the cotton crop were the P. and O. (wiggle-tail) two-horse disc cultivator and the one-row scuffler, equipped with both the ordinary 2½ in. points and the sweeps or "duck feet." The latter machine was found to be of excellent service in coping with the weed growths after the plants were of some height—the sweeps being put on the back shanks of the cultivator, and care taken to keep them sharpened.

All the plots were hilled up gradually through the season by means of the disc cultivator, and at the time of the last cultivation with this machine a heavy ridging was made in order to smother any young weed growth in the rows and also to brace the stalks against any severe winds.

All thinnings of the bulk crop and experiments, unless otherwise specified, were done when the plants were 6 in. high and spaced to a distance of 20 in. between the plants.

Generally speaking, these distances seemed to be satisfactory, although in some portions of the farm, on the heavier soils, a rather rank vegetative growth was made under the luxuriant growing conditions which existed this past season.

The details of the experiments conducted are given under the section of the report dealing with this phase of the farms activities, and only the general features of them will be discussed at this point.

Among the most interesting of the experiments was that to test the time of planting, in which a plot was planted in each month at the first opportune time. The results obtained were distinctly conclusive, as shown in the following table:—

September planting	..	2,184 lb. seed cotton per acre
October planting	..	1,543 lb. seed cotton per acre
November planting	..	1,120 lb. seed cotton per acre
December planting	..	Failure due to frosts on 21st April
January planting	..	Failure due to frosts on 21st April

These results show the decided advantage to be obtained from early planting, although it is pointed out that the planting in September should be made only if the soil temperatures have risen sufficiently

to give a good steady growth of the young seedlings. Much damage can be done if the soil temperatures are too low, as the seed either rots or, if germination is effected, the young plants are checked by the low temperature, which causes "sore shin" or damping off, and in some cases stunts the growth to such an extent that the plants do not fully recover.

The root system of the plants in the September planting were developed to a much further depth and extent than were those of the other plantings. This enabled the plants to withstand the heat wave in February, as an ample supply of moisture was available in the lower sub-soils.

Another experiment of importance was the test between the ratoon and the annual planting methods of growing cotton. The cultural aspects of this problem were shown in the experiment in a striking manner, especially the phase of keeping the land free of weeds and grass. Owing to the spreading habit of the ratooned plant, machine cultivation has to be discontinued early in the season, which necessitates a considerable amount of hand labour, especially if the soil has been under cultivation previously for a number of years. Hand labour can be utilized only to the extent of keeping down the growth of large weeds, &c., so that the soils in the middles between the rows soon become covered with small weeds and grasses, whereas the planted cotton can be cultivated during the later stages by means of a one-horse scuffler until the plants are of sufficient height to shade the ground and thus reduce the weed growth.

The difference was shown very clearly in this experiment at the end of the season after the plants had been removed; the planted plot being clean and free of weed or grass growth, whereas the ratooned plot was badly infested with weed and grass growth which had seeded, and consequently will require expensive cultivation for several seasons.

The average yield of all plots which were planted up to 30th November was 1,550 lb. per acre of mature high-grade cotton—the major part of the crop having received grades at the ginnery of from A to C with some 1X.

UPPER BURNETT AREA.

The settlers on this area during this past season recognised that the growing of a cotton crop offered them the best opportunity of making a livelihood under the present conditions of expensive transportation and lack of facilities for dairying, &c. An area of some 640 acres of pure Durango seed and 250 acres of bulk Durango seed was applied for, and the most of it was planted in a fairly satisfactory manner.

Owing to the farmers arriving on their selections rather late in the winter the preparation of the seed beds for this past season was somewhat delayed, but, fortunately heavy rains in November supplied ample moisture to enable the plants to make a steady growth through the season until the heat wave in February occurred. This had a tendency to check the growth of the crops on the heavier soils where there was a tendency to make somewhat of a rank vegetative growth, with the result that a very heavy top crop developed over most of the settlement.

Some damage was done by the heat wave to the crops planted on the higher sandy soils near the creeks, the squares falling off in many cases and the lower bolls being forced open prematurely. This caused the fibre of the lower bolls to be weak and tender and consequently it was of lower value than properly matured cotton. Fortunately, the heat wave was of short duration so that the bulk of the crop of the area was of high grade mature cotton and yielded handsome returns to the growers.

Several of the farmers' crops averaged per acre yields of around 1,500 lb. of seed cotton of heavy body and of a staple length of $1\frac{1}{8}$ full to $1\frac{3}{16}$ in. It can be seen, therefore, that cotton-growing in this area has been of marked assistance to the new settlers in that it supplied a valuable cash crop which has returned the grower sufficient capital in many cases, and enabled him to make considerable headway in improving his selection.

Such encouraging results as have been obtained this past season must demonstrate to the settlers of this area that cotton-growing should be allotted one of the major places in their system of farming, and it is anticipated that after this crop has been grown for a few more seasons that it will be recognised as the most valuable and reliable cash crop that they can grow.

EXPERIMENTAL PLOTS—MONAL CREEK FARM.

SEASON 1924–25.

In summarising the experimental work on the Monal Creek Research Farm, a brief analysis of the climatic conditions governing the growing period are given.

Generally speaking, the season has been an exceptional one. The only set-back, other than too much wet weather, being a heat wave, extending from 10th February to the 24th. The highest maximum screen temperature reading 103·2 degrees on the 21st February, whilst the lowest maximum for the period registered 95·5 degrees. This greatly affected the crops growing on the higher sandy soil, causing a fairly high percentage of shedding and temporary wilting. The crops on the heavy black soil were also affected, but recovered very quickly so that only small damage was done.

Frosts were the next set-back (other than insect pests), occurring approximately the same time as last season. The first was registered on the 23rd April and extended to the 27th, as much as 7·2 degrees of frost being recorded. From then on, until the beginning of June, no frosts of any note were experienced. From 1st June on to the 1st July a frost occurred every morning, the lowest being on the 7th June, when approximately 10 degrees of frost were registered. Heavy mists and dews prevailed during April and May, the former, at times, not rising until as late as 9.45 a.m. (17th May).

With regard to rainfall, rather too much fell during the early part of the growing period. In February and March, the falls recorded were much lighter, falling off until April and May, during which period only 131 points were registered, giving the pickers a good opportunity to get the crops lifted. A noticeable effect of the heavy November rains was the temporary check in growth of the young seedlings.

RAINFALL—AUGUST, 1924–MAY, 1925.

Month.	Points 1924.	Average 1890-1924.	Month.	Points.	Average 1890-1924.	Month.	Points.	Average 1890-1924.
August ..	108	122	Dec. ..	447	398	April ..	25	176
Sept. ..	150	149	Jan. ..	592	421	May ..	106	150
Oct. ..	191	223	Feb. ..	234	336	Season Total	28·95	
Nov. ..	673	253	Mar. ..	323	314			

The total rainfall for the ten months, was 28·59 in., whilst the average annual fall is 28·86 in. Approximately 16 in. fell during the period October to January, and was responsible for the somewhat excessive growth of the plants.

Experimental Plots.

A total acreage of about 17 acres was planted with cotton. Of this area, approximately 11 acres were under experiments. Besides this area, 3 acres of ratoon and standover cotton were also grown.

The following experiments were carried out on the lighter sandy soil adjacent to the creek:—

(1) Cotton grown on fallow,

(2) Annual section for comparison with ratoon,

(3) Standover and ratoon;

and on the heavier soils, adjacent to road and approximately 50 yds. east of the foregoing group, the following experiments:—

(1) Height of thinning and spacing,

(2) Method of planting, wet and dry seed, furrows or drills,

(3) Check plot, spacing ordinary, 20 in.,

(4) Hilling, one, two, and three plants to each "hill,"

(5) Paired row,

(6) Thinning and spacing test.

FALLOW VERSUS CONTINUOUS CROPPING.

Many of the cotton areas in this State experience very erratic conditions of rainfall during the late winter and spring months, so much so as often to make the preparation of the seed bed very difficult owing to the dryness of the soils. When such conditions arise they naturally increase the difficulty of maintaining a good strike owing to the subsoils not being able to supply sufficient moisture to the young plants to withstand a period of drought.

Accordingly an experiment was conducted to show the effects of growing cotton on fallowed ground and on ground which had been in cotton the previous season. The crop from this latter plot was ploughed out and burned and the soil ploughed to a depth of 6 in. on 1st September, harrowed on the 10th, cultivated on the 23rd with spring time cultivator, and planted on 31st September, a total of 1·50 in. of rain having fallen during the month.

The fallowed plot had been prepared during the previous season and had been cultivated and harrowed throughout the winter to prevent any weed growth. This plot was the earliest sown—the planting being made on the 30th August following a rainfall of 108 points during that month.

Owing to the luxuriant conditions of the months of October and November, when a total of 8·64 inches of rain fell, the plants developed an excessive vegetative growth on the lower half of the area which was of a heavy soil.

The severe heat wave which was experienced in February caused a very immature bursting of the bolls, especially on the section of the experiment which was on sandy soil adjacent to the creek bank. Many of these bolls opened poorly as the locks were hard and immature.

The final yields of the two plots were—Fallowed ground, at the rate of 1,519½ lb. per acre; late prepared, at the rate of 1,693 lb. per acre.

Such results must not be expected in every season, as a greater difference in favour of the fallowed plot was obtained this season in a similar test at the Callide Research Station where the climatic conditions were not so favourable.

The experiences of the growers who have tried planting on late prepared seed beds as against well fallowed soils have been more in line with the results obtained at the Callide Research Station, where the fallowed plot gave a yield of 1,215 lb of seed cotton as against 947 lb. on the late prepared plot adjacent to it.

Ratoon Experiment.

This experiment was planned in accordance with Government's promise to investigate the merits of ratooned and annually grown cotton. Accordingly, 1-acre plots were planted in November, 1923, to supply material for the ratooned and standover crops of the season 1924-25.

The experiment included the following systems of growing cotton:—Ratooned, standover, late planted for ratooning in the following season, and annual.

Ratooned Plot.

The 1923-24 crop was ratooned in June, the plants being cut back to 4 to 6 in. above the ground. The field was thoroughly scarified before the young sprouts commenced developing in order to get a good mulch and destroy any young weed growth.

The resultant "strike" was very discouraging, approximately only a 20 per cent. stand being obtained. The frosts were too severe, as not only were the stalks above ground killed but apparently the roots as well. The winter of 1924 was, according to records, a mild one compared with the average.

Careful cultivation was maintained until the lower branches spread over the ground and interlaced across the rows prohibiting further machine cultivation. Weed growth from then on was checked by means of hand hoeing, which increased appreciably the expense of growing the crop, as the machine cultivation had to be discontinued much earlier than where the annual crop was being grown.

In order to study the behaviour of ratooned plants pruned back to one sprout, two rows, each 10 chains long, were treated in this manner. The operations were timed and worked out at the rate of 13½ hours per acre per man. At 13s. 4d. per day this would mean an additional cost of 22s. 6d. per acre, which would not be justifiable by the results secured from the experiment. The yield of the plot was at the rate of 430 lb. of seed cotton per acre.

Standover Plot.

Owing to the killing of the stalks by frost to below the surface of the ground, this experiment could not be completed.

Late Planted Plots for Ratooning.

It has been suggested that by planting during the rainy season a good strike could be obtained and the plants, not having borne a crop, would produce heavily during the following season, if ratooned early in the spring. Accordingly a plot was planted in January, 1924, and another in March of the same season.

The January planting did not yield anything that season and was allowed to stand over until spring, when examination showed that but approximately 5 per cent. of the plants were sprouting. The total number of plants on the 13th December, 1924, was 88, and of this number 79 were on the edge of sandy soil next to the creek bank, whilst the remaining ¾ of an acre had 9 plants only. The March planting was an absolute failure—not one plant having survived the winter.

The Annual Plot.

This plot grew cotton in the previous season, which necessitated removing the old crop, which was effected by means of ploughing out the rows of stalks, making them into piles and burning them. The soil was then ploughed to a depth of 6 in. on the 1st September, harrowed on the 10th, cultivated on the 23rd with the spring tine cultivator, and planted on the 31st September. A total of 1·50 in. of rain fell that month.

The plants were thinned when 6 in. in height to a distance of 20 in. apart—the rows were 4½ ft. apart—the distance being the same in all plots.

The plot was thoroughly scarified at intervals of roughly three weeks apart, until the vegetative growth of the plants prohibited further passage without severe damage being done to the branches. This was at a much later date than when cultivation ceased in the ratoon plot, so that a much better mulch and consequent destruction of weeds was maintained until the growth of the plants afforded sufficient shade to suppress weed growth to a great extent. The yield from this plot was 1,693 lb. of seed cotton per acre.

Summarising, it appears that the growing of ratoon cotton in this area, in any of the forms tried in the experiment, will give very unsatisfactory results. Not only were the yields extremely low as compared to that obtained from the annual plot, but the nature of the growth of the plants was such as to handicap the picking operations and possibly

would increase the cost of picking to an appreciable extent. The yield obtained from the annual plot indicates that under proper methods of cultivation and with a well-prepared seed bed, profitable results may be obtained from the annually planted cotton even when grown under such conditions of early frost as existed in the area this past season.

The following tables give the dates of each cultural operation and the costs thereof of the ratooned versus annual experiment. The cultivation given and the approximate costs of production are given below:—

Plant Cotton Block.

Date.	Operation.	Cost.
		£ s. d.
1924.		
1st Spetember ..	Ploughed to 6 in.	0 12 0
10th September ..	Harrowed	0 2 0
23rd September ..	Cultivated	0 2 0
31st September ..	Planted 15 lb. seed per acre in rows 4 ft. 6 in. apart	0 2 6
5th November ..	Thinned out to single plants at 20 in. apart ..	0 8 0
14th November ..	Cultivated	0 2 0
8th December ..	Hand hoed	0 4 0
23rd December ..	Cultivated and laid by	0 2 0
1925.		
15th March ..	Picking commenced	..
		1 14 6
Cost of picking 1,693 lb. at 2d. a lb.		14 2 2
	Total	15 16 8
Value of 1,693 lb. at 5d. per lb.		35 5 5
	Net profit	£19 8 9

Ratoon Cotton Block.

Date.	Operation.	Cost.
		£ s. d.
1924.		
8th September ..	Old stalks cut down to 3 in. of ground level, removed and burnt	0 10 0
11th September ..	Disc cultivated	0 2 0
19th September ..	Spring tooth cultivated	0 2 0
1st October ..	Hand hoed	0 4 0
6th November ..	Hand hoed	0 4 0
1925.		
16th February ..	First picking	..
		1 2 0
	Cost of picking 430 lb. at 2½d. per lb.	4 9 7
	Total	£5 7 7
	Value of 430 lb. at 4d. a lb.	7 3 4
	Net profit	£1 15 9

It will be noted that but two hand hoeings were given to the ratoon section. It was found impractical to destroy all of the weed growth

in the row spaces, so that the hoeings consisted mainly of destroying any large weeds which were close enough to the cotton plants to endanger the cotton becoming entangled with the seeds thereof.

As was pointed out, the land was in a deplorable condition after the removal of the ratoon crop, and heavy expense will be incurred in getting the plot cleaned up free from weed growth during the next few seasons.

HEIGHT OF THINNING EXPERIMENT.

The average cotton-grower is generally growing cotton as a side line to some other industry such as dairying, &c., and often is unable to devote the full amount of labour to the cotton crop that it needs at some particular stage in the development of the crop. The thinning operations are often delayed until the plants are of the height which the grower likes them to reach before commencing to thin. Unfortunately, something may occur to delay the completion of the operation at that particular stage, and the last of the thinning may not take place until the plants are considerably taller than were the plants which were thinned at first.

The question arises as to the effect of the delayed thinning, and the following experiment was outlined:—

An area of one-half acre was used for this trial, being divided into six sections of five rows each, to be thinned at the height of 4, 6, 8, 10, 12, and 15 in. respectively. Each of these sections were divided so as to allow 15 in. and 24 in. spacing in the same row.

Planted 22nd November, 1924, and thinned as follows:—

4 in.—5/11/24	10 in.—18/11/24
6 in.—8/11/24	12 in.—22/11/24
8 in.—10/11/24	15 in.—27/11/24

The plots were carefully cultivated six times with the riding cultivator, being "laid by" on the 29th December, after which they were hand hoed to keep down weed growth.

The plants of the late thinned plots grew somewhat spindly in shape at the expense of the bottom crop of bolls.

From the table of picking weights it will be seen that the plants which were thinned when 4 in. in height produced the lowest yields, with the exception of one plot where the stand was somewhat deficient. This was probably due to the heavier development of the vegetative branches caused by the luxuriant growing conditions. The later thinnings tended to suppress the development of these branches, which allowed a better development of the fruiting branches with a consequent higher yield.

There appears to have been little difference in the results obtained from thinning when the plants were 6, 8, 10, or 12 in. in height, and this would naturally be expected under luxuriant growing conditions, the growth having developed so quickly as to require only fourteen days between the 6 in. and the 12 in. thinning.

The 12 in. and 15 in. thinnings show the greatest differences between the 15 in. and 24 in. spacings, due to the spindly development of the plants, the spacing with the more plants per acre giving the higher yield.

The results of the experiment are as follows:—

Height of Thinning.	Yield per acre in lb. Seed Cotton.	
	15-inch Spacing.	24-inch Spacing.
4	1,436	1,488
6	1,632	1,592
8	1,592	1,612
10	1,592	1,580
12	1,632	1,550
15	1,508	1,436

In a season of less favourable growing conditions during the thinning stage of the development of the plant, it is questionable if the results obtained from such an experiment would indicate that the thinning could be done over such a wide range in the height of the plant. The growth being slower, a longer time would necessarily elapse between the stage where the plants were 6 in. in height and where they were 12 in. in height. The delay in the thinning would then have the tendency to suppress the formation of the lower fruiting branches as well as the vegetative branches, so that the plants might have to be spaced closer together in order to bear the same total crop of bolls, as happened this season in the spacing experiment where the 6-in. spacing gave the highest yields per acre but with fewer bolls per plant.

