ANNUAL RATES OF SUBSCRIPTION.—Farmers, Graziers, Horticulturists, and Schools of Arts, **One Shilling,** members of Agricultural Societies, **Five Shillings,** including postage. General Public, **Ten Shillings,** including postage.

Vol. XLIX. 1 FEBRUARY, 1938. Part 2

Event and Comment

Animal Health.

SOME of the methods of dealing with disease in stock used by the State veterinary services were discussed by the Minister for Agriculture (Mr. Frank W. Bulcock) in the course of a recent address to Brisbane Rotarians. He said that at first glance the matter of animal health was the concern solely of sheep and cattle men, but, in reality, it was one which affected the prosperity of the whole State. The extent to which preventive veterinary practice could be applied, and its influence on the economy of the pastoral industry, was revealed by current statistics.

Originally the Council of Scientific and Industrial Research and State Departments had worked separately, but now practically complete co-operation between Commonwealth and State authorities in matters pertaining to animal health had been achieved. The major cause of economic loss in the sheep industry was the blowfly, and he expressed the opinion that until the agricultural research worker received a reward commensurate with his importance in the community and at least comparable with that obtained in commercial callings, there would be a lag in the discovery and application of remedial measures. Brains had to be paid for, and results could not be obtained unless the right men were appointed and paid in accordance with their worth to the community. Research showed fifty years ago that the tick was not really the cause of tick fever, as had hitherto been suspected. A satisfactory means of reducing mortality in cattle from this cause had been found, but complete immunity had yet to be discovered.

Describing the extent and availability of the veterinary services of his Department to the man on the land, Mr. Bulcock quoted a recent instance of the notification by a studmaster of the outbreak of a mysterious disease among his rams. From the minute details supplied, anthrax was suspected. A mobile veterinary unit was despatched immediately from the Department, and the disease was quickly diagnosed as blackleg. The fact that a mobile laboratory could be sent and the flock inoculated without delay had no doubt prevented the disease from spreading, thus saving serious loss to the pastoral industry.

Similar services, the Minister added, were available to the dairy industry. Testing cattle for tuberculosis was going on day after day throughout the dairying districts of the State. Dealing generally with the veterinary activities of his Department, he stressed that they involved not only the improvement of the conditions of animal husbandry, but also contributed vastly to the maintenance of public health.

Queensland's Future.

"I CAN see a tremendous future for Queensland. You have so much natural wealth here that with a well-directed policy you could make tremendous strides and increase output in all directions." Dr. Hugh Dalton, M.P., chairman of the National Executive of the British Labour Party, with that expression of opinion in the course of an interview prefaced a very interesting commentary on what he had observed as a visitor to the State.

Dr. Dalton said that he had had glimpses of the forestry, sugar, agricultural, and cattle industries during his brief stay, and he had been very impressed with what he had seen. He was astonished to see the great variety of crops and fruit that could be grown in Queensland by white labour, and he was amazed at the standard of health and prosperity here.

"I was very impressed with the way your Government has taken hold of the situation and is planning the development of the State with the standard of living of the people a primary consideration," Dr. Dalton stated.

"You don't want coloured labour, but well-paid, efficient white labour. The labour in Queensland is very efficient, and I was struck with the efficiency and fine physique of the workers."

Referring to the overseas marketing of our products, Dr. Dalton said that the Labour Party in Great Britain liked the idea of bulk purchasing. By bulk purchasing and planned trade he thought there could be a big increase in the trade between Australia and Great Britain.

"By planned trade I do not mean either free trade or protection," he added. "A protective tariff is put on owing to the requirements of particular interests, but without being worked into a framework of public policy and planning in the community interest. Planned, organised exchange of goods . . . . there is great scope for that.

"I would like to see a big growth in the exports of chilled beef from Australia. It would be better from the point of view of developing the British Commonwealth of Nations if Great Britain were to get more chilled beef from Australia than from sources outside the Empire."

Dr. Dalton is a keen believer in reafforestation, and a great supporter of the Forestry Commission which was set up in Great Britain in 1919 to acquire land and plant softwood. He was very impressed, he said, by his visit to the State forests at Beerwah.

Pine trees grew much faster in Queensland than in other parts of the world, and he thought there were great possibilities for commercial reafforestation in this State. He thought that there would be a good market for all the softwoods that could be grown here, and there seemed to be considerable areas of land in the Beerwah district, and no doubt in other parts of the State, which were suitable for the planting of softwoods. The market for Queensland cabinet timbers was expanding rapidly in Great Britain, and they were being used for a great variety of purposes. He expressed the opinion that forestry operations in Queensland were being carried out in a very scientific way.

Empire Trade.

MORE imaginative publicity for Australian produce in London and experiments in bulk trading between organisations set up in the two countries were suggested by Dr. Dalton in a subsequent address to State and Federal members of Parliament and other guests at a luncheon at Parliament House.

Dr. Dalton was welcomed by the Governor (Sir Leslie Wilson) and the Premier (Hon. W. Forgan Smith), who paid a tribute to Dr. Dalton as a scholar and a distinguished member of the House of Commons.

Dr. Dalton said he could be depended on as a firm advocate of the interests of Queensland and Australia generally in the British Parliament and the United Kingdom.

In the House of Commons in 1924 he had voted in favour of increasing the margins of preference on Empire products, including sugar, dried fruits, wines, and tobacco. Ever since he had been trying to get his money back by getting an Empire tobacco he could smoke with enjoyment, and he had done his best with Empire wines.

Empire wines were of a high quality, but their merits had not been made known to the extent warranted by their quality.

Referring to travel between Australia and England, he said he could not see why there should not be a speedier service by smaller, faster, simpler, and less luxurious ships. If people could get across in less time on a simpler menu it would be a great improvement. Much of the Empire's future depended on whether communications could be made faster. That had been accomplished to some extent by air services, but the more democratic sea travel had not improved correspondingly. Not only would sea travel have to be faster, but the cost would have to be brought down so that it would be easier for people to travel.

Dr. Dalton expressed appreciation of the kindness and hospitality he had received in Queensland. He had been particularly pleased to renew his acquaintanceship with the Premier, who had carved an outstanding name for himself in England, where he was looked upon as a great Queenslander, a great Australian, and a great Britisher.

The Varieties of Guinea Grass *(Panicum maximum)* Cultivated in Queensland.

C. T. WHITE, Government Botanist.

GUINEA Grass, which, as its name indicates, is a native of tropical Africa, is probably the most extensively cultivated grass for grazing and cutting throughout the tropical regions of the world. It has never become an important fodder grass in Queensland in the same way as Rhodes, Paspalum, Kikuyu, and a few others, though it has always been known that stock are extremely fond of it. The reasons for its limited use have probably been the difficulty of establishing the grass from seed, and the necessity for cultivation before planting. The ordinary form is perhaps more suitable for cutting than grazing, and under grazing conditions has the reputation of tending to disappear in a short time.

What we regard as the ordinary or common form of Guinea Grass has been cultivated in Queensland for many years, and occurs wild in many places, especially in vacant allotments, and as a weed of coastal fruit farms, &c. During the past few years several strains of this grass have been introduced, and two of these are very different from those previously grown here, and show, I think, a decided improvement on the ordinary form, particularly the one known as Green Panic or Slender Guinea Grass. This form would probably lend itself to establishment in newly burned country in somewhat the same way as Rhodes or Paspalum.

COMMON GUINEA GRASS (Panicum maximum).

This is a tall grass, in favoured circumstances attaining a height of 9 feet. The seed heads are from 9 inches to over a foot in length, and much the same across. They are spreading with a number of slender branches. The spikelets (''seeds'') are pale-green in colour, sometimes with a purplish tinge. They are borne in great abundance, are about an eighth of an inch long, and consist of a short outer rounded glume about one-quarter the length of the spikelet and two longer inner glumes or lemmas loosely enclosing the grain. Though seed is produced in great abundance, the percentage of fertility in commercial samples tested by this Department has been very low.

DESCRIPTION OF PLATE 41.

GUINEA GRASS (*Panicum maximum*).

A.—Seed head of Guinea Grass (*Panicum maximum*), half natural size.

B1.—Base of leaf and top of leaf sheath of Common Guinea Grass (*Panicum maximum*), natural size.

B2.—Single spikelet of Common Guinea Grass (*Panicum maximum*) x 10.

C1.—Base of leaf and top of leaf sheath of Green Panic or Slender Guinea Grass (*Panicum maximum* var. *trichoglume*), natural size.

C2.—Single spikelet of Green Panic or Slender Guinea Grass (*Panicum maximum* var. *trichoglume*) x 10.

D1.—Base of leaf and top of leaf sheath of Purple-topped Guinea Grass (*Panicum maximum* var *coloratum*), natural size.

D2.—Single spikelet of Purple-topped Guinea Grass (*Panicum maximum* var. *coloratum*) x 10.

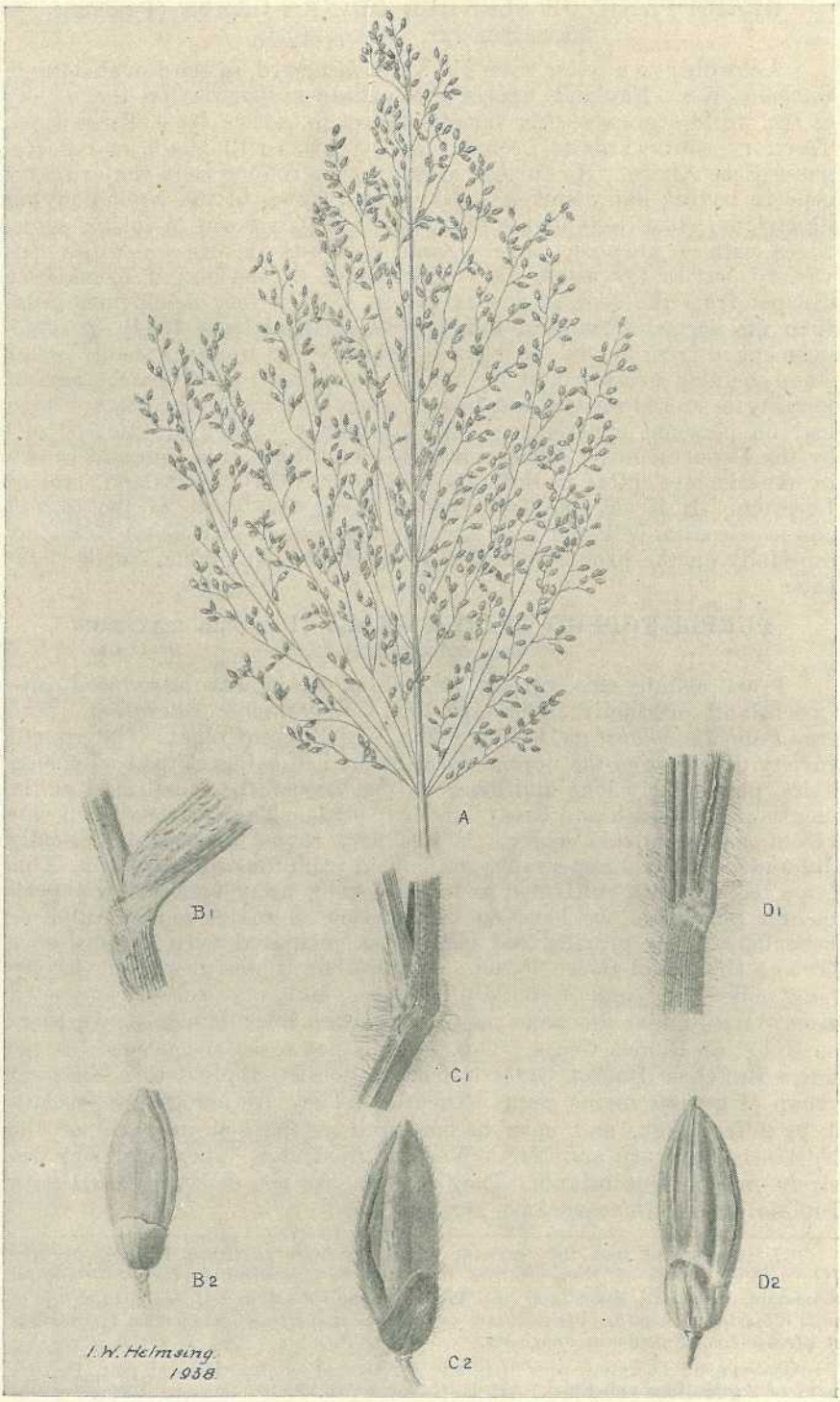

Plate 41.
GUINEA GRASS (*Panicum maximum*).

GREEN PANIC OR SLENDER GUINEA GRASS (Panicum maximum var. trichoglume).

According to a letter from Mr. C. E. Hubbard, of the Royal Botanic Gardens, Kew, England, one of the leading authorities on the botany of the world's grasses, this variety occurs in Africa from Tanganyika Territory, southwards to Bechuanaland, Southern Rhodesia, and Portuguese East Africa. He further states that it differs from the ordinary type in having hairy spikelets, which are shown in the accompanying illustration; like those of the type, they are pale-green in colour, sometimes with a purplish tinge. Some botanists do not recognise this variety, but so far as we have observed in Queensland it seems very distinct from the type in general habit It is a very much finer grass than the normal form, and would probably lend itself freely to establishment in fresh burns. It is much less cany and would probably better stand regular grazing and periodical feeding-off. The percentage of fertility in stored seed is said to be higher, but on this question I have had no personal experience. This particular variety was introduced by the Department of Agriculture and Stock some time ago and grown in experimental plots in different places in North Queensland, and at Lawnton. It is suitable for growing along the whole of the coastal and near-coastal belt, as I have seen excellent stands of it about Brisbane, especially on the property of Mr. W. R. Petrie, at Petrie, North Coast Line.

PURPLE-TOPPED GUINEA GRASS (Panicum maximum var. coloratum).*

I am calling this variety *coloratum*, as it was introduced into Queensland originally under the name of *Panicum coloratum*. The true *Panicum coloratum*, however, is a very different plant. The present variety differs from the normal form in the leaf being clothed with long hairs, particularly long and dense at the base of the sheath and at the mouth of the sheath and base of the leaf blade. The spikelets when ripe are of a dark purple colour. It is a very robust grass and markedly different in general appearance in the field from the ordinary form. This grass has not been cultivated as far as I know away from a few experimental plots, and we have no information as to its fodder value or behaviour under grazing and cutting as compared with the ordinary Guinea Grass and Green Panic. At one time it was grown in Queensland under the name of Red Buffel Grass, and was probably imported from Africa under this name, as Guinea Grass is sometimes known there as Buffel or Buffels Grass. This name is not to be encouraged, as the name Buffel or Buffels Grass is more generally applied to a different group of grasses in the genus Cenchrus. They are low grasses, mostly 1 to 2 feet high, and have become well established in parts of the Northern Territory and North-Western Australia. They are comparatively rare in Queensland. They in turn are not to be confused with Buffalo Grass, *Stenotaprhum secundatum*.

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* I cannot find that this varietal name has been published before. By the International Rules of Nomenclature it should be described in Latin:—*Panicum maximum* Jacq. var. *coloratum*, var. nov. *Gramen robustum ad. 3m. altum. Folia pilis albis longis obsita, pilis adbasem vaginarum et ad basin laminarum longioribus et densioribus. Spiculæ atropurpuræ.*

Queensland: Lawnton, near Brisbane (cultivated in experimental plot, Department of Agriculture and Stock). F. B. Coleman, No. T. 167, March, 1932 (Type of the variety).

Wild Sunflower—A Plant Poisonous to Stock.

COMMONLY known as wild sunflower, *Verbesina encelioides*, a hardy annual, grows in the Maranoa, Darling Downs, and Lockyer districts. At the end of dry periods it is often seen in patches of several hundred plants on vacant pieces of ground. It has frequently been suspected of causing mortalities in both sheep and cattle.

It recently came under suspicion in the Pittsworth district, where it was suspected of causing the death of a number of cattle which had been grazing on an area where the plant was growing in abundance. The most noticeable lesion was a definite pneumonia with marked oedema of the lungs.

It would appear that the plant is not readily eaten by stock. It is woody in nature, and not palatable, and is therefore more likely to be consumed during periods of dry weather when other feed is scarce.

Through the assistance of Mr. P. Round, the Pittsworth Stock Inspector, a quantity of material was obtained from the Mount Tyson district.

Feeding and Drenching Experiments.*

A. *Guinea pigs and rabbits* were first tested. After starving they were given various quantities of the leaves cut up into small portions. They did not take this readily, though starving. The plant was then mixed with various quantities of bran, but the animals still refused to eat the mixture, except when large quantities of bran were used. Owing to this method proving unsatisfactory feeding tests with these animals were not continued.

B. *Sheep.—Wether No.* 104, full mouth, in good condition.

This animal was first starved for twenty-four hours, and then fed with small quantities of leaves cut up into little pieces. They were not relished, and over a period of three days only about half a pound was consumed. Attempts were made to induce the animal to eat the plant mixed with bran, but it was refused.

A watery extract obtained by grinding up 1 lb. of stalks and leaves, then damping overnight and extracting in a press next morning, was administered after twenty-four hours' starvation. The result was negative. Further amounts of extract were obtained in the same manner using 2 lb. of leaves and administered on each of two occasions after starving overnight. Again the results were negative.

Wether No. 105.—Full mouth, good condition.

Starved for twenty-four hours and then drenched by the stomach tube with 1,500 ml. of watery extract obtained by mincing 2 lb. of leaves and then standing overnight in a basin with sufficient water added just to cover the minced plant. The animal appeared normal during the

* Feeding tests conducted at Animal Health Station, Yeerongpilly. This work was carried out under the aegis of the Poison Plants Committee of the Department of Agriculture and Stock. Funds for this purpose have been provided by the Australian Wool Board.

day, but died overnight. Post-mortem showed little change in the intestinal tract, but there was a distinct pneumonia. The lungs were engorged, the blood vessels being distended except at the apical lobes. There was diffuse oedema throughout, being particularly noticeable in the interlobular tissue. Gelatinous oedema was marked around the bifurcation of the trachea. Between 2 to 3 pints of blood-stained fluid were present in the pleural cavity.

Wether No. 107. Full mouth, in good condition.

This sheep was, after starving for twenty-four hours, drenched with a watery extract obtained from 1 lb. of leaves of old plant. The result was negative. A few days later it received watery extract from 2 lb. of leaves from the mature plant, and nine days later a further watery extract obtained from a further 2 lb. of the young plant. The results were negative.

Wether No. 106. Full mouth, in good condition.

After starving this sheep received the watery extract from 1 lb. of the young plant. The results were negative. Three weeks later it was again starved for twenty-four hours and drenched with the watery extract obtained from 2 lb. of the young plant. The result was again negative.

The conclusions, however, are that the plant is definitely toxic to sheep, producing a typical type of pneumonia associated with congestion and oedema, which is particularly marked in the interlobular tissue.

C. Bovines. Bovine 174. A red shorthorn steer about 2 years old, in store condition.

It was first drenched by the stomach tube without previous starvation with the watery extract obtained from 2 lb. of mature plant (about litres). The result was negative. Over a period of three weeks it was drenched after previous starvation on four occasions with the watery extract obtained from 4 lb. of the mature plant. On the first occasion 4 lb. of the leaves were just damped before being pressed out. On the second occasion the 4 lb. of seed heads and leaves were soaked overnight and then pressed out, and on the third occasion when 4 lb. of seed heads and leaves were again soaked overnight. Administration in each case was after twenty-four hours' starving. On the last and fourth occasion 4 lb. of seed heads and leaves were soaked overnight, and then after pressing out given after forty-eight hours' starvation. The results were negative.

Conclusions.

1. *Verbesina encelioides* is definitely poisonous.

2. It produces a characteristic pneumonia with marked congestion and oedema, which is particularly noticeable along the interlobular septa.

3. Animals vary in their susceptibility to the plant.

4. The characteristic lesion seen in the lung is identical with that observed in natural cases.

Cattle Lice.

F. H. S. ROBERTS, D.Sc., Animal Health Station, Yeerongpilly.

THERE are few districts in Queensland where lice are not serious on cattle at some time or other, both dairy and beef cattle of all ages being affected. The pests are most troublesome during the winter and spring when the pastures are dry and the animals poor in condition. Heavy infestations may be present also at other times of the year, and in such cases are associated either with drought or general unthriftiness. Again, animals which are stabled for any considerable length of time may carry large numbers of lice. The conditions under which lice become serious are not fully known, but are thought to be concerned with the animals' health. It is known, for instance, that the large numbers which are seen during dry seasons dwindle to insignificant proportions shortly after good rains have fallen.

Lice feed upon the tissues of the host. They cause considerable irritation, and to relieve this the animal scratches and rubs itself against any convenient object. As a result there is a marked loss of hair, the skin becomes scaly, and large sores and scabby areas appear. Cattle are unable to feed and rest to the normal extent. The final effect is a loss of condition, which at times can be severe. The infestations are all the more serious as they usually occur during dry times, when cattle find it difficult to secure sufficient nourishment for their own bodies without feeding large numbers of lice as well. Lice, by lowering the vitality of an animal, also render it more susceptible to inclement weather and to other diseases. Thus the damage and loss caused by lice are sufficiently serious to warrant careful consideration and the application of proper treatment.

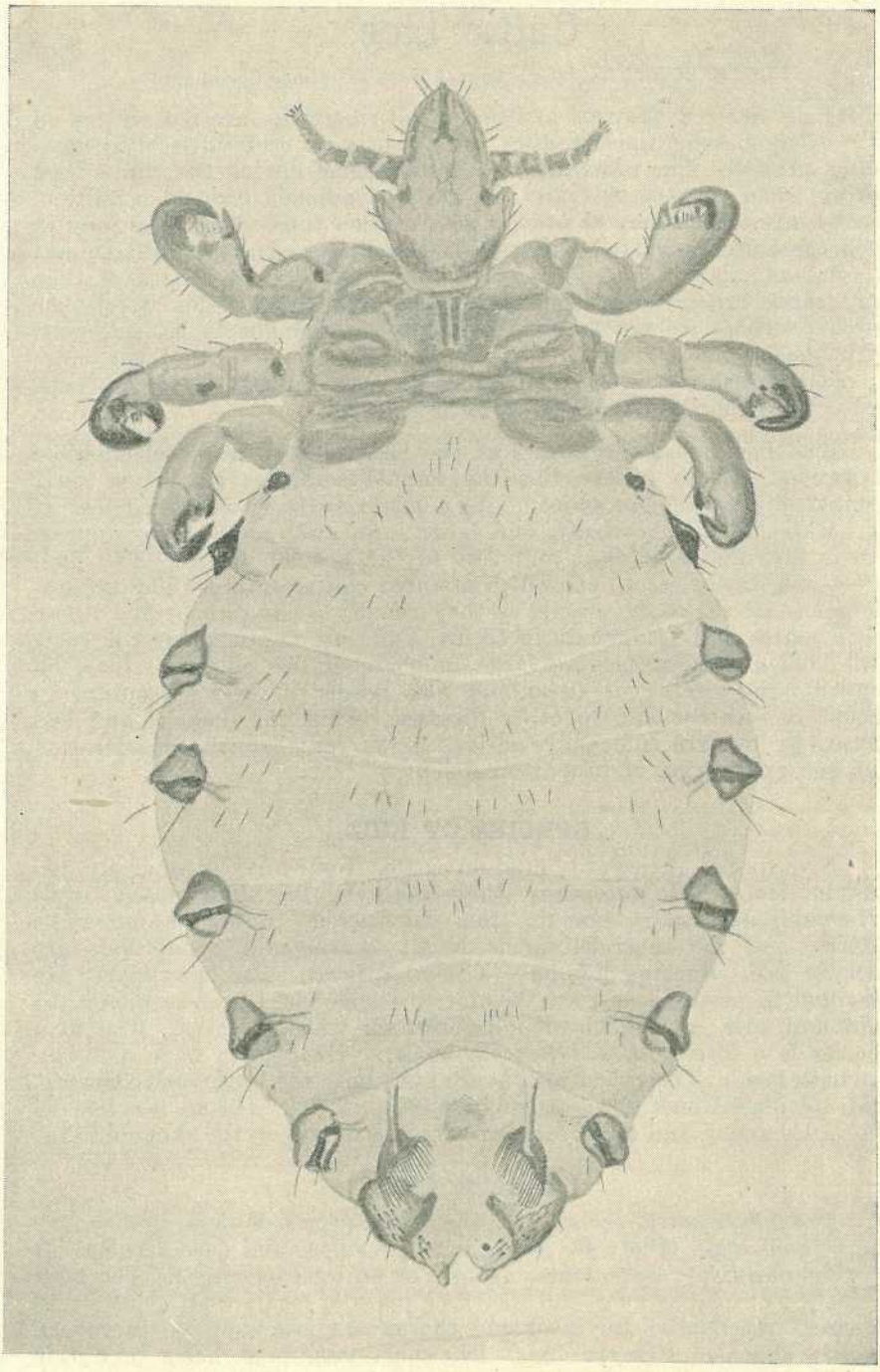
SPECIES OF LICE.

Five species of lice are found on cattle. Four of these—namely, the buffalo louse (*Hæmatopinus tuberculatus*), the short-nosed louse (*Hæmatopinus eurysternus*), the long-nosed louse (*Linognathus vituli*), and the tubercle-bearing louse (*Solenopotes capillatus*)—are sucking lice. Sucking lice have a pointed head. The mouthparts are terminal in position, and are tubular to enable the insect to pierce the skin and suck up the blood and fluids on which it lives. The fifth species is a biting louse (*Bovicola bovis*). Biting lice have a broad, squarish head. Their mouthparts are built only for biting and chewing, and are placed on the under surface of the head. Biting lice live on the scales, scurf, and other material which is found on the skin surface.

Sucking Lice.

The Short-nosed Louse.—Of the four species of sucking lice, the short-nosed louse (Plate 42) is the most prevalent and most serious. It is a comparatively large louse, up to ⅛ of an inch in length. The head is about as broad as long, and the three pairs of legs are all about equal in size. When alive the head and thorax are yellow-brown in colour, and the abdomen a greyish-blue. The short-nosed louse has a very wide distribution, and is the louse most usually found on grown cattle.

The Buffalo Louse.—The buffalo louse, which is found normally on the Indian buffalo, is known to occur on cattle only in the Gulf districts,



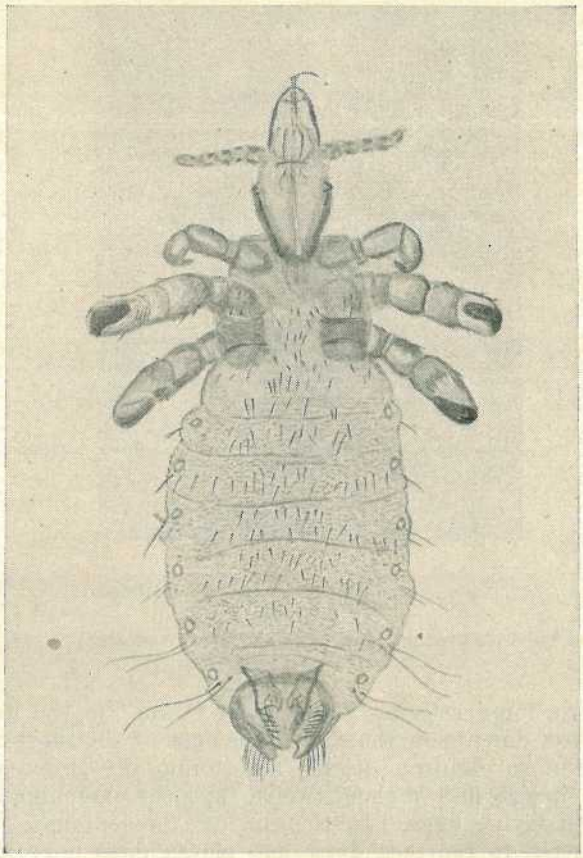
[*I. W. Helmsing.*

Plate 42.

The Short-nosed Louse (*Hæmatopinus eurysternus*) × 48.

and it is doubtful if it is to be regarded as serious. This species is very similar in general appearance to the short-nosed louse, from which it can be distinguished only by microscopic examination.

The Long-nosed Louse.—This species (Plate 43) is next in prevalence and importance to the short-nosed louse. It is usually found on young cattle, but is by no means uncommon on grown animals, especially dairy cattle. It has the same general colouration as the short-nosed louse, but is smaller and more slender in appearance. The head is long and narrow, being much longer than broad, and the forelegs are smaller than the middle and hind legs.



[*I. W. Helmsing.*

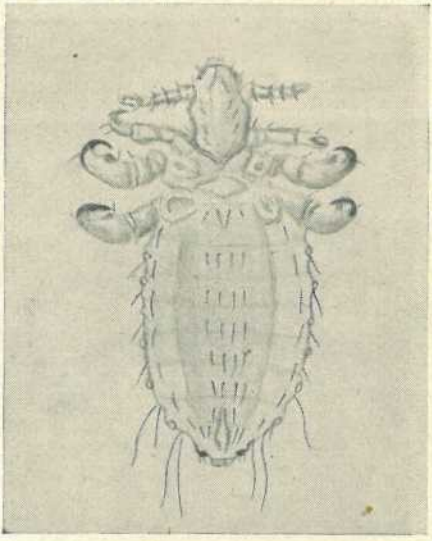
Plate 43.

The Long-nosed Louse (*Linognathus vituli*) × 48.

The Tubercle-bearing Louse—This louse gets its common name from the position of the abdominal spiracles or breathing pores, which open on small laterally placed tubercles (Plate 44). It is the smallest of the sucking lice, and is only about half the size of the short-nosed louse. It has a short, bluntly-rounded head, and, as in the long-nosed louse, the forelegs are smaller than the middle and hind legs. This louse is

probably a comparatively recent introduction into Queensland, but is now well distributed over the southern part of the State.

Habits and Life History.—Sucking lice feed in groups or clusters and are usually found on the top of the head, around the eyes, on the neck, brisket, withers, rump, tail, inside the thighs, and on the scrotum or udder. The most favoured sites are those from which the animal has most difficulty in dislodging them. Their habit of feeding in groups, and the fact that they feed by piercing the skin, make sucking lice more serious than biting lice.



[*I. W. Helmsing.*

Plate 44.

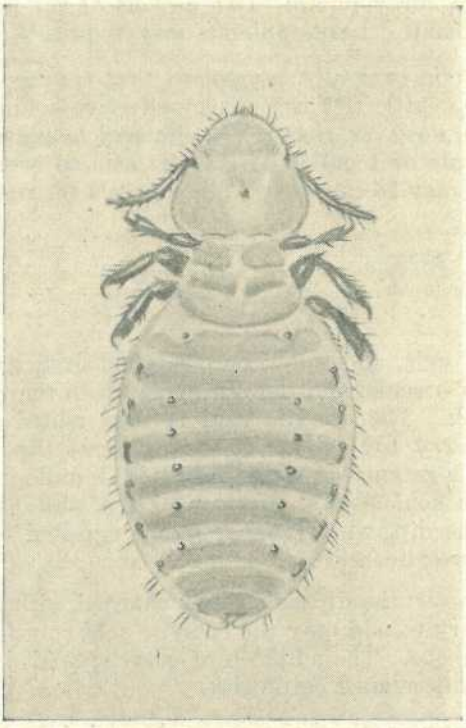
The Tubercle-bearing Louse (*Solenopotes capillatus*) × 48.

The female louse attaches her eggs or "nits" to the hairs of the coat, usually low down near the skin. The eggs of the short-nosed louse hatch in eleven to eighteen days. The young lice differ from their parent chiefly in size, and in about twelve days after hatching are mature and commence laying eggs. In the case of the long-nosed louse, the eggs hatch in ten to fourteen days, and eleven days later the lice are mature. Details of the life histories of the buffalo louse and the tubercle-bearing louse are unknown.

Biting Lice.

The biting louse (Plate 45) is not uncommon, but is neither as prevalent nor as important as either the short-nosed or long-nosed species. It is a small louse, with a broad, blunt, reddish head and a yellowish-white abdomen. The shape of the head readily distinguishes it from the sucking lice. It may occur on cattle of all ages, and is commonly seen on dairying stock.

Habits and Life History.—Biting lice are found most commonly on the top of the head, on the neck, shoulders, withers, along the back, hips, and rump. As mentioned before, they are not as serious as sucking lice, but when sufficiently numerous may cause sores, on which the pests concentrate. The eggs, which are glued to the hairs, hatch in about nine days, the young lice reaching maturity about fourteen days later.



[*I. W. Helmsing.*

Plate 45.

The Biting Louse (*Bovicola bovis*) × 48.

TREATMENT AND CONTROL.

Lice live and breed only upon the body of the animal. Occasionally they may become detached from the host, in which case biting lice are said to live as long as seven days and sucking lice about four days. Eggs which become detached may hatch even after twenty days, and the young lice that emerge may live as long as three days. It is possible, therefore, that there is a risk of infestation from yards and stables which have held lousy cattle; but the chief manner by which lice spread is undoubtedly by contact. By treating infested animals with fluids which kill the lice, the infestations can be controlled and, if the treatment is carefully carried out, completely eradicated.

Treatment may be applied either by washing, spraying, or dipping.

Spraying and Washing.—This method of treatment is practicable only when small numbers of animals are concerned, such as dairy herds and stud cattle. Nicotine sulphate is an excellent fluid for this purpose.

It is used at the rate of 5 cubic centimetres (almost 2 teaspoonfuls) to a gallon of water. *Nicotine sulphate is a very poisonous drug and the greatest care should be taken when handling it.* The drug should contain 40 per cent. or thereabouts of nicotine, and should not be used in any stronger proportions than that advised. The diluted solution can be applied with equal effectiveness either by washing with a rag or brush or by means of a spray pump. Two gallons of the mixture suffice for average-sized animals. Large animals may require 3 gallons.

Dipping.—It is generally recognised that the arsenic-soda dipping fluid used against cattle tick is not very effective against lice. There is reason to believe, however, that if cresylic acid is added to this dipping solution at the rate of 1 gallon of cresylic acid to every 400 gallons of dip, good results may be expected. The formula for such a dip is:—

Arsenic	8 lb.
Caustic Soda	5 lb.
Cresylic Acid	1 gallon.
Water	400 gallons.

The arsenic, soda, and water are prepared first, using 2 lb. of soda for every 8 lb. of arsenic, and the dip made up to the required quantity as for cattle tick. The cresylic acid is then added in the following manner:—*For every* 400 *gallons* of the prepared dip, dissolve 3 lb. of caustic soda in 3 gallons of water and add 1 gallon of cresylic acid. Add the cresylic acid slowly, stirring all the while. This solution is then added to the dip, which is thoroughly agitated to secure an even solution of the cresylic acid.

Should, however, the dip be already charged with arsenic and soda, it will be necessary to add only the cresylic acid solution prepared with caustic soda as above. The addition of cresylic acid does not affect the efficiency of the dip against cattle tick.

While spraying or dipping may be depended upon to kill the lice, *it is important to remember that these fluids have little effect upon the eggs;* consequently, if only one treatment is given, animals remain clean only until lice emerge from the eggs which have not been killed by the dip. A second treatment is thus given after such an interval as will permit all eggs not killed by the first treatment to hatch, but not sufficiently long to allow the young lice to mature and lay further eggs. The interval between treatments is fourteen to sixteen days. Sometimes a third treatment may be necessary. If these recommendations are properly carried out, lice may be completely eradicated.

The best time to dip is during the autumn or early winter, thus sending the cattle into the winter free from lice. The muster should be as complete as practicable, as any lousy animals that escape treatment can readily reinfest the rest of the herd. The beneficial effects of autumn dipping may be summed up in the words of a grazier whose cattle had suffered very severe infestations for many years, but who in the autumn of this year dipped twice—that "although the winter rainfall was well below average, the cattle wintered better than ever before."

Banana Growing in Queensland.

H. J. FREEMAN, Senior Instructor in Fruit Culture, and Chief Inspector of the Banana Industry Protection Board.

[*Continued from page 57, January,* 1938.]

HOLING AND PLANTING.

STEEP hillsides being the usual location for establishing banana plantations, the important work of holing and planting is by no means easy. On the contrary, it involves heavy labour, such as digging holes in awkward situations, levering out big and obstinate stones, and carrying bags of plants for distribution along each new row. Naturally, the cleaner the ground surface after the burn, the easier this work becomes.

The planting distances adopted more or less generally throughout Queensland are 10 feet by 10 feet or 12 feet by 12 feet apart for the Cavendish variety, and 12 feet by 12 feet or 14 feet by 14 feet for Mons Marie. Sugar bananas are planted 14 feet by 14 feet, while Lady's Fingers, because of their height and particularly vigorous growth, are spaced from 14 feet by 14 feet up to 18 feet by 18 feet apart. The aim is to get the lines of plants as straight as possible up and down hill, and this is accomplished by running a reasonably straight line across the lowest section of the cleared land and another across the highest portion.

If the area of land to be planted is too great, or the steepness of the grade will not allow a sight to be taken from one line to the other, additional cross-lines at convenient intervals would have to be run. Measure off each line, driving a sighting stick into the ground at every 10 feet, or whatever other distance is required. The sighting sticks are handiest if cut about 6 or 7 feet long, sharpened to a good point at one end, and with a piece of newspaper about 1 foot wide bound around the other end to present an easily distinguishable mark when sighting through. Having a supply of these "sighters," one man proceeds to place a stick at about every 5 chains up each row, while a second man sights from the lowest stick to the highest, thus keeping the line quite straight. To save cutting too many sticks, sight five rows at a time, moving the sighters over as one works across.

Next cut a long, thin stick for each man engaged in holing-out. This is used as a measuring rod, and should be cut to measurement—i.e., 10 feet, 12 feet, &c., as the case may be. Starting from the lowest "sighter," the first hole is dug. When completed sight the line, placing the measuring stick from the middle of hole just dug straight up the line. The other end of the stick denotes where the centre of the next hole should be, and so on.

A mattock is the best tool for holing-out, but the blade must be kept strong, long, and sharp. A reinforced blade is often preferable to a new mattock on account of its additional strength. In any case, at least a 5-lb. mattock is needed for this work. The hole need not be made quite symmetrical, but should be at least 18 inches square by 15 inches

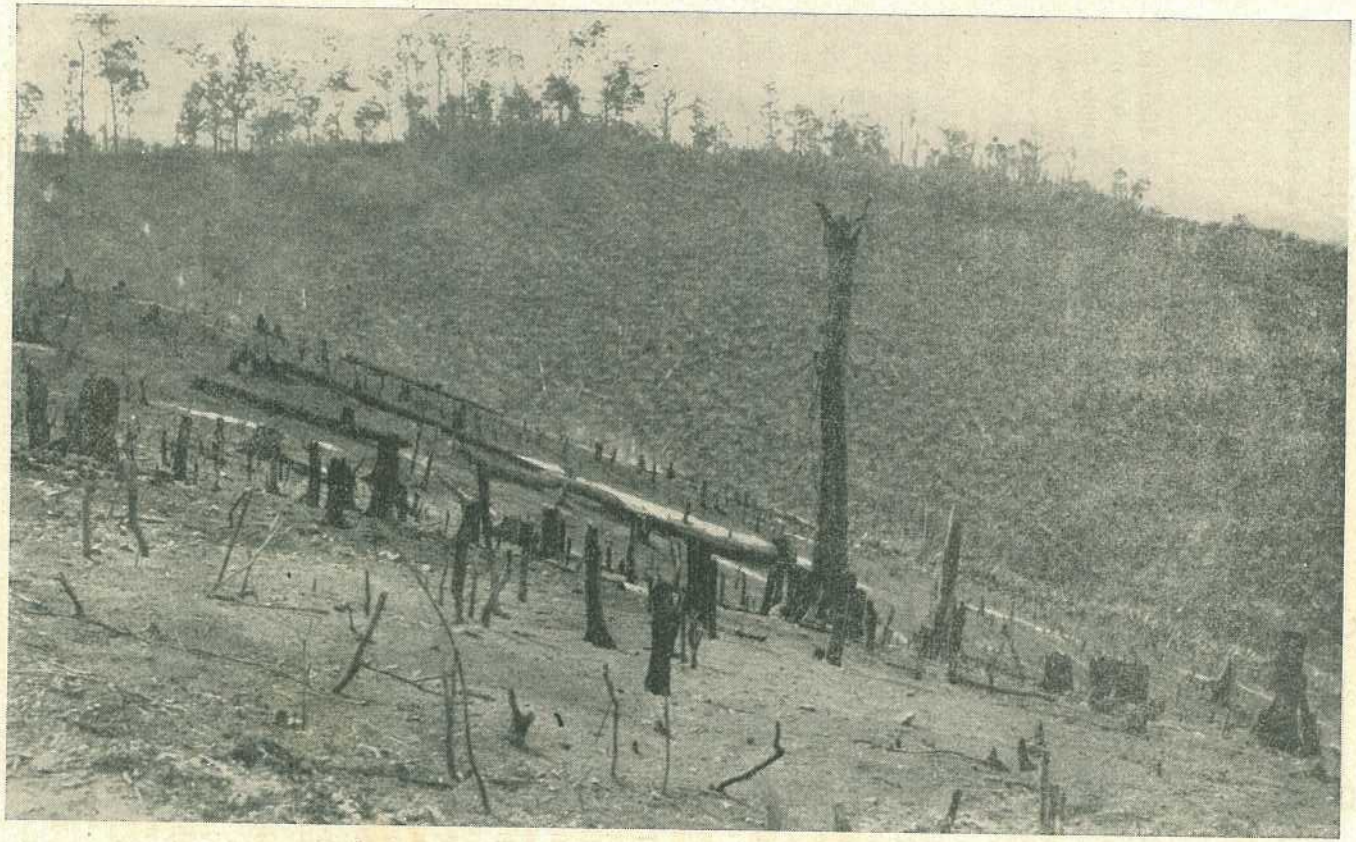


Plate 46.

NEWLY BURNT-OFF SCRUB LAND READY TO HOLE-OUT.—Note row of Lady's Finger bananas planted as a break-wind in background.

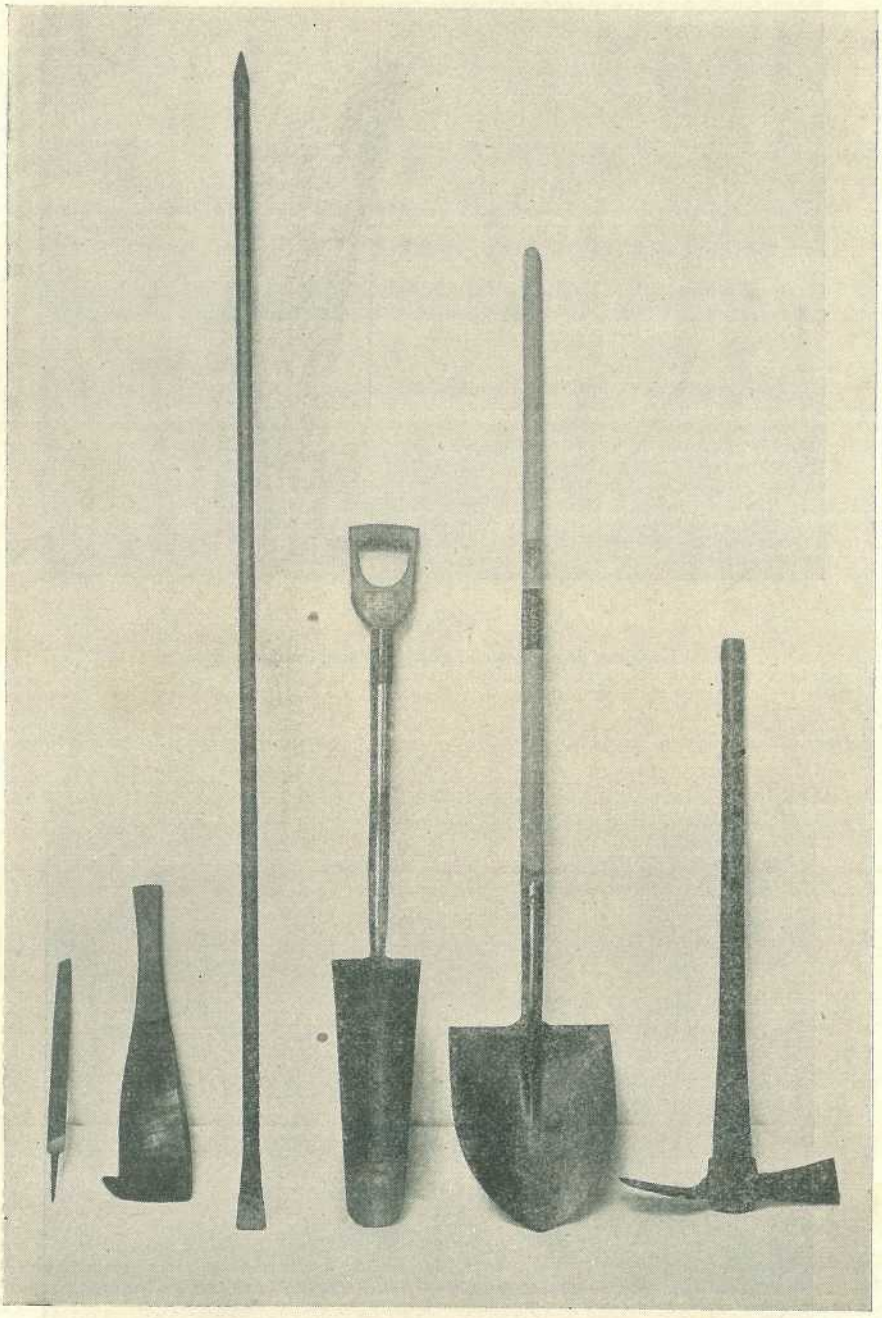


Plate 47.

NECESSARY TOOLS FOR USE IN HOLING-OUT.—(1) 12-inch flat file. (2) Cane Knife for trimming plants. (3) Crowbar. (4) Draining Spade for removing suckers (plants) from the parent stool. (5) Long Handled Shovel. (6) Mattock.

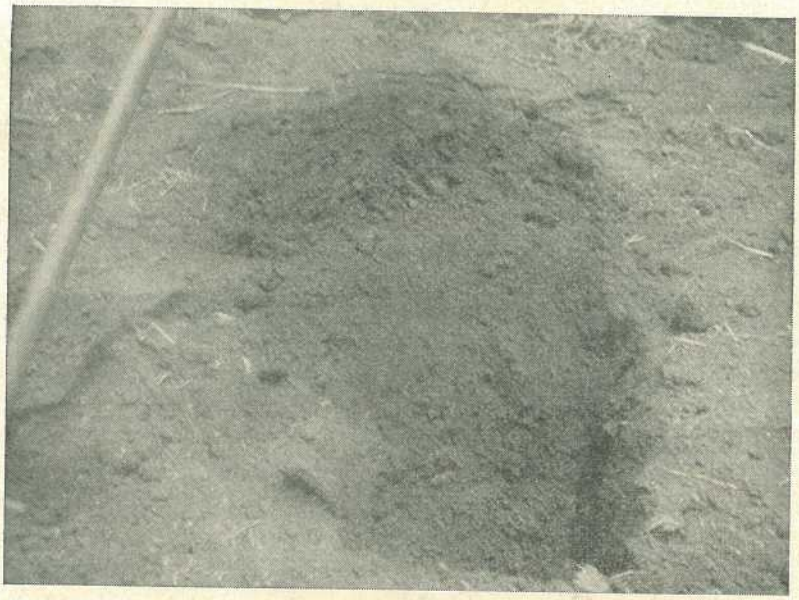


Plate 48.
Looking down into a newly-opened banana hole.