As has been pointed out, the closer spacing of the plants is not desirable under droughty conditions, as the yield is reduced considerably and the quality of the fibre may be affected.

An experiment on similar lines is being arranged with growers over a wide range of conditions for the coming season, and it is anticipated that much valuable data on this important subject will be obtained.

METHOD OF PLANTING EXPERIMENT.

Many of the farmers who have experimented with cotton-growing have not had machines suitable for planting cotton, and rather than incur the expense of purchasing cotton-planting machines have used the old method of ploughing out light furrows, sowing the seed by hand, and then covering with a scuffler or by cross harrowing.

Such a system of planting often returns very good results, especially when the climatic and soil conditions are favourable, but there are several undesirable features to this system which make it of a doubtful value.

In the first place the ploughing open of the furrow causes a certain amount of moisture to be lost, and under the average climatic conditions that obtain during the planting season in Queensland, this is highly undesirable. Another feature of this operation is that unless the surface of the seed bed is prepared carefully, it will be somewhat difficult to ensure a proper depth of the furrow being maintained. This will affect the depth of covering of the seed and may result in a very uneven depth of planting of the seed, which is conducive to securing an uneven

rate of germination, or possibly affect the germination to such an extent that the stand of plants will be so irregular as to depreciate the yield obtained from the crop.

The securing of a good strike has been one of the main problems of the cotton-growers of the last three seasons, and it is believed that far more attention should be paid to this very important feature than has been done. It can be noticed in nearly every field that when the seedlings are just coming through, the first to appear are either the scattered seed on the headlands where the soil is more compact than in the seed-bed proper, or in the ends of the rows, where the planting has been very shallow. This indicates the advantage to be obtained from shallow planting on a well-prepared firm seed bed, especially in early planting when the subsoils are cold and only the surface soils warm up to any appreciable extent.

The following experiment was conducted this season in the endeavour to ascertain the merits of furrow planting and planting by machine. Planting dry and wet seed was also included in the experiment.

The seed bed was carefully prepared and was in very good order, being firm and containing a good amount of moisture. Four furrows were opened up by means of a plough set to a shallow depth and seed was sown at a heavy rate—wet seed being used in two furrows and dry in the other two. The furrows were filled in immediately after they were seeded (by means of a scuffler) the depth of covering attempted being 2 in.

Four rows were sown adjacently by means of a cotton planter, two being planted with dry seed and two with wet seed—the depth of covering being 2 in. The wet planted seed was approximately two days earlier in germinating than the dry seed. Unfortunately, heavy rains were received soon after the plants were through and the furrows, although of a shallow depth, settled and allowed the water to nearly swamp the young plants during the storms. The plants in the furrow rows received a check from this treatment which lasted for nearly three weeks before any appreciable growth could be noted, whereas the plants in the drilled rows responded quickly.

Such excessive amounts of rainfall may not always be received at this period, in which case the plants in the furrow rows would probably respond more quickly, but the danger of such a happening is one of the drawbacks to the system of planting in furrows.

The yields on an acre basis rate were as follow:—

Dry drills	1,387	lb. of seed cotton
Wet drills	1,320	lb. of seed cotton
Dry furrows	937	lb. of seed cotton
Wet furrows	813½	lb. of seed cotton

It would appear that there was no advantage obtained by planting with wet seed in this particular experiment and, if anything, a slight loss of yield was incurred, although the explanation of this result is not clear. The difference between the furrows and drill plantings was quite conclusive, though the early flooding may have had a decided influence on the obtaining of such a pronounced difference.

HILLING EXPERIMENT.

The system of planting cotton in hills on the "square" method, or "check row" system as it is frequently called, has had many advocates and has been tried out to some extent by the farmers of the coastal areas. No definite information has been obtained on the results of this system, however, so an experiment was conducted this past season.

The experiment consisted of three plots of five rows each of hills with 1, 2, and 3 plants per hill respectively. The distance between the rows and the hills being 3 ft. 6 in. in every case.

The early cultivations were made both ways in order to test out the possibility of eliminating hand-hoe chipping in the destruction of the weeds and grass in the row of cotton. It was soon found though that the plants, in the 2 or 3 plants to the hill system, were developing a tendency to lodge, and eventually on this account the cultivations close to the plants had to cease at an earlier date than desirable.

A good uniform growth was obtained over the whole experiment, so that the yields may be taken as uniformly reliable, and were as follows:—

1 plant to the hill—Rate per acre of 813 lb. seed cotton.
2 plants to the hill—Rate per acre of 1,318 lb. seed cotton.
3 plants to the hill—Rate per acre of 1,386 lb. seed cotton.

A further study will be made of this system in the coming season owing to the possibility of the method of cross cultivating being of great assistance in reducing the amount of hand labour in the controlling of the weed and grass growths. It is pointed out, however, that any system of machine cultivation attempting to accomplish the control of the weed growth by cross cultivation, will necessarily require the cutting parts of the machine to go very close to the plant. The plants, therefore, should be of erect growth and with little lateral branch formation, otherwise considerable damage will be done to the lower branches of the plant.

PAIRED ROW EXPERIMENT.

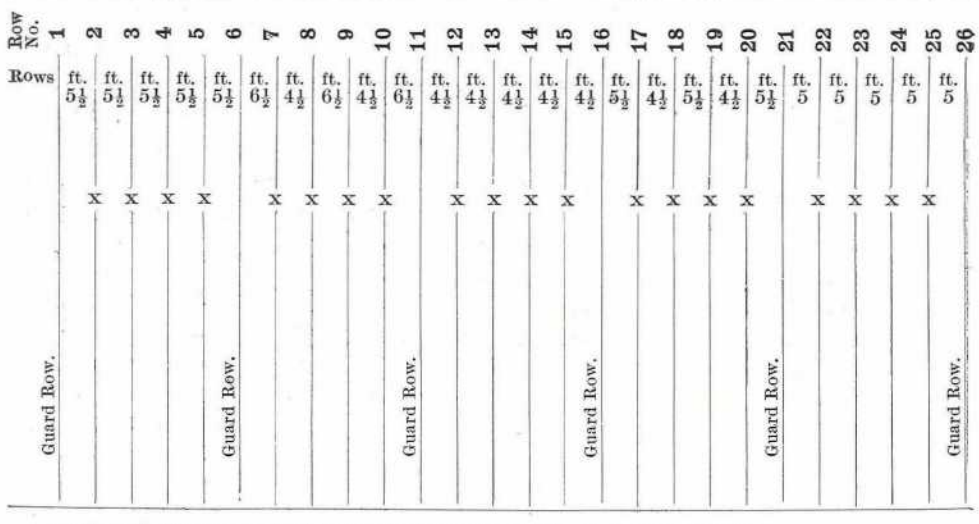
One of the most important problems in cotton-growing in the coastal areas and on the rich alluvial creek loams further inland, is to space the rows so as to afford some means of insurance against too rank a growth during a period of excessive rainfall in January and February. Owing to the prevalence of boll rots during such periods of rainfall in any cotton of sufficient height to afford a fairly dense shade, much loss has occurred in Queensland during the past two seasons.

It often has been observed that the outside row of a plot of cotton generally gives the highest yield, and one would think that by spacing the rows wider apart this condition could be approached. There is some other factor besides space entering into the problem, as nearly every experiment of widely-spaced rows seems to give a negative result or develops such a rank vegetative growth of plants that picking difficulties, damage from winds and other troubles arise to such an extent as to make the change to wider distances appear undesirable. The damage received from rank overgrowth during wet seasons makes it desirable that some means of wider spacing should be effected, so that more light and air can get to the bottom parts of the plants and thereby reduce the damage caused by boll rots and insects.

The system of paired rows has been devised whereby every row approximates to the conditions of an outside row. In this system the rows are planted in pairs—the distance between the rows being left at 4½ ft., but the spaces between the pairs extended to greater distances.

The following diagram explains the experiment which was conducted at Monal Creek during this past season:—

PAIRED ROW EXPERIMENT.



"x" Indicates rows which are to be harvested and weighed separately.
Guard rows can be picked together.
Plant seed not greater depth than 2 inches, and at the rate of 20 pounds per acre.
Thin plants when 6 inches tall to a distance of 20 inches apart.

This plot was planted on 23rd October and commenced flowering on the 1st January.

With the excessive rainfall which was received this season it is considered that the experiment received a good test, and the results

obtained seem to indicate that the system warrants further investigating. The yields of the experiment were as follow:—

Rate per Acre Yields in lb. of Seed Cotton.

5½ ft.	1,723½
6½ ft. middles } 4½ ft. pairs }	1,830
4½ ft.	1,710½
5½ ft. middles } 4½ ft. pairs }	1,830
5 ft.	1,478

It was interesting to note that even with the excessive rainfall only four plants were found in the paired rows which were too brittle to support the fruit on them. Although in many cases excessive vegetative growth developed, the plants were not shaded in any great degree from the sunlight, whereas in the ordinary plantings it was very difficult to force a passage through the field. The 5 ft. spacing was of a decided tendency to produce vegetative branches at the expense of fruiting branches, which probably accounts for the low yields obtained.

Insect attack was responsible for considerable loss of terminal buds in the paired rows, but an inspection of the bolls failed to discover any boll rot losses.

The following table gives the average height, the average number of vegetative branches, and the average total length of vegetative branches per bush for the total number of plants in the middle two rows of each spacing.

It would seem that there was but little difference in the total amount of vegetative growth for each plant, with the exception of the 5 ft. spacing which, while of the same average height of main stalk, produced an average of 1 ft. 3 in. more of vegetative branch than any other spacing. This would indicate that the paired row system with the wider spacings between the pairs had not been conducive to excessive vegatative growth, and the increased yields from this system would indicate that far less loss had occurred than where the same amount of vegetative growth had been spaced at regular distances apart.

Row No. 23.

Average height of main stalk—4 ft.-11·88 in.

Average number of vegetative branches per bush—4·00.

Average total length of vegetative branches per bush—13 ft.-8·16 in.

Row No. 24.

Average height of main stalk—4 ft.-9·44 in.

Average number of vegetative branches per bush—3·54.

Average total length of vegetative branches per bush—12 ft.-4·02 in.

SUMMARY.

Row No.	Average Height of Main Stalk.	Average No. of Vegetative Branches per Bush.	Average Total Length of Vegetative Branches per Bush.	Average of Two Rows.
3	4′-7·6″	2·98	9′-10·4″	9′-9·0″
4	4′-6·84″	2·93	9′-7·68″	
8	4′-10·56″	2·86	9′-11·52″	9′-9·9″
9	4′-9·24″	3·29	11′-9·84″	
13	5′-0·12″	3·14	10′-10·55″	10′-10″
14	4′-10·68″	2·58	9′-3·48″	
18	4′10·56″	2·79	9′-9·84″	11′-8·7″
19	4′-10·2″	3·6	13′-7·64″	
23	4′-11·88″	4·00	13′-8·16″	13′
24	4′-9·44″	3·54	12′-4·02″	

THINNING AND SPACING EXPERIMENT.

There appears to be a wide diversity of opinion amongst the cotton-growers as to the proper distance to space the plants in the row. Some maintain that by leaving the plants closer together the vegetative growth is checked, thereby increasing the production of fruit. Others maintain that the plants should be spaced widely apart in order to enable each plant to have a considerable area of soil from which to obtain moisture and plant food, while other growers are inclined to a medium spacing year after year.

The following experiment was designed in an endeavour to obtain some information as to the effect of different spacings. It is realised that seasonal and soil conditions will have a marked effect on the results obtained, but it is anticipated that by conducting the experiment over a series of years some reliable data may be obtained.

The experiment was planted on the 25th October on a well-prepared seed bed of alluvial loam, and was composed of the following combinations:—

3½ ft. widths between the rows, and 6, 12, 18, and 24 in. between the plants respectively.

4 ft. widths between the rows, and 6, 12, 18, and 24 in. between the plants respectively.

4½ ft. widths between the rows, and 6, 12, 18, and 24 in. between the plants respectively.

5 ft. widths between the rows, and 6, 12, 18, and 24 in. between the plants respectively.

Each combination of row width and plant spacing was composed of five rows 100 ft. long. In determining the yields of each treatment the mean of the weights of the three inner rows was used as a basis for computation.

The plots were thinned when the plants were 6 in. in height, leaving one plant to a space.

The calculated yields per acre of the various plots were as follow:—

Row widths—		
3 ft. 6 in.	6-in. spacing	1,834 lb.
Ditto	12-in. spacing	2,020½ lb.
Ditto	18-in. spacing	1,344 lb.
Ditto	24-in. spacing	1,393 lb.
4 ft.	6-in. spacing	1,949 lb.
Ditto	12-in. spacing	1,653 lb.
Ditto	18-in. spacing	1,758 lb.
Ditto	24-in. spacing	1,492 lb.
4 ft. 6 in.	6 in. spacing	1,783 lb.
Ditto	12-in. spacing	1,732 lb.
Ditto	18-in. spacing	1,460 lb.
Ditto	24-in. spacing	1,256 lb.
5 ft.	6-in. spacing	1,711 lb
Ditto	12-in. spacing	1,548 lb.
Ditto	18-in. spacing	1,345 lb.
Ditto	24-in. spacing	1,223 lb.

It will be observed that in three of the row widths the 6-in. spacing gave the highest yield—the 3 ft. 6 in. width being the exception—the 12-in. spacing yielding appreciably higher results in this plot.

These results may be explained by the effect of the seasonal conditions on the growth of the plants. The closer spacings developed tall, erect-growing plants carrying little or no bottom crop, and it was only with the advent of the heat wave in February that this rapid growth was checked. From that point on a heavy crop of fruit developed and with the closer spacing a greater number of bolls per row space were obtained.

The wider spaced plants developed a good bottom crop at an early stage of the growth of the plant, but, unfortunately, a severe attack of the maize grub (*Chloridia obsoleta*) destroyed most of the lower bolls, so that the bulk of the crop picked from these spacings represented growths developed after the heat wave had been received. With the wider spacing of the plants, naturally a greater number of bolls per plant were necessary if the same number per row space were to be obtained. This proved to be too much under the conditions of early frost.

It must be remembered that the season was abnormally wet in the fore part and then a very unusually severe heat spell was experienced, so that results obtained from experiments grown under such conditions must be questioned somewhat until several years of data from similar experiments have been obtained.

Report on Cotton Experiments carried out at the Gatton Agricultural College and High School in the Season 1924-25.

The south-eastern portion of Queensland possesses a different climate from the areas in the cotton belt further north. The temperatures are naturally appreciably lower and the season shorter, whilst the spring thunderstorms are said to start earlier and to be more reliable than in the Central District.

In the original scheme for cotton-growing research that was drawn up it was suggested that a cotton experimental station should be established to meet the needs of this area.

Mainly on account of financial stringency, however, this proposal has had to be kept in abeyance, but temporary arrangements have been made to carry out some of the more urgent work on the farm attached to the Agricultural College and High School at Gatton. The officers attached to this institution have given us every facility and have expressed great interest in the work, and we are greatly indebted to Mr. J. K. Murray, the Principal, for all his assistance in the matter. The cotton experimental work was placed in charge of Mr. R. R. Anson, of the cotton section of the Department of Agriculture and Stock, and he was allotted quarters at the College by the Principal.

Locality.

The College Farm is situated about the middle of the Lockyer Valley, about 60 miles from the seaboard and due west from Brisbane; latitude 27½ degrees south and longitude 152¼ degrees east. Between this Valley and the coastal belt is a range of hills known as the Little Liverpool Range, which has the effect of shutting out a good deal of the rainfall. The total precipitations and the atmospheric humidity are consequently considerably less than on the coastal side of the Range.

The cotton was planted for the most part on a level alluvial flat of great depth along the banks of the Lockyer Creek. This soil consists of a grey clay loam containing a good deal of silt, and is rather difficult and heavy to work. Some of the cotton, including the fertilizer tests, were planted on a sandstone ridge containing a somewhat shallow lighter sandy soil, with a tendency to run together and set hard after rain. The soils are not representative of some of the best cotton soils in this area, but represent a fairly large area in the neighbourhood.

The experimental work on this farm was in sole charge of Mr. R. R. Anson, who was stationed at the College.

Season.

The season was not favourable to cotton in this part of the State. The subsoil was parched after a dry winter, and although the spring showers came early they were not heavy enough. The nights also

remained cold throughout September, the average minimum being 50·93 degrees, so that some difficulty was experienced in obtaining an even stand owing to the number of seedlings that died off under these conditions. The numerous light showers of the spring caused the plants to be shallow rooted and somewhat soft and sappy. December and January turned very dry and hot, with the result that the plants suffered from drought and shed a large proportion of squares and bolls, this being particularly the case with the ratooned areas.* Further damage was done by a heat wave in February, which finished the ratoon, but heavy rain in March caused the annual plant to come along again, and a fair top crop was subsequently secured.

Selection Work.

The only variety grown on this farm was Acala, seed having been imported from the Shafter Experimental Station, California, two years ago. Nineteen plants, selected by the Director in the previous year from a bulk crop of this seed grown at Beaudesert, were planted out in single rows and kept under observation. From these three rows, viz., Nos. 10, 14, and 30, have been selected as the most uniform and promising, and the seed from these have been kept aside for further planting next year. From these rows also, twelve of the best plants have been selected for further propagation.