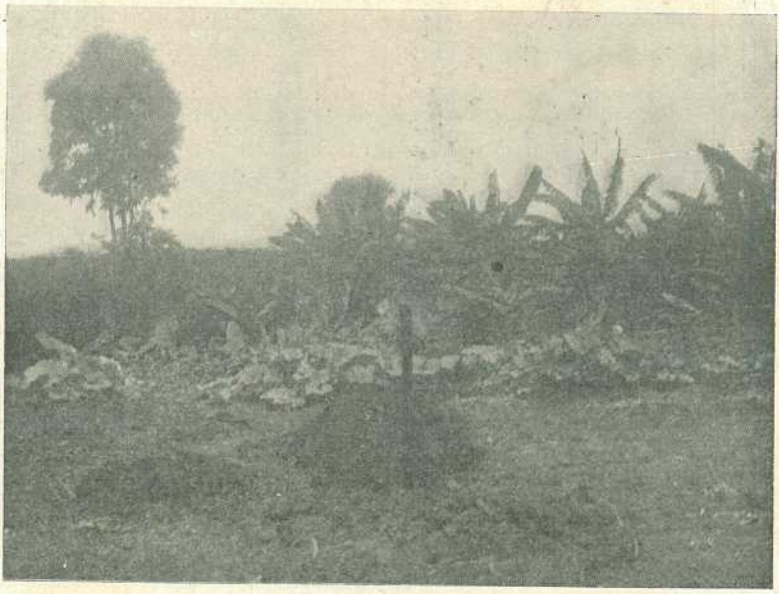


Plate 49.
Showing necessary mound on lower side and size of newly-opened banana hole.

deep. The larger the hole, the greater the quantity of well-broken-up soil which can be filled in around the young plant, thus enabling the young roots to get a good start. In digging holes for bananas, the earth as removed should be drawn to the lower side, making a small mound, for by so doing erosion from around the young plant is prevented. (See Plates 48 and 49.)

Occasionally big stones which are difficult to remove are met with. Where stones can be taken out without undue loss of time, a crowbar is the best tool to use. If too large to shift without very much trouble, it is better to dig the hole a little above or below the stone, whichever is more suitable.

Some growers use a crowbar, mattock, and shovel for holing-out, but as the use of a shovel has a tendency to make the hole similar to a post-hole, with straight sides and a smooth, hard bottom, the method is not recommended. By using a mattock only, the sides of the hole are made somewhat sloping and irregular, and the bottom of the hole is broken and covered to a varying extent with well-broken soil.

The plants are usually carried in corn-sacks from the parent plantation, and finally deposited within or adjacent to the new area. The bags should be opened, plants tipped out, and a final inspection made of the material before planting. Any diseased, weak, or faulty plants should be destroyed. Then, again using a corn-sack, pack in the plants for distribution throughout the field. Sometimes a temporarily-erected overhead wire can be used to assist in this work, while, better still, an improvised pack-saddle and a quiet horse may be brought into service. To make such a saddle, take two corn-sacks, cut them open lengthwise, lap two separate ends over 6 or 7 inches, and sew them strongly together with hemp. Then fold the other ends back on to the main part of the sack so as to make two open pockets when sewn. Put an ordinary riding saddle on the horse, and throw the bag carrier over the saddle. Fill the carrier with plants, and then lead the horse between the rows, unloading the plants from both near and off sides into the adjacent holes. About 1½ cwt. of plants can be distributed each load in this way. Where the land is too steep for a horse to stand (actually where it is almost precipitous), man power is the only means of distributing the planting material.

A mattock is then brought into use for planting. A small amount of surface soil is broken into the hole from the top bank. The plant is placed in the centre of the hole in an upright position, and sufficient soil is dug from the top and side banks to surround the plant with soil to a depth of about 4 inches. This soil should be tramped down firmly; another thin layer of loose soil spread over this surface will complete the job. Looking down on to the plant, it will be seen as set in a shallow basin in which the soil has been well worked. The high mound on the lower side will prevent erosion and offer better conditions for the young plant's roots on the downhill side.

[TO BE CONTINUED.]

Citrus Budwood Selection in Queensland.

H. BARNES, Director of Fruit Culture; and R. L. PREST, Instructor in Fruit Culture.

STANDARDISATION of varieties is a fundamental principle in commercial citrus-growing. In older established orchards, which were planted before any special attention was given to budwood selection, growers are well aware of the existence of trees producing poor crops of fruit of all shapes and of indifferent quality. In most cases, these old trees can be reworked with selected buds to make them produce good fruit. The method is not difficult, and to those orchardists who are not certain how to proceed the Department will willingly make available the services of an instructor to demonstrate in the orchard how the work is done.

Plate 50.

Type of tree now being propagated under the Departmental budwood scheme.

Growers who have planted during the past two or three years, and those intending to plant, are not confronted with the same difficulties of standardising their varieties as were the older growers, because the best varieties have now been classified as 'A" grade and the poorer varieties as "B" grade. "A" grade varieties comprise—

Oranges—

Washington Navel.
Valencia Late.
Joppa.
White Siletta.

Mandarins—
Beauty of Glen Retreat.
Emperor.
Scarlet.

Lemons—
Lisbon.
Villa Franca.

Grapefruit—
Marsh Seedless.

All other varieties are classed as "B" grade.

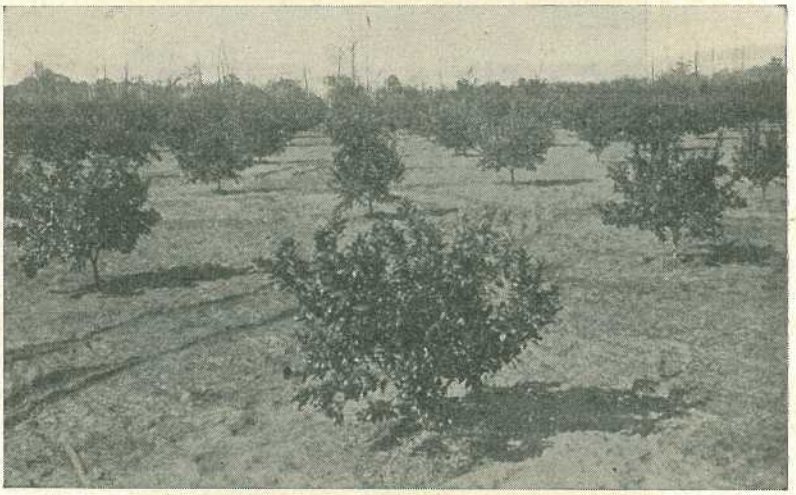


Plate 51.
Desirable types of trees propagated under the budwood scheme—twelve months planted.

It is further provided by regulation that no trees of "A" grade varieties shall be sold in Queensland unless they have been worked with buds selected by the Department of Agriculture and Stock. In order to ensure that buds of these varieties would be selected from only the very best trees, the Department, some years ago, undertook a wide survey of the orchards in Queensland, and noted those trees of outstanding merit in respect of health, vigour, size of crops, evenness of fruit, and quality of fruit. From the best of these trees budwood is now selected. Purchasers of citrus trees may, therefore, rest assured that trees of the varieties named purchased from local nurserymen possess reliable characteristics, and when grown under suitable conditions will yield a good standardised product.

To illustrate the extent to which the work of selection by the Department is appreciated by nurserymen and growers, in 1934 the number of buds selected and distributed by the Department was 51,625, in 1935 62,545, in 1936 71,416, and in 1937 the number increased to 83,650. These figures are exclusive of about 16,000 buds supplied outside the State. The demand from Queensland nurserymen is growing so fast each year, however, that now it is only possible to supply our own

requirements. The figures undoubtedly indicate an upward trend in the citrus industry, which, in face of adverse seasonal conditions, is gratifying. There is no doubt that one of the main factors in this improvement in the industry is the high standard of citrus trees now obtainable through the operation of the departmental budwood scheme.

Plate 52.
A tree in the Valencia Late Budwood Plot.

The new plantings are being made on sound commercial lines under the direction of departmental officers. The following figures showing the number of buds of the main varieties distributed in the course of 1937 are interesting, and serve as a measure of the popularity of each variety:—

	Buds.
Valencia Late	14,700
Washington Navel	13,000
Joppa	12,850
Glen Retreat	9,950
Emperor	7,850
Villa Franca	7,300
Lisbon	5,450
Marsh Seedless	4,775

In addition to selecting budwood, the Department also selects each year sufficient seedling orange and bush lemon seed to meet nurserymen's requirements for raising seedlings. For the 1937 season, 45 lb. of lemon seed and 53 lb. of orange seed were distributed. While it is recognised that final selection of seedlings from the seed-bed is the most reliable means of securing vigorous stocks on which to work, nevertheless stronger seedlings are produced from seed selected from vigorous, healthy seedling trees than from seed obtained haphazardly from any convenient source.

Plate 53.
A tree in the Scarlet Mandarin Budwood Plot.

In order to ensure continuity of supply of reliable budwood, the Department, some years ago, established a small orchard in the Gayndah district with trees worked with buds obtained from the best known trees. The plot has made excellent growth, and in a few more years will supply most of the budwood requirements for Queensland citrus nurserymen. Most of the trees are producing fruit of good quality and appearance, and analyses are being made annually of the fruits for comparative

purposes. For example, last season's fruit from three-year-old Washington Navel trees were analysed, with the following result:—

Rind	.. ..	25·0 per cent.
Rag	.. ..	8·6 per cent.
Juice	.. ..	47·5 per cent.
Brix	.. ..	8·44 to 9·29
Acidity	.. ..	0·95 per cent. to 1·07 per cent. citric acid
N/10 Soda Test		14·9 to 16·7

Plate 54.
A Marsh Seedless tree in the Budwood Plot.

This is an exceptionally good result, which will improve very considerably as the trees grow older.

TO CALCULATE CONTENTS OF A CIRCULAR TANK.

A simple formula for finding out the contents of a circular tank, or, in fact, any cylinder:—

The number of gallons in water in 30 feet length of any cylinder equals the square of the diameter in inches. Thus a tank 100 inches in diameter would contain 100^2, or 10,000 gallons of water in a depth of 30 feet; therefore, for a depth of 6 feet the contents would be 2000 gallons.—"The Pastoral Review."

Main Road Construction in Queensland.

IN Queensland, last financial year, 383·63 miles of new roadway—more than a mile a day—were completed and opened for traffic by the Main Roads Commission. In addition, 134·95 miles of previously improved roadway were converted to a higher type to meet the demands of increased traffic; making a total of 518·58 miles. At the close of the year 495·31 miles of new road works and 86·96 miles of stage construction were in progress, representing works approximately one-third completed. The total length of works constructed to 30th June amounted to 4,011·61 miles, including the sections remodelled for increased traffic.

Bridges of all types to an aggregate length of 6,986 feet were completed during the year and an additional 4,063 feet were under construction when the year closed. The total length of bridges completed from inception of operations to 30th June, 1937, was 12·69 miles.

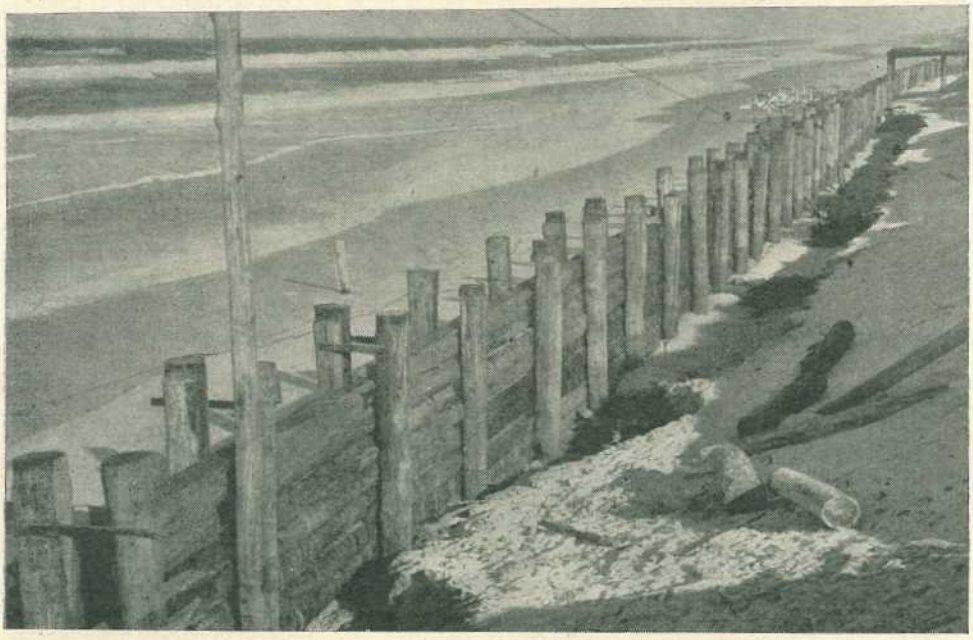


Plate 55.
Protective work at Narrowneck, on the Pacific Highway, near Southport.

In addition to this progressive works programme, all previously constructed sections were kept up to standard with maintenance expenditure. Further than this, unconstructed sections, where permanent works treatment was not possible, received maintenance attention to assist traffic in the meantime. In all, 12,994 miles of road were maintained. This programme resulted in continuous employment for an average of more than 3,000 employees.

The foregoing facts have been taken from the Sixteenth Annual Report of the Commissioner of Main Roads, Mr. J. R. Kemp.

Plate 56.
A Bend in the Barney View Road, looking towards Palen Creek, near Beaudesert.

Plate 57.
Where the Barney View Road joins the New England Highway.

Plate 58.
New Bridge over Tenthill Creek, on the Brisbane-Toowoomba Road.

Plate 59.
ALONG THE LOCKYER-DARLING DOWNS HIGHWAY.—"A" class bridge, with 8-30 feet timber spans, 1-90 feet timber and steel truss span, 20 feet between kerbs, 53 feet maximum above stream bed, constructed by the Main Roads Commission.

Following are further excerpts from Mr. Kemp's report, which are of particular interest to farmers and everyone else concerned with rural development and the general progress of the State. Through the courtesy of the Commission, we also are able to reproduce a series of excellent illustrations from the report, and which give some indication of the immense importance of a great national service.

CONSTRUCTION AND MAINTENANCE.*

Road construction and maintenance are in a constant state of evolution. This is due to the revolution in transport methods which has taken place largely within the life of the Commission. The old high-crowned macadam road has given way to flat-profiled smooth surfaced pavements suitable for fast moving rubber-tyred vehicles which (with the exception of those shod with solid rubber tyres), whilst not imposing such destructive vertical impacts upon road pavement foundations, do impose severe shearing forces to road surfaces. These forces become very destructive at comparatively low traffic densities, and in Queensland the economics of maintenance are such as to require the treatment of surfaces with bitumen, bitumen-tar compounds, concrete, &c., when the traffic density exceeds 100 vehicles per day per traffic lane. Even below this density it would frequently be economical to surface-treat the pavement.

For the lower type roads it is very important that proper selection of materials be made to avoid heavy recurring maintenance costs due to pot-holing and corrugation. For this reason, unsurfaced water-bound macadam is now seldom used in new construction, unless it be intended to surface with tar or bitumen in the near future. In its stead the Commission uses sound hill gravels which usually contain good binder, river gravels which require binding with loam, C class metals, and B or A class metals of harder quality, crushed down so as to make artificial gravels.

River and creek gravels wear well if screened to small size, provided they are well bound with suitable loam (slightly clayey), properly incorporated. This type is named by the Commission as Class E, and some objections have been raised by road users when they learn that an E class road has been selected for their needs in place of C or D. Their fears are groundless, for the selection does not imply a lower type than C or D, but indicates that it is more economical to construct and maintain this type in that particular instance.

The Commission has evolved a simple procedure for testing loams to be used either as binders or for the construction of loam roads where other materials are not available, and one of the tests employed is under consideration by the Australian road authorities as an Australian standard.

The importance of laboratory tests is very great, and the Australian road authorities to-day hold regular conferences of their technical officers in order to arrive at uniform methods and to give each other the benefit of their experience.

Instances can be quoted where the result of tests has indicated that it was more economical to use binders on a haul of several miles than to use the local material. The indications are generally confirmed

* From the Sixteenth Annual Report of the Commissioner of Main Roads for the year ended 30th June, 1937.

Plate 60.
The Road through the Forest to Tin Can Bay.

Plate 61.
The Mary River Road at Fleiter's Hill.

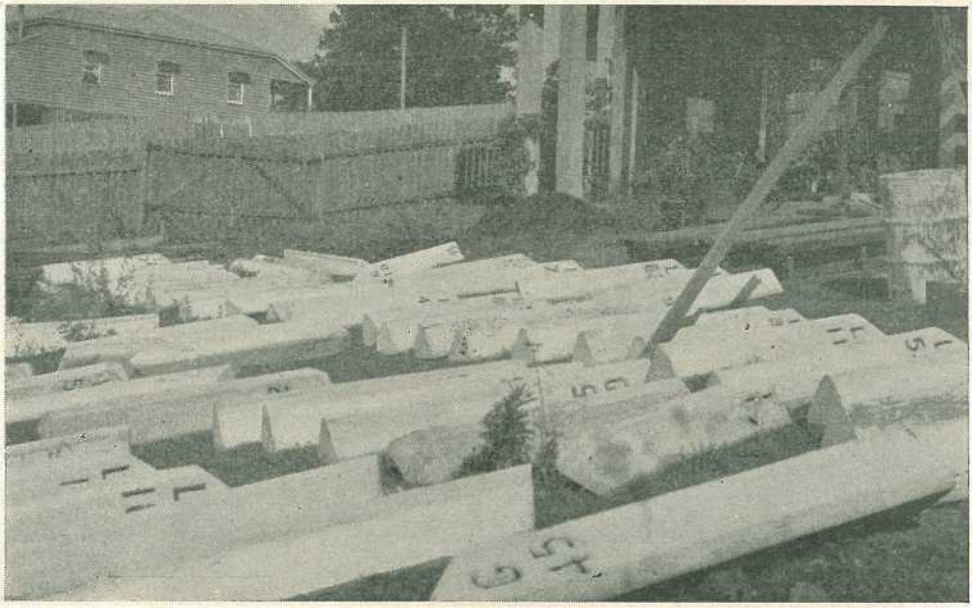


Plate 62.
Mile Posts for Mary River Road ready for distribution.

Plate 63.
Kilkivan-Boonara Road-Wide Bay Creek. Multiple concrete culvert. The old crossing is shown on right,

in practice. It is now generally demanded that roads constructed with C class materials shall have the top course of selected harder material fine-crushed, thus enabling its future maintenance to be undertaken with graders at low cost. This material when free from clay is frequently used, even on roads of high traffic density, in which case it is surfaced with tar and bitumen compounds.

Fine crushed rock is now one of our most valuable surfacing materials for lower type roads. It consists of the run of the crusher from B or A class metals, the harder the metal the smaller the size required, the object all the time being to produce an artificial gravel easy to maintain. In order to produce hard and smooth pavements, traffic consolidation and grading are employed as much as possible on this type of material.

Partially decomposed rhyolites, trachytes, and andesites, amongst other rocks, lend themselves to this treatment, and a fine example is to be seen on the upper portion of the Nerang-Beechmont road in the shires of Nerang and Tambourine.

The importance of cataloguing, classifying, and describing rocks of various classes—each class being economically suitable for certain traffic in certain localities—has long been recognised, and many years ago the University of Queensland did valuable work in this respect. To-day, our requirements are very different in respect of road-building materials from those of even a few years ago.

HEAT TREATMENT.

The two heat treatment plants have continued in almost uninterrupted use in the Cunnamulla, Dirranbandi, and Bollon districts in areas where no other suitable road-making material is available at reasonable cost. The economic use of these machines at present is governed by suitability of the soil and by the cost of other material. This method will only be employed where possible, if the cost of loam or better class road-making material is not less than one and a-half to twice that of the burned material. The sections at Dirranbandi on the Culgoa River flats have been subjected to flood conditions since construction and, although water remained on them for a week, very little damage, even from scour, resulted. The plastic properties of the clays have been completely destroyed in the process of heat treatment. The machine under suitable conditions has effectively burned the soil to a depth of from 2½ to 3 inches at a lineal speed of up to 55 feet per hour (6 feet width).

ROAD SAFETY.

The construction of motor vehicles is not, as far as is known, controlled anywhere in the world by road construction authorities. The capability of vehicles for speed has increased rapidly, due to engine, springing, tyre, braking, and other improvements. Speed upon the open road has increased proportionately, and this increase in average speed, combined with greater traffic density has necessitated increased pavement widths, smoother non-skid surfaces, increased visibility on both horizontal and vertical curves, and greater super-elevation or banking on curves than formerly.

By the expenditure of sufficient money on remodelling and improving roads, it would be possible, within certain limits, to make the roads as safe as they were formerly for the then fewer vehicles travelling

at slower average speeds, but other factors enter into the matter. The increasing number of drivers apparently is adding to the number of irresponsible ones; let us hope not in a higher ratio to safe ones than formerly. At any rate, the number of accidents has increased since the introduction of the motor vehicle, and to such an extent as to warrant drastic action towards control of driving.

The adaptability of the human mind and frame to deal with the driving difficulties associated with increases in speed has finite limits, and it is certain that we will never see an adaptability to speed by the average motorist equal to that of the professional racing track motorist; and so we are faced with the question of how to control traffic for safety upon our roads in a manner consistent with their condition, the density of traffic, and the types of vehicles employed.

The Royal Commission on Transport agreed with the submitted statement of the Commissioner of Police that regulations fixing speeds are necessary. The facts set out below are enough to show this necessity; for the motor vehicle in the hands of a reckless or inexperienced driver is a dangerous projectile, and the heavier the vehicle the more the danger.

The "Main Roads" Journal, Vol. 8, No. 4, published by the Department of Main Roads, New South Wales, contains an illuminating article on the subject of "Speed versus Safety," which gives extracts from articles by R. A. Moyer, Associate Professor, Highway Engineering, of the Iowa State College, U.S.A., in the journal, "Civil Engineering," December, 1936, and February, 1937, issues.

It is there indicated that a slow-thinking driver at 40 miles per hour will travel 59 feet after seeing danger before he can apply brakes. If his brakes are good, he can stop in another 66½ feet, or a total of 125½ feet; but on the average in 107 feet, or a total of 166 feet after seeing danger.

Similarly, at 60 miles per hour, the figures are—

88 feet, plus 150 feet, or 238 feet, with good brakes; and

88 feet, plus 241 feet, or 329 feet, with average brakes;

whilst at 80 miles per hour they are—

117 feet, plus 267½ feet, or 384½ feet, with good brakes; and

117 feet, plus 428 feet, or 545 feet, with average brakes.

The results may be imagined when brakes are faulty or the road slippery and where sharp curves exist, or where road profiles are not perfect.

The same article states that if the brakes on one side exert a force 40 per cent. greater than on the other, the car may suddenly swerve over into the lane of oncoming traffic in an emergency stop at high speeds. Tests on 2,134 cars indicated that 31 per cent. of them had 40 per cent. more braking effort on one side than the other. If cars here are in similar condition—and there is no reason to suppose they are not—it is evident for this reason alone that high speeds are dangerous on our roads, which have not, for financial reasons, been built to the high-speed standards of more important American and English highways.

High speeds, it is quite evident then, demand greater road widths for given traffic density.