In addition, 100 plants have been selected from the bulk crop of Acala which, as was only to have been expected, is showing a good deal of "new place effect." The seed cotton of each of these is bagged separately and a five-boll sample of each picked for determining boll weights. Full details of the vegetative and other field characters have been noted, and the cotton of each selection has since been subjected to a careful scrutiny in the laboratory and subjected to the usual tests.

Fertiliser Tests.

The field selected for this test was on a gentle slope of cleared forest land. The top foot of the soil consisted of a light, sandy loam, which had a tendency to set hard after rain. The second foot consisted of disintegrated sandstone with a small percentage of yellow clay and underneath was sandstone. This soil requires careful handling, but if the harrow is used frequently and the surface crust kept broken after each rain, this class of land was found to hold moisture better than on the heavy flats, and consequently the plants suffered less from drought. In the present case the fertiliser was applied at the same time as the seed, drills being opened on the 7th September, and the fertiliser mixed with sand being applied to each furrow and then lightly harrowed in. The seed was planted on 9th September and a good stand secured. Unfortunately, cold nights and dry weather caused a certain number of the young seedlings to die and some were also killed by *Crocidosema, Earias* and other insects. Replanting gaps was therefore found necessary, and the stand was not as even as was desirable in experimental work of this sort in consequence. Later on, further attacks of *Crocidosema plebiana* occurred in some of the plots. It is believed that the fertiliser was applied too late to be really effective, and in the coming season this experiment will be repeated in duplicate, and the fertiliser will be applied at least six weeks before the time of planting, so that the

*In this connection a reference to the graphs at the end of this report is invited.

young seedlings may appreciate any benefit right away from the start. One series will be limed, and the other series kept unlimed, as there is evidence to indicate that this constituent may be lacking. The rows are 4 ft. 6 in. apart, and the plants were thinned out on the 7th October when 6 in. high to 10 per row, leaving 20 in. between each plant. Each plot contained 22 rows, and every endeavour was made to have 220 plants in each plot. For the reasons given above the results which are recorded below must be regarded as inconclusive. The land was chosen for its apparent evenness, but it is evident that it is somewhat better towards the eastern end of the paddock.

FERTILISER TESTS AT GATTON, 1924-1925.

Plot No.	Fertiliser.	SEED COTTON.		Remarks.
		Per Plot.	PerAcre.	
		Lb.	Lb.	
1	No manure	34·1	692	Outside effect.
2	40 lb. sulphate of potash	33·8	671	These two plots were damaged by rain scour
3	40 lb. sulphate of potash 150 lb. Nauru phosphate	23·1	477	
4	No manure	32·2	659	
5	40 sulphate of potash 150 lb. basic slag	32·3	644	
6	40 lb. sulphate of potash 150 lb. superphosphate	39·4	785	
7	No manure	22·3	444	
8	40 lb. sulphate of potash 150 lb. basic slag 100 lb. dried blood	28·1	572	
9	40 lb. sulphate of potash 150 lb. superphosphate 100 lb. dried blood	34·7	689	
10	No manure	26·11	534	
11	40 lb. sulphate of potash 300 lb. Nauru phosphate 100 lb. dried blood	31·6	628	
12	150 lb. Nauru phosphate	32·1	641	
13	No manure	31·11	634	
14	300 lb. Nauru phosphate	31·4	625	
15	40 lb. sulphate of potash 150 lb. Nauru phosphate 100 lb. dried blood	35·1	718	
16	No manure	38·1	778	
17	40 lb. sulphate of potash 300 lb. Nauru phosphate 100 lb. dried blood	40·1	818	
18	40 lb. sulphate of potash 150 lb. Nauru phosphate 50 lb. dried blood	44·1	893	
19	No manure	45·7	909	
20	40 lb. sulphate of potash 150 lb. Nauru phosphate 88 lb. nitrate of soda (top dressing)	47·8	951	
21	80 lb. sulphate of potash 300 lb. Nauru phosphate 100 lb. dried blood	45·1	918	
22	No manure	40·5	807	
23	90 lb. sulphate of ammonia	43·2	863	
24	300 lb. superphosphate	40·1	818	
25	No manure	44·6	888	

The date of first flowering and bolling, and also the average height and rate of growth were carefully recorded on a number of marked plants in each plot. An examination of these records shows no definite results, however, and as stated above it is believed that the late application of the fertilisers, together with the dry season, did not permit the various fertilisers to show their proper effect on the crop.

Comparative Trials of Annual and Ratooned Cotton.

Different methods of ratooning were tried and compared with the annual cotton. The plots were all half an acre in size, and were laid down side by side on a very uniform strip of alluvial soil. The plan was as follows:—

Plot 1.—Ratooned to within 8 in. of ground level.

Plot 2.—Ratooned to the last node at ground level.

Plot 3.—Lightly pruned at the top to remove the ends of the branches which had been touched by the frost in the winter.

Plot 4.—Annual planted on 11th September, 1924, 4½ ft. between the rows and thinned out to single plants at 20 in.

Plot 5.—Same as Plot 1.

Plot 6.—Same as Plot 2.

Plot 7.—Same as Plot 3.

Plot 8.—Same as Plot 4.

At first the ratoon plots looked very healthy and put out numerous suckers with an abundance of squares and bolls, but when the dry spell came the roots were not able to support them and very heavy shedding occurred. Careful boll counts of selected plants of all the plots were made, and the heavy shedding that took place on the ratooned plots is clearly brought out in the graphs that are attached to this report and have been prepared by Mr. Anson from the data he has collected throughout the season. The annual plants, on the other hand, made steady progress, and in spite of the vicissitudes of the season, finally ripened off far more bolls per plant than the ratoon. Boll counts were made on five marked plants in each plot throughout the season, and an examination of the figures thus collected brings out this fact in a most marked manner.

Every endeavour was made to keep the plots clean, and in fact more labour was expended to this end than it would pay the average cotton-grower to employ. In spite of this fact, the ratoon plants spread along the ground to such an extent that it became impossible to hoe in between them properly, and towards the end of the season Bell Vine (Ipomaea), nut-grass, and other weeds, got a strong hold and materially

affected the yield in consequence. The yields for each half-acre plot were as follow:—

Plot No.	——	SEED COTTON IN LB.	
		Yield per ½-acre Plot.	Total of Two Plots.
		Lbs.	Lbs.
1	Ratooned to 8 in.	95½	169½
5	Ditto	74	
2	Ratooned to last node	73	222
6	Ditto	149	
3	Standover and lightly pruned	96	172
7	Ditto	76	
4	Annual	301	613
8	Ditto	312	

The yields are low owing to the unfavourable season, but the difference between the annual and ratoon is nevertheless striking. The latter, as was the case at the other two farms, proved very difficult and expensive to pick, and did not prove popular with the students at the College in consequence.

The costs of cultivation per acre of the various plots are given below:—

PLOTS 1 AND 5. RATOONED TO 8 IN.

	£	s.	d.
Hand pruning, using clippers (49⅓ men working hours, at 12s. 6d. per day)	3	17	1½
Eight cultivations at 2s. 6d.	1	0	0
Four hand hoeings at 12s. 6d.	2	10	0
Total	£7	7	1½

PLOTS 2 AND 6. RATOONED TO GROUND LEVEL.

	£	s.	d.
Ratooning with cane knives (19¾ men working hours at 12s. 6d. per day)	1	10	9
Eight cultivations at 2s. 6d.	1	0	0
Four hand hoeings at 12s. 6d.	2	10	0
Total	£5	0	9

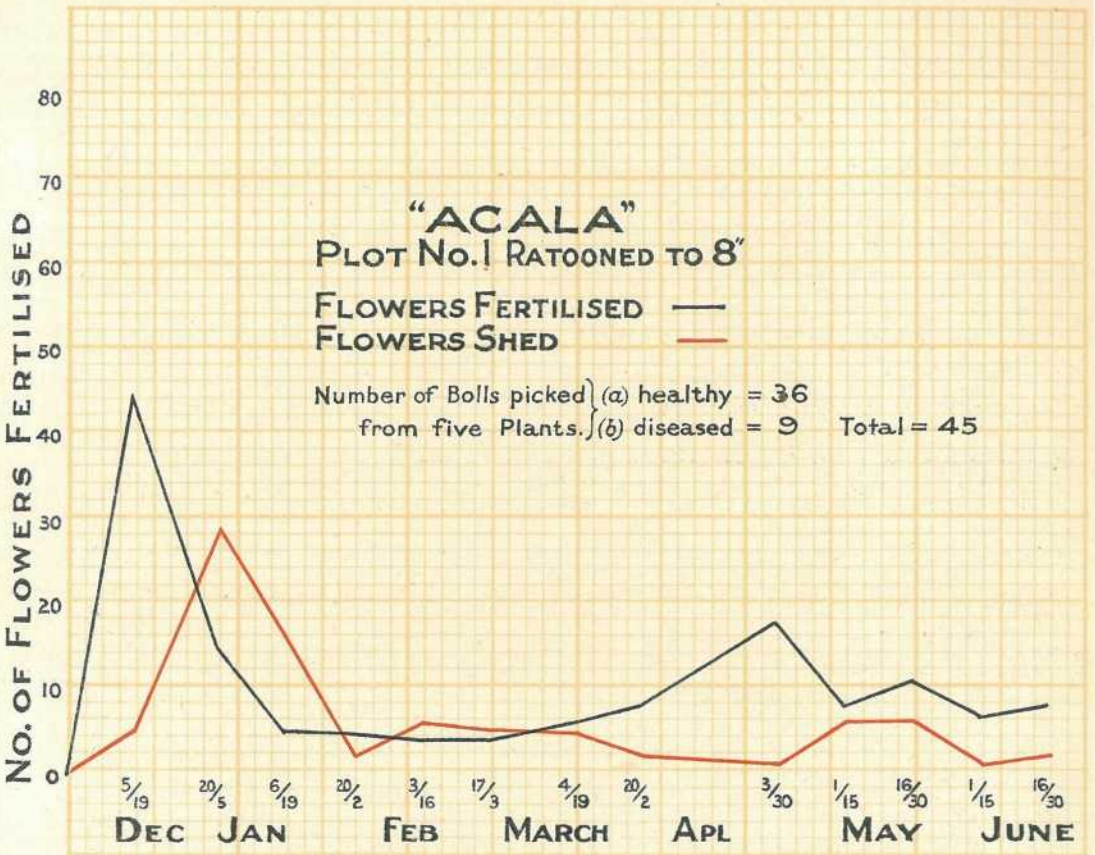
PLOTS 3 AND 7. STANDOVER AND LIGHTLY PRUNED.

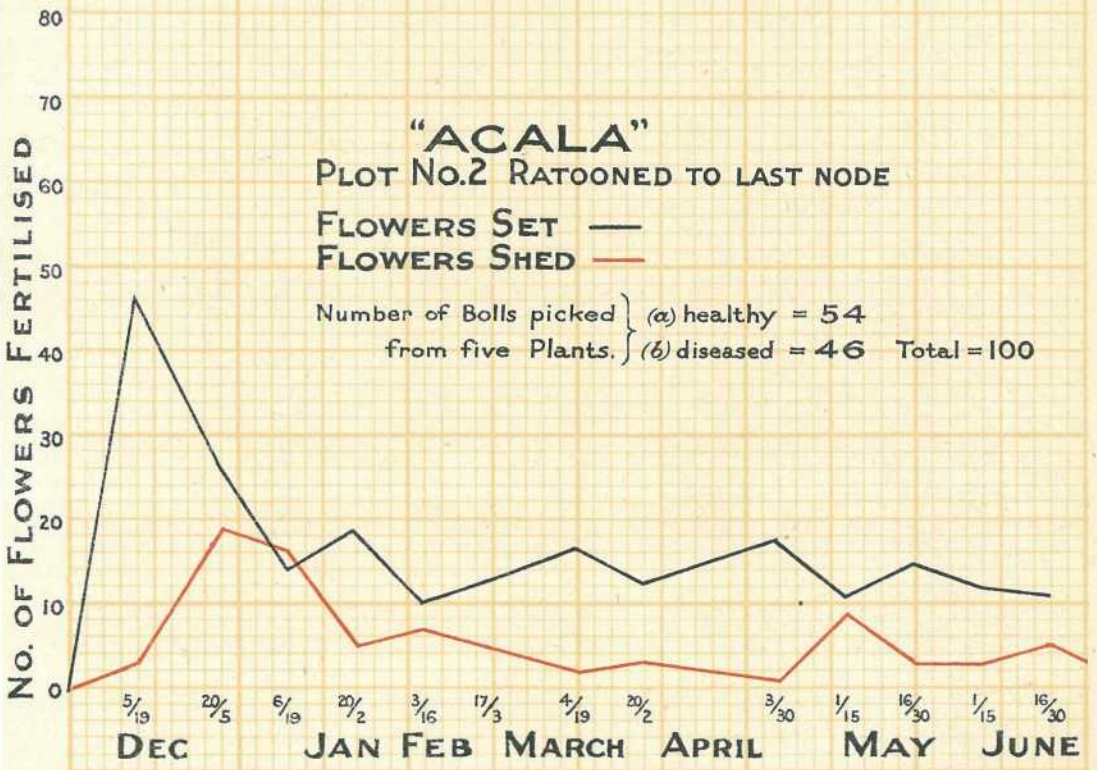
	£	s.	d.
Hand pruning with clippers (49⅓ men working hours at 12s. 6d. per day)	3	17	1
Eight cultivations at 2s. 6d.	1	0	0
Four hand hoeings at 12s. 6d.	2	10	0
Total	£7	7	1

PLOTS 4 AND 8. ANNUAL.

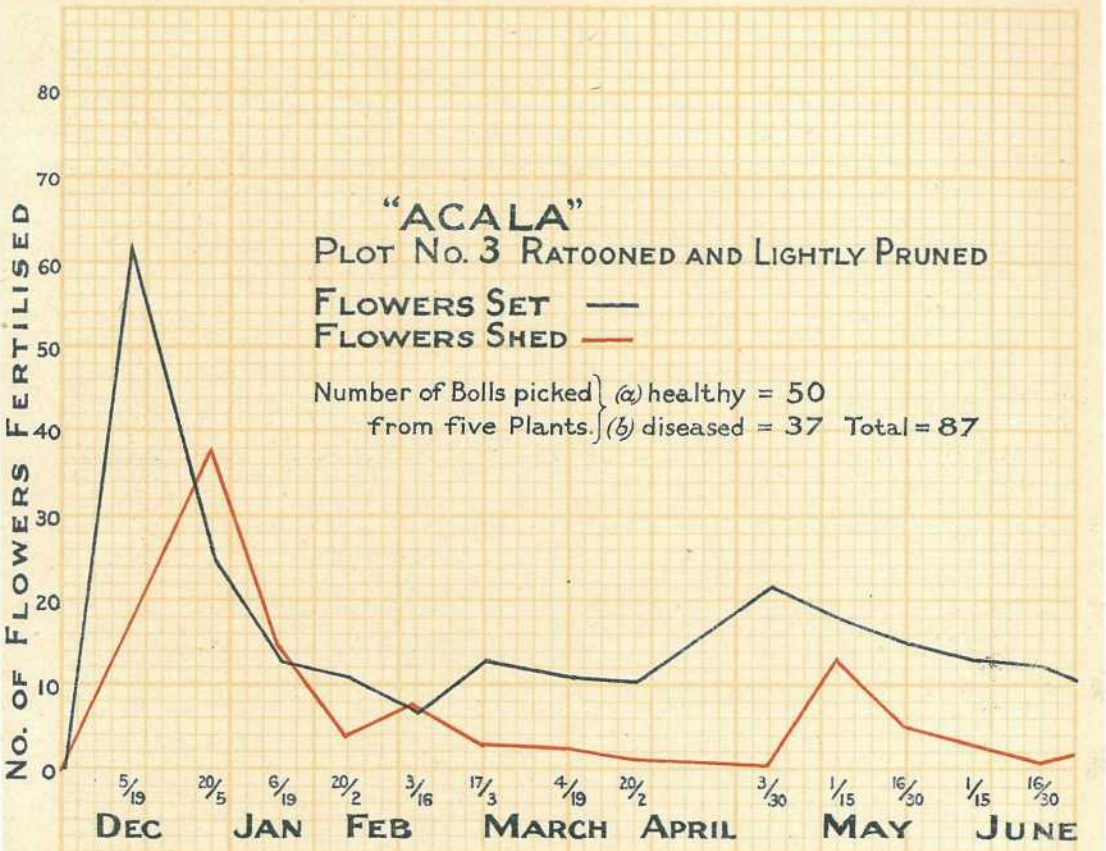
	£	s.	d.
One ploughing	0	12	0
Two harrowings at 1s. 6d.	0	3	0
Opening drills and planting	0	6	3
Ten cultivations at 2s. 6d.	1	5	0
Six chippings at 12s. 6d.	3	15	0
Total	£6	1	3

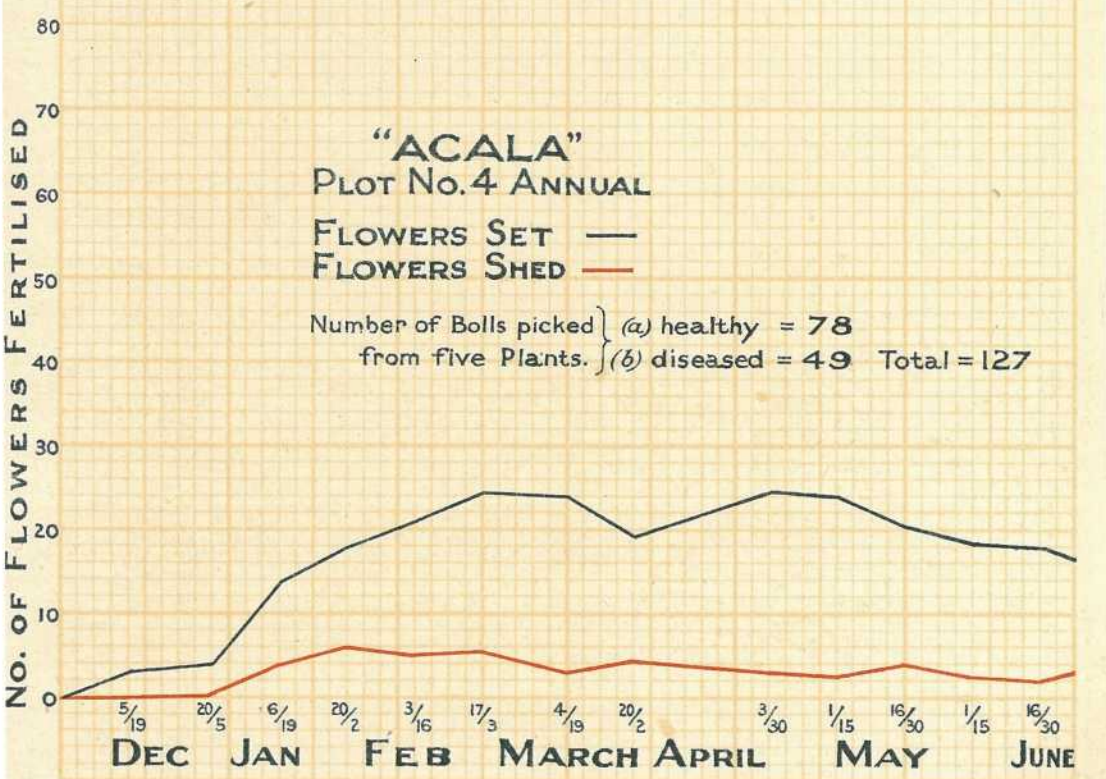
GRAPHS SHOWING THE INCIDENCE OF BOLL SHEDDING IN RATOON AND ANNUAL COTTON AT GATTON COLLEGE.