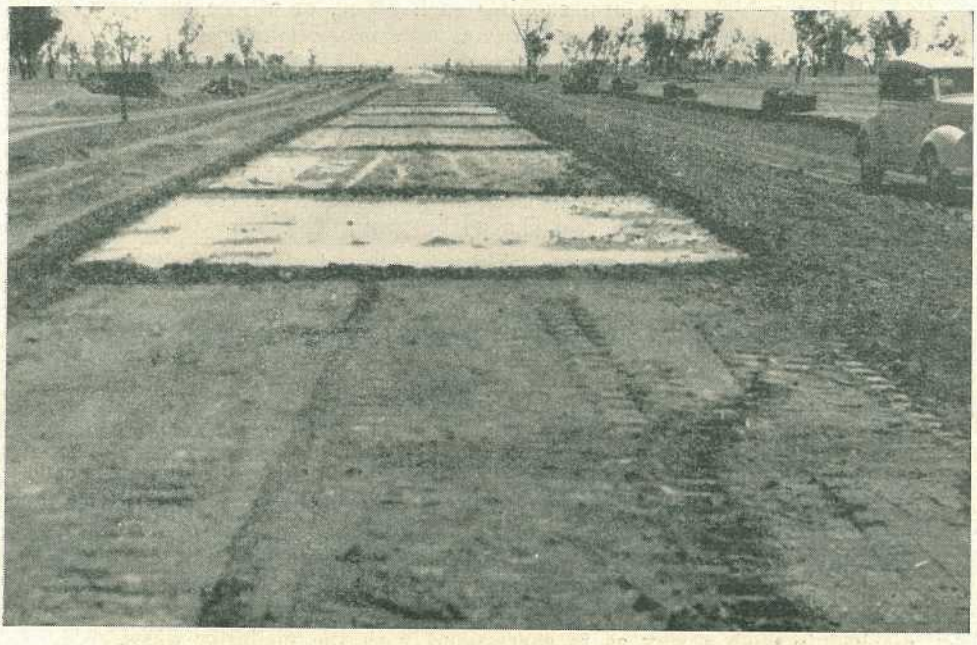


Plate 64.

Heat treatment work proceeding under drought conditions. Preliminary consolidation of the black soil formation is effected by filling bays with bore water.

Plate 65.

Heat treated black soil. The white strip is the third traverse of the machine, and it will be graded over on to the adjacent lower course strip.

When vehicles are approaching each other, or where the view is restricted to less than 660 feet special care is necessary.

Overtaking of vehicles under any circumstances on roads under 20 feet width should not be permitted where any visible vehicle is approaching in the opposite direction within a distance of 660 feet from the vehicle to be overtaken.

Overtaking on either horizontal or vertical curves where the visibility is less than 660 feet should be prohibited.

Overtaking of vehicles should be prohibited on bridges less than 30 feet wide, and less than 500 feet long.

When a road is crowded it is thus obvious that maximum traffic capacity does not depend on high speed, and those selfish motorists who break out of line and pass strings of vehicles under such circumstances become a menace to no purpose.

Australian standard railway crossing signs are being erected on all important roads. The Main Roads Commission, in addition, is erecting visibility discs on curves, particularly for the guidance of night traffic. The disc exhibits a plain white surface on the left or near side, while those on the right-hand or off-side are white with a horizontal black bar 3 inches wide across the centre. They are placed on the outside only of curves. Culvert posts serve as a guide to traffic, being marked in such a way as to correspond with the visibility discs.

It, therefore, behoves the travelling public to obey such rules as indicated and avoid the loss of life and injury to persons, not to mention the severe monetary losses incurred in the damage to vehicles.

AN EASY WAY OF PULLING OUT POSTS.

This method is unbeatable where a line of posts has to be pulled out. Drive the tractor alongside, put a chain round the bottom of the post and make fast to a

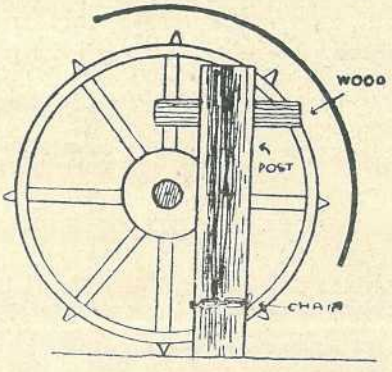


Plate 66.

gripper on the back of the wheel. Put a piece of timber between the top of the post and the wheel to act as a fender, then move forward in low gear and out it comes.

Sheep on the Farm.

JAS. CAREW, Senior Instructor in Sheep and Wool.

SHEEP should have a permanent place on any farm on which conditions are suitable. One of the advantages of sheep is that they provide two distinct sources of income annually—wool and mutton—besides their natural increase.

In Queensland, merino sheep constitutes about 97 per cent. of our total number. This breed is especially adapted to conditions in the central and western districts of the State, but when forced to breed and develop in an unsuitable environment constitutional weakness is a real risk.

British breeds have been developed and maintained in an environment which has influenced their adaptability to Queensland conditions. In mixed farming districts these breeds—especially the pure-bred rams—can be used with advantage. The Corriedale originated in New Zealand, and their improvement has been progressive both there and in Australia. In Queensland the Corriedale is regarded as a dual-purpose sheep, coming between the merino and pure British breeds, overlapping both in adaptability to a considerable degree.

In sheep-breeding, local conditions should decide the system of production.

Sheep-breeding under diversified farming conditions where the British breeds are used is totally different from merino-breeding in the West. The merino is bred under purely pastoral conditions, and the progeny is retained for wool and mutton production. With the imported mutton breeds the aim of the farmer is to dispose of the progeny at the earliest marketable age. To do this successfully there are two major points to be observed:—

(1) The use of pure-bred rams of quick-maturing qualities suitable to location and conditions.

(2) Suitable pasture or cultivated crops should be available for ewes as soon as their lambs are dropped, and for topping off the lambs.

Other considerations of importance are the suitability of the ewe flock for wool production as well as for breeding; economy in pasturing the ewe flock from the time the lambs are taken off until the next drop of lambs; the general health of the flock and freedom from parasites; fodder provision for carrying the flock successfully through periods of scarcity; and culling the breeding flock for age while they are still capable of being fattened and sold at a profit. To start successfully in breeding, whether for wool, mutton, or for fat lambs, healthy sheep are essential. This may mean paying more for young sheep, but it will generally prove the best and safest policy.

SHEEP ON COASTAL COUNTRY.

Coastal farmers who are desirous of stocking sheep usually ask the question how to start to the best advantage. Conditions and circumstances along the coast vary so greatly that no hard and fast rules can be laid down.

It is usually considered that where dairying, pig raising, and mixed farming can be successfully combined in coastal areas the conditions are favourable for fat lamb raising. There is one chief guiding point, and that is, where the rainfall can be considered as excessive for the combination mentioned, it will be decidedly against the wellbeing of sheep.

For fat lamb raising the British breeds should be used. The most suitable of them is the Romney Marsh, and the wetter the conditions the nearer to the pure Romney Marsh the breeding flock should be. If crossbred or Corriedale ewes are not available, then strong-woolled, plain-bodied merino ewes should be introduced, to which should be mated pure Romney Marsh rams. Of the progeny, ewes should be retained for breeding and the wethers used for home consumption or sold as fat lambs. Merino ewes should not be retained on the coast for longer than two seasons. Now is about the best time to buy them, and, if joined immediately and allowed six weeks with the rams, lambing should be completed by the beginning of August. All lambs should be marked during August, and the ewes shorn in September. If the ewes are healthy and well fed from the time the lambs are dropped, all lambs that are to be sold should be fit before or during December. A month after the lambs are disposed of, the ewes that are to be sold should be fat and sold as such to secure best results. Healthy merino ewes with good teeth and carrying not more than four or five months' wool should fatten on good feed in three or four weeks.

—Jas. Carew.

Plate 67. [*Photo.: Department of Agriculture and Stock.*
Ewes and Lambs, Glengallon, Warwick District.

SHEEP NASAL FLY.

During the spring and summer months, graziers in many parts of the State may be puzzled for an explanation as to why their sheep, for no apparent reason, suddenly gallop round the paddock, or stand in bunches with their faces buried in each other's wool, or held very closely to the ground. If such a group is watched closely, the attitude of the animals will be seen to be due to the presence of a stout, greyish fly, which frequently is to be seen during this time of the year resting on the fly screens and water tanks around the homestead. This is the sheep nasal fly, which lays its maggots on the edges of the nostrils of the sheep. The action of the animals in burying their noses in the wool of other sheep, or in the soil, in an endeavour to protect them from the flies, is readily understandable.

The maggots, after they have been laid by the female fly, crawl up the sheep's nostrils and into the communicating cavities. Here they remain for several months. Being provided with a pair of stout hooks in the region of the mouth, they attach themselves to the lining of the nostrils and cause the secretion of much pus-charged mucous, on which they feed. The condition in sheep known as "snotty nose" is due to the presence of these maggots, which may also be responsible for such a severe irritation that the infested animal loses condition.

Control of the sheep nasal fly is not very effective at present, but much good can be done by daubing the animals' noses at frequent intervals with Stockholm tar. This procedure should be especially carried out between October and January, inclusive, when the flies are most numerous.

—*Dr. F. H. S. Roberts.*

SHEEP IN AUSTRALIA.

The sheep population of the Commonwealth at the end of September, 1937, was—

Queensland	20,011,749
New South Wales	51,936,000
Federal Capital	228,317
Victoria	17,663,103
South Australia	7,905,112
Western Australia	9,024,758
Tasmania	2,149,900
Northern Territory	25,483
Australian Total	108,944,422

For comparison, the figures for some other countries in the Southern Hemisphere are given below—

Argentine	44,000,000
South Africa	35,843,744
New Zealand	31,210,734

A study of the figures reveals some interesting and little-known facts. For instance, few people realise that Western Australia has surpassed South Australia in sheep numbers.

In view of reiterated statements of South African competition, it is of interest to know that New South Wales has 16,092,256 more sheep than that country. Few people realise that Argentine has nearly 9,000,000 more sheep than South Africa.

PROSPECTS FOR FAT LAMB RAISING IN QUEENSLAND.

The prospects for fat lamb raising in Queensland are becoming more assured as time goes on. The last two years on the Darling Downs and the coastal areas have not been favourable either for pastures or for the raising of crops. Notwithstanding this fact, steady progress has been maintained, and the lambs coming forward showed a percentage to be the right age and correct formation, with plenty of quality and possessing export bloom.

Other lambs which came forward were showing age, the effect of dry conditions, and the scarcity of suitable food. This is, as was to be expected, in keeping with the conditions prevailing; but, what is most important is that mostly all the lambs showed suitable breeding, and, if such results can be obtained under adverse circumstances, it is easy to realise what might be expected under favourable conditions.

The introduction of such a number of pure breeds under the Fat Lamb Scheme has had a most desirable effect, and it would appear that the confidence of those in the industry now is taking definite form. One big disadvantage is the lack of suitable ewes, and this is becoming more definite as other phases of the industry become more manifest. Until we have the great proportion of our breeders of an even type and suitable for the purpose, irregularity in the form of carcase in lambs can be expected. The ideal breeder for the purpose is the large-framed, roomy ewe productive in wool and milk that will give a high percentage in lambs and mate at a season suitable for lambs to develop and top off for sale. Under present circumstances the best must be done with those that are available.

GATE HOLDER.

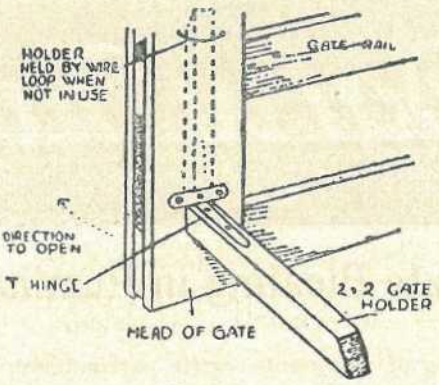


Plate 68.

A simple attachment, which will automatically hold a gate open in any position, can be made from a small T hinge and a piece of 2 x 2 timber about 18 inches long. The diagram explains the method of construction.

TO ANCHOR A STRAINING POST.

When it is necessary to put a strainer post on a face where it is too steep for a stay to be effective, or where for other reason it is unsatisfactory to use a wooden stay, the following method will be found satisfactory:—

Dig a trench, in line with the fence and at right angles to it, about four feet back from the post. Then dig another similar trench four feet further back big enough to hold a solid block. Put several strands of No. 8 wire from the base of the

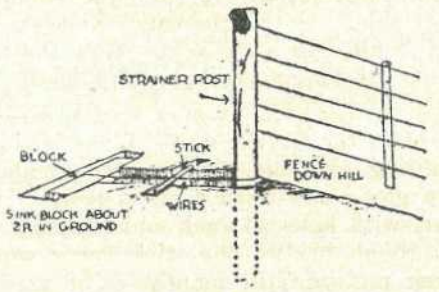


Plate 69.

strainer post, just under ground level, along a shallow trench and round the block which is to act as anchor. Now insert a stout twitch stick between the wires in the trench halfway between post and block and twitch or twist up until tight. Then fill in all the trenches and ram tight. This anchor will never let the strainer post lift or lean on any country.—*Weekly News* (Auckland, N.Z.)

Acute Bloating in Ruminants.

W. DIXON, Inspector of Stock.

ACUTE bloating of ruminants, cattle particularly, may occur at any time from a variety of causes, but most commonly through turning hungry cattle on to luxuriant green feed, or on to herbage country, after heavy rains and when the young herbage is making rapid growth.

Under station conditions, where stock are not seen every day, little can be done to prevent losses, but on smaller holdings losses may be minimised if a stack of dry hay is provided and to which stock have access before and after being allowed on to green feed. The long, dry hay assists regurgitation, which is difficult when large quantities of short, succulent feed has been eaten, and, if it is available, animals will always take a few mouthfuls, with beneficial results.

Symptoms of bloating appear quickly. Animals stop feeding and stand still with arched backs, turning their heads frequently to the abdomen, which increases rapidly in size—the swelling becoming most marked on the left side. As the abdomen enlarges, breathing becomes more and more difficult. In very acute cases the nostrils dilate, the animal stretches out its tongue, bellows, and finally staggers and dies in convulsions.

In less acute cases the development of gas is slower, and frequent belching and vomiting prevents its excessive accumulation. In these cases the use of a gag made from a stick about 8 inches long and 2 inches in diameter, with holes at each end through which a thin rope is run to form a rough bridle—the stick being smeared with tar or grease before being put into the mouth—is of value, as it facilitates belching.

Massage of both flanks, applying moderate pressure with both fists upwards and downwards—particularly over the whole of the left flank—while the animal stands with its head uphill, is also beneficial.

Puncture of the rumen with a trocar and canula saves many valuable animals. The instrument must be sterilised by boiling for ten minutes before use. It is wise to keep it ready, wrapped in a sterile towel. The trocar, with its protecting tube, is pushed into the most prominent point of the left flank, usually midway between the point of the hip and the middle of the last rib. Holding the instrument in the left hand, a sharp blow with the palm of the right hand causes it to penetrate the skin, abdominal wall, and the rumen.

The point of the trocar is directed towards the right elbow.

The trocar is withdrawn gradually from its sheath, allowing the gas to escape slowly, giving immediate relief to the animal.

When gas ceases to escape, a cork may be used to close the canula, which is left in position and secured by a clean bandage tied over it and round the body of the animal. Any further accumulation of gas is allowed to escape slowly by removing the cork. When no longer required the canula is withdrawn, and the small puncture dressed with tincture of iodine.

SOME FACTORS IN PROFITABLE DAIRY PRACTICE.

The first essential is to have every cow in the herd tested to make certain that she is worth keeping. As the animals must be adequately and properly fed, the next important factor is that governing production.

A good water supply is necessary. An ideal condition is, of course, sufficient water at convenient points in every paddock. Many dairy farmers, however, are satisfied with at least one good watering place. That means that if the herd is feeding at a distance from the water the cows do not go to the trough to drink as frequently as they would if it were closer to their grazing ground. On hot days it takes quite a lot out of animals to walk any distance, and when they do come into water they stay in its vicinity. As the area surrounding the water is usually bare from over-grazing, they get very little to eat. So, in either case, the milk flow is seriously affected.

Another point which is often overlooked is the destruction of grass and herbage caused by the extra tramping of the animals going to and fro. Cows frequently destroy more feed with their feet than they actually eat.

Subdivision of paddocks will provide succulent pastures carrying a full complement of proteins, which the cattle relish and clean up as they proceed without tramping half of it into the ground. With pastures under complete control, the herbage and grasses can be fed off as required; and, in times of plenty, all surplus growths may be mown and conserved either as hay or ensilage.

—*G. H. E. Heers.*

CALVING TABLE.

AVERAGE PERIOD OF GESTATION, 285 DAYS.

If served on—	Will calve about—	If served on—	Will calve about—
1 January	13 October	1 July	12 April
7 January	19 October	7 July	18 April
14 January	26 October	14 July	25 April
21 January	2 November	21 July	2 May
28 January	9 November	28 July	9 May
31 January	12 November	31 July	12 May
1 February	13 November	1 August	13 May
7 February	19 November	7 August	19 May
14 February	26 November	14 August	28 May
21 February	3 December	21 August	2 June
28 February	10 December	28 August	9 June
1 March	11 December	31 August	12 June
7 March	17 December	1 September	13 June
14 March	24 December	7 September	19 June
21 March	31 December	14 September	26 June
28 March	7 January	21 September	2 July
31 March	10 January	28 September	9 July
1 April	11 January	30 September	12 July
7 April	17 January	1 October	13 July
14 April	24 January	7 October	19 July
21 April	31 January	14 October	26 July
28 April	7 February	21 October	2 August
30 April	9 February	28 October	9 August
1 May	10 February	31 October	12 August
7 May	16 February	1 November	13 August
14 May	23 February	7 November	19 August
21 May	2 March	14 November	26 August
28 May	9 March	21 November	2 September
31 May	12 March	28 November	9 September
1 June	13 March	30 November	11 September
7 June	19 March	1 December	12 September
14 June	26 March	7 December	18 September
21 June	2 April	14 December	25 September
28 June	9 April	21 December	2 October
30 June	11 April	28 December	9 October

COMFORT IN THE COW YARD IN WET WEATHER.

On many farms the cow yard becomes very boggy in the wet season, and conditions are then anything but pleasant for the milker, as well as the cow. The dairyman has to walk through mud and slush, sometimes up to or over his ankles, and the cows often drag their udders through the mud when walking into the bail from the yard. Consequently, the mud adheres to legs, udder, and belly, entailing a considerable amount of work in washing both teats and udder. If this cleansing job is not done correctly and thoroughly cream of inferior quality may be delivered at the butter factory, for which only second-grade price can be paid.

To ensure comfort in the cow yard in wet weather, a small enclosure, 36 feet long and 36 feet wide, may be constructed. This small yard should be concreted. Sand and stone can be obtained quite handy to the farm as a rule, so the work can be done by the farmer at the cost of the cement. Dairy farmers who have adopted this idea declare that they wonder why they had not built such a draining yard before. It makes all the difference in the comfort of both man and beast in wet weather milking. A yard of the dimensions given will hold twenty cows quite comfortably.

WHAT IS PROFITABLE DAIRYING?

Some farmers consider that the more cows they milk, the more efficient and profitable their dairying practice becomes. But when success in dairying is mentioned, many other factors must come into the reckoning.

Pasture management, milk and cream quality, and stock diseases can all be controlled by the farmer.

Good pasture management requires the introduction of the best grasses, rotational grazing, the conservation of fodder, pasture renovation, and the use of any necessary fertilizers.

The quality of milk and cream is controlled largely by the attention given to milking, separating, storage on the farm, freedom of the pastures from milk-tainting weeds, and the health of the herd.

The incidence of disease in the dairy herd, of course, depends largely on the care and attention given to the animals.

The milking capacity of the herd depends obviously on the milking capacity of the individual cows. The question as to which are the best producers can be determined by systematic herd testing. Unprofitable cows should be culled as soon as practicable. Only the best cows should be kept as breeders. Boiled down, the yield of butter-fat to the acre determines the soundness of dairy farm management.

Good farm management and a poor herd are just as bad as a good herd and poor management. Good management and a good herd together must result in a high yield per acre.

KNOTS TO KNOW.

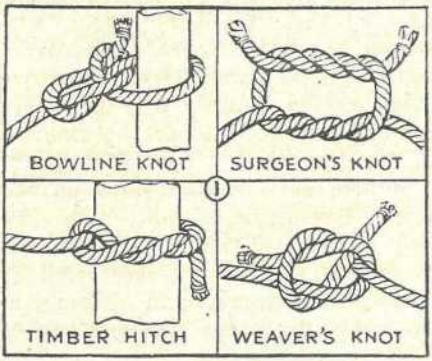


Plate 70.

The bowline knot is especially useful in making simple rope halters, as it is easy to tie and will not slip. Put the rope around the animal's neck, form a loop, run the short end of the rope through it, then around the long end and back through the loop. To tie the timber hitch, make a half hitch and give the loose end an extra twist, as shown. This is used on jobs such as hauling posts or pipes. For tying sacks and heavy packages there's nothing better than the surgeon's knot. The only difference between this knot and a square knot is the extra twists in the rope, but it stays much better. The weaver's knot should be kept in mind for rope-splicing jobs.

Market for Pig Meats in the United Kingdom.

THE Australian Meat Board, at a recent meeting, gave attention to the question of the United Kingdom market for pig meats and the best way to export pig meats from Australia to meet the needs of that market. In this connection the Board had before it a report by Mr. R. G. Watson, chairman of the Australian Pig Industry Council, and representative of the pig producers on the Australian Meat Board. Mr. Watson's conclusions, arrived at after personal investigation in the course of a visit to the United Kingdom, were confirmed in a communication received from the Board's executive officer in London (Mr. H. R. Heywood), and they were strongly supported by Mr. A. C. Fisken, the chairman of the Board, who had recently returned to Australia from abroad. The decision of the Board in relation to the matter was embodied in a resolution passed at the meeting, and which it was decided to publish as a recommendation to pig producers in the Commonwealth. The resolution reads—"The Board considers that the best way to export pig meats from Australia to the United Kingdom is in the form of frozen baconer carcases and pieces suitable for manufacture into bacon and hams, and recommends accordingly to producers." In recommending the baconer trade of the United Kingdom as the best avenue for the development of the Australian pig export industry, the Board was influenced by the report that the British producers are capable of producing the great bulk of the pork requirements of the United Kingdom.

Thus, it is considered, that future restrictions, if any, on Empire pig meats are more likely to be placed on porkers than on baconers, the latter being in short supply as evidenced by the inability of United Kingdom curing factories to operate at more than 50 per cent. capacity.

The expansion of Australian exports of baconers would therefore assist the bacon curing industry in the United Kingdom and have the further merit of not competing so directly, or to the same extent, against the Home producer as would an increase in the export of porkers.

The considerable increase in the volume of exports of pig meats from New Zealand and Australia to the United Kingdom which has taken place in recent years has been due, mainly, to the increase in shipments of baconers.

—H. S. Hunter.

MORTALITY IN YOUNG PIGS.

In a series of observations carried out in England by Mr. A. W. Menzies Kitchin, and in which the objective was the collation of data relating to pre- and post-weaning mortality in young pigs, complete records of cause of death were obtained in twenty-four herds covering 1,741 observations. The results are analysed in the following table:—

Cause of Death (Pre-weaning).	Per cent.
Overlaid by sow	52.0
Pneumonia, colds, &c.	10.1
Savaged by sow	2.5
Insufficient milk	2.6
Accident	2.8
Bad doers	10.4
Erysipelas	0.2
Scour	5.0
Not known	2.3
Not recorded	9.0
Other causes (rupture, castration, physical defects, &c.)	3.1
	100.0

During the same year, post-weaning mortality (death after weaning) represented 3.15 per cent. of the number of pigs, and showed a herd range of from nothing to 11.30 per cent. The analysis of the causes of death of 314 pigs drawn from twenty-three herds is given below:—

Cause of Death (Post-weaning).	Per cent.
Scour and gastritis	10.5
Accident	1.3
Cad pigs	25.5
Erysipelas	10.8
Worms	1.9
Pneumonia and colds	12.1
Tuberculosis	3.5
Sugar beet top poisoning	9.9
Not known	13.6
Not recorded	2.9
Inflammation	1.9
Other causes	6.1
	100.0

"Cad pigs" were pigs which for some unknown reason failed to grow, lost weight, and finally died or were destroyed. Undiagnosed worms, pneumonia, tuberculosis, and bacterial infection are probable causes of loss. To these may be added insufficient trough space which resulted in the crowding out and ultimate starvation of the weaker pigs, the feeding of ill-balanced or unsuitable rations, and a lowering of resistance to infection due to unsuitable housing, and particularly to damp and draughts. Poisoning by sugar beet tops occurred on one farm. At one feed the tops were accidentally fed green in excessive quantities, and as a result thirty-one pigs died during the ensuing week.

—E. J. Shelton.

PIGGERY PESTS.

At this season of the year pigs are frequently tormented by house flies, mosquitoes, and lice. This irritation can be allayed to a large extent by giving the pigs a daily dressing (only a very small quantity at each application) of oil to which a small quantity of distinfectant has been added.

The pig has a tough skin and often carries a coarse coat of hair, but despite that his health may suffer through parasitic infestation. Where the skin is lacerated or badly sunburnt and cracked, blowflies and house flies swarm around, becoming a source of risk to the animal's general health. Wounds resultant from castration and other operations are favourable places for attack by blowflies. Where there is considerable inflammation, painting the affected areas with a dilute solution of iodine will be helpful. Carbolised glycerine—or boro-glycerine—is an excellent dressing once the wounds have been thoroughly cleansed by washing and/or syringing out. Any treatment for reduction of irritation and inflammation and assistance in healing will be beneficial.

Prevention of attack is often difficult, but something might be attempted along these lines by eradicating breeding grounds like manure heaps where flies breed freely. Swampy areas encourage mosquitoes and sandflies, and neglected sties and pens and rubbish lying about harbour fleas and lice. A general clean-up along the lines of a spring cleaning is well worth while.

—E. J. Shelton.

TESTING AND RECORDING LITTERS.

In a total of 435 litters examined in New Zealand and reported on by Mr. C. P. McMeekan, the average number of pigs born per litter was 9.6, born alive 8.8, and weaned 7.9. The average litter weight in lb. at twenty-one days was 100, or 12.7 per pig, at fifty-six days 295, or 37.5 per pig. There was little variation in the yearly averages. Average weights per pig varied from 6 to 21 lb. at twenty-one days, and from 15 to 56 lb. at fifty-six days.

The results show that a standard of 300 lb. per litter at eight weeks can reasonably be expected, but only 50 per cent. of the sows tested attained this production. The best and worst herds showed litter weights of 330 lb. and 200 lb. at fifty-six days. The worst herd had more pigs born per litter, but a mortality rate of 27 per cent.

The number of pigs weaned is more important than a heavy (weaning) weight per pigling, although both are necessary. The individual weight of the weaner is not dependent on litter size.

Mortality records show a total mortality of piglings born alive of 11 per cent. Many deaths can be avoided by efficient management. Maiden sows weaned fewer pigs and produced a lower total litter weight than sows with their second to sixth litter. A few data on tenth and eleventh litters indicate that the sow may retain her breeding qualities to this stage.

Season of farrow has little effect on number weaned or litter weight, and farrowings are apparently well spaced throughout the year, although correlated with the seasonal cow-milk supply.

A table showing litter production by purebred Tamworth, Large White, Large Black, and Berkshire, as well as first-cross litters, indicates that the strain within the breed is of far greater importance than the breed itself. The figures do not suggest that the first cross must be used to obtain prolificacy, thriftiness, and rapid growth, nor were there wide differences between the first cross or purebred male x grade female litters. The ability of a sow to transmit high-producing qualities to her progeny is most important.

Poultry Notes.

P. RUMBALL, Poultry Expert.

Size of Eggs.

ALTHOUGH the internal quality of the egg is of primary importance in determining price, the factor of size cannot be overlooked. Eggs are usually graded for sale according to size; but those averaging 24 oz. to the dozen are in greatest demand, not only in Queensland, but in the markets to which our surplus production is consigned.

In these circumstances, every poultry raiser should strive to produce eggs that meet the requirements of the market. To do this, it is necessary to select breeders that will reproduce progeny capable of laying the maximum number of eggs closely approaching 2 oz. in weight. Most poultry keepers when selecting their breeders know very little about the early performance of their stock in respect of size of egg—particularly the size of egg that a hen laid during her first year of production. As a breed is more prolific during the first laying year, it is then that the egg size is of particular importance.

All pullets when commencing to lay produce an egg very much undersized. Some birds take a considerable time before their eggs reach the most desirable commercial size, and others, again, may take only a week or two. As it is an inherited factor, egg size is one of the chief points to be considered in selecting future breeders. Many pullets —the breeding stock of the future—will be coming into production within the next month or so, and it is suggested that poultry breeders who are not entirely satisfied with the size of egg from their flocks should take the opportunity of selecting and marketing pullets that commence to lay eggs of a 2 oz. standard early in life. Many of these birds may have to be rejected for some purpose or other, consequently the number selected should be large enough to allow for a reasonable percentage of rejections.

Milk as a Poultry Food.

Skim milk is an excellent poultry food, and if fowls are given all the skim milk they can drink, and even if fed on nothing else but grain, they will continue to lay well.

Farmers generally appreciate the necessity of efficient feeding, and to give their fowls the necessary amount of protein use one or other of the prepared mashes. These mashes are usually fed with grain, the birds being given an equal quantity of each. In these circumstances, a sufficient amount of protein is made available to the birds.

The farmer who has skim milk to give his birds may, therefore, depart somewhat from his ordinary practice, for skim milk is a protein-rich food; but how far he may do so depends on the quantity of skim milk available. If the birds are given only, say, half the skim milk they will consume, half the quantity of mash that is usually fed should be supplied, and the grain increased by about 50 per cent.

It will generally be found a sound policy when milk, mash, and grain are being fed to the flock, to give the birds all the grain that they will consume, and not force them to eat given quantities of mash. This policy will largely enable the birds to balance their own ration.

Protect Eggs from Mould.

With the humid conditions prevailing at this time of the year, eggs are more prone to decomposition than during winter. This is not because of the effect of the climate on the egg itself, but to the rapidity with which mould growths develop during warm weather. If it were practicable to prevent the egg coming in contact with moulds, decomposition of the egg from this cause would not occur.

If fowl yards are allowed to become littered with straw, dry grass, and similar material, mould spores will develop abundantly. Consequently, the poultry farmer is advised to clear away all rubbish, and do all that he can to prevent the development of moulds.

Dampness in any degree is conducive to the rapid growth of moulds, therefore, every precaution should be taken to ensure that the nesting material is dry and clean, and that the eggs and fillers used for the packing of eggs are dry.

Two recent examples of how easily the quality of eggs may be depreciated are cited:—In one case it was found necessary, because of a muddy poultry run, to wash every egg. The washing was well done, stains were removed with an odourless sandsoap, and the eggs were clean when packed; but, unfortunately, they were packed in strawboard fillers, with a slight bead of moisture on the shell. In the course of two days, when these eggs reached the market, there were quite a number of rots. As the poultry farmer concerned had a reputation for marketing good eggs, the agent retained the eggs that were apparently good on arrival for a further two days, but, on testing, many more rots were found.

The second case was that of a farmer who had well-grassed runs for his fowls. Although nests were provided, many of the hens nested in the grass. Complaints as to the quality of the eggs were received by the agent to whom these eggs had been consigned, with the result that the next consignment of eggs to reach the floors were carefully candled. Candling disclosed a number of rots. Those that were in, apparently, good condition were retained on the floors for another two days and again candled, when more rots were revealed. This led to an investigation by the Department of Agriculture, when it was found that only the eggs that had been laid in the grass were affected, and that the rottenness was caused by mould growths which had gained access through the pores of the shell. Providing the hens with more clean nests and discouraging them from laying in the grass corrected the trouble.

In these two examples it will be seen how easily the quality of eggs can be affected, and that it is essential—particularly during hot, humid weather—to protect eggs from decomposition caused by moulds.

Marketing Table Poultry.

In order to secure the highest returns, it is necessary to market poultry for table purposes in the best possible condition. The term condition can be taken to mean the state of the feather, flesh, and age of the bird. If culling of the layers receives the attention that it should, little can be done by the poultry raiser to improve the returns that he will receive from culled hens.

Experiments have indicated that the flesh carried by a well-fed hen that has finished production cannot be increased economically by

a system of feeding, and that the hen that has lost weight due to egg production takes too long to respond to a course of feeding. The best practice, therefore, is to market culled hens before they become a mass of pin feathers. This condition applies particularly at this time of the year.

Just now, the correct marketing of cockerels is of particular importance. This class of fowl sells reasonably well at any stage of development, if the bird is sold before it reaches what is known as the "staggy" stage. This term is applied to birds commencing to show spur development. In order to obtain the maximum value for cockerels for table purposes, they must be sold while the spur is still in the bud stage. Many breeders keep cockerels until this stage has passed, and, consequently, do not get top prices.

In the marketing of cockerels, it is as well to examine the feather growth. Cockerels with a lot of pin feathers do not dress attractively. This applies particularly to birds such as the Australorp, because of the colour of the plumage. Pin feathers on white feathered birds are not so noticeable.

Again, certain breeds are not well-fleshed at all times. This applies generally to the bigger birds—such as the Light Sussex and the Rhode Island Red.

To summarise—poultry raisers with cockerels to market should, firstly, bear in mind the fact that birds with indications of spur development do not realise the maximum value; secondly, that the rate of development of cockerels from twenty to twenty-four weeks of age is not as great as that which takes place earlier, consequently any increase in body weight is at a greater cost; and thirdly, that it is undesirable to market cockerels carrying a lot of pin feathers, and those that are scraggy and not well fleshed.

ANOTHER TYPE OF BUSH GATE.

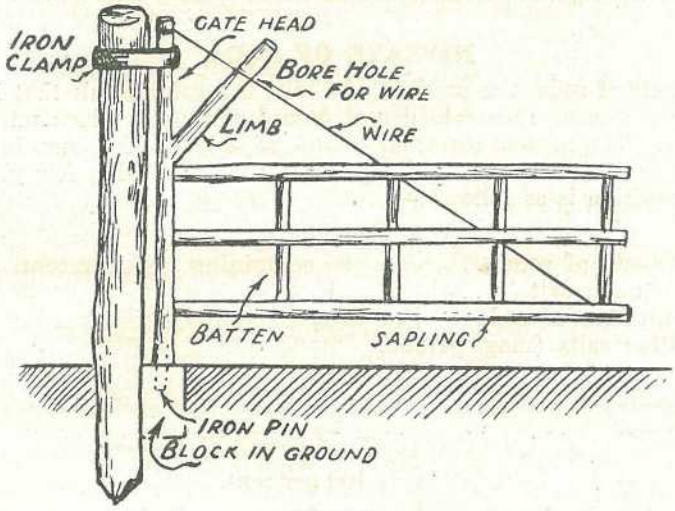


Plate 71.

Get a medium-sized sapling, forked as shown in the drawing, also three small saplings and fencing wire. With those materials, the diagram shows how a neat, handy, and cheap gate can be built.

Fertilizer Facts for Farmers.

F. B. COLEMAN, Officer in Charge, Seeds, Fertilizers, Veterinary Medicines, Pest Destroyers, and Stock Foods Investigation Branch.

THE present Fertilizers Act is based on the experience of past years and came into active operation on 1st January, 1936, when the then existing Act was repealed.

Fertilizers are used for the purpose of supplying to the soil for the use of plants nitrogen, phosphoric acid, potash, and in some cases where required sulphur, magnesia, and, more rarely still, boron and other elements. All these may be termed the *active constituents* of the fertilizer in which they are contained.

With the exception of sulphur, these active constituents are not applied chemically pure, because of price, over-concentration, and non-availability to the plant; but are applied in compounds or mixtures in which they are present in varying amounts.

The actual "straight" fertilizers that are now upon the Queensland market are—

Nitrate of soda	Meatworks fertilizer
Sulphate of ammonia	Basic phosphate
Dried blood	Nauru phosphate
Superphosphate	Sulphate of potash
Bone dust	Muriate of potash.

A large proportion of the fertilizer distributed in Queensland is sold in the form of mechanical mixtures—*i.e.*, mixtures containing two or more of the abovementioned "straight fertilizers" in varying quantities—with the exception of basic phosphate and Nauru phosphate, which are not now used in mixtures.

The composition of the various straight fertilizers is set out in the following, but it should be understood clearly that the proportions vary and the figures given should be taken merely as a guide.

NITRATE OF SODA.

Nitrate of soda, the product of Chile, is a soluble salt that is found in rainless areas. It is mined and passed through various purification processes. The present granular nitrate of soda is a free-running, much superior material to the old damp, lumpy material of a few years ago. Its composition is as follows:—

	Per cent.
Nitrate of soda	95 containing 15·6 per cent. nitrogen
Common salt	1
Sulphate of soda ..	½
Other salts (mag. potass., etc.)	1
Insoluble	¼
Water	2¼
	100 per cent.

In other words, nitrate of soda is composed of nitrogen combined with oxygen and sodium to approximately 95 per cent. with approximately 5 per cent. impurities.

SULPHATE OF AMMONIA.

Sulphate of ammonia is composed of ammonia in combination with sulphuric acid. It may be manufactured in several ways, and has a small percentage of impurities associated with the method of manufacture. Its composition may be set out as follows:—

	Per cent.
Sulphate of ammonia	97·1 containing 20·6 per cent. nitrogen
Moisture and impurities	2·9
	100 per cent.

Sulphate of ammonia of 21 per cent. nitrogen content would naturally have a slightly lower percentage of impurities.

Sulphate of ammonia is manufactured either as a by-product of gasworks or—in Europe and America—fixed from the air. In simple terms, it is composed of nitrogen and oxygen from the air, hydrogen from water, and mined sulphur.

ROCK PHOSPHATE.

(Nauru or Ocean Island.)

A good sample of Nauru phosphate rock may be analysed as follows:—

	Per cent.
Tricalcium phosphate	87·0 containing 39 per cent. phosphoric acid
Calcium carbonate	4·5
Calcium fluoride	1·0
Free water	1·5
Organic matter	0·5
Impurities: Iron, alumina, silica, insoluble, &c.	5·5
	100 per cent.

The percentage of phosphoric acid ranges actually from 37 to 39, and 37 may be taken as a safe guarantee. This material is obtained from Nauru and Ocean Islands.

This rock phosphate is used for the manufacture of superphosphate.

SUPERPHOSPHATE.

The process of manufacture involves the grinding of Nauru or Ocean Island phosphoric rock to a very fine degree, and then mixing with approximately equal proportions of sulphuric acid, which process renders almost all of the insoluble phosphoric acid in the rock phosphate water-soluble.

In other parts of the world very cheap superphosphates are obtainable, because of their low water-soluble phosphoric acid content. In Australia the "super." sold is as high a grade as is sold anywhere in the world, excepting, of course, "double super."

Composition of superphosphate—

	Per cent.	
Water-soluble phosphate of lime ..	35	containing 20.5 per cent. water-soluble phosphoric acid
Free phosphoric acid	1	
Citrate-soluble phosphate of lime ..	1½	containing 0·5 per cent. citrate-soluble phosphoric acid
Insoluble phosphate of lime	2½	containing 1 per cent. insoluble phosphoric acid
Calcium sulphate (including gypsum)	48	
Moisture	7	
Impurities (silica, &c.)	5	
	100 per cent.	

The following figures, often met with, are explained respectively thus:—

20·5 *per cent. phosphoric acid*: This refers to the water-soluble phosphoric acid present.

22 *per cent. super.:* This refers to the total phosphoric acid—

20·5 per cent. water-soluble
0·5 per cent. citrate-soluble
1·0 citrate insoluble

22.0 per cent. total

45 *per cent. soluble phosphate:* This is a theoretical calculated figure obtained by converting 20·5 per cent. water-soluble phosphoric acid to tricalcic phosphate, which is the insoluble calcium phosphate (occurring in bone and rock phosphate).

48 *per cent. tricalcic phosphate*: This is a theoretical calculated figure obtained by converting the 22 per cent. total phosphoric acid to tricalcic phosphate.

It should be noted that all the above expressions are used in connection with the one superphosphate on the Queensland market; the only useful figure for comparison, however, is the 20·5 per cent. water-soluble phosphoric acid.

Superphosphate is not made in Queensland. Our supplies are obtained from Port Kembla and Cockle Creek, both of New South Wales. The Queensland consumption does not warrant the erection of a manufacturing plant here as yet.

BASIC PHOSPHATE.

This is manufactured by mixing superphosphate with lime in varying proportions.

This causes the water-soluble phosphoric acid to alter or revert to what chiefly is citrate-soluble phosphoric acid. It contains 17 per cent. citrate-soluble phosphoric acid. This material has a limited use and is not included in mixed fertilizers in Queensland.

SULPHATE OF POTASH.

This is composed of—

	Per cent.	
Sulphate of potash ..	92	containing 50 per cent. potash.
Other sulphates and chlorides	7	
Water	1	
	100 per cent.	

The potash content varies from 48 to 50 per cent.

CHLORIDE (MURIATE) OF POTASH.

This is composed of—

	Per cent.	
Chloride of potash ..	82	containing 52 per cent. potash.
Common salt	14	
Other sulphates and chlorides	3	
Water	1	
	100 per cent.	

The potash content varies from 50 to 52 per cent.

Our potash supplies come from France, Germany, and the Dead Sea in Palestine. Before the upheaval in Spain we drew some supplies from that country.

MEATWORKS BY-PRODUCTS.

These materials, being of organic origin—as will be seen—vary in composition. It is possible that materials of different nitrogen and phosphoric acid content to those set out below may be met with occasionally.

Blood.—The following composition is typical:—

	Per cent.	
Crude proteins ..	81¼	containing 13 per cent. nitrogen.
Moisture .. .. } Organic matter, &c. }	18¾	
	100 per cent.	

Usually the dried blood on the Queensland market contains from 11 to 13 per cent. of nitrogen.

Bone.—An average quality bone dust is composed of the following:—

	Per cent.	
Crude protein ..	22	containing 3½ per cent. nitrogen.
Tricalcic phosphate of lime	50	containing 23 per cent. phosphoric acid.
Moisture .. .. } Organic matter, &c. }	28	
	100 per cent.	

Bone dust in Queensland contains from 3 to 3·5 per cent. nitrogen and 22 to 23·5 per cent. phosphoric acid. Generally speaking, the more the bone is subjected to steam heating or sterilising, the lower becomes the nitrogen and the higher the phosphoric acid.

Highly sterilised bone is sold as a stock food and may contain less than 1 per cent. of nitrogen and over 30 per cent. of phosphoric acid.

Meatworks is composed of flesh, bone, and sometimes blood; it can have the following analysis:—

	Per cent.	
Crude protein ..	37½ to 18¾	containing 6 to 3 per cent. nitrogen.
Tricalcic phosphate of lime	31 to 50	containing 14 to 23 per cent. phosphoric acid.
Moisture	31½	
Organic matter, &c ..		
	100 per cent.	

It should be noted that as the nitrogen increases the phosphoric acid decreases and *vice versa.*

In explanation of the figures given above, it may be stated that nitrogen may be converted to crude protein by multiplying by 6¼.

MIXED FERTILIZERS.

Having reviewed the chief fertilizers that are used in Queensland to compound mixtures, we will now address ourselves to the task of making up some mixed fertilizers from formulæ.

As a start, we will make a mixture of equal parts by weight of the following ingredients, and consider the resulting figures.

Material used.	*Contains.*
Sulphate of ammonia	20·6 per cent. nitrogen.
Superphosphate ..	20·5 per cent. water-soluble phosphoric acid.
Bone	3.5 per cent. nitrogen as bone. 23·0 per cent. phosphoric acid as bone.
Chloride of potash ..	52·0 per cent. potash as chloride.

Amount of Material used.	*Calculated per cent. obtained.*		
	Nitrogen. Per cent.	Phosphoric acid. Per cent.	Potash. Per cent.
25 per cent. sulphate of ammonia	5·15 ..	— ..	—
25 per cent. superphosphate ..	— ..	5·12 ..	—
25 per cent. bone	0·87 ..	5·75 ..	—
25 per cent. chloride of potash ..	— ..	— ..	13
100 per cent.			

The Fertilizers Act requires a minimum guarantee to be stated on the label. To obtain this and make provision for variations, errors, &c., it is the practice to use an overrun allowance when compounding mixed fertilizers. In compiling the labels herein mentioned an overrun allowance of 7½ per cent. has been made.

A label for the mixture set out above, if offered for sale, would read as follows:—

.....Fertilizer Mixture.

.....lb. net.

4.7 per cent. nitrogen as sulphate of ammonia
.8 per cent. nitrogen as bone
4.7 per cent. phosphoric acid water-soluble
5.3 per cent. phosphoric acid from bone
12.0 per cent. potash as chloride (muriate) of potash

Fine.....per cent.

Coarse.....per cent.

Name and address of seller or manufacturer.

"Fine" and "coarse" is explained later.

Now, by adding the various active constituents together, we obtain 5·5 per cent. nitrogen, 10·0 per cent. phosphoric acid, and 12·0 per cent. potash. This would be classed as a 5½-10-12 mixture.

These figures should be used always in the sequence of nitrogen, phosphoric acid and potash, and are designated the *grade formula.*

Now, supposing some one desired a 4¾-8½-10¼ mixture, it could be compounded as follows:—

Amount of Material used.	*Calculated per cent. obtained.*		
	Nitrogen. Per cent.	Phosphoric acid. Per cent.	Potash. Per cent.
20 per cent. sulphate of ammonia	4·1	—	—
20 per cent. superphosphate	—	4.1	—
20 per cent. bone	0·7	4·6	—
20 per cent. chloride of potash	—	—	10·4
20 per cent. filler (sand)	—	—	—
100 per cent.	4·8	8·7	10·4

From this it must be realised that it is not possible to compound any *grade formula* picked, at random, in such a way as to give a complete ton of fertilizer; *a filler may have to be used.*

Consequently, this aspect should be considered before some *fancy grade formula* is requested. Even if a filler can be obtained for nothing, freight, handling, and mixing costs must still be paid on it.

If this material is to be offered for sale, a label, after making an overrun allowance, should read—

Fertilizer Mixture.

.....lb. net.

3.8 per cent. nitrogen as sulphate of ammonia
.6 per cent. nitrogen as bone
3.8 per cent. phosphoric acid water-soluble
4.3 per cent. phosphoric acid as bone
9.6 per cent. potash as chloride (muriate) of potash
*20 per cent. sand

Fine.....per cent.

Coarse.....per cent.

Name and address of seller or manufacturer.

* See "Filler" (page 162) *re* labelling.

It will be observed that the grade formula now would be $4\frac{1}{4}$-8-$9\frac{1}{2}$, the figures having been taken to the nearest quarter below the actual total per cent. present.

FINENESS.

All organic fertilizers—i.e., blood, bone, and meatworks—depend upon their fineness of division to a great extent for their availability—i.e., the finer they are the greater is the surface exposed, and the more quickly does decomposition take place.

The regulations prescribe the following standards for fineness:—

	Fine. Material that passes through apertures of	*Prohibited.* Material that will not pass apertures of
Bone	$\frac{1}{50}$ in. square	$\frac{1}{10}$ in. square
Blood, Meatworks, Mechanical mixtures	$\frac{1}{50}$ in. square	$\frac{3}{16}$ in. square
Rock phosphate, Phospho guano	$\frac{1}{50}$ in. square	$\frac{1}{8}$ in. square
Lime	$\frac{1}{100}$ in. square	$\frac{1}{8}$ in. square

"Coarse" material is the particles that are larger than "fine" and smaller than "prohibited."