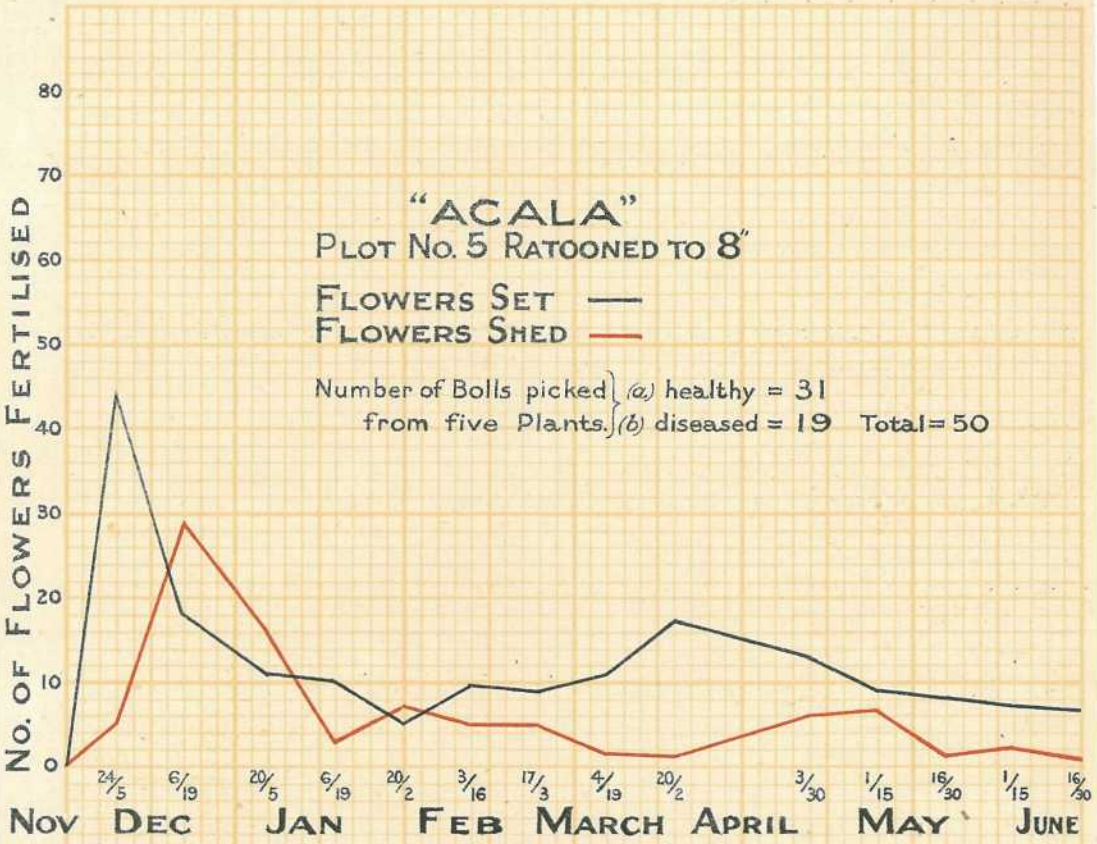


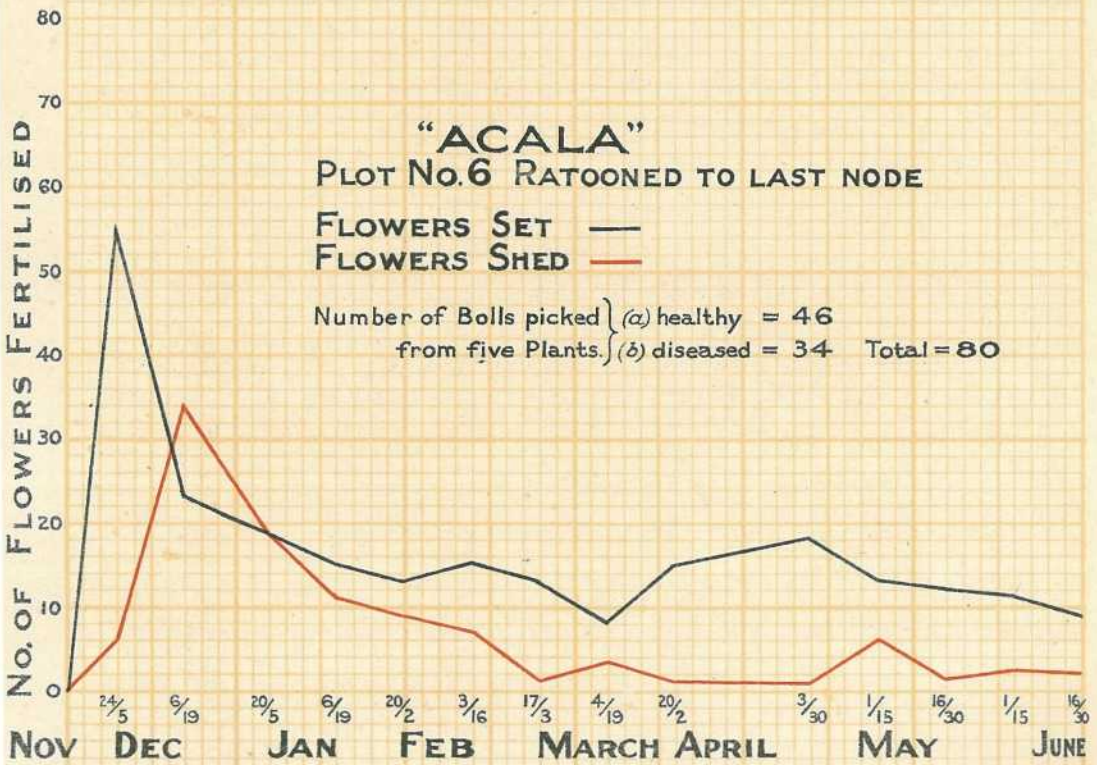
GRAPHS SHOWING THE INCIDENCE OF BOLL SHEDDING IN RATOON AND ANNUAL COTTON AT GATTON COLLEGE.



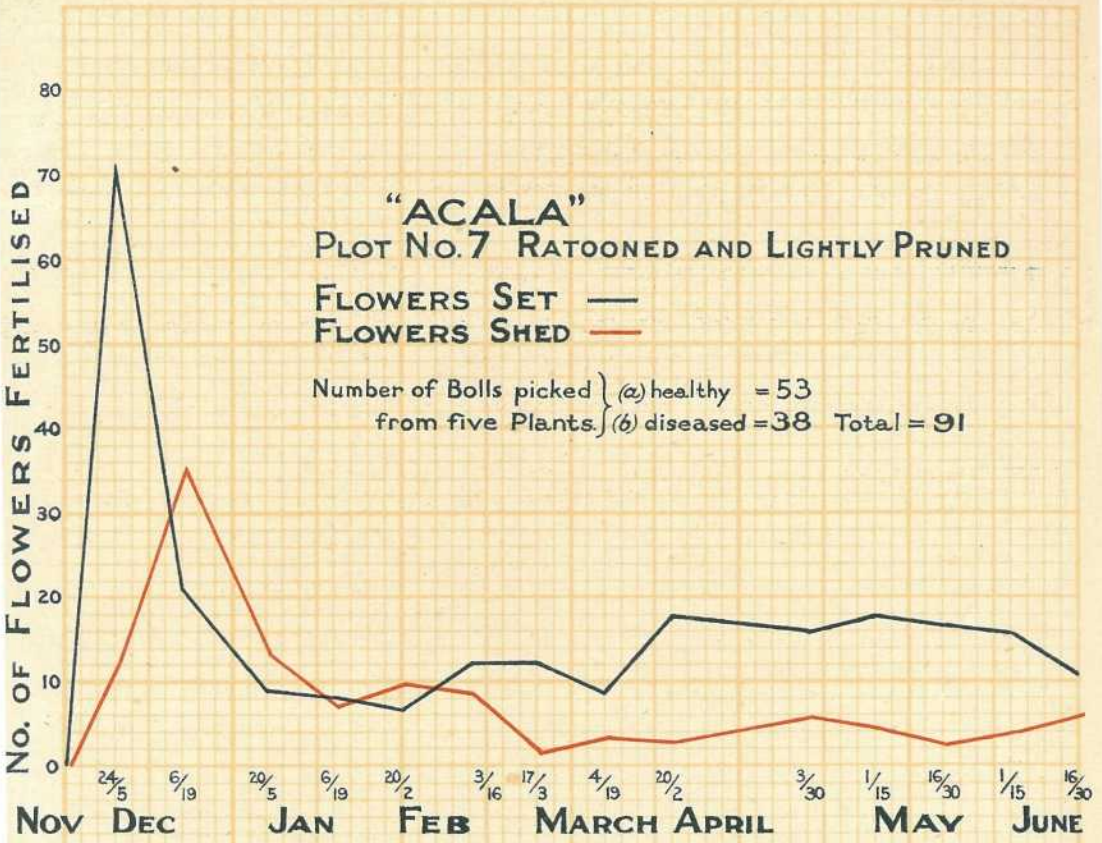


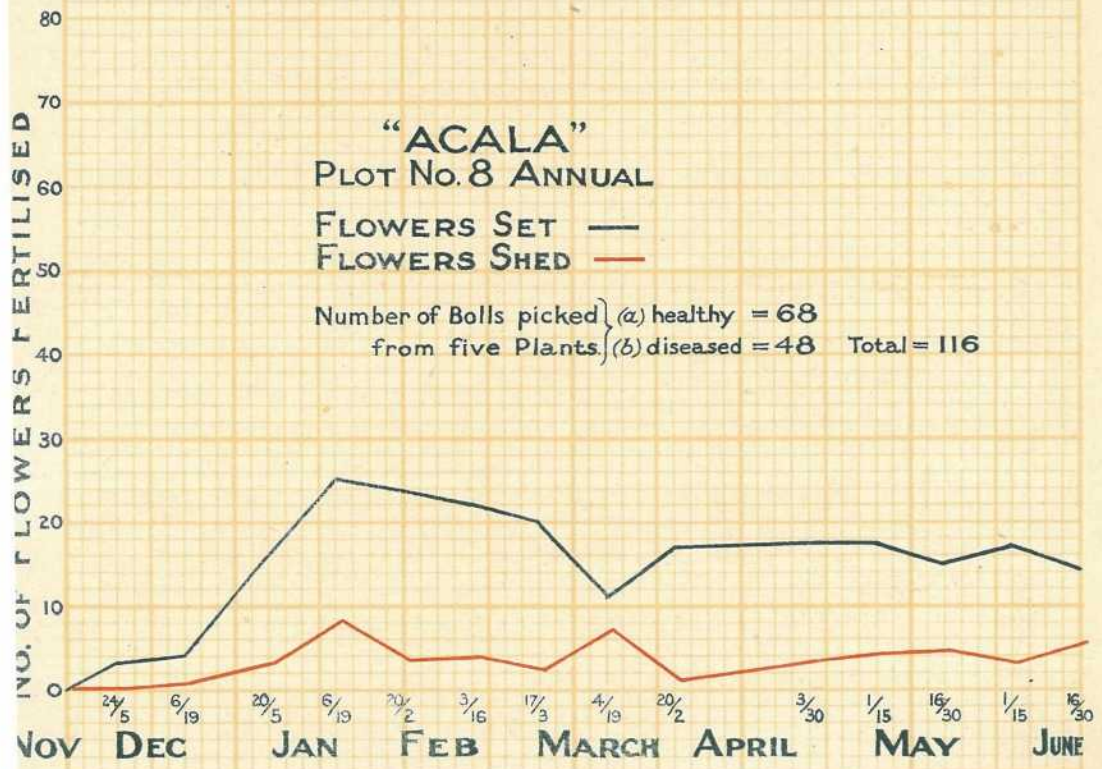
GRAPHS SHOWING THE INCIDENCE OF BOLL SHEDDING IN RATOON AND ANNUAL COTTON AT GATTON COLLEGE.





GRAPHS SHOWING THE INCIDENCE OF BOLL SHEDDING IN RATOON AND ANNUAL COTTON AT GATTON COLLEGE.





It will be observed that the rough and ready method of pruning with a cane knife was nearly as effective and much cheaper than pruning with hand clippers. The growth of Bell Vine rendered it practically impossible to give the two last hand hoeings to the ratoon plots, as after the heavy rain in February, this and other weeds completely took charge of these plots. The annual plots therefore received two more hand and horse cultivations than the ratoon.

Height of Thinning Experiment.

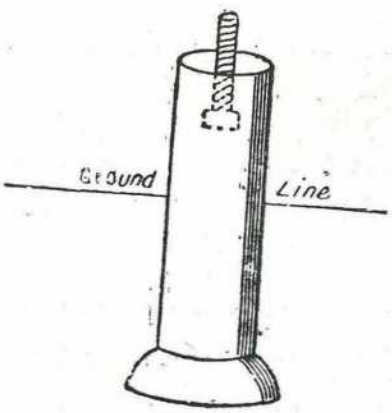
These plots were planted on a field of clayey loam, which proved difficult to work since it tended to set hard after rain and also proved cold in the spring, with the result that it was difficult to secure an even stand since many of the young seedlings died off and some of the gaps had to be replanted two or three times. Five rows, measuring 50 ft. long and spaced 4 ft. apart, were taken for each plot. The plants were thinned out at 4 in., 6 in., 8 in., 12 in., and 16 in., and the plots were in duplicate, one series being spaced out to a distance of 15 in., and the other to 24 in. apart. Each row was picked, bagged, and weighed separately. Owing to the unevenness of the stand caused by the unfavourable season, the results cannot be said to be reliable and no sound deductions can be drawn from them. It is not proposed to print these figures therefore.

Rainfall Table for Season 1924-25 at Gatton College.

	1924.	In.		1925.	In.
July	.. .. ..	2·62	January	.. .. ..	4·18
August	.. .. ..	1·75	February	.. .. ..	5·92
September	.. .. ..	2·65	March	.. .. ..	3·15
October	.. .. ..	1·70	April	.. .. ..	·10
November	.. .. ..	3·15	May	.. .. ..	1·35
December	.. .. ..	1·94	June	.. .. ..	2·99
			Total	.. .. ..	31·20

TILE BUILDING BLOCKS.

A very good substitute for the building block of timber is found in the glazed tile used for draining. The flanged end makes a very firm base when embedded in the ground, and the hollow centre may be filled with cement and sand put in when wet. To fasten the plates to the stumps, bolts can be embedded in the concrete mixture, while it is wet. The nut will hold the timber (bored to receive the bolt) securely to the base.



General Notes.

Honey Board.

Following is the result of the counting of votes in connection with the proposed formation of a Honey Board:—

For a Board	275 votes	(62¾ per cent.)
Against a Board	163 votes	(37¼ per cent.)
Incomplete and informal	6	

As the necessary two-thirds majority of votes was not obtained, the proposal has been defeated.

Staff Changes and Appointments.

The following have been appointed Government Representatives on the Dingo Boards respectively set opposite each:—

The Police Magistrate, Rockhampton, Gogango Dingo Board.

J. E. N. Bell, Kinnoul, Dawson Dingo Board.

H. J. Hearn, Maranoa Downs, Booringa Dingo Board.

The Officer in Charge of Police, Mitchell, who holds the appointment as Acting Inspector of Stock, has also been appointed Inspector of Brands.

Messrs. H. H. Collins, J. J. McDonald, L. R. Crouch, J. P. McCarthy, J. Gargan, and L. R. Macgregor (Minister's representative) have been appointed Members of the Atherton Tableland Maize Board, and will hold office from the 1st January, 1926, to the 31st August, 1927.

Constables J. E. Linnane, W. H. Rigney, and M. C. S. McLean, of Coomera, Botoota, and Jackson respectively, have been appointed Inspectors of Slaughter-houses.