Under the old Act and Regulations provision was made for "unspecified" and "unspecified lumps." This very coarse material now is prohibited.

It should be understood clearly that the percentage of "Coarse" shown on labels of mixtures is actually the organic material only, except in the case of lime, rock phosphate, and phospho guano.

The method of analysis provides that all chemical material (almost completely water-soluble or capable of being broken down by water) shall be washed out, and the organic, blood, bone, flesh, and offal only shall be "tested for fineness." The percentage of "coarse" is the percentage of the insoluble organic material present in the mixture.

FILLER.

On and after 1st October, 1937, any fertilizer containing a filler must show on the label the percentage of the same. "Filler" is any material contained in any fertilizer that does not contain nitrogen, phosphoric acid, potash, sulphur, or magnesia, in appreciable quantities.

For instance:—

Earth,	Sawdust,
Ashes,	Antbed, &c.,

They are merely added, as explained above, to make the weight of fertilizer up to a ton—or for other less worthy reasons.

A clearer explanation would be—

Sulphate of ammonia is not filler, because it is used to supply nitrogen.

Superphosphate is not filler, because it is used to supply phosphoric acid.

Nauru rock is not filler, because it is used to supply phosphoric acid.

Sulphate of potash is not filler, because it is used to supply potash.

Cotton seed meal is not filler, because it could be used to supply nitrogen.

Magnesium sulphate is not filler, because it is used to supply magnesia.

CALCULATIONS.

In order to assist in the explanation as to how to obtain the weight of ingredients to use, to obtain a certain guarantee, or the guarantee that would result from the use of any proportion of ingredients in a mixed fertilizer, the use of questions and answers has been resorted to.

Calculations have been made to the nearest pound only.

Question.—How much sulphate of ammonia shall I use in 1 ton to obtain 5 per cent. of nitrogen?

Answer.—Formula to use:—

$$\frac{\text{Total weight required} \times \text{Per cent. of Active Constituent required}}{\text{Per cent. of Active Constituent in Ingredient used}} = \text{Weight of Ingredient to be used.}$$

Calculation—

$$\frac{2{,}240 \text{ lb.} \times 5}{20{\cdot}6} = 544 \text{ lb.}$$

Therefore, 544 lb. of sulphate of ammonia (containing 20·6 per cent. nitrogen) in 1 ton of fertilizer would give 5 per cent. nitrogen.

Question.—If I use 544 lb. of sulphate of ammonia (containing 20·6 per cent. nitrogen) in 1 ton of fertilizer, what would be the percentage of nitrogen present?

Answer.—Formula to use:—

$$\frac{\text{Weight of Ingredient used} \times \text{Per cent. Active Constituent in Ingredient used}}{\text{Total Weight}} = \text{Per cent. Active Constituent present.}$$

Calculation—

$$\frac{544 \text{ lb.} \times 20{\cdot}6}{2{,}240} = 5 \text{ per cent. Nitrogen.}$$

Therefore, 5 per cent. nitrogen, as sulphate of ammonia, would be present in 1 ton of fertilizer containing 544 lb. of sulphate of ammonia.

The various other percentages obtainable from different ingredients would be calculated similarly.

In calculating the above, an overrun allowance has not been made, and should be provided for if it is intended to offer fertilizers for sale.

LIME.

The Fertilizers Act applies to lime for agricultural purposes as well as to fertilizers. This has been dealt with very comprehensively in the *Queensland Agricultural Journal* of January, 1937.

THE FERTILIZERS ACT OF 1935.

The following are the main requirements of the Fertilizers Act:—

Every dealer must be licensed to sell fertilizer and lime for agricultural purposes (cost £1 1s. yearly).

Every fertilizer or lime must be registered yearly.

Every sale of fertilizer or lime over the value of 10s. must be covered by an invoice and warranty.

Every bag of fertilizer or lime must be labelled.

Every bag of fertilizer must be branded with the brand and name of the fertilizer.

Any buyer who desires to have an analysis made of a fertilizer or lime that he has purchased, must give notice to the seller, within fourteen days of delivery, of his intention to have it analysed, and must also comply with the provisions set out in Regulation 15 under the Fertilizers Act.

OFFENCES.

The Fertilizers Act is for the purpose of protecting buyers, and any irregularity, actual or suspected, should be reported immediately to the Fertilizers Branch in order that investigation and necessary action may be taken at once.

EXPLANATION OF TERMS.

The following terms, often met with, have the meanings as set out hereunder:—

N	= Nitrogen
P_2O_5	= Phosphoric acid
K_2O	= Potash
Super.	= Superphosphate
Sulp. amm. or amm. sulp.	= Sulphate of ammonia
Pot. chlor. .. .. / Muriate of potash ..	= Potassium chloride
Tricalcic phosphate of lime	= Phosphoric acid and lime in combination in the insoluble form

Grade formula expresses the respective percentages of nitrogen, phosphoric acid, and potash in the order given and guaranteed to be present by the dealer in mixed fertilizers, such as 5½-10-12.

Sale of Seeds.

REGULATORY LEGISLATION.

F. B. COLEMAN, Officer in Charge, Seeds, Fertilizers, Veterinary Medicines, Pest Destroyers, and Stock Foods Investigation Branch.

Definition of Vendor.

A VENDOR under the Seeds Act is any person who sells or offers or exposes for sale or contracts or agrees to sell or deliver any seeds for sowing.

Seeds Sold in Made-up Packets to be Marked.

When seeds are sold in made-up packets or packages the following particulars shall be legibly and indelibly marked on the outside of each packet or package, namely:—

(*a*) The full name and address of vendor or packer;

(*b*) The kind and variety or strain of such seeds;

(*c*) The date after which the contents should not be used.

Prohibited.

The principal totally prohibited seeds are:—

Datura spp.	.. ..	Thorn Apple
Cuscuta spp.	.. ..	Dodder
Sorghum halepense	..	Johnson Grass

The following insects are also prohibited:—

Live—

Bruchophagus funebris	..	Lucerne Seed Chalcid Fly
Bruchus spp.	.. ..	Bean, Cowpea, and Pea Weevils.
Sitophilus (*Calandra*) spp.		Grain Weevils;

and seeds infested with same in any stage of development. For full list of prohibited seeds, see Regulations.

Standards of Purity and Germination.

The Regulations under the Act prescribe the minimum germination and the maximum proportions or amounts of weed seeds, other crop seeds, and inert matter that may be present in the different kinds of seeds for sowing. A copy may be obtained on application to the Department of Agriculture and Stock, Brisbane. For list of the more important seeds, see Table I.

Efficient Seed-cleaning Machinery.

The Regulations do not apply to:—

Seeds sold by the actual grower direct to any vendor in possession of one or more efficient cleaning machines, for the purpose of the seeds being cleaned and graded before being offered for sale as seed for sowing.

Samples from Bulk in Sender's Possession.

Provision is made for the examination of samples at the Seed Testing Station, Brisbane, upon payment of the prescribed fee; seeds purchased for sowing, and not resale, are examined free.

TABLE I.

GERMINATION STANDARDS OF THE MORE IMPORTANT SEEDS.

(For full list, see copy of Regulations.)

Kind of Seed.	Germination by Count. Minimum.	Kind of Seed.	Germination by Count. Minimum.
	Per Cent.		Per Cent.
Barley	80	Lupins	60
Beans—		Maize	80
French	70	Mangel	*55
Mauritius	70	Marrow	70
Rice	75	Millets—	
Beet	*55	French	75
Cabbage	60	Foxtail	75
Carrot	50	Japanese	75
Cauliflower	60	Panicum	75
Clovers—		Setaria—Giant and dwarf	75
Red clover	75	White panicum	75
White clover	70	Oats	80
Cotton	70	Onion	50
Cowpeas	70	Parsnip	40
Cucumber	70	Peanuts	60
Grasses—		Peas	75
Blue panic—Giant panic	40	Pumpkins	70
Canary—Seed canary	65	Radish	75
Cocksfoot	60	Rape	70
Couch grass	40	Rockmelon	70
Molasses grass	20	Rye corn	80
Paspalum	20	Sorghum grain	70
Phalaris tuberosa	55	Sorghum saccharine	70
Prairie grass	65	Squash	70
Rhodes grass	30	Sudan grass	65
Rye grass—		Swede turnip	65
Italian	65	Tares	60
Perennial	65	Tobacco	60
Wimmera	65	Tomato	65
Leek	50	Turnip	65
Lettuce	75	Vetch	60
Lucerne	75	Watermelon	65
		Wheat	80

* Of clusters.

Sampling Instructions.

(1) When drawing samples, it is of the utmost importance that they be drawn by a responsible person and care be taken to make them truly representative of the bulk.

(2) To enable this to be done satisfactorily, approximately equal parts should be drawn alternatively from the top, middle, and bottom of the bags, the proportion of bags to be sampled being as follows:—

1 to 19 bag lots—A portion from each bag.
20 to 39 bag lots—A portion from each of not less than 20 bags.
40 to 59 bag lots—A portion from each of not less than 28 bags.
60 to 79 bag lots—A portion from each of not less than 32 bags.
80 to 99 bag lots—A portion from each of not less than 36 bags.
100 to 199 bag lots—A portion from each of not less than 40 bags.
200 bags and over—A portion from each of not less than 20 per cent. of the total number of bags.

(3) If, when drawing samples, it is observed that great variation occurs in the bulk, two or more samples should be obtained, each from bags whose contents are similar, and representing the variations that may have been noticed. These different lots should be marked with distinguishing marks, and the samples marked similarly.

(4) After a sample has been drawn as above indicated, it should be emptied out on to a large piece of paper, thoroughly mixed, and then a quantity not less than the prescribed weight for the particular kind of seed should be drawn for purposes of forwarding to the Seed Testing Station. A duplicate sample should be kept for reference.

(5) In the Seed Testing Station great pains are taken to ensure absolute accuracy of work. It therefore follows that all this care is wasted unless the person forwarding samples for examination takes some trouble to ensure that the samples drawn truly represent the bulks from which they are obtained. The minimum weight of such samples is as follows:—

TABLE II.

WEIGHT OF SAMPLES.

Kind of Seed.	Weight required.	Kind of Seed.	Weight required.
Barley	8 oz.	Panicum	4 oz.
Beans	8 oz.	Parsnip	½ oz.
Beet	½ oz.	Paspalum	3 oz.
Cabbage	½ oz.	Peanuts	2 lb.
Canary	4 oz.	Peas	8 oz.
Carrot	½ oz.	*Phalaris tuberosa*	3 oz.
Cocksfoot	3 oz.	Prairie grass	4 oz.
Couch	3 oz.	Radish	½ oz.
Cowpeas	8 oz.	Rhodes grass	3 oz.
French millet	4 oz.	Rice	8 oz
Grasses	3 oz.	Rye	8 oz.
Japanese millet	4 oz.	Rye grass	3 oz.
Linseed	4 oz.	Sorghum	4 oz.
Lucerne	4 oz.	Sudan grass	4 oz.
Maize	8 oz.	Tares	8 oz.
Mauritius beans	1 lb.	Tomatoes	½ oz.
Millets	4 oz.	Vegetable seeds in made-up packets	5 pkts.
Molasses grass	3 oz.	Wheat	8 oz.
Oats	8 oz.	White panicum	4 oz.
Onion	½ oz.		

Where seeds are stored loose in bulk, the samples shall be taken from various parts of the heap or bin, and shall be of the like proportion, as nearly as can be fairly estimated, as would be required if such seed were in bags, so that a representative sample of the whole bulk is obtained.

In the case of seeds not mentioned above, the weight set out for the seed of nearest size should be forwarded.

In the case of seeds obviously containing weed seeds or other impurities, not less than double the weight mentioned should be sent.

Marking of Samples.

All samples must be plainly written on in ink, setting out the undermentioned particulars:—

Sample of seed drawn from bags
representing a total of bags.

Bags marked:—

Purchased from of on

Name of sender:

Address:

Date:

The examination of samples without name and address of sender cannot be undertaken.

Samples should be addressed as follows:—

Seed Sample for Examination.
Officer in Charge,
Seed Testing Station,
Department of Agriculture and Stock,
Brisbane.

Special care should be taken to securely fasten up the sample. The examination of samples that have been opened in transit is useless for any determination, as only a sample received intact can be taken as representing any bulk.

Fee and Covering Letter.

A covering letter, enclosing the prescribed fee, should be addressed to the Under Secretary, Department of Agriculture and Stock, Brisbane.

The fee for a copy of the result of any examination of any seeds shall be as follows:—

1. 2s. 6d. per certificate, or
2. (*a*) £3 10s. for the first fifty certificates, and thereafter 1s. per additional certificate during the twelve months ending 30th June—providing the sum of £3 10s. shall be paid in advance: Provided that—

   (*b*) In the event of any person claiming a refund of fees paid under 2 (*a*) on account of the number of certificates being less than fifty, such refund shall consist of the amount left after the charge of 2s. 6d. per certificate has been made.

Free Examination.

Samples representing seeds purchased by farmers for their own sowing are examined free of charge, providing that the full particulars as above are marked upon the sample, and a covering letter stating the purpose for which the seed is to be used is forwarded.

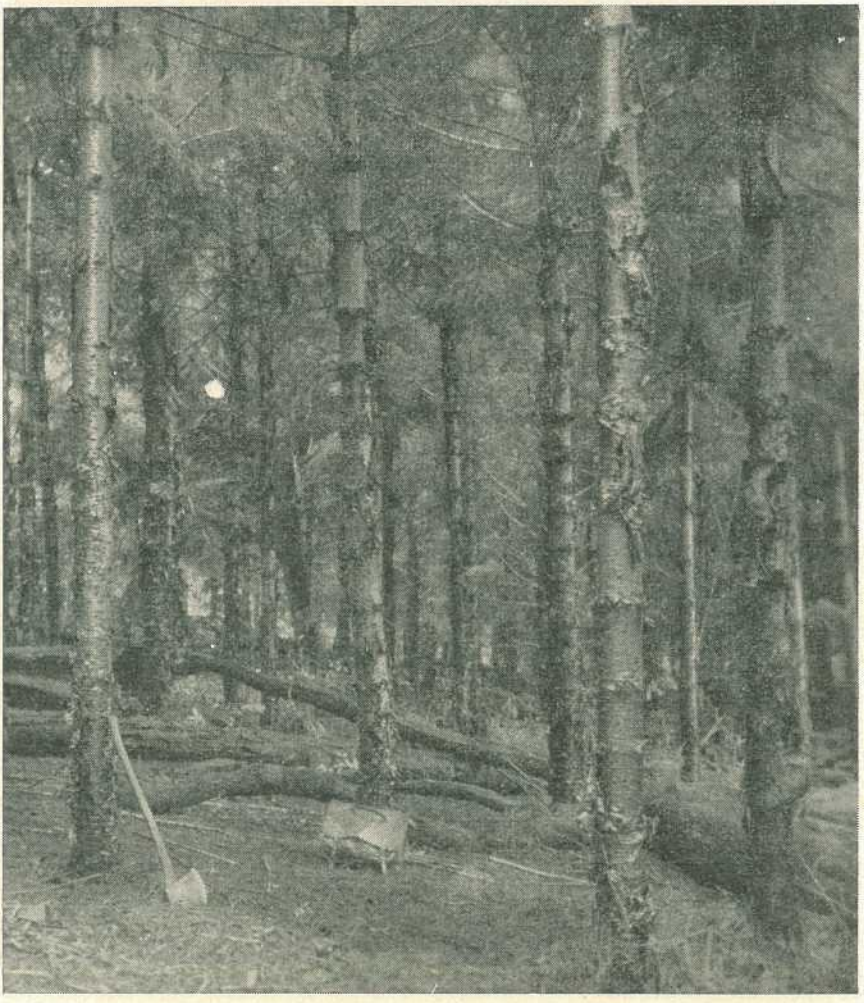
Complaints.

In case of any complaints regarding analytical purity or germination, the buyer should at once send a sample of the seed, marked with the

particulars as above set out, together with a covering letter to the Department advising of the despatch of the sample; this will be examined free of charge.

Examine Goods on the Day of Delivery.

Both buyers and sellers are urged to examine all goods on the day of delivery, and when in doubt regarding any seeds, fertilizers, veterinary medicines, pest destroyers, or stock foods, to write at once to the Department of Agriculture and Stock, Brisbane, in order that the matter may be at once investigated.



[*Photo. Forest Service.*

Plate 72.

A RAPIDLY GROWING ASSET.—A nine-year-old stand of Hoop Pine at Barron, North Queensland.

THE MEAT INDUSTRY.

The investigations of the Rural Development Committee of the Bureau of Industry indicated that the chilled-beef trade offered the best opening for the expansion of the Cattle Industry. Suppliers of livestock for chilled-beef export purposes might be divided into two distinct types—Graziers; Farmers.

As to Graziers—

The Rural Development Committee propounded a set of factors which appeared to have an important bearing upon a successful scheme of chilled-beef export insofar as graziers were concerned. The factors enumerated were:—

(*a*) The requirements for a continuous supply of suitable beef cattle;

(*b*) The areas suitable for the breeding and fattening of such cattle;

(*c*) The pastures and other requirements for the continuous growth of the cattle to maturity in prime condition;

(*d*) The most effective procedure for transferring the cattle from breeding areas to fattening areas and from the fattening areas to the points of treatment for export;

(*e*) The relationship between the supply of such cattle and the supply of other livestock suitable for export trade;

(*f*) Generally, the most effective means of establishing the beef-cattle industry on a more satisfactory basis in relation to Queensland conditions and other industries.

These factors were weighty ones and satisfactory conclusions concerning them, and successful practical action based upon the conclusions, might have had an important influence upon the Cattle Industry and the chilled-beef export trade.

Under the aegis of the Bureau a conference of interested parties was held, but, apparently, the conference was abortive—and led to a position of stalemate.

As to Farmers—

Research by various Bureau Committees elicited much useful information. I summarise below some of the tentative conclusions which were reached—

(*a*) The average dairy farmer, if he is to meet his commitments and to provide employment for his sons, may be compelled to add some other source of income to his dairy activities.

(*b*) General agriculture does not afford an attractive avenue owing to recurring gluts, instability of prices, and small margins of profits.

(*c*) The auxiliary of raising fat stock, lambs, and pigs for the local and export markets may afford a moderately remunerative sideline if satisfactory arrangements could be made for group-marketing—say, through the butter and cheese factories. Coupled with this project should be the growing of more crops for conservation of fodder on the farm.

The orderly development of the meat industry is an important branch of State expansion, and it would appear desirable to explore the possibilities thoroughly, particularly as new paths to development are being sought so anxiously and the urge to help the small man is so strong.

But, seemingly, a stage has been reached when committees and conferences have ceased to be effective and when other methods should be tried. A comprehensive memorandum on the subject was submitted to the Chief Secretary.

—*From the Annual Report of the Public Service Commissioner, Mr. J. D. Story, I.S.O.*

REGISTERED STALLIONS.

Subjoined is a list of stallions in respect of which Certificates of Registration were issued under "*The Stallions Registration Acts*, 1923 *to* 1934," during the year 1937-38:—

BLOOD STALLIONS CERTIFICATED FOR LIFE DURING YEAR 1937-38.

Name.	No.	Age.	Colour.	Owner.
Afghan	1944	Aged	Black	F. G. B. Gottwaltz, Powlathanga
Alcman	1996	Aged	Brown	C. H. Wright, Waverley, St. Lawrence
Amber King	1945	6	Bay	J. C. Alford, Mount Ravenswood
Andy Ra	1910	5	Dark bay	W. Northcott, Grange, Brisbane
Ardon's Pride	1911	6	Brown	A. E. Tucker, Hendra
Bachelor's Echo	1863	Aged	Bay	W. E. May, Clifton
Baldwin	1770	Aged	Brown	P. Hughes, Macdonaldtown, Toowoomba
Bally's Pride	2035	5	Brown	F. Schmidt, Eton
Beau Valette	2024	5	Chestnut	G. Skene, St. Alban's, Nebo
Bender Boy	1771	5	Bay	W. E. Stevens, Kogan
Blue Boy	2025	5	Grey	H. G. Walters, Proserpine
Bon Soldat	1912	5	Chestnut	J. Gault, Edward street, Brisbane
Bronzollo	1817	5	Chestnut	J. Daniels, Canungra
Brown Lock	1890	5	Bay	J. Reid, Glamorgan Vale
Bullomin	1913	5	Brown	L. C. Lawson, Grafton
Buzzalot	1946	5	Chestnut	H. Lanzen, Alice River, Townsville
Cadency	1914	5	Chestnut	W. Robson, Coraki, New South Wales
Cangou	1823	5	Chestnut	F. M. Hooke, Woolooga
Cannon King	1772	5	Chestnut	W. G. Douglas, Nutgrove
Careful Marcus	1997	Aged	Chestnut	A. E. Rankin, Duaringa
Carrawob	1773	5	Bay or Brown	D. A. Wormwell, Meandarra
Compodomico	1774	Aged	Bay or Brown	C. O. Frith, Taunton
Cool Valley	1915	5	Bay	Bergstrom and Hansen, Ascot
Daily Leader	1824	5	Bay	P. G. Allen, Cinnabar
Dandale	1775	5	Brown	V. W. Fysh, Pampas
David Hope	2026	Aged	Brown	E. Y. Shannon, Nebo
Demon Lad	2004	Aged	Bay	J. M. McCartney, Princhester
Elderdown	1825	5	Bay	A. Lutvey, Gayndah
Ellcast	1776	5	Chestnut	R. C. Dickman, Chinchilla
Falmacre	1947	Aged	Brown	A. Parsons, Herberton
Fernside	1998	5	Brown	R. Beak, Wumalgi
Flight	2027	5	Blood Bay	M. C. M. James, Dow's Creek, Mirani
Fugaleye	1864	Aged	Chestnut	H. C. Bradford, Omanama
Gee Whiz	1948	Aged	Brown	Hedlef Brothers, Ravenswood
Golden Knight (imp.)	1949	Aged	Chestnut	Estate J. S. Love, Valley of Lagoons, Ingham
Golden Leaf	1950	5	Chestnut	J. Downey, Kirk River, Mingela
Gold Dust	1777	5	Bay	W. J. Brazier, Jandowae
Gozinate	2028	5	Brown	D. A. and S. O. Nielsen, Nebo
Grecian More	1916	Aged	Chestnut	F. Powell and Sons, Richmond, New South Wales
Grey Amber	1951	5	Grey	R. J. Atkinson, Mount Garnet
Grosnet	1778	5	Bay	H. A. Clark, Westbrook
Gunfelt	1917	5	Bay or brown	W. G. Anderson, Urandangie
Havelock	1826	5	Brown	F. G. Willert, Goomeri
High Drama	1918	6	Bay	W. Northcott, Grange, Brisbane
High Order	1953	Aged	Bay	Gunnawarra Pastoral Co., Gunnawarra
Impish Boy	1954	5	Dark bay	Miss E. M. Lee, Mount Molloy
Ishmail (Arab)	2019	6	Iron grey	Wilson and McDouall, Calliope
Jackoli	1999	5	Brown	Camboon Pastoral Co., Camboon
Jocular	1919	5	Brown	E. L. Ramsay, Cambooya
King Leo	1891	5	Bay	P. E. Grace, Boonah
King Logan	1827	5	Grey	D. A. Proctor, Byrnestown
L'Elite	1920	Aged	Chestnut	W. C. Keane, Dirranbandi
Leo Dear	1921	5	Bay	W. Wilson, Drake street, Hill End
Lilmatic	1828	6	Brown	W. J. Williams, Mungungo
Lobomin	1922	5	Bay	L. Dahl, Manson road, Hendra
Lord Downshire	1923	5	Bay or brown	H. J. Carter, Alfred street, Charleville
Magnet	2029	5	Brown	Bradshaw and Goodale, Gargett
Malt	1955	6	Brown	C. Simonelli, Ravenswood
Matelot	1829	5	Bay	H. S. Kent and Co., Gayndah
Mentoi	1818	5	Bay	J. T. Sherlock, Sherwood
Mont Blanc	1779	5	Chestnut	Grace Brothers, Boondoondilla Siding
Paine Raughton	2030	Aged	Brown	V. A. Toms, Mossvale, Jaraga
Pathfield	2031	5	Chestnut	F. Smith, Beaconsfield, St. Lawrence
Perlo	2032	5	Iron grey	T. and C. Nielsen, Eton
Petition	1830	6	Bay	T. J. Downey, Gooroolba
Problem	2000	5	Brown	Archer Brothers Pty., Biloela
Rallier	1956	Aged	Black	Estate H. J. Alkinson, Wyandotte
Richmond	2033	Aged	Bay	M. M. Gordon, Grosvenor Downs
Ruffian	1924	6	Brown	M. F. Yore, Logan Village
Sea Laddie	1892	5	Black	T. J. Ford, Gatton
Senator	2001	5	Bay	R. G. Mackay, Morinish
Server	1831	5	Bay	S. McCracken, Bundaberg
Silver	2002	5	Grey	A. W. Christiansen, Raglan
Simon	1832	5	Chestnut	Perrett Brothers, Kinbombi
Sir Foot	2034	Aged	Brown	W. H. Bradshaw, Nebo
Sir Rally	1957	5	Black	J. Irwin, Ewan
Snowfire (imp.)	1780	Aged	Bay	P. Hughes, Toowoomba
St. Carmen	1781	6	Brown	J. D. Wormwell, Dalby
Strathalvon	1958	Aged	Brown	C. Suhr, Ravenswood
Syce Tune	1833	Aged	Bay	H. Barber, Mungungo

BLOOD STALLIONS CERTIFICATED FOR LIFE DURING YEAR 1937-38—*continued.*

Name.	No.	Age.	Colour.	Owner.
Sydney Lad	1925	5	Bay	G. F. Goodrich, Inglewood
Taubada	1782	5	Bay	Mrs. R. V. Broydon, Haden
Tauber	1926	5	Bay	B. C. Bell, Aroo, Boonah
Three Cheers	1959	Aged	Bay	G. and M. Core, Blue Range, Charters Towers
Trent Bernie	1834	5	Chestnut	J. Frame, Inverlaw, Kingaroy
Tripple Gleam	1960	Aged	Bay	J. H. Alkinson, Greenvale, Charters Towers
Unbrave	1927	5	Chestnut	P. Venaglia, Wilsonton
War Arm	1783	5	Bay	R. J. Barry, Jandowae
Waratah	1835	5	Bay	G. W. Nahrung, Miva
Warrigal	1784	5	Chestnut	J. F. Lowien, Wutul
Warwick Bachelor	1785	5	Brown	F. J. C. Martin, Kumbarilla
Warwick Love	1961	Aged	Bay	J. Rollinson, Homestead
Weir Wedge	1786	5	Brown	F. G. Searcy, Kinkabilla
Wide Bay	1787	6	Bay	J. C. Clark, Daandine, Dalby
Winbow (5th)	2003	Aged	Brown	Estate Geo. Creed, Raglan

PONY STALLIONS CERTIFICATED FOR LIFE DURING YEAR 1937-38.