Messrs. R. Naylor, F. C. Sheldon, C. Warren, R. T. Jolly, and B. Vise, of Stanthorpe, have been appointed Temporary Inspectors under the Diseases in Plants Acts, for the Stanthorpe Area.

Mr. Jas. Brownjohn, of Stanthorpe, has been appointed Temporary Instructor in Fruit Packing and Grading, and Mr. Wm. Ellison, junr., of Landsborough, has been appointed Temporary Instructor in Banana Packing and Grading.

The resignation of Mr. J. G. Brandsen as Part-time Veterinary Officer, Northern District, has been accepted, and Mr. Brandsen has been relieved of his appointments as Inspector of Stock, Slaughter-houses, and Dairies.

Mr. A. R. Charles has been appointed Government Representative on the Western Downs Dingo Board.

Mr. H. Keefer has been appointed Chairman of the State Wheat Board.

The Officer in Charge of Police, Stanthorpe, has been appointed an Acting Inspector of Stock.

Northern Pig Board.

The Order in Council constituting the Northern Pig Board has received Executive approval. The Board will deal with pigs grown in the Petty Sessions Districts of Atherton, Herberton, Chillagoe, Cairns, Douglas, and Mourilyan, and will be in operation from the 1st January, 1926, to the 31st December, 1930. The necessary election for members of the Board has been held, and the following gentlemen have been appointed members of the Board as from the 1st January, 1926, to the 31st December, 1926:—

Robert Campbell, F. H. Hyde, R. T. Croker, C. W. Roseblade, D. Johnston, and L. R. Macgregor (Minister's representative).

Slaughtering Act Regulations.

Additional Regulations have been approved under the Slaughtering Act, providing that any person engaged in the handling or delivery, &c., of meat shall keep his body clean and shall wear a clean coat or jumper and apron to protect his other clothing. Provision is also made that no person shall place or allow to stand on any footpath or road, any package, &c., used for the delivery of meat for sale.

Canary Seed Board.

The Order in Council constituting the Canary Seed Board for the seasons 1925-1926 and 1926-1927 has received Executive approval. The necessary election for members of the Board has been held, and the following gentlemen appointed to hold office from the 8th January, 1926, to the 7th January, 1927:—

T. P. Grimes, Clifton,
Thos. Muir, Allora, and
R. Walsh, Toowoomba (Minister's Representative).

Bunchy Top in Bananas.

To prevent the further spread of bunchy top in bananas, a Proclamation has been issued declaring that the removal of any banana plant, excepting the fruit thereof, from or out of any nursery, orchard, &c., in the undermentioned area, to any part within such area or to any place beyond the boundaries of that area, is and shall be absolutely prohibited as from the 9th January, 1926:—

> "The area bounded on the south by the Brisbane River; on the west by the D'Aguilar Range; on the north by the Caboolture River; and on the east by the shores of Moreton Bay."

Primary Producers' Co-operative Associations.

The Regulations under the Primary Producers' Co-operative Associations Act have been amended to provide that one at least of the auditors employed by an association shall retire in each year and shall not be eligible for re-election for a period of twelve months except on the approval of the Auditor-General. The former Regulation provided for such approval to be given by the Council of Agriculture.

Sugar-cane Pests.

Kangaroo rats have been included in the list of cane pests declared under and for the purposes of the Sugar Experiment Stations Acts.

Proposed Cotton Board.

His Excellency the Lieutenant-Governor has issued the notice of intention to constitute a Cotton Board to deal with seed cotton produced in Queensland for a period of five years as from the 1st January, 1927. In addition to the usual functions of a Pool Board, the Cotton Board will have power to make arrangements for the ginning and marketing of cotton and cotton seed and/or by-products in Australia and overseas, and will co-operate with the Department of Agriculture and Stock with respect to distribution of seed for planting.

The Board to deal with the cotton will consist of seven representatives of growers and one representative of the Minister. Nominations will be received up to the 13th February, 1926, for election for one year as growers' representatives, and for this purpose the State has been divided into seven districts. Any petition for a poll to decide whether the Board shall be constituted must reach the Minister before the 13th February, 1926, and to ensure their names being on the roll of persons eligible to vote on any referendum or election in connection with the proposed Board during 1926, persons who supplied cotton to ginneries during 1925, and also *bonâ fide* growers of cotton in 1926 are asked to send their names and addresses at once to the Under Secretary, Department of Agriculture and Stock, Brisbane.

The electorates for the purposes of electing members to the proposed Cotton Board will be the areas served by railway stations in the following districts:—

District No. 1.—Lockyer District.
District No. 2.—From Helidon to Toowoomba, Darling Downs, Maranoa, &c.
District No. 3.—From Brisbane to Ipswich; Brisbane Valley Line, South Coast Line, and North Coast to Gunalda and branches.
District No. 4.—Gayndah-Mundubbera Line.
District No. 5.—North Coast Line from Theebine to Gladstone, and all branches except Gayndah-Mundubbera Line.
District No. 6.—Dawson Valley Line and Central Line west from Kabra and branches.
District No. 7.—North of Gladstone West and from Rockhampton to Malchi on the Central Line; whole of the Boyne Valley Line.

Egg Board.

Following on the referendum which was held recently in connection with the formation of an Egg Pool, such Pool has now been constituted to deal with persons owning fifty fowls and over in that part of Queensland lying east of a straight line drawn from North Bundaberg to Goondiwindi. The Board will be in operation from the 1st January, 1926, to the 31st December, 1928, and Members of the Board will be elected every twelve months.

Broom Millet Board.

A notice has been issued of the intention to constitute a Broom Millet Board to deal with broom millet produced in Queensland from seed sown after the 1st July, 1925, such Board to be in existence for three years. The Board to deal with such broom millet will consist of two members elected annually by growers and one appointed by the Minister, and nominations for the growers' representatives for the first Board will be received at the Department of Agriculture up till noon on the 20th February, 1926. Persons deemed to be growers and eligible to vote on any referendum or election held in connection with the Board before the 30th June, 1926, will be persons who have at any time since the 1st July, 1924, grown for sale broom millet in any part of Queensland. Any petition for a poll to decide whether the proposed Board shall be formed must be signed by at least fifty growers of broom millet as above and must reach the Minister before the 20th February, 1926.

Pineapple Levy Regulations.

New Regulations have been issued in connection with the levy imposed by the Committee of Direction of Fruit Marketing on growers of pineapples. These Regulations provide for a reduction in the rate of the levy as previously imposed. Levy will now be collected at the rate of ½d. per 42 rough or ripley pineapples, and ½d. for every 24 smooth pineapples.

Grading of Bananas.

The method to be adopted in grading bananas has been altered by regulation. Provision is now made that all Cavendish bananas shall be packed according to size, and the variation in length of the fruit in any one case shall not exceed 1½ inches. Cavendish bananas measuring below 5½ inches in length by 4 inches in circumference will not be allowed to be marketed. When varieties other than Cavendish bananas are marketed, the name of the variety shall be marked on the case.

Prices for Seed Cotton.

Arrangements have been made for the acquiring by the Crown of all seed cotton grown in Queensland before the 31st July, 1926, and the Crown guarantees a price for such cotton until the date mentioned above. Payment will be made for the cotton according to length of staple as well as according to grade as previously.

The Director of Cotton Culture.

The Acting Minister for Agriculture (Hon. M. J. Kirwan, M.L.A.) has announced that Mr. G. Evans, C.I.E., M.A., the Director of Cotton Culture, will leave Australia for England next month on four months' leave from his principals—the Empire Cotton Growing Corporation. At the end of his leave Mr. Evans will probably be sent by the Empire Cotton Growing Association to the United States of America to carry out certain inquiry work there. In recent correspondence with the Department, the Corporation indicated the improbability of Mr. Evans's return to Australia. In notifying this the Corporation, whose operations are world wide, pointed out that Queensland is now far from devoid of capable technical advisers on cotton matters, and hence its inability to promise the return of Mr. Evans to Australia.

Needless to say, Mr. Kirwan added, the Government much regret losing the services of a gentleman with such a world-wide reputation in cotton matters as Mr. Evans.

Regulations under Animals and Birds Acts.

Regulations under the Animals and Birds Acts have been approved which primarily deal with the trapping of native animals. Provision is made for the establishment of districts, the issue of permits for trappers, and the registration of dealers. These regulations also provide for the payment, to the Government, of a royalty of 5 per cent. of the gross selling price of all opossum and native bear skins. To ensure the collection of this royalty, statements are required to be supplied

by dealers, and certain records must be kept and shall be open for inspection to all collectors of royalty. The fee for a trapper's permit has been fixed at 10s., that of the certificate of registration of a dealer at £10, and for registration of a retail dealer £1. These regulations, however, will not actually apply until provision is made to open the season for the trapping of opossums or native bears.

Sharpening a Lawn Mower.

The ordinary lawn mower with its rotating knives is not an easy article to keep in the careful adjustment necessary for the best quality of work. The cutting action of these knives is really a shearing one, and the knives will sooner or later wear so that the grass will be in a way "chewed" off rather than cleanly cut. Most lawn mowers are made with the stationary blade adjustable, and all that is necessary to sharpen the mower is to loosen and tighten certain screws by which this stationary blade is adjusted. It sounds simple, but it must be very carefully done, otherwise the bearing of the rotary knives against the stationary knife will not be even, and the mower will be hard to operate, and will give poor results.

The idea sometimes possesses one to use a file on the rotary blades, but this is a mistake, because it is extremely difficult to keep the line of their cut exactly parallel with the stationary blade. It is better to let the lawn mower be self-sharpening with the slight adjustments that are necessary for the stationary blade.

To Calculate Dead Weight of Sheep and Lambs.

In order to calculate the dead weight of sheep and lambs with some accuracy, the following freezing works figures, obtained as a result of a slaughter test at a Canterbury (N.Z.) works may be useful.

Ten average sheep and ten average lambs were killed, and the following results were noted:—

	Sheep.		Lambs.	
	lb.	per cent.	lb.	per cent.
Live weight	1,097	—	675	—
Dressed weight, warm	565	51.4	368	54.5
Dressed weight, cold	554	50.5	364	54.0
Freezing weight	531	48.2	346	51.2

It will be observed that the percentage of loss between warm and freezing weights is just over 3 per cent. on a sheep, and rather more on a lamb.

An analysis of these figures shows that the average live weight of the sheep was 109¾ lb., the dressed weight warm 56½ lb., the dressed weight cold 55⅝ lb., and the freezing weight 53 1/10 lb. The percentage of dead to live weight was warm 51.4, cold 50.5, and frozen 48.2. The average live weight of the lambs was 67½ lb., the dressed weight warm 36¾ lb., the dressed weight cold 36⅜ lb., and the frozen weight 34⅜ lb.

To Make Kerosene Emulsion.

The prepared spraying oils of heavier nature, under various brands, have mostly taken the place of kerosene emulsion on deciduous trees, and resin wash is preferable to kerosene emulsion for scale on citrus trees. As, however, this emulsion is still used by a good many gardeners, the following is given as a useful formula:—

Dissolve ½ lb. of hard soap in 1 gallon of boiling water; while still boiling, stir in 2 gallons of kerosene, then immediately pump the whole from one vessel into another. The outlet from the short delivery hose (or iron pipe—for the rubber perishes) should be small enough to enable a good pressure to be maintained while pumping; a coarse spray nozzle on the end of the outlet hose or pipe will suffice.

If any trouble is found in emulsifying these proportions, a greater quantity of the boiling soap solution should be added, and the whole put through the pump again.

Treat the above as the stock solution, and dilute it to make up to 22 gallons with boiling water; for tender plants more water can be used. Soft water only should be used for mixing and diluting.

Kerosene is very severe on rubber hoses, and they should have a warm soda solution pumped through them after use to clear them thoroughly of the oil.

When Transplanting Tomatoes.

When all is ready for removing young tomato plants into the field, they should have a good watering some hours before, so that the roots will retain hold of as much soil as possible. The earth may be cut both ways between the plants with a sharp spade or knife, and lifted underneath also. When the plants are lifted out, as much soil should go with each as may remain with the roots, taking care not to break the fine rootlets, so that the plants may suffer as little shock as possible. A large number may be lifted and carried out to the field at one time by using large board trays or other rough appliances made for the purpose. Plant at least 1 inch deeper than in the frame, and if the quantity is not very large, evening is the best time for moving them, or after showers.

Unless the soil is dry, do not use water in the transplanting, as the plants are liable to damp off in cold, wet soil. They may need shading a little in the heat of the day for the first two or three days after moving; otherwise the more light and air they get the better.

It is better to plant 4½ ft. or 5 ft. apart, and to stake them up like vines in a vineyard, instead of letting them trail on the ground.

Trailing vines hardly bear as well, and are far more subject to disease than those supported from the earth. The land should be kept clean between the rows and plants, as in any other well-tended crop.

Care of the Spray Outfit.

A spray-pump, like any other machine, will do good work and last in proportion to the care given to it. When a pump does not work properly, the cause of the trouble should be ascertained at once and remedied, otherwise permanent damage may result.

When a spray-pump is first received, its working parts should be carefully studied. After the pump has been used it should be thoroughly washed out with warm water, as most of the spraying mixtures are highly corrosive in their action. The hose should also be thoroughly washed out, especially after using oil sprays. Always keep the barrel filled with water when not in use, to prevent the wood from warping and hoops from becoming loosened. With proper care the pump should last several years; the hose, however, will probably have to be replaced after one or two seasons.

Poultry Diseases—the Best Assurance of Prevention.

It is questionable if on the whole poultry suffer from more diseases than do four-footed animals, for while they are liable to diseases peculiar to themselves they escape others occurring in the latter. But while there are many simple ailments that it will be found profitable to treat, it is more than doubtful practice to attempt to cure any serious diseases in poultry, except in the case of a very valuable show specimen. From a commercial point of view, it is not advisable to breed from birds that have suffered from any serious disease, for they are scarcely ever profitable even after cure. It will be found less costly to raise other healthy birds than to treat sick ones for any length of time.

This being the case, prevention and not cure is what the poultry-keeper should make special study of. As an instance of this it may be stated that the greater number of ailments occurring among chickens are the result not so much of disease as of the conditions under which the birds are run—that is to say, faulty breeding, overcrowding, &c., due to inexperience or bad equipment, or both. The importance of these matters cannot be too strongly impressed upon poultry-keepers. It would be foolish, however, to underrate the liability of poultry to diseases, especially under average poultry-farming conditions.

In attempting to treat disease of any kind the first essential is, of course, correct diagnosis. Without this we work in the dark, and medicines administered may do more harm than good. Yet we find all sorts of chemicals administered in attempts to cure an illness that is unrecognised or undefined. The system of dosing fowls with kerosene is a case in point. A much more pernicious practice that prevails among poultry-keepers is that of putting chemicals in the food or drinking water with the idea of preventing disease. This practice is responsible for a great deal of damage to the delicate constitutions of poultry, and is calculated to render them susceptible to troubles they might otherwise escape.—"Poultry Farming" in N.S.W.

Wheat Grown for Seed—"Rogueing."

By the term "rogueing" is meant the removing of so-called "rogues" or off-type and foreign plants from the growing fields of grain. The presence of a small percentage of these foreign plants throughout a field grown for commercial purposes is not a serious matter, writes L. H. Newman, Cerealist of the Canadian Department of Agriculture, but where these plants are found in a field grown for the production of seed wheat, the situation is different. Rogues, if not removed, may continue to increase in proportion to the rest of the crop with each successive season, until in due time the variety may contain a very large percentage of plants which are not as desirable as the parent variety. Rogues are objectionable chiefly in that they may be of an earlier- or later-maturing variety than the parent variety, or of one which under local conditions will give poorer yields. In badly mixed fields of wheat grown for commercial purposes the percentage of off-type plants may be sufficiently great to cause a cut to be made in the grade.

Rogues may arise in two main ways—as accidental mixtures introduced through the threshing machine, fanning mill, or other agency, or they may occur as a result of natural crossing. While the common cereals do not cross readily, yet it is well known that crossing may take place occasionally. Where such occurs, a number of different types would probably show up in succeeding generations. To attempt to eliminate these unfixed forms by continuous rogueing is a doubtful practice. Where a farmer rogues his crops faithfully year after year, exercising special care in preventing occurrence of accidental mixtures, and continues to find off-type forms in his crop, he would be well advised to obtain a few pounds—or, better still, a few bushels—of pedigree seed as a new starting point. As a general rule it is advisable to obtain a stock of such seed as a basis of supply for the main crop periodically, unless the variety or strain one is working with continues to show a very high degree of purity.

Rogueing is best done just before the crop ripens, either in the early morning or in the late afternoon, when the sun is relatively near the horizon.

The presence of oats in wheat or wheat in oats is not so important, as these grains can be separated after they are threshed, by means of proper cleaning and grading machines. The situation is different, however, where a different type of wheat than the apparent type appears in one's fields, or where a different type of oats or of barley shows up. It is only by taking these out by hand that one can eliminate them.

The Best Dairy Breed.

Some dairy farmers, points out R. C. Barker in the "Butter, Cheese, and Egg Journal," will spend years in discussing what is the best dairy breed and continue to milk scrub cows. He goes on:—

"I am frequently asked by farmers who are in this position what breed I prefer. I always answer: 'Pure breds.' Three per cent. of the cattle in the United States are purebred. Ninety-seven per cent. are grades, crossbreds, or scrubs. I will stand with any breed of the 3 per cent. as against the 97 per cent. The pure breeding of any dairy blood, developed for production, is superior to mixed blood if given the same care and opportunity: I mean this as no reflection on the thousands of high grades whose production has been built up by selection and the use of purebred sires from high-producing dams. Investigation in thirty-six States, covering 25,000 head of breeding stock of all breeds, including pure breds, crossbreds, grades and scrubs, brings out the fact that based on utility alone, apart from breeding value or sale value, dairy cows of pure breeding have 48 per cent. greater earning power than others."

The Fly Menace—Way of Reducing the Pest.

A correspondent from the Bundaberg district, who says that flies are very bad in her vicinity, has forwarded some suggestions for abolishing the pests. One or other of these may be more convenient for some people to use than those directions already published on this page. She says that in spite of screened doors and windows many flies find their way into the house, and after adding her tribute to the effectiveness of kerosene for sprinkling about the dust bin or any other likely breeding-place, as well as for using a few drops on dusters and in the water with which windows are to be cleaned, the following directions are given for killing any that are in the house. Prepare a solution of 15 parts of commercial formol, 20 parts of milk, and 65 parts of water, and place it in saucers or other shallow dishes. The flies will be attracted to it if nothing in the food line is left about, and it is a most effective poison for them.

Another remedy is to heat a shovel and pour twenty drops of carbonic acid on it in a closed room, and the fumes will exterminate the flies. A safer remedy for most people to use is to place a piece of bread on a plate and pour over it a mixture containing two teaspoonfuls of formalin, half a pint of milk and half a pint of water, and a teaspoonful of sugar. The sugared bread will attract the flies, and the liquid it is soaking in is fatal to them. Needless to say, these mixtures should be placed on high shelves or somewhere where children cannot get at them.

If the window ledges are kept sprinkled with any well-known fly-killing powder it clogs the feet of the flies. They are then unable to cling to the glass, and fall again and again into the powder, until they die. A trap which makes an extra safeguard at the windows is to have a trough made about three-quarters of an inch wide and the same depth, and as long as the width of the window. Place this close against the window on the inside, and keep it filled with paraffin. The fumes will overpower the flies as they approach the windows and they will drop into the trough. The window would, of course, need to be closed at the bottom to make this trap effective.

A hint for increasing the usefulness of screens on the doors and windows comes from New South Wales. It is to paint the inside framework of the screens with a dark-coloured paint, and the outside with a light blue. It is said that flies will never settle on anything light blue, but will readily cluster on a dark-coloured object. By painting in this way it will be found that any flies inside will settle on the screens and be ready to go out as soon as there is an opening. On the other hand, none will cluster on the light blue outside paint waiting to gain entrance when anyone passes in or out. Flies have a long list of horrible offences against human life and health proved against them. These even include infantile paralysis, for which no adequate remedy has yet been found. If all the women of the community adopt some precaution and destroy the flies in their own homes they will be rewarded by the improved health of their families and friends. A jug of milk into which a fly has fallen is very quickly transformed into a jug of liquid disease, and flies settling about the face of children or alighting on small open wounds may even cause death.

Many of the methods quoted for the extermination of this pest may be taken in the ordinary course of domestic duties without any special effort being necessary. It only requires a little thought, and the results will be well worth while.—"Gympie Times."

Weight in Horses.

In a recent issue of the "Scottish Farmer," a Mr. R. J. Young, a former resident and farmer in Australia, but now engaged in farming in the South of England, criticised the farm horses of Great Britain, and advised using teams of lighter horses than now employed. He objected to fat, heavy horses.

It is interesting to recall the advice given by Captain A. M. Montgomery, who some time ago dispersed the famous Nether Hall Clydesdale stud, and in a farewell address to his fellow Clydesdale breeders said, "*Whatever you do, go in for weight in horses.* A good deal of experience of horses and foreign buyers has shown me that, if the Clydesdale breed is to be kept where it is, we must keep weight in view first—we must use heavier, bigger, thicker stallions. Sixty, perhaps seventy, per cent. of the mares we are breeding from are too small. You cannot breed big stallions from small mares."

"Glancer," writing in the "Scottish Farmer," says that—"If the horse is to maintain his position against the motor lorry, and is to improve upon it (*which he is doing just now*) then the horse must be heavy. Horse-breeding is not a pure agricultural problem; the horse breeder looks forward to selling his geldings for street and lorry work when they are five, six, or seven years old. He knows that if he breeds a lighter class of horse he will not be able to get as big a price for his geldings and that, accordingly, they will not pay to breed. North America will soon be wanting big horses; over there they are learning to judge the pulling power of an animal by an accurate method."

Mr. David Murray has added some sound opinions to the discussion. He says: "Weighty horses are indispensable to handle loads in the ever-increasing traffic congestion in our large cities where stopping and starting imposes a very heavy strain even on heavy horses—light ones are useless for this purpose. . . . With the type of farm horse in use throughout the United Kingdom at the present time, and with the transport trade 50 per cent. below normal, I know it is very difficult to get a sufficient number of horses weighty enough to pull a lorry. . . . It is admitted by all who know the road transport industry *that motor vehicles for city or short distance traffic are a spent force, and cannot stand against the horse either in cost or convenience.*"

Australian draught horse breeders will find a lot of sound horse sense in the views of "Glancer" and Mr. Murray. Size and a strong dash of quality are looked for by carriers and they are the sort to bring big money. Choose the right type of breeding stock and keep the food supply up to the growing colts in order to produce payable draught horses. Remember the demand for good quality, weighty draught horses will increase each year, especially in the cities, owing to the continuous reversion to horse-power on account of the congestion of traffic.

Draught Horse Pulling Contests.

In recent years draught horse pulling contests have become very popular at fairs and horse shows in the United States and Canada. They are carried out by means of a specially constructed dynamometer, patented but a few years ago and which accurately records the weight pulled.

Canadian horses, until recently, held the championships for pulling, but recently a pair of horses established a record pull at the Iowa State Fair. Weighing 16 cwt. 68 lb. and 16 cwt. 23 lb. respectively, they moved a load of 3,425 lb. tractive pull, which is equal to starting a load of 44,500 lb. (nearly 20 tons) on granite block pavement.

These pulling contests were started by the Horse Association of America, and they are now creating a tremendous amount of interest, says an advice from that association, and they are doing for the draught breed what races have done for the race horse—develop test by test.

The contests have proved that good draught horses can develop over 20 horse-power per pair, and can pull on paved streets any load they can start. They will eventually give horsemen accurate data as to the type and weight of horses best suited for heavy loads.

These tests, by means of the dynamometer, have been conducted sufficiently long and have proved so successful in U.S.A. and Canada as to warrant particular notice and consideration by our leading agricultural societies. The cost of the dynamometer is about £300 at Iowa, U.S.A., and it would be a good move on the part of the Royal Agricultural Societies to go into the question of procuring one for their States, and in addition to staging pulling contests at the Royal Shows, the dynamometer could be hired out to the country societies.

Farm Power Problem.

Those who regard the tractor as the solution of farm power problem will be interested to know that the Montana (U.S.A.) Agricultural Extension Service, co-operating with the U.S.A. Department of Agriculture, as a result of two years study, affirms that big teams mean maximum production and minimum cost.

"Passing of the Horse."

This heading appeared in a Sydney paper recently, as a result of the opinions of a Sydney medical man at an Automobile Conference in Melbourne. He predicted the disappearance of the horse from the roads, following on a visit to America. Seeing that in the United States there are some 25,000,000 horses and mules, and breeding activities are greater now than they have been for some years past, that prediction seems a long way from fulfilment.

American Horse Trade Active.

The "Breeders' Gazette" (Chicago) of the 8th October states:—". . . . Every horse with a definite job clears readily, more Eastern buyers are operating in the west, and inquiry is increasing. There is an unappeased demand for wagon stock adapted to city delivery trade. . . . In two weeks the general level of values has advanced 10 dollars to 15 dollars (£2 to £3) a head.

Road Transport.

In California the restriction of heavy loads became a serious matter, necessitating their limitation some time ago. The Minister for Highways in Ontario, Canada, has now warned truck and tractor owners that trucks of 4½ and 5 ton capacity would probably be prohibited use of the roads. The excessive speed of light trucks and excessive loading of heavy trucks has necessitated the adoption there of drastic measures.

Clydesdales under the Test.

That the Clydesdale is remarkably free from unsoundness is gleaned from the report of the Board of Agriculture of Scotland. For the year ending 30th June, 1925, 429 stallions were examined and of these 419 were granted a license, the percentage of refusals being only 2.05. Six years previously 9.2 per cent. of stallions were refused certificates.

Geese—an Attractive Sideline.

There are hundreds of homesteads in this State, particularly in the coastal and Northern Rivers districts (writes the poultry expert of the N.S.W. Department of Agriculture in a recently issued pamphlet on "Ducks and Geese"), where ideal conditions exist for keeping a small flock of geese without in any way interfering with ordinary farming or dairying operations. A small flock properly handled would become quite an acquisition as a side-line, or as an adjunct to bigger things on the farm, and a means of interest perhaps to some member of the family.

In some parts of the world goose-farming is carried on upon quite a large scale, but it is questionable whether carried on in that way it would be a success in this State, except under very unusual conditions and with the guidance of persons with wide experience with geese. Nor is it desirable that an attempt should be made to add geese to a poultry or duck farm, although small numbers of one or both may not be any serious drawback.

Geese require but little attention, except during the breeding season, in the spring of the year, when the eggs are being set and the goslings are being reared. They are also remarkably free from disease, except spirochætosis, which is communicated to them by the fowl tick (*Argas persicus*), to the attacks of which they are susceptible.

Adult geese will thrive well upon little else than good pasture and a little grain at night. True, in times of drought they have to be fed in much the same way as fowls, but in such seasons no goslings need be reared, and only the breeding stock, which would be few in number, kept to feed. The goose is long-lived, and there is no necessity, as in the case of fowls and ducks (which are short-lived), to be continually replacing the original stock. There is some prejudice against keeping geese on pastures where other animals are kept, but this appears to be unfounded, except where too many geese are kept on a small area on which other animals are depastured. The objection arises from the fouling of the pasture that is the result of overstocking.

There are several varieties of geese, but for all practical purposes three breeds might be taken as representative of all, and the most available and likely to be kept. These are the Toulouse, Emden, and African or (as they are popularly known in Australia) Cape geese.

The Toulouse makes the heaviest weight, mature ganders making as much as 25 lb. to 30 lb., and geese 18 lb. to 20 lb.; the Emden run 20 lb. and 18 lb. respectively, and the African slightly under these weights. In appearance the latter are much smaller, but this is on account of the African being much tighter in feather, just as a Game fowl of equal weight with an Orpington looks much the lighter.

Ganders and geese make the best breeders after they are two years old; before that time they are not considered mature. They should continue to be good stock geese until about ten years old, but will live to a very much greater age. Usually about two or three geese are allowed to one gander, but very often one goose is the favourite, and this results in a less satisfactory percentage of fertile eggs from the others.

The ideal position for geese is good pasture and a creek with a stony bed, but the latter is not absolutely necessary, and thousands of geese are successfully bred where there is no permanent water. Sufficient to cleanse themselves with now and again is really all that is required.

Chicken-Pox—How to Protect Pullets.

Poultry farmers are reminded that the protective measures against chicken-pox should have now been commenced.

A tablespoonful of flowers of sulphur for the equivalent of every fifty adult birds should be given in the morning mash every third day for a period of three weeks. Then this should be stopped, and for the next three weeks Epsom salts should be added every third day to the drinking water at the rate of one ounce to the gallon. At the end of the three weeks stop the Epsom salts and return to the flowers of sulphur in the mash, and continue alternating the treatment until the period is passed over which chicken-pox is seasonable.

It is emphasised, writes the N.S.W. poultry expert, that the full protective benefit of the flowers of sulphur will not be obtained unless the advice given is carried out in its entirety and to the letter, but in order that no misunderstanding may arise it may be stated in terms of weight for weight. With every 7 or 8 lb. of the mash, whether wet or dry, one ounce of sulphur should be mixed, commencing well ahead of the time when the disease is liable to appear, and continuing until

the season is over, which means that it is advisable to commence the sulphur treatment in this State in the first week in January and to continue it through the summer till about April.

In using dry mash the sulphur should only be given every third day, the same as for the wet mash.

The Essential Benefit of Tillage.

Part of the secret of the average insect's great activity is, we are convinced (writes Professor J. A. Thomson in the "Scottish Journal of Agriculture"), to be found in the fact that the blood does not become appreciably impure. This is because the blood is always near some branch of the system of air tubes or tracheæ, which ramify into every hole and corner of the insect's body. In most other animals the blood goes to the air, either on the skin or on the gills, or on the walls of the lungs, but in insects the air goes to the blood. These air tubes have a very large internal surface, and interchange of gases with the blood is thus facilitated. Similarly, though birds' lungs are relatively small, they have a very large internal surface on which the blood-vessels are spread out. The feathery gills of the lobster have likewise a very large external surface on which the blood is exposed to aeration. The absorption of digested food from the small intestine is facilitated by the immense surface afforded by the microscopic finger-like processes or villi which line the interior. People who go to live at Johannesburg, about 6,000 ft. above the sea, often show a great increase in the number of their red blood corpuscles. This is a very useful adaptation, for it means that at an altitude where oxygen is scarcer than usual there is an increase in the surface of the oxygen-capturing red blood corpuscles.

If someone should ask what this has to do with agriculture, goes on the writer, he might well be answered by asking what advantage there is in breaking up the soil. Whether this is effected by ploughing or clod-crushing, whether the agency be earthworms or frost, is not the result an increase of surface in the soil or among the soil fragments, an increase which promotes, to take the simplest issue, the solution of salts, thus affording more food for the roots of plants? Or one might inquire into the significance of the multitudinous leaves of the grasses, which do not get in one another's way, or into the value of cut-up leaves, which thus increase their surface for absorbing carbon dioxide and for receiving those rays of sunlight that pass through the shade of green and promote photo-synthesis—in other words, the making of starch and other still more previous carbon compounds. A large tree in the middle of a field on the farm may be exposing a leaf surface of more than an acre.

"Perhaps a severe critic might say that we are over-emphasising the superficial," says the writer in concluding an elaboration of the thought, "but we wish to put forward in all seriousness the thesis that one of the great trends of organic evolution —from the colloidal amœba to the cerebral cortex of man—has been towards more surface."

Rain and Afforestation.

Although there are some who think that isolated clumps of trees can "attract" rain, there is no foundation for such a belief, comments the "Journal" of the South African Department of Agriculture, and it is generally accepted by experts that forests, excepting those located in particularly favourable situations, do not increase the rainfall in their vicinity. They do reduce the temperature of the air, and may also reduce the severity of rainstorms; but on the other hand many species of trees consume much moisture and frequently dry up springs in their neighbourhood.

A programme of extensive afforestation is nevertheless necessary. It will lead to decreased soil erosion and a more economic use of the rainfall, the preservation and improvement of mountain catchment areas, and the regulation of the flow of rivers and the clarification of the waters thereof.

Rain falling on forests is retarded in its fall to the earth by the leafy canopy, and reaches the earth with a decreased velocity and a reduced destructive force. The trees themselves, and the sponge-like litter of leaves in all stages of decay lying beneath them, act as obstacles to the rain water running off. The time of contact between the water and the soil is thereby greatly lengthened, and opportunity for soaking into the soil is increased. Useless evaporation is reduced. The underground water, provided the trees do not transpire excessive quantities of water, is strengthened, and the perennial flow of springs assured. The surface water, running off more slowly, causes less soil erosion, and the binding effect of the roots of the trees renders the soil more resistant to the action of running water.

Death of a noted Stud Pig Breeder—The late Mr. W. J. Warburton.

Death has recently claimed one of Australia's most noted stud pig breeders and show prize winner, Mr. W. J. Warburton, owner of the famous Northgate stud at Northgate Junction. The late Mr. Warburton had for almost a generation been associated with farming activities in Queensland, and for a quarter of a century or more he made pig-raising his special life's work, and had attained a measure of success of which an agriculturist in any part of the world might well be proud.

Feeding Grain to Cows on Spring Grass.

It is evident to all dairymen that cows reach their maximum milk flow during the late spring and early summer, because the fresh green grass is of the ideal composition for milk production, and is usually plentiful enough to supply all the wants of the animal with a minimum amount of labour and time in grazing. Under these conditions there is not much need for feeding grain. Not so in the spring, for then the grass is watery and immature, making it difficult for the cows to consume enough bulk to properly supply the necessary dry matter to fill all their needs. It pays, therefore, to feed some grain when the cows are on this early spring grass. One farmer says: "We use the same mixture as fed in the winter; this consists of barley and oats mixed, supplemented with a little linseed meal and some bran." A small quantity of this, say 2 lb. of the mixture fed at each milking, tones up the condition of the cows, increases their production, and gets them in good fettle for a long lactation period. With good cows, good feeding pays, and as one dairyman says: "Good dairy cows will pay for grain at any time, but particularly in the early spring months."—"Farm Economy."

How to Make Lime Water.

Lime water is a useful corrective in many forms of indigestion, diarrhoea, or scours in young animals, and is particularly valuable for calves and pigs. To make the water, secure a clean 35-gallon cask and a loose lid to fit over the open top. Into this cask put a half bag of recently burnt lime, or a similar quantity of recently slaked lime. Fill the cask up with clean rain water and stir well with a stick, put the lid on and allow to stand for a few hours. The water then dissolves a very small proportion of the lime, the undissolved portions of which sink to the bottom of the cask.

The lime water (which contains ten grains of lime to the pint) is then ready for use, and in this mild form can be fed to stock of all ages. A few pints can be added to the feed of both calves and pigs weekly with profit, as it has a beneficial effect on both the growth and health of young animals.

When the lime water in the cask is used up it should be filled again with clean rain water, stirred well and allowed to settle. This treatment should be repeated until the lime is exhausted, which becomes apparent when the water loses its caustic earthy flavour. This is a sign that the burnt lime in the cask requires replenishing.—"Farm Economy."