Ankor II.	1865	5	Grey	W. Gilmore, Allora
Basra	1819	5	Bay	D. McDougall, Veresdale
Black Pride	1820	5	Black	J. T. Collett, Pomona
Bonny Gem	1811	5	Bay or brown	E. J. Ezzy, Kooroongarra
Boonah's Pride	1893	5	Black	G. E. Kirchner, Boonah
Bruno	1866	Aged	Cream	H. Redington, Goondiwindi
Darby	1837	5	Chestnut	L. J. Mackaway, Goomeri
Golden Laddie	1894	5	Chestnut	W. H. Strasburg, Lark Hill
Hope	1930	5	Brown	R. C. Draney, Townson
Johnnie	1838	5	Cream	F. M. Hooke, Woolooga
Kailhan	1839	Aged	Bay	R. B. Jefferies, Nanango
Little Sam	1840	5	Black	E. O. Althause, Cloyna
Mark Twain	2020	Aged	Grey	Archer Bros. Pty., Ltd., Biloela
Master Cypher	2021	5	Brown	Miss E. E. Perrier, Mount Larcom
Master Ludo	1931	5	Brown	Mrs. M. E. S. Bates, Eagle Farm
Migalo	1841	5	Bay or brown	M. J. Daly, Murgon
Nifty Jim	1932	5	Bay	W. G. Blomfield, Miriam Vale
Paddy	2022	5	Brown	J. G. McCartney, Marlborough
Ramadi	1812	5	Grey	J. V. Willis, Meringandan
Rex	1963	Aged	Black	C. R. Mortimer, Tarzali
Royalty	1964	5	Bay	J. M. McCloskey, Plum Tree
Shumar	1813	5	Chestnut	G. G. Wilson, Bell
Silver Prince	1842	6	Chestnut	F. M. Hooke, Woolooga
Springmeade Bright Lad	1933	5	Bay	Ziesemer Bros., Boujean
Tim	1814	5	Black	A. Tame, Kulpi
Tom Thumb	1965	Aged	Blue grey	W. Squire, Ravenswood
Toomba	1966	Aged	Flea bitten grey	Bell and Hatfield, Caerphilly, Charters Towers
Wee Georgie	1934	6	Iron Grey	A. J. McPhie, Ulmarra, New South Wales
Wild Fire	1895	5	Chestnut	A. Moore, Mount Forbes, Rosewood

TROTTER STALLIONS CERTIFICATED FOR LIFE DURING YEAR 1937-38.

Belmont Boy	1836	5	Bay	S. R. Steele, Proston
Cole Sound	1928	5	Bay	W. D. Dale, Marburg
Direct Dean	1896	5	Bay	C. A. J. Tillack, Laidley
Dynamite	1897	5	Bay	H. Gon Chee, Esk
Prince Pronto	1815	Aged	Bay	P. Hughes, Macdonaldtown, Toowoomba
Raven Dean	1816	5	Bay	Mrs. C. Bruhl, Cecil Plains
Sylmo	1962	5	Chestnut	Jas. Campbell, Oonoomba
The Sail	1929	Aged	Bay	D. Sharp, Ekebin
Vicks	1821	Aged	Bay	F. Pryor, Verrierdale, Eumundi
Young Afghan	2023	Aged	Brown	E. Griffiths, Dumbleton, Mackay

DRAUGHT STALLIONS CERTIFICATED FOR LIFE DURING YEAR 1937-38.

Adventist	2005	Aged	Bay	Estate Geo. Creed, Raglan
Aerial Mail	2006	5	Bay	Camboon Pastoralist Co., Camboon
Arraglen	1843	5	Bay	Pownall and Pownall, Mahoon
Attraction	1844	5	Bay	R. T. Jones, Didcot
Barana Comet	1967	Aged	Chestnut	C. E. Deane, Hodel, Townsville
Barney	1968	Aged	Grey	R. C. Ramsay, Mingela
Baron Knight	1845	5	Bay	S. and B. Scotney, Moorland
Beau Laddie	1898	5	Bay	S. J. Draper, Stoney Creek
Ben Attow	1969	5	Bay	P. F. King, Home Hill
Black Prince	1970	Aged	Black	J. H. Alkinson, Greenvale, Charters Towers
Bonnie Intent	1846	5	Bay	W. E. Elsebach, Gayndah
Boree Wallace	1867	Aged	Brown	P. J. Wilson, Elphinstone
Bowler	1971	Aged	Brown	A. Peagham, Pentland
Boxer	2007	5	Brown	N. W. Meissner, Biloela
Bright	1972	Aged	Bay	Eliza E. Rollinson, Balfe's Creek
British Lion	2008	Aged	Bay	R. Beak, Wumalgi
British Prince	1847	5	Bay	C. F. Draheim, Murgon
Brooklyn Keynotes Sport	2009	5	Bay	R. Beak, Wumalgi
Brown Dale	2010	5	Brown	J. B. Shannon, Tooloombah

DRAUGHT STALLIONS CERTIFICATED FOR LIFE DURING YEAR 1937-38—*continued.*

Name.	No.	Age.	Colour.	Owner.
Burrundale George	1848	5	Bay	J. E. Stanton, Goomeri
Captain	1849	Aged	Bay	Hunter Bros., Cinnabar
Captain	1850	5	Bay	J. T. Mulcahy, Nanango
Captain Shepherd	1788	5	Brown	M. G. Polzin, Douglas, Goombungee
Captain Wallace	1851	5	Brown	A. Perrett, Coolabunia
Captain Wallace	1899	5	Bay	W. E. Houston, Blackbutt
Carlyle Pet	1789	5	Bay	A. R. and R. C. Curd, Jandowae
Cedric	1790	5	Black	E. C. Stark, Pinelands, Crow's Nest
Chieftain	2036	5	Bay	W. Foan, Sarina
Chieftain	2037	5	Bay	D. P. Markey, Boldon, Mackay
Chieftain	1868	5	Bay	Estate E. Jowett, Clifton
Clematic Flash Mac	1900	5	Brown	J. M. Newman, Caboolture
Clinker	1869	5	Bay	V. Osborne, Cobba-da-mana
Commander	1935	5	Bay	G. H. Burrows, Tasmania
Craiglea Again	1973	6	Dapple brown	J. Williams, Ingham
Crown	1974	Aged	Dark bay	G. F. Crowley, Mount Leyshon
Crystal	1975	6	Grey	B. Lynn, Ingham
Crystal Boy	1901	Aged	Bay	S. Webster, Kilcoy
Crystal King	1852	5	Brown	J. B. Edwards and Son, Kingaroy
Cypress Grove Baron Vue	1936	Aged	Bay	Forge Bros., Tamworth
Dale	2038	5	Bay	W. H. Gillham, Suttor Creek, Nebo
Dangar	1993	Aged	Chestnut	J. Barker, Oak Hills, Ingham
Diamond King	1976	6	Bay	G. Altoft, Macknade
Dijon	1977	Aged	Dapple grey	T. H. Baker, Mount Molloy
Dollfuss	1853	5	Brown	E. Reinbott, Booie
Don	1978	Aged	Dark bay	P. Catrastellero, Victoria East, Ingham
Dragon	1870	5	Bay	G. S. Burns, Goondiwindi
Duke of Gloucester	1871	5	Bay	J. Little, Cobba-da-mana
Duke of Windsor	1872	5	Bay	G. Wickham, Karara
Earl Marshall	2039	6	Bay	G. W. Orchard, Parapi
Fashion Prince	1873	6	Bay	Dwan and Sons, Deuchar
General Dale	1979	5	Brown	P. F. King, Home Hill
George Wallace	1874	5	Bay	T. J. Lyons, Clinton Vale
Glenroy	2040	5	Black	A. Parkinson, Finch Hatton
Grove King	2041	5	Bay	B. J. Langford, Finch Hatton
Haile Selassie	2042	5	Brown	N. Mackay, Mirani
Hero	1875	Aged	Black	E. E. Gray, Cobba-da-mana
Highland Greyboy	2043	6	Grey	A. Petersen, Homebush road, Mackay
Highland Sensation	1980	Aged	Black	C. B. McPherson, Mingela
Intent's Pride	1981	5	Bay or Brown	H. B. Burstall, Ayr
Jack	1822	5	Roan	D. Hose, Pomona
Jelbyn Jock	2044	5	Bay	Wright and Davidson, Kemmis Creek, Nebo
Jimmy	2011	6	Bay	C. Acutt, Kalapa
Johnnie Walker	1791	5	Bay	T. Gadsby, Woleebee, Jackson
Jondaryan Duke	1792	5	Bay	G. W. Hartmann, Bowenville
Jondaryan Maple	1793	5	Bay	W. P. O'Sullivan, Greenmount
Jondaryan Minstrel	1794	5	Bay	W. J. Lloyd, Harrow
Jondaryan Worthy Sheriff	1795	5	Bay	Miss E. Armstrong, Toowoomba
Kerlock	1902	5	Black	R. E. A. Schafferius, Ingoldsby
Kerr Lad	2045	5	Brown	E. Atherton, Koumala
Kerrston Lad	1903	5	Brown	S. H. Hallas, Gatton
Kimbar Mailboy Jack	1796	5	Bay	Alexander Bros., Inverai
King Wyllie	1904	5	Black	F. F. Harm, Plainland, Laidley
Lion	1854	5	Bay	W. Ellicombe, Mundubbera
Lord Darnley	1797	Aged	Bay	E. D. Jones, Cherwonda, Wandoan
Mac	1982	5	Bay	W. Conley, Ayr
Majorlace	1855	5	Black	H. Seiler, Wondai
Major Wallace	1877	5	Bay	E. J. Breen, Eukey
Major Wyllie	1983	Aged	Brown	J. B. Taylor, Malanda
Master Carlyle	1798	5	Bay	G. H. Bidstrup, Warra
Master Wallace	1878	5	Bay	T. O'Dempsey, Lower Freestone
Mountain View	2012	5	Bay	E. A. Russell, Thangool
Mount Irving Prince Alexander	1879	6	Bay	J. D. Hynes, Riverton, Tenterfield
My Intent	1880	5	Brown	T. Ryan, Greymare
Napoleon	1800	5	Bay	W. B. Dent, Glenmona, Warra
Newtown Intent	1984	Aged	Black	Estate H. J. Atkinson, Ingham
Ngaia Juvenal	1856	5	Bay	J. R. L. Hyne, Riversleigh
Noble	1985	Aged	Bay	G. Snodgrass, Yungaburra
Noble Hero	1801	5	Bay	E. Ehlrich, Oakey
Noble of Cashmere	1986	6	Bay	W. A. Jenkins, Julatten
Nugget	2046	5	Bay	E. A. Spearing, Carmila
Nuggett	2013	Aged	Bay	M. McGrath, Nankin Junction
O'Lad	1802	5	Bay	C. G. King, Goombungee
Peel River Monarch	1799	5	Bay	Currowah Pty. Ltd., Brookstead
Peter Jackson	1803	5	Bay	Baker Bros. Pty. Ltd., Bowenville
Pine Park Chief	1938	5	Bay	R. Stokes, Collingwood, Victoria
Pine Vale Mainmast	1939	5	Black	J. Hamilton, Forest Hill
Plucky Prince	2014	5	Bay	W. H. Davey, Baralaba
Pride of Fairview	1905	5	Bay	J. G. Tones, Sheep Station Creek, Kilcoy
Prince Chamberlain	1995	Aged	Bay	C. F. Schmid, Nikenbah
Prince Charles	1987	Aged	Bay	Estate J. S. Love, Gainsford, Charters Towers
Prince Dale	1857	5	Bay	F. C. Rekow, South Kalkie, Bundaberg
Prince Henry	1804	5	Bay	Bebbington Bros., Cambooya
Prince Roy	1805	5	Bay	P. G. Ruhle, Motley, *via* Oakey

DRAUGHT STALLIONS CERTIFICATED FOR LIFE DURING 1937–38—*continued.*

Name.	No.	Age.	Colour.	Owner.
Punch	2015	5	Bay	A. Thomasson, The Caves
Rare Champion	1906	5	Bay	H. A. Bartholomai, Boonah
Ravelrigg (imp.), N.Z.	1940	6	Brown	T. Robson, Crow's Nest, Sydney
Roan Tom	2016	6	Roan	J. B. Shannon, Tooloombah
Robin of Lilyvale	1941	5	Bay	J. O. Hagan, Belmont
Rob Roy	1907	5	Bay	H. Williams, Blackbutt
Royal	1858	5	Brown	J. A. Perkins, Mundubbera
Royal Banker	1881	5	Black	Hart Bros., Headington Hill, Clifton
Royal Mac	1859	5	Bay	J. McDermid, Monto
Royal Shepherd	1806	5	Bay	P. T. Dwyer, Maclagan
Royal Top	1882	5	Bay	A. N. McKechnie, Cottonvale
Scotsdale	1988	Aged	Bay	M. Laws, Malanda
Shamrock	1883	5	Bay	M. Bourke, Yangan
Silver	2047	Aged	Chestnut	R. J. Kelly, Jaraga
Sir Burton	2048	5	Brown	R. J. Aslette, Harrycrandt, Nebo
Sir Glancer	1989	6	Brown	Mrs. F. L. Doyle, Mareeba
Sir Pendennis	1884	5	Bay	B. Y. L. Peckman, Boggabilla, New South Wales
Sir William 2nd	1885	5	Chestnut	E. Homan, Killarney
Slogan	1990	6	Chestnut	J. M. McCloskey, Plum Tree, G.N.R.
Smoky	2017	5	Bay	W. J. Greedy, St. Lawrence
Star Rover	1807	5	Bay	S. B. Smith, Tor street, Toowoomba
Sterling Slade	1908	5	Black	A. Kubler, Boonah
Studley Laddie	2049	5	Bay	J. Jones, Savannah
Sudden Surprise	1808	5	Brown	L. F. Kuhl, Narko
Talgai Model	1886	5	Bay	J. J. Rynne, Goomburra
The Willow's Trustep	1887	5	Bay	A. M. Cadell, Texas
Toby	1994	6	Bay	T. Clarke, Wietalaba
Trooper Dale	2018	Aged	Bay	W. H. and C. F. Bauer, Watalgan
Ulupna Carl	1809	5	Bay	A. A. Treasure, Brigalow
Viron	1860	5	Bay	H. J. Rasmussen, Kepnock, Bundaberg
Waipa	1991	Aged	Bay	Estate S. L. Roberts, Julatten
Warwick Lad	1992	Aged	Bay	J. P. Guy, Clare, *via* Ayr
Wildash Pride	1861	5	Black	W. J. Borchert, Murgon
William Wallace	1810	5	Bay	M. Lysaght, Bringalily
Willowbank High Degree	1942	5	Black	J. Hamilton, Forest Hill
Willowbank Ronald	1943	5	Bay	R. Stokes, Collingwood, Victoria
Willow Grove Fashion	1909	5	Bay	P. Ryan, Newlands, Gatton
Worthy John	1888	5	Roan	W. A. Deacon, Allora
Young Douglas	1889	5	Bay	E. Costello, Thane
Young George	2050	5	Bay	J. Hall, Wagoora

BLOOD STALLIONS CERTIFICATED FOR THE YEAR 1937–38.

Ankober	1501	3	Chestnut	L. S. Oxley, Wilga, *via* Yelarbon
Archer	1457	4	Brown	L. E. Gossow, Maidenwell
Banker	1458	4	Bay	Elworthy & Mellor, Brooweena
Blue Tie	1459	3	Steel grey	D. Moloney, Chahpingah, Kingaroy
Bon Aero	1455	4	Bay	P. Brennan, Jimboomba
Deer Pride	1547	4	Chestnut	W. Manz, Lowood
Featherdust	1460	4	Brown	J. C. Stockden, Cinnabar
Fernstone	1503	3	Black	Wright and Sons, Kindon, Goondiwindi
Foundation	1548	4	Bay	L. Shine, Fernvale
Fox Vale	1640	3	Brown	A. C. Williams, Homevale, Nebo
Glenveil	1461	4	Bay	A. Guiney, Wondai
Golden Persse	1504	4	Chestnut	C. L. Fraser, Richmond Hill, Pratten
Great Scott	1641	3	Chestnut	F. A. Ross, Waitara, Nebo
Hamleigh	1600	3	Bay	F. Fraser, Hamleigh, Ingham
Home Vale	1642	3	Chestnut	Bell Bros. and Co., Croydon, St. Lawrence
Idol Answer	1462	4	Brown	R. Webb, Beaconsfield, *via* Childers
Klondyke	1588	4	Bay	J. O'Brien, Moggill
Loch Melvin	1589	4	Bay	A. J. Manson, Rockbourne terrace, Paddington
Lord Alwina	1398	4	Bay or brown	W. B. Dent, Glenmona, Warra
Lord Leopolis	1399	4	Brown	Miss N. Pomeroy, Clifford street, Toowoomba
My Paddy	1400	4	Brown	H. A. Clark, Westbrook
Peterborough	1401	4	Chestnut	J. Scotney, Greenmount
Polyveil	1463	4	Chestnut	M. MacDonnell, Coolmore, Gympie
Reklaw	1464	4	Bay	L. C. Walker, Bingera
Revelad	1465	3	Bay	W. E. Sauer, Gayndah
Rexlad	1549	3	Bay	B. Voigt, Glamorganvale, *via* Walloon
Rufus	1644	3	Chestnut	A. D. Shannon, Oxford Downs, Nebo
Sarnyx	1611	4	Iron grey	Camboon Pastoral Co., Camboon
Scholar's Cap	1550	3	Bay	R. Betts, Boonah
Sir Magnum	1551	4	Black	A. Wiegand, Tallegalla
Someday	1466	3	Brown	R. E. Pickels, Coolabunia
Starlight	1467	4	Black	L. J. Mackaway, Goomeri
Sunnie	1468	4	Chestnut	E. N. Sawtell, Coolabunia
Tony	1469	3	Chestnut	W. H. Sawtell, Wooroolin
Warwick Lad	1552	4	Bay	G. A. Heise, Minden
White Flag	1553	4	Chestnut	R. Jackson, Munbilla

PONY STALLIONS CERTIFICATED FOR THE YEAR 1937–38.

Name.	No.	Age.	Colour.	Owner.
Black Prince	1470	3	Brown	A. J. Manning, Byee, *via* Murgon
Bonnie Boy	1507	4	Bay	J. L. Mann, Broadwater, Stanthorpe
Bonny Boy	1471	4	Black	H. Taylor, Gayndah
Bosca	1505	3	Cream	R. A. Howell, Killarney
Cupid	1554	4	Bay	J. Duncan, Stockyard Creek, Helidon
Darbie's Boy	1508	4	Grey	T. Hildred, Gladfield
Darby II.	1509	4	Grey	M. G. Yorston, Coton, Gladfield
Electric Boy	1402	3	Brown	O. Postle, St. Helen's road, Pittsworth
Gold Top	1403	3	Taffy	B. V. Neale, Ramsay, Cambooya
Grey Boy	1472	3	Grey	V. P. Walsh, Runnymede, Nanango
Jimmy Boy	1404	4	Bay	P. T. Dwyer, Maclagan
Lieutenant Jim	1620	4	Bay	W. G. Blomfield, Miriam Vale
Little Jim	1555	3	Bay	J. C. Logan, Gatton
Mac's Choice	1405	3	Chestnut	S. H. Reynolds, Glasgow street, Toowoomba
Pilgrim	1556	4	Grey	D. D. Logan, Pineview, Kilcoy
Playmate	1621	4	Piebald	J. J. Bauer, Watalgan
Prince Carda	1622	3	Brown	C. H. Hammond, Ubobo
Prince Reuben	1406	3	Bay	H. Ruhle, Mount Tyson
School Boy	1623	3	Blue grey	W. T. Brown, Calliope
Silver King	1473	3	Chestnut	E. Litfin, Hivesville
Silver Laddie	1591	4	Grey	H. Cox, Mount Sylvia, Gatton
Spring Meade Bright Fox	1592	4	Black	C. J. Cotter, Hardgrave street, Ipswich
Stibnite	1456	4	Blue roan	J. M. Newman, Caboolture
Theo	1407	3	Creamy	E. G. Lister, Shenstone, *via* Warra
Wee Jim	1510	3	Chestnut	R. A. Newman, Goondiwindi

TROTTER STALLIONS CERTIFICATED FOR THE YEAR 1937–38.

Broad Findon	1474	4	Brown	E. J. Campbell, Kingaroy
Broadwood	1475	3	Bay	A. C. Underwood, Tingoora
Chiming Derby	1590	4	Bay	S. H. Scells, Eveleigh street, Wooloowin
Derby Cole	1511	4	Bay	F. K. Weidman, Clifton
Joker's Echo	1476	4	Bay	T. Renfrey, Degilbo
King David	1557	3	Black	P. Staines, Templin, *via* Boonah
Master Nepean	1408	3	Bay	W. Sullivan, Box 130, Pittsworth

DRAUGHT STALLIONS CERTIFICATED FOR THE YEAR 1937–38.