Draught Horses Breeding—The State Clydesdales.

The Minister for Agriculture and Stock, Hon. W. Forgan Smith, referring to the draught horse breeding season, which had commenced in mid September last, said that four of the State Clydesdale stallions were allocated to the Murgon, Laidley, Cunningham, and Crow's Nest districts, a full complement of mares being assured at each centre. General satisfaction has been expressed by the owners of the mares which were bred to in 1923. The foals sired by the several State stallions were without exception well grown and showing plenty of type and constitution. From reports submitted to date the percentage of foals resulting from work during 1924 by sires which completed their full season will be slightly better than that of the previous year. Good rains fell in October, 1925, in every district where State stallions were located, with a result that there is now an abundance of natural pastures just at a time when brood mares require ample supplies of good succulent food. Of the eight horses used in 1924 one died, and a second horse was withdrawn from service during the currency of the season through a temporary breakdown. During the first two seasons' operations, 791 mares were bred to by State Clydesdale stallions. Fees on account of an additional 265 mares have been received to date, and at the end of the current season the total number of mares bred to will be well over 1,000.

Answers to Correspondents.

Pig Feeding.

J. McK. (Millmerran).—The Instructor in Pig Raising (Mr. Shelton) advises:—

If you are feeding a number of pigs it would certainly pay you to get a crushing plant so that you could convert the whole grain into meal. Possibly a local storekeeper would have this work done for you at nominal cost. It pays handsomely to grind cereal grains before feeding them to pigs of all ages, otherwise the waste is heavy and the cost of production is increased. In any case it pays to soak the grain or meal for about twelve hours before use, and if you have the conveniences for soaking in hot water, or for cooking, so much the better, though there is not a great deal of advantage in actually cooking these grains or meals if you soak them beforehand. See table of rations in pamphlet forwarded.

Molasses should not be necessary if you have a good supply of skim milk and green foods; its addition to coarse and otherwise indigestible fodders, is recommended, more so than to ground and soaked wheat and skim milk. Much money may be wasted on molasses unless its feeding value is understood. It cannot be regarded as a direct food, its use is recommended more as a condiment and to make other foods more palatable and appetising than as a food to be given in certain quantities daily. Pollard is a by-product of milling wheat which ordinarily is not of as high a feeding value as crushed and soaked or boiled wheat. If you were selling your wheat direct to the miller you could arrange to secure a certain quantity of pollard as required, and this must be of a certain standard (see pamphlet "Pigs for Profit"), and, as previously stated, the addition of molasses is no more necessary in the case of pollard than with ground wheat. Green foods (lucerne, &c.) are of very high feeding value for pigs of all ages, and they materially assist in reducing costs of production and in this respect alone are well worth cultivation.

Sow Farrowing Dead Litter.

J.L. (Peeramon)—

Glad to note that you have been successful with your Poland-Chinas, particularly with the boar; he should develop into a very useful sire as he comes from first-class stock. In Mr. Shelton's opinion it is a great mistake to allow breeding sows to become too fat; it is equally disastrous to have them very low in condition, though in general the very fat sow will suffer most, as also will her litter. It is not quite possible to say just what is the cause of your sow farrowing a litter of dead pigs, and then later on dying herself. Possibly it was, in her case, the result of blood poisoning, while the birth of the dead pigs indicates either a previous accident or lack of nutriment and of vitamines in the food. In this connection the pamphlet entitled "Profitably Feeding Iodine to Swine" is worth special study. We will follow this matter up in an early issue of the Journal. Without further detail we cannot give any definite advice.

Paralysis in Pigs.

H.T.C. (Mount Larcom)—

It is evident that your pigs are suffering from a form of paralysis, possibly induced by a lack of mineral matters in the food, and an insufficient supply of succulent greenstuff. It is quite possible to relieve pigs of the paralytic symptoms, though it takes time and patience. Try the addition of lime water to the food of these young pigs, see more *re* its preparation in the pamphlet dealing with "Diarrhoea, or White Scour in Young Pigs," also give the pigs bone meal. Your produce merchants could give you a quote for the supply of sterilised bone meal, while Borthwicks Limited, of Wharf street, Brisbane, would quote for protein or meat meal. All these are valuable additions to the list of feeds, especially for young growing stock. Keep the stock out in the open as much as possible; for this purpose a large pig paddock is desirable, and if you can arrange for two paddocks, so much the better, for one could be rested while the other was in use. Pamphlets posted.

Care of Tamworth Boar.

N.J.L. (Miriam Vale)—

Mr. Shelton (Instructor in Pig Raising) suggests keeping him away from the sows for a week or two; reduce the allowance of green corn and of corn or other cereal—grain and meal, and also his allowance of skim milk, but give plenty of green stuff and clean drinking water. If you could feed some soaked cowpeas or field peas it would be effective in freshening him up. Regular doses of two packets of Epsom salts (of one ounce each), say every week, for the time until he recovers his normal vigour, are suggested. Compulsory, and, if necessary, vigorous exercise is sometimes necessary in inducing activity in young boars, while in some instances one has to resort to drugs, but it is highly undesirable that drugs should be given, for if the lack of vigour is characteristic of the strain from which the boar comes and is therefore hereditary, it is better to cull out the strain altogether, and introduce more vigorous types. The introduction of another boar sometimes is effective, but it is not always convenient to introduce a second boar for this purpose. Perhaps the sows are on the fat side and are not active enough. They might be flushed as directed in the pamphlet "Flushing the Brood Sow," a copy of which goes forward to you with other pamphlets on the subject of pig raising.

Infertile Sow.

W. J. (Rydalmere, N.S.W.)—

Possibly the sow has become overfat, for sows carrying heavy condition frequently become very shy breeders and fail to hold to the service of the boar until they are thinned down to an almost poor condition. Our veterinary surgeons are of opinion that many of these troubles are also caused through the sow becoming injured at farrowing time, this especially so if the sow is overfat at this time. Very fat sows frequently fail to recover properly after farrowing, the result being that septic inflammation of the womb (known also as metritis) is set up. This tends to make them shy breeders if not altogether barren.

Mr. Shelton (Instructor in Pig Raising) suggests your trying syringing the sow's uterus and womb with a solution of one tablespoonful of table salt in one pint of sterile water (water which has been boiled and allowed to cool down to blood temperature). If this is continued for a few days prior to the time the sow is due to come in season, and also if repeated the day after service, it may prove successful. If unsuccessful try syringing with a solution of twenty grains of permanganate of potash in one pint of sterile water at blood temperature for three consecutive days before service and again a day or two afterwards. It is also advisable to give the sow a course of purgative medicine during treatment, giving two to three ounces of Epsom salts in half a pint of warm water, or add this to the food if the sow is eating well. It is an advantage also to change the boar, using a young vigorous one, but in every case keep your stock in medium breeding condition only, and do not feed breeders too heavily on grain. See also pamphlet "Flushing the Breeding Sow," sent under separate cover. It is also a good plan to compel the sow to take vigorous exercise for a few minutes before service, and to allow her to be removed from the boar immediately after service, and be placed in a pen by herself for a day or two away from all other pigs. Plenty of green food and good grazing and a shorter supply of fattening foods are advised.

Pig Lice and Worms—Blood as Pig Food.

H.Y. (Wowan)—Mr. Shelton advises:—

Your pig worry indicates the presence of intestinal worms internally and lice externally, as persistent irritation is one of the principal indications of parasitic infestation. For destruction of hog lice, make a mixture of benzine ½ pint, kerosene ½ pint, and oil 7 pints, and apply by hand after the animals have been cleansed from accumulation of mud, &c. Internally you will find a tea to dessertspoonful doses of oil of turpentine, given in a cupful of warm milk or water, as a drench or in a small trough as a drink effective. If more than one pig is being fed in the one trough, arrange so that each pig will receive as near as possible the same dosage. Follow the turps with a good dose of Epsom salts given about eight hours after the medicine, and if necessary repeat. If the pigs pass any worms, send us a few worms in a small bottle of glycerine and boiled water (cooled down before use) half and half, and we will tell you the name of the worms and give you any further information available.

It would be an advantage to keep a good sized piece of mutton fat about, and when you see a pig with a coarse dry skin, give him a good rub over, or a good oily cloth will do. For the lice mixture, try to get hold of some fish oil or some raw linseed oil; a little sulphur is also good, as you have found.

Blood, to be of value as a pig food, would first have to be cooked and then be mixed in with the other food. We would not recommend the use of uncooked blood, as the risk of disease is too great. You could use the blood to some advantage, but you would find it more trouble than it is worth. As it decays rapidly, it would increase your work in keeping the place reasonably sweet and clean. Leave it alone absolutely, or else use it as a manure for vegetables, &c., and then only when mixed with ashes or loose soil.

Destruction of Lantana.

A correspondent writes: I have a lot of lantana growing along the banks of a creek through the orchard; this I have cut down time and again, but do not care to grub out the roots as the creek banks are very steep, and and it will mean bringing down a lot of soil into the creek bed. Could you advise me whether the stumps and roots could be poisoned and what poison to use, and so get rid of the lantana for good without disturbing the banks of the creek.

Reply.—Prepare an arsenical solution double the strength of that referred to in the note on the killing of green trees with arsenical poison on page 13 of the January issue of this Journal. Slash down the lantana and apply the solution to the base of each plant which should be split with an axe, mattock, or whatever tool is being used for the purpose. A swab made of hessian fastened to a stick long enough to work comfortably is the best way to distribute the poison. Plants in awkward places might be sprayed effectively. The best results are obtained during hot, dry weather.

Rose "Prolification."

K.L. (Lunville, Esk Line)—

The Government Botanist (Mr. C. White, F.L.S., advises that the specimen of rose you forwarded shows a peculiar malformation known to botanists as "prolification." Prolification of the flower generally consists of one flower growing out from the centre of another, sometimes in place of the antreflower a small leafy shoot may be developed. The abnormality is not uncommon and besides roses is found in a number of other flowers. We are unable to enlighten you as to the cause, for nothing definite is known in this respect.

Worms in Horses.

M.H.M., Mooloolah—

Replying to an inquiry as to the treatment for worms in horses, Mr. Veterinary Surgeon Rudd advises:—

Linseed oil and turpentine is a very safe remedy. One ounce of turpentine to one pint of linseed oil is sufficient for the horse of average weight. If the subject is in fair condition, fasting for a period from twelve to twenty-four hours is necessary, but ample water should be easily accessible to the horse during the fasting period. Considerable assistance may also be rendered by giving the horse two bran mashes, in each of which is placed a dessertspoonful of salt, the mashes to be given six hours apart and the period of fasting to begin after the last bran mash has been eaten. The treatment may be repeated at the end of twenty-one days.

HOW TO FEED LINSEED TO CALVES.

It may not be generally known (says a writer in "Farm Economy") that linseed and linseed cake meal is sometimes responsible for calf poisoning. Investigations, however have shown that the poisoning is not due to the bad quality of linseed or to the presence of some deleterious material, but to lack of care in preparing the food at the farm.

Linseed in its various forms is a valuable feeding stuff for cattle, and particularly for rearing calves where the bulk of the milk is sold, as is the case on most of our dairy farms. It is, however, necessary to exercise care in its preparation

owing to the fact that linseed contains two substances—an enzyme and glucoside—which, under certain conditions, produce prussic acid, a deadly poison to all forms of life.

The following points should be borne in mind when feeding linseed to young animals:—

(1) There is no risk of poisoning if linseed is fed dry, whether whole, crushed, or in the form of cake or meal, as the acid nature of the gastric juices (the juices in the stomach) prevent the action of the enzyme.

(2) There is considerable danger in feeding linseed or linseed cake meal after steeping in warm water or even in cold water. These conditions are most favourable for the production of prussic acid, especially if the mash or gruel is allowed to stand even for a short time before using.

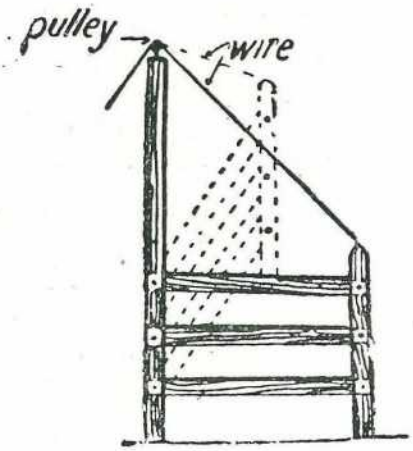
(3) If it is desired to feed the linseed cake meal or crushed linseed meal wet, the following procedure should be adopted:—Add the linseed in small portions to boiling water, 3 lb. of linseed to 2 gallons of water, and boil for twenty minutes. This will destroy the enzyme and obviate all risk of the formation of poison. It is a good practice to add ½ lb. of wheat flour in the form of a paste five minutes before the gruel has finished boiling. This counteracts the laxative effect of the linseed, and the gruel so formed may be kept for several days.

Linseed cake and linseed meal should be fed dry to calves. No advantage is gained by preparing a gruel and adding it to the separate milk at feeding time. Better results will be obtained by giving the milk alone and then feeding the cake and meals dry in a trough than by adopting the troublesome and more costly method of making gruel. Moreover, if calves have been trained to eat dry meals they can be more easily weaned and kept in a thriving condition when the supply of milk has to be reduced.

In conclusion, it may be emphasised that cattle of all ages may be poisoned by the incorrect use of linseed cake. All risk can be avoided by feeding the material dry or by boiling it before use.* It is dangerous to steep any form of linseed in water that is not boiling and then to feed it to cattle after it has been allowed to stand for some time.

HANDY GATE.

A swing gate is often difficult to open from horseback when driving stock. The illustration shows a gate which, by means of a long wire, can be lifted upwards and backwards. The crossbars move on loose bolts, with play enough to permit the gate to fold up; but not loose enough to make the gate shaky. Washers should be employed on both sides of the uprights to prevent the timber wearing away around the bolt holes. Gates with double latch and hinge pieces lend themselves to this style of construction.—"Australasian."



HANDY GATE.

* The Department of Agriculture and Stock is having a test made at Warren State Farm to determine the value of feeding linseed in a dry state to calves.

EGG-LAYING COMPETITION.

MOUNT GRAVATT.

During the month 4,424 eggs were laid, being an average of 17 eggs per bird after allowing for vacant pens. A regrettable feature has been the loss by death of birds in Messrs. Woodward's and Ward's pens. These competitors were leading in Sections 1 and 2 respectively at the commencement of the month.

The following are the individual scores:—

SECTION 1.

White Leghorns.

Competitor.	A.	B.	C.	D.	E.	F.	Total.
W. and G. W. Hindes	207	203	192	214	217	223	1256U
Mrs. R. E. Hodge	190	193	177	210	167	184	1121U
John J. McLachlan	184	202	191	175	208	158	1118
W. E. Woodward	156	198	191	167	205	185	1102
S. L. Grenier	203	208	205	141	171	167	1095
E. J. Stilton	179	172	172	206	201	147	1077
Eclipse Poultry Farm	205	194	152	188	162	171	1072
H. Fraser	136	196	198	201	193	147	1071U
R. C. J. Turner	188	169	183	197	161	173	1071
M. F. Marsden	178	194	174	163	177	184	1070
Jas. Earl	195	180	137	186	158	178	1034U
G. W. Cox	144	162	203	191	173	157	1030
B. Driver	194	161	109	175	190	200	1029
H. P. Clarke	168	183	151	172	160	190	1024U
Geo. Marks	153	202	157	151	205	153	1021
Jas. Hutton	192	161	213	134	156	161	1017U
W. Wakefield	190	197	145	185	164	123	1004
N. F. Newberry	150	170	190	161	158	151	980
L. Bird	174	122	159	150	207	164	976U
J. Harrington	124	173	98	207	176	196	974
T. H. Craig	137	191	121	178	173	163	965
Mrs. Clarke	134	184	166	154	176	118	932
Mrs. C. E. Lindley	171	107	100	198	179	174	929U
Chris. A. Goos	192	137	123	163	141	154	910
E. Anderson	103	122	158	138	184	202	907U
A. S. Walters	158	151	136	159	112	181	897
J. E. G. Parnell	164	117	158	197	113	128	877
T. W. Honeywell	152	2	186	169	160	148	817
W. D. Melrose	188	140	64	18	162	15	587

SECTION 2.

Black Orpingtons (except where stated).

Competitor.	A.	B.	C.	D.	E.	F.	Total.
Eclipse Poultry Farm	195	168	181	205	163	208	1120U
Mrs. A. E. Gallagher	185	175	183	167	176	214	1100U
H. Cutcliffe	154	174	187	172	192	191	1074U
E. W. Ward	192	168	167	157	168	155	1007
Jas. Potter	183	157	162	157	169	161	989
Carinya Poultry Farm	176	190	125	121	168	159	939
W. and G. W. Hindes	199	143	132	105	162	191	933
G. E. Rodgers	162	194	169	130	184	92	931
R. Burns	165	135	156	169	156	129	910
Thos. Hindley	198	116	180	116	141	122	873
W. D. Melrose	20	144	163	193	163	138	821
J. Pryde (R. I. Reds)	150	148	89	170	101	163	821
C. Dennis	161	137	181	154	64	112	809
E. Walters	68	97	155	143	150	135	748
Jas. Hutton	173	154	83	66	81	151	708
E. C. Stead	79	97	122	96	118	125	637U

"U" indicates that the pens failed to obtain the average weight of 24 ounces to the dozen.

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF DECEMBER, IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING DECEMBER, 1925 AND 1924, FOR COMPARISON.