Abbey Morn	1409	4	Brown	C. H. Frizzell, Southbrook
Adelong	1602	3	Chestnut	C. Jensen, Atherton
Airdale	1477	4	Bay	R. S. McKenzie, Maroondan, Gin Gin
Alan	1624	3	Brown	E. G. Lascelles, Goorganga
Aldouran's Hope	1625	4	Brown	A. A. Brooks, Wundaru, *via* Mackay
Arolla's Heir	1512	3	Bay	D. Ryan, Allora
Balwherri Intent	1478	3	Brown	F. Tucker, Elksmere, Kingaroy
Barney	1644	4	Brown	T. Embrey, Kunioon, Nanango
Baronet II.	1479	3	Bay	G. Wilson, Degilbo
Baron Favourite	1513	3	Bay	P. Fogarty, Headington Hill, Clifton
Baron Model	1410	3	Bay	D. T. Rosenthal, Glenview, Southbrook
Barron Chief	1558	3	Bay	T. M. McGrath, Kincora, Kalbar
Ben Bold	1514	4	Bay	E. Austin, Flemmingdale, Texas
Benefactor	1515	4	Bay	G. McArthur, Maryvale
Berriew Premier	1559	3	Bay	F. D. Arthur, Stockyard Creek, Helidon
Black Boy	1626	3	Black	E. G. Lascelles, Goorganga
Black Intent	1560	4	Black	C. Gnech, Boonah
Black Kerr	1561	4	Black	H. D. Reisenleiter, Mount Sylvia, Gatton
Bob	1443	4	Bay	G. Singh, Canungra
Bold Exchange	1480	3	Brown	H. V. Petersen, Kolan River South
Bold March	1481	4	Bay	L. W. Horne, Takura
Bonnie Charlie	1411	3	Bay	C. H. Barrett, Tara
Bonnie Sheppard	1412	4	Brown	W. Park, Anzac avenue, Toowoomba
Bowler	1603	4	Bay	P. Caspani, Mingela
British King	1516	4	Bay	T. J. Ryan, Clintonvale
Brittany Intent	1604	3	Black	H. B. Orr, Sala Siding
Brown Dale	1627	4	Brown	H. Rowe, Mirani
Bully Bar	1613	3	Bay	V. R. Katte, Kola Bar, Dingo
Canberra Duke	1413	4	Bay	H. A. Koehler, Yamison
Captain	1614	3	Bay	C. T. Johnson, Gracemere
Captain	1517	4	Bay	B. G. Erhart, Goomburra
Caringal Craig Lad	1518	3	Black	W. Evans, Hirstvale road, Greenmount
Carlisle Boy	1519	4	Bay	J. H. McIvor, Emu Vale
Carlyle Boy	1414	5	Bay	W. Redman, Braemar (provisional only)
Christian	1605	3	Bay	Mrs. E. C. Clarke, Maryvale, Charters Towers
Christmas	1606	3	Black	Mrs. E. C. Clarke, Maryvale, Charters Towers
Clinker	1615	3	Bay	J. Moran, Taragoola, Calliope
Clyde	1415	4	Bay	C. Barber, Rywung
Coolana Dignity	1562	3	Bay	J. Lehmann, Coolana
Cowley	1520	4	Bay	E. Cowley, Taxes
Craig Boy	1416	4	Bay	J. and D. Brodie, Nobby
Craig Hero	1417	4	Bay	Derrick Bros., Gaulton, Bell
Craig Son	1418	4	Bay or brown	G. A. Lewis, Canning Creek
Crest Vale Nobility	1521	4	Roan	A. Ritson, Clifton
Crown Prince	1419	3	Bay	J. Allen, Porter's Gap, *via* Bell
Crystal Maybride II.	1420	4	Bay	Mrs. H. R. Kewley, The Gums.

DRAUGHT STALLIONS CERTIFICATED FOR THE YEAR 1937-38—*continued.*

Name.	No.	Age.	Colour.	Owner.
Culverthorpe High Opinion	1483	4	Bay ..	S. B. Trigger, Biggenden
Dark Chief	1421	4	Brown ..	M. Stower, Linthorpe, Pittsworth
Darnley Boy	1522	4	Bay ..	W. R. Penrose, Beebo
Dooling Major Lee ..	1484	4	Bay ..	M. Lobwein, Kybong
Duke	1444	4	Bay ..	G. Low, Pomona
Duke	1422	3	Bay ..	E. Wieck, Maclagan
Duke of Suffolk ..	1563	3	Chestnut ..	Ivy May Arndt, Rosewood
Duke of Windsor ..	1445	3	Bay ..	C. Maas, Waterford
Earl Dale	1564	4	Black ..	E. C. A. Zillmann, Hattonvale
Earl of Windsor ..	1523	3	Black ..	F. Peters, Willowvale
Earl's Pride	1593	4	Bay ..	A. A. Stokes, Collingwood, Victoria
Empston	1565	4	Black ..	T. Zelinski, Lake Clarendon
Eureka Walter ..	1619	4	Silver Roan	C.Q.M.E. Co., Lake's Creek
Extent	1423	3	Black ..	C. O'Sullivan, Greenmount
Fairymead Baron Knight	1524	4	Bay ..	J. P. Warden, Goondiwindi
Fairymead Bold Lorraine	1616	3	Bay ..	H. Dougall, Littlemore
Fairymead Success ..	1628	4	Bay ..	R. Smith, Bowen
Farleton John ..	1610	5	Brown ..	A. P. Nelson, Jesmond, Charters Towers (provisional only)
Farmer	1629	4	Roan ..	A. Welsh, Mia Mia, Mirani
Farmer	1525	4	Bay	C. Erlandson, Allora
Fashion's Prince ..	1526	4	Bay ..	T. J. Brosnan, Killarney
General Kerr ..	1566	4	Bay ..	A. F. Schimke, Summerhill, Laidley
Glasgow Clyde ..	1527	4	Bay ..	G. and F. W. Grimes, Clifton
Glen Dale	1424	4	Bay ..	P. W. Bermingham, Greenmount
Glen Lock	1485	4	Bay ..	C. F. Schmid, Pialba
Glenmore II. ..	1617	3	Black ..	P. Ziebarth, Biloela
Gold Mount Prince ..	1425	4	Brown ..	C. Meskin, Maclagan
Gold Nought ..	1528	4	Chestnut ..	D. Sullivan, Allora
Hero	1486	4	Bay ..	B. T. and L. Balderson, Theebine
Hillview Prince ..	1446	4	Bay ..	E. W. Hill, Hillview
Homedale Honour ..	1638	3	Bay ..	S. McLennan, Red Hill, Nebo
Hurdcott Duke ..	1594	3	Bay ..	R. Stokes, Collingwood, Victoria
Intent's Best	1639	4	Roan ..	A. Shannon, Saltbush Park, St. Lawrence
Jackson	1426	4	Bay ..	D. Kirstenfeldt, Kulpi
Jollie Gloucester ..	1447	3	Bay ..	S. O. Mear, Maleny
Kelso Surprise ..	1487	4	Bay ..	L. C. Walker, Bingera
Kerr Lap	1568	3	Bay ..	H. D. Reisenleiter, Mount Sylvia
Kerrston Carlyle ..	1569	4	Bay ..	J. M. Newman, Caboooltune
Kerrston's Delight ..	1570	4	Chestnut ..	W. M. E. P. Prufert, Laidley
Kerrston's Prospect ..	1631	4	Black ..	C. D. Loadsman, Orkabie
Kerrston's Viceroy ..	1488	5	Black ..	W. D. Porter, Kumbia (provisional only)
Kerr Stop	1571	4	Bay ..	H. D. Reisenleiter, Mount Sylvia, Gatton
Kerwein	1572	4	Bay ..	H. Schultz, Morton Vale, *via* Gatton
Kimbar Major ..	1573	3	Bay ..	F. Benbow, Mount Alford
Kimbar Starlight ..	1575	3	Bay ..	D. Vogel, Boonah
King Billy	1448	3	Bay ..	A. O. Bishop, Caboolture
King Dale	1529	5	Bay ..	W. Eastwell, Willowvale (provisional only)
King Hope	1489	4	Brown ..	H. Powell, Kumbia
King Pin	1490	4	Bay ..	R. B. Jefferies, Nanango
Leed's Grove Slade Alba	1491	3	Bay ..	Fairymead Sugar Co., Bundaberg
Lehmanni Tenor ..	1427	4	Black ..	Mrs. R. V. Breydon, Brooklyn, Haden
Lion	1428	3	Bay ..	H. Simmons, St. Martin's, Yandilla
Logan Prince ..	1449	4	Bay ..	W. W. Bell, Rathdowney
Lord Eacham ..	1607	4	Bay ..	Winfield Bros., Yungaburra
Lord Kerrston ..	1429	4	Black ..	R. Anderson, Southbrook
Loyal Carlisle ..	1530	3	Black ..	W. Doro, Pozieres
Mailboy's Heir ..	1450	4	Bay ..	R. H. F. Graham, Tabragalba
Major	1492	4	Bay ..	C. A. Taylor, Brooloo
Major	1493	4	Brown ..	T. Turner, Mannuem road, Kingaroy
Major Wallace ..	1575	3	Bay ..	B. Czislowski, Lilydale, Helidon
Marble Intent ..	1632	3	Iron grey ..	T. Comerford, Finch Hatton
Marshall Gaiety ..	1576	4	Bay ..	C. A. Martens, Marburg
Marshall Ney ..	1633	4	Roan ..	M. R. Shannon, Olive Downs, Nebo
Martin Dale	1430	3	Bay ..	J. H. L. Van Pein Quibet, Pittsworth
Master Dale	1577	4	Bay ..	H. O. Neumann, Plainland
Maxwell	1578	3	Bay ..	M. W. Kruger, Mutdapilly
Napuna Lad	1531	3	Brown ..	P. Fogarty, Headington Hill, Clifton
Ngapuna	1595	3	Brown ..	T. Robson, Crow's Nest, Sydney
Nigger	1431	4	Black ..	C. Dunemann, Murra Murra
Noble	1532	3	Bay ..	M. McMahon, Warwick
Noble Intent ..	1634	4	Bay ..	A. F. Clausen, Homebush road, Mackay
Noble King	1533	3	Bay ..	D. C. O'Leary, King's Creek
Oak Branch	1482	4	Bay ..	A. A. Dent, Gayndah
Oxford Don	1494	3	Brown ..	S. J. C. Jenkins, Miva
Plainview Intent ..	1534	3	Bay ..	A. S. Freer, Clifton
Poplar	1635	3	Blue Grey ..	E. Collins, Tondara, Gumlu
Pride	1432	4	Bay ..	S. E. O'Brien, Jandowae (provisional only)
Prince	1433	4	Bay ..	N. Thornton, Rocky Creek
Prince	1535	4	Bay ..	S. G. Bremner, Yelarbon
Prince	1495	3	Black ..	J. Regan, Coolabunia
Prince Charlie ..	1536	4	Bay ..	Gross Bros., Campbell's Plains
Prince Rocket ..	1496	4	Bay ..	Stewart and McCauley, Mundubbera

Draught Stallions Certificated for the Year 1937-38—*continued.*

Name.	No.	Age.	Colour.	Owner.
Prince Wallace	1579	3	Bay	W. Profke, Glamorganvale
Red Robin	1537	3	Bay	W. A. Deacon, Allora
Rich Lad	1497	3	Bay	H. Welsh, Proston
Robin Dale	1451	4	Bay	H. Wynne, Jimboomba
Rob Roy	1434	4	Black	A. H. Gierke, Chinchilla
Rocket	1538	4	Bay	A. W. Naumann, Mount Kent, Nobby
Ron	1498	4	Bay	D. C. Myles, Mungungo
Rosefarm Bold Kerrston	1580	4	Bay	J. W. Evans, Boonah
Rosefarm Kerrston's Pride	1499	3	Bay	E. L. Dent, Reid's Creek, Gayndah
Royal Dale	1435	4	Black	I. N. Kahler, Geham
Royal Intent	1539	4	Bay	H. J. Pacholke, Five Ways, Clifton
Royal Kerr	1618	4	Bay	F. R. Lehmann, Biloela
Royal Kerrston	1581	3	Bay	H. Heisner, Blenheim, Laidley
Royal Scot	1582	4	Bay	J. L. Strack, Mount Whitestone
Royal Sheppard	1436	3	Bay	S. T. Evans, Chinchilla
Scottish King	1437	4	Bay	G. Telford, Nobby
Sergeant Bruce of Greyhurst	1438	3	Bay	A. J. P. Kruger, Goombungee
Shepherd Hill Major Robin	1596	4	Bay	J. H. Kelvington, Glenore Grove
Shepherd Hill Sandy Kerlin	1597	4	Brown	J. H. Kelvington, Glenore Grove
Shepherd's Pride	1439	4	Brown	H. A. Nauschutz, Canaga, Jandowae
Sherlock	1583	4	Bay	G. A. Wieland, Allendale, Boonah
Sir Nolan	1452	4	Bay	J. L. Everdell, Veresdale
Squaredale's Pride	1540	3	Bay	B. Hoffmann, Emu Vale
Square William	1541	3	Bay	G. H. Rettke, Emu Vale
St. Helen's Dalkirk	1500	4	Bay	R. G. Allen, Wolca
Sydler	1636	4	Bay	J. Dalton, Pleystowe
Talgai Duke	1440	3	Bay	J. D. Learmonth, Hill View, Pittsworth
Talgai Gaiety	1542	3	Bay	H. Sprott, Ellinthorp
Talgai Hero	1441	4	Black	W. Freyling, Hogdson Vale
Talgai Robin	1598	3	Bay	H. Sprott, Ellinthorp
Talgai Warrior	1543	3	Bay	H. Sprott, Ellinthorp
Tarzan	1584	4	Bay	Roderick Estate, Wilson's Plains
Tenthill Victory	1585	3	Bay	W. H. Grams, Upper Tent Hill
Tiger Boy	1544	3	Black	A. F. Barlow, Five Ways, Clifton
Tom	1453	4	Bay	R. and S. Lahrs, Norwell
Trooper	1545	4	Bay	R. and L. Ole, Yarranlea
True Blue	1454	4	Grey	B. T. Smiles, Hillview
Ulupna Glade	1608	4	Grey	W. C. Storer, Upper Barron, Atherton
Wee Glen	1586	3	Bay	J. Baulch, Mulgowie
Werndew Depression	1599	3	Bay	A. A. Stokes, Collingwood, Victoria
Willow Banks Footprints	1637	3	Brown	N. McLennan, Gargett, Mackay
Wolsingham Gold Miner	1609	4	Bay	M. Murnane, Atherton
Young Intent	1546	3	Bay	P. G. Freer, Clifton
Young Kerrston	1587	4	Bay	B. O'Connor, Grantham
Young Ngpuna	1442	4	Bay	A. J. Harris, Yarranlea

REJECTED STALLIONS.

List of Stallions in respect of which Certificates of Registration were refused, on account of either lack of type and/or conformation, lack of size, or unsoundness during the year 1937-38. These horses are prohibited from use for stud purposes, either public or private:—

Blood Stallions Rejected during Year 1937-38.

Name.	Age.	Colour.	Reason for Rejection.	Owner.
Abbadear	6	Grey	L. T. and C...	M. F. Postich, Warra
Archie Spear	4	Brown	Curb	S. G. Borchert, Rosevale
Bilola	3	Brown	L.T.	E. Wason, Goomeri
Dick	Aged	Chestnut	Spavin	A. McDowall, Yeppoon
Fishhawk	4	Brown	Spavin	T. F. Dallon, Nankin Junction
Hadagen	3	Bay	L.T. and C. ..	C. J. McWilliam, Leyburn
Lear	6	Brown	L.T. and C. ..	J. Waldron, Boggabilla
Lone Hand	3	Chestnut	L.T.	C. B. Treloar, Gympie
Marksman	5	Bay	Bog Spavin ..	A. Marxsen, Ubobo

BLOOD STALLIONS REJECTED DURING YEAR 1937-38—*continued.*

Name.	Age.	Colour.	Reason for Rejection.	Owner.
Master Nickleby ..	4	Brown ..	Spavin and Nasal Dis.	G. Grey, Yeppoon
Muscatel	4	Bay ..	L.T. and Con.	P. E. Logan, Upper Tent Hill
Music	Aged	Chestnut ..	Unicrypt and L.T. and C.	R. Alford, Ravenswood
Mutiara	6	Bay ..	Roarer ..	A. W. Jarvis, Eidsvold
Paddy	4	Brown ..	L.T. and Con.	D. Stark, Anduramba
Pasha Boy	5	Grey ..	L.C.	S. Offord, Bajool
Ribbon Lad	5	Bay ..	L.T. and Con.	F. M. Toppenberg, Mount Morgan
Sunny Boy	3	Chestnut ..	L.T. ..	T. Burke, Kandanga
Tony	4	Brown ..	L.T. and Con.	Kerr Bros., Warra
..	6	Bay ..	L.C. ..	W. M. Coles, Gladstone
..	7	Piebald ..	L.T. and Con.	A. Fraser, Ingham
..	3	Brown ..	L.T. and Con.	J. Barker, Oak Hills, Ingham

PONY STALLIONS REJECTED DURING YEAR 1937-38.

Gay Lad	Aged	Black or brown	L.T. and Con.	H. E. Weare, Upper Barron, Atherton
Jacko	4	Bay ..	Curb ..	N. T. Wright, Goondiwindi
Lord Jim	3	Piebald ..	L.T. ..	J. Hayden, Kingaroy
Night Wind	4	Bay ..	L.T. and Con.	D. Lewis, Carinya, Maclagan
Patlight	4	Piebald ..	Uni-crypt ..	W. Wilkin, Coal Plains
Sir William	3	Bay ..	L.T. and Con.	G. Byers and T. Barton, Plainby
Trinket	Aged	Grey ..	Uni-crypt ..	F. Nell, Yeppoon

DRAUGHT STALLIONS REJECTED DURING YEAR 1937-38.

Adam	5	Bay ..	Sidebone ..	T. McGrath, Moombra, Coominya
Admiral Wallace ..	4	Brown ..	L.T. and Con.	W. A. Trott, Pittsworth
Argyll Mafeking ..	5	Grey ..	Sidebone ..	T. Noble and Sons, 656 Route, Mackay
Back Plains Silverdale	5	Bay ..	Sidebone ..	C. E. Lack, Back Plains
Black Prince	4	Black ..	L.T. ..	L. C. Walker, Bingera
Blutcher	3	Brown ..	Sidebone ..	J. H. Bryant, Charters Towers
Boxer	6	Brown ..	L.T. ..	H. L. Harris, Mungungo
Bright	Aged	Bay ..	L.T. and Con.	A. L. Ramsay, Mount Fox, Ingham
Brooklyn Keynotes Dignity	6	Bay ..	Sidebone ..	W. Backhouse, Killarney
Captain	5	Bay ..	L.T. ..	A. C. Andreassen, Tuchekoi
Charley	4	Black ..	L.T. and Con.	T. J. and M. J. Dwan, Bony Mountain, Cunningham
Chrystal Blaze ..	3	Bay ..	L.T. and Con.	E. Cooper, Pratten
Colonel	4	Chestnut ..	L.T. and Con.	W. Johnson, Malanda
Crystal Stripe ..	6	Bay ..	L.T. and Con.	V. Jankhe, Rywung
Damsel's Lad ..	5	Bay ..	Sidebone ..	W. C. Miller, Woodford
David	Aged	Bay ..	L.T. and Con.	D. N. Perry, Milmerran
Davy	3	Bay ..	L.T. and Con.	T. W. Luck, Southbrook
Don	Aged	Brown ..	Sidebone and L.T. and C.	J. Tate, Tolga
Drummer	Aged	Bay ..	L.T. and Con.	E. G. Webb, Pittsworth
Duke	4	Black ..	Sidebone ..	A. Murphy, Alderney, Mount Larcom
Duke	5	Bay ..	L.T. ..	F. W. Chippendall, Kandanga
Farmer's Boy ..	3	Bay ..	L.T. and Con.	W. A. Deacon, Allora
General	4	Bay ..	L.T. ..	A. E. Traves, Woolooga
Glen Allen	5	Bay ..	L.T. ..	B. E. Kerle, Wondai
Glen II.	5	Bay ..	L.T. and Con.	J. Tennyson, Chinchilla
Jim Donald	Aged	Bay ..	L.T. ..	J. Macfarlane, Woolooga
Kerr Son	4	Black ..	L.T. and Con.	N. D. Dallinger, Mount Sylvia, Gatton
Kerrston Again ..	6	Brown ..	Sidebone ..	M. R. S. McLaughlin, Bracewell
King George ..	5	Bay ..	Sidebone ..	L. Hogarth, Stonehenge
Kingsford	4	Brown ..	L.T. ..	D. J. Cavanagh, Tarong
Knight	5	Black ..	L.T. and Con.	A. O. Raddatz, Ingoldsby, Gatton
Knight Abbit ..	Aged	Brown ..	Sidebone ..	W. R. Buchholz, Sharon, Bingera
Mac's Pride	5	Brown ..	L.T. and Con.	L. McGrath, Oakey
Major	5	Bay ..	L.T. and Con.	P. O'Shea, Monmouth, Chinchilla
Major	5	Brown ..	L.T. and Con.	P. W. G. Wirth, Square Top
Marshall	3	Brown ..	Sidebone ..	E. J. G. Thormahlen, Bowen
Max	5	Bay ..	Sidebone ..	S. B. Anderson, Wondai
Mystery	4	Bay ..	L.T. and Con.	A. O'Toole, Milmerran
Ned	Aged	Roan ..	L.T. and Con.	J. A. Holland, Yuruga
Ned	Aged	Brown ..	L.T. ..	G. Philip, Pine Creek
Noble	4	Black ..	Bog spavin and Thoro-pin	F. Lawrence, Blackbutt
Noble	Aged	Bay ..	L.T. ..	R. Newitt, Pine Creek
Noble Lad	Aged	Roan ..	Sidebone ..	St. Ronan's Pastoral Co., Gordonvale
Perfect Dale	Aged	Bay ..	L.T. and Con.	B. Castles, Punche's Creek, Rocky Creek
Pilot	5	Bay ..	L.T. ..	P. W. Ross, Goodwood
Prince	5	Brown ..	L.T. and Con.	M. J. MacGinley, Greenmount
Prince	6	Bay ..	Sidebone and L.T. and C.	L. Favier and Sons, Kairi
Prince	Aged	Grey ..	Sidebone ..	S. G. Crocker, Wagoora
Prince	Aged	Bay ..	L.T. ..	C. J. Jansen, South Kolan
Punch	4	Bay ..	Sidebone ..	D. J. Kelly, Bororen

DRAUGHT STALLIONS REJECTED DURING YEAR 1937-38—*continued.*

Name.	Age.	Colour.	Reason for Rejection.	Owner.
Punch	5	Bay ..	L.T. ..	N. J. D'Arcy, Goomeri
Punch	4	Bay ..	L.T. and Con.	J. Ost, Upper Tent Hill
Royal Prince II. ..	4	Brown ..	Sidebone ..	G. V. Hess, Kaimkillenbun
Sailor	3	Bay ..	L.T. and Con.	R. Graham, Minbun
Scotch Lad	3	Bay ..	L.T. and Con.	A. Varley, Tarzali
Sonny Boy	5	Bay ..	Sidebone ..	S. A. Barrett, Drumberle
Studleigh Premier Lad II.	4	Bay ..	L.T. and Con.	Mrs. E. I. Walker, Greenmount
Toby	6	Roan ..	L.T. ..	E. Heathcote, Eel Creek, Gympie
Wallace	5	Brown ..	Sidebone ..	W. H