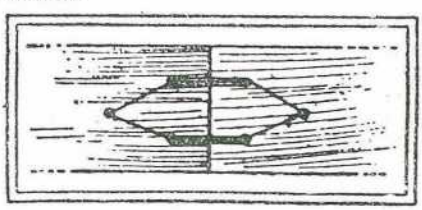
Divisions and Stations.	Average Rainfall.		Total Rainfall.		Divisions and Stations.	Average Rainfall.		Total Rainfall.	
	Dec.	No. of Years' Records.	Dec., 1925.	Dec., 1924.		Dec.	No. of Years' Records.	Dec., 1925.	Dec., 1924.
North Coast.					*South Coast—continued:*				
	In.		In.	In		In.		In.	In.
Atherton	7·69	24	7·55	11·48	Nambour	6·26	29	4·56	6·74
Cairns	9·12	43	1·71	15·48	Nanango	3·78	43	3·21	2·44
Cardwell	8·45	52	1·35	7·36	Rockhampton ...	4·65	38	3·90	7·57
Cooktown	7·10	49	0·60	18·03	Woodford ...	5·42	38	4·04	2·70
Herberton	5·59	38	5·54	3·66					
Ingham	7·15	33	1·99	6·73	*Darling Downs.*				
Innisfail	12·13	44	1·49	14·19					
Mossman	13·10	17	5·96	17·51	Dalby	3·16	55	4·57	3·23
Townsville	5·54	54	5·03	8·33	Emu Vale ...	3·60	29	1·64	3·01
					Jimbour	3·14	37	3·21	2·85
Central Coast.					Miles	2·78	40	4·86	5·61
					Stanthorpe ...	3·50	52	2·37	2·32
Ayr	3·91	38	1·22	4·51	Toowoomba ...	4·27	53	3·49	5·52
Bowen	4·43	54	2·13	2·99	Warwick	3·50	60	1·40	2·34
Charters Towers ...	3·59	43	0·87	2·94					
Mackay	6·79	54	8·33	6·96					
Proserpine	8·49	22	2·02	5·93					
St. Lawrence ...	4·55	54	2·21	2·46	*Maranoa.*				
South Coast.					Roma	2·42	51	3·08	2·10
Biggenden	4·47	26	5·51	4·49					
Bundaberg	4·68	42	6·45	3·62	*State Farms, &c.*				
Brisbane	4·90	74	6·17	1·56					
Childers	5·48	30	7·02	4·42	Bungeworgorai ...	2·79	11	2·11	1·54
Crohamhurst ...	6·83	30	5·48	4·20	Gatton College ...	3·45	25	2·97	1·94
Esk	4·40	38	4·19	2·39	Gindie	2·77	26	5·78	3·73
Gayndah	4·04	54	4·43	5·60	Hermitage ...	3·06	19	1·41	2·53
Gympie	5·70	55	10·39	3·95	Kairi	6·58	10	5·19	9·51
Caboolture	5·05	38	5·98	3·18	Sugar Experiment Station, Mackay	8·12	28	12·77	6·17
Kilkivan	4·37	46	6·95	5·42	Warren	3·48	11	3·52	3·56
Maryborough ...	4·70	53	6·43	4·47					

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for December, 1925, and for the same period of 1924, having been compiled from telegraphic reports, are subject to revision.

GEORGE G. BOND, Divisional Meteorologist.

MENDING HARNESS WITH WIRE.

A good way to mend harness, or in fact any kind of strap, is with a piece of small copper wire, about twenty gauge. Take a small leather punch, making holes in the piece to be mended about half an inch apart as shown in the accompanying illustration. Also half an inch back, punch other holes for lines. Wider straps need more holes, but if the wire is pulled firmly and evenly you will find the strap as firm and strong at the splice as elsewhere. By tapping with a hammer the splice will be perfectly smooth. Thresher belts can be laced with wire as well or better than with lace leather.



Farm Notes for March.

Land on which it is intended to plant winter cereals should be in a forward stage of preparation. Sowings of lucerne may be made at the latter end of the month on land which is free from weed growth and has been previously well prepared.

The March-April planting season has much in its favour, not the least of which is that weeds will not make such vigorous growth during the next few months, and, as a consequence, the young lucerne plants will have an excellent opportunity of becoming well established.

Potato crops should be showing above ground, and should be well cultivated to keep the surface soil in good condition; also to destroy any weed growth.

In districts where blight has previously existed, or where there is the slightest possible chance of its appearing, preventive methods should be adopted—*i.e.*, spraying with "Burgundy mixture"—when the plants are a few inches high and have formed the leaves; to be followed by a second, and, if necessary, a third spraying before the flowering stage is reached.

Maize crops which have fully ripened should be picked as soon as possible and the ears stored in well-ventilated corn cribs, or barns. Selected grain which is intended for future seed supplies should be well fumigated for twenty-four hours and subsequently aerated and stored in airtight containers. Weevils are usually very prevalent in the field at this time of the year and do considerable damage to the grain when in the husk.

The following crops for pig feed may be sown:—Mangel, sugar beet, turnips and swedes, rape, field cabbage, and carrots. Owing to the small nature of the seeds, the land should be worked up to a fine tilth before planting, and should contain ample moisture in the surface soil to ensure a good germination. Particular attention should be paid to all weed growth during the early stages of growth of the young plants.

As regular supplies of succulent fodder are essentials of success in dairying operations, consideration should be given to a definite cropping system throughout the autumn and winter, and to the preparation and manuring of the land well in advance of the periods allotted for the successive sowings of seed.

The early planted cotton crops should be now ready for picking. This should not be done while there is any moisture on the bolls, either from showers or dew. Packed cotton showing any trace of dampness should be exposed to the sun for a few hours on tarpaulins, bag or hessian sheets, before storage in bulk or bagging or baling for ginning. Sowings of prairie grass and *phalaris bulbosa* (Toowoomba canary grass) may be made this month. Both are excellent winter grasses. Prairie grass does particularly well on scrub soil.

Dairymen who have maize crops which were too far advanced to benefit by the recent rains, and which show no promise of returning satisfactory yields of grain, would be well advised to convert these into ensilage to be used for winter feed. This, especially when fed in conjunction with lucerne or cowpea, is a valuable fodder. Where crops of Soudan grass, sorghum, white panicum, Japanese millet, and liberty millet have reached a suitable stage for converting into ensilage, it will be found that this method of conserving them has much to recommend it. Stacking with a framework of poles, and well weighting the fodder, is necessary for best results. All stacks should be protected from rain by topping off with a good covering of bush hay built to a full eave and held in position by means of weighted wires.

Orchard Notes for March.

THE COASTAL DISTRICTS.

As soon as the weather is favourable, all orchards, plantations, and vineyards that have been allowed to get somewhat out of hand during the rainy season should be cleaned up, and the ground brought into a good state of tilth so as to enable it to retain the necessary moisture for the proper development of trees or plants. As the wet season is frequently followed by dry autumn weather, this attention is important.

Banana plantations must be kept free from weeds, and suckering must be rigorously carried out, as there is no greater cause of injury to a banana plantation than neglect to cultivate. Good strong suckers will give good bunches of good fruit, whereas a lot of weedy overcrowded suckers will only give small bunches of undersized fruit that is hard to dispose of, even at a low price.

The cooler weather will tend to improve the carrying qualities of the fruit, but care must still be taken to see that it is not allowed to become overdeveloped before it is packed, otherwise it may arrive at its destination in an overripe and consequently unsaleable condition. The greatest care should be taken in grading and packing fruit. Only one size of fruit of even quality must be packed. Smaller or inferior fruit must never be packed with good large fruit, but must always be packed separately as required by regulation.

The marketing of the main crop of pineapples, both for canning and the fresh fruit trade, will be completed in the course of the month, and as soon as the fruit is disposed of plantations which are apt to become somewhat dirty during the gathering of the crop must be cleaned up. All weeds must be destroyed, and if blady grass has got hold anywhere it must be eradicated, even though a number of pineapple plants have to be sacrificed, for once a plantation becomes infested with this weed it takes possession and soon kills the crop. In addition to destroying all weed growth, the land should be well worked and brought into a state of thorough tilth.

In the Central and Northern districts, early varieties of the main crop of citrus fruits will ripen towards the end of the month. They will not be fully coloured, but they can be marketed as soon as they have developed sufficient sugar to be palatable; they should not be gathered whilst still sour and green. Citrus fruits of all kinds require the most careful handling, as a bruised fruit is a spoilt fruit, and is very liable to speck or rot. The fungus that causes specking cannot injury any fruit unless the skin is first injured. Fruit with perfect skin will eventually shrivel, but will not speck. Specking or blue mould can therefore be guarded against by the exercise of great care in handling and packing. At the same time, some fruit is always liable to become injured, either by mechanical means, such as thorn pricks, wind action, hail, punctures by sucking insects, fruit flies, the spotted peach moth, or gnawing insects injuring the skin. Any one of these injuries makes it easy for the spores of the fungus to enter the fruit and germinate. All such fruit must therefore be gathered and destroyed, and so minimise the risk of infection. When specked fruit is allowed to lie about in the orchard or to hang on the trees, or when it is left in the packing sheds, it is a constant source of danger, as millions of spores are produced by it. These spores are carried by the wind in every direction, and are ready to establish themselves whenever they come in contact with any fruit into which they can penetrate. Specking is accountable for a large percentage of loss frequently experienced in sending citrus fruits to the Southern States, especially early in the season, and as it can be largely prevented by the exercise of necessary care and attention, growers are urged not to neglect these important measures.

Fruit must be carefully graded for size and colour, and only one size of fruit of one quality should be packed in one case. The flat bushel-case (long packer) commonly used for citrus fruits, does not lend itself to up-to-date methods of grading and packing, and we have yet to find a better case than the American orange case recommended by the writer when he came to this country from California in 1892, and which has again proved its superiority in the recent shipments of oranges from

the Southern States to England. Failing this case, a bushel-case suggested by the New South Wales Department of Agriculture is, in the writer's opinion, the most suitable for citrus fruits, and were it adopted it would be a simple matter to standardise the grades of our citrus fruit, as has been done in respect to apples packed in the standard bushel-case used generally for apples throughout the Commonwealth. The inside measurements of the case suggested are 18 in. long, 11¾ in. wide, and 10½ in. deep. This case has a capacity of 2,200 cubic inches, but is not included in the schedule of the regulations under "*The Fruit Cases Acts*, 1912-1922." The half-bushel case, No. 6 of the Schedule above referred to, is 10 in. by 11¾ in. by 5¼ in. inside measurements with a capacity of 1,100 cubic inches. The case should be suitable for oranges and the half-case for mandarins. No matter which case is used, the fruit must be sweated for seven days before it is sent to the southern markets, in order to determine what fruit has been attacked by fruit fly, and also to enable bruised or injured fruit liable to speck to be removed prior to despatch.

Fruit fly must be systematically fought in all orchards, for if this important work is neglected there is always a very great risk of this pest causing serious loss to citrus growers.

The spotted peach-moth frequently causes serious loss, especially in the case of navels. It can be treated in a similar manner to the codlin moth of pip fruit, by spraying with arsenate of lead, but an even better remedy is not to grow any corn or other crop that harbours this pest in or near the orchard. Large sucking-moths also damage the ripening fruit. They are easily attracted by very ripe bananas or by a water-melon cut in pieces, and can be caught or destroyed by a flare or torch when feeding on these trap fruits. If this method of destruction is followed up for a few nights, the moth will soon be thinned out.

Strawberry planting can be continued during the month, and the advice given in last month's notes still holds good. Remember that no crop gives a better return for extra care and attention in the preparation of the land and for generous manuring than the strawberry.

GRANITE BELT, SOUTHERN AND CENTRAL TABLELANDS.

The advice given in these notes for the last few months regarding the handling, grading, and packing of fruit should still be carefully followed. The later varieties of apples and other fruits are much better keepers than earlier-ripening sorts, and as they can be sent to comparatively distant markets, the necessity for very careful grading and packing is, if anything, greater than it is in the case of fruit sent to nearby markets for immediate consumption. Instruction in the most up-to-date methods of grading and packing fruit has been published by the Department, which advice and instruction should enable the growers in that district to market their produce in a much more attractive form.

The same care is necessary in the packing of grapes, and it is pleasing to note that some growers are packing their fruit very well. Those who are not so expert cannot do better than follow the methods of the most successful packers.

Parrots are frequently very troublesome in the orchards at this time of the year, especially if there is a shortage of their natural food. So far, there is no very satisfactory method of combating them, as they are very difficult to scare, and, though shooting reduces their numbers considerably, they are so numerous that it is only a subsidiary means.

As soon as the crop of fruit has been disposed of, the orchard should be cleaned up, and the land worked. If this is done, many of the fruit-fly pupæ that are in the soil will be exposed to destruction in large numbers by birds, or by ants and other insects. If the ground is not worked and is covered with weed growth, there is little chance of the pupæ being destroyed.

Where citrus trees show signs of requiring water, they should be given an irrigation during the month, but if the fruit is well developed and approaching the ripening state, it is not advisable to do more than keep the ground in a thorough state of tilth, unless the trees are suffering badly, as too much water is apt to produce a large, puffy fruit of poor quality and a bad shipper. A light irrigation is therefore all that is necessary in this case, especially if the orchard has been given the attention recommended in these notes from month to month.

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.

1926.	JANUARY.		FEBRUARY.		MOONRISE. JAN.	FEB.
Date.	Rises.	Sets.	Rises.	Sets.	Rises.	Rises.
					p.m.	p.m.
1	5·1	6·48	5·25	6·45	8·30	8 54
2	5·2	6 49	5·26	6·45	9 6	9 27
3	5 3	6·49	5 27	6·44	9·44	9·59
4	5·3	6·49	5 28	6·43	10 16	10·33
5	5·4	6·49	5 29	6·42	10 55	11 9
6	5·5	6 50	5·30	6·42	11·25	11·49
7	5 5	6·50	5 30	6 41	12·0	nil
						a.m.
8	5 6	6 50	5 31	6 40	nil	12 32
					a.m.	
9	5 6	6 50	5 32	6 39	12·36	1 24
10	5·7	6 50	5 33	6 38	1 14	2·21
11	5 8	6 50	5·33	6·38	1·57	3·24
12	5 9	6 50	5·34	6 37	2 45	4 32
13	5·10	6 50	5·35	6 37	3 41	5·41
14	5·11	6 50	5 36	6 36	4·43	6 49
15	5 12	6·50	5 36	6 35	5 47	7·56
16	5·12	6 50	5 37	6 34	6 58	9 0
17	5·13	6 50	5·38	6·34	8·7	10 2
18	5 14	6 49	5 38	6·33	9 13	11·3
19	5 15	6·49	5 39	6·32	10 15	12·0
						p.m.
20	5·16	6 49	5 40	6 31	11 14	12 52
					p.m.	
21	5·16	6 49	5·40	6 31	12 14	1·53
22	5 17	6 49	5 41	6 30	1·12	2·46
23	5·18	6 48	5·41	6·29	2·8	3·37
24	5·19	6·48	5·42	6·28	3·3	4 22
25	5·20	6 48	5·42	6·27	3·58	5 4
26	5·20	6·47	5·43	6 26	4·49	5·44
27	5·21	6 47	5 44	6 25	5 38	6·21
28	5 22	6·46	5 55	6·24	6·25	7 5
29	5·23	6·46	...	...	7·6	...
30	5·24	6·45	...	...	7·45	...
31	5·25	6·45	...	...	8·20	...

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.

7 Jan.	☾	Last Quarter	5 22 p.m.
14 ,,	●	New Moon	4 35 p.m.
21 ,,	☽	First Quarter	8 31 a.m.
29 ,,	○	Full Moon	7 35 a.m.

Apogee, 2nd January, at 8 36 p.m.
Perigee, 15th January, at 9 36 a.m.
Apogee, 30th January, at 2 24 a.m.

About two hours before sunset on the 14thinstant, the sun will undergo a total eclipse, when viewed from parts of the world a good deal to the north and west of Australia. From a portion of Queensland north of Townsville, and of Perth, in Western Australia, a glimpse of a partial eclipse of the sun will be obtained, but for the rest of Australia no difference in the ordinary appearance of the sun will be observable.

The nearest approach of the earth to the sun will occur on the 2nd instant, at 2 p.m. On the following day Venus will attain its greatest brilliancy. Saturn will be in conjunction with the moon on the 10th, at 12·47 p.m., when it will be 2 degrees 47 seconds south of that luminary. Jupiter will be lost to view this month on account of its being in conjunction with the sun on the 25th. The Southern Cross will be below the horizon in Queensland until about 10 p.m., in the early part of the month, but becoming visible earlier as the days proceed. It will be lying on one side about 50 degrees eastward of the southern meridian, at first about midnight but later in the month nearer 11 p.m.

6 Feb.	☾	Last Quarter	9 25 p.m.
13 ,,	●	New Moon	3 20 a.m.,
19 ,,	☽	First Quarter	10 36 p.m.
28 ,,	○	Full Moon	2 51 a.m.

Perigee, 12th February, at 10 21 p.m.
Apogee, 25th February, at 3 12 a.m.

As Venus will be in inferior conjunction with the sun—that is, nearly in a straight line with it—on the 7th, when its dark side only will be presented toward the earth, it will be lost to sight for the greater part of this month. On the 16th Mercury will be in superior conjunction with the sun—that is, on the far side of its orbit and apparently so close to the sun as to be invisible. An interesting occultation of the star delta Geminorum, a star of magnitude 3·5, will occur on the 23rd. With a pair of binoculars or small telescope the star should be seen on the east side of the moon, which will approach the star and suddenly occult it shortly after 7 p.m., before the bright edge of the moon has quite reached it. About an hour later, in Southern Queensland, the star will reappear on the western side of the moon, but it will be more difficult to notice its reappearance on account of the brighter edge of the moon on that side. In the north the occultation of the star will be of shorter duration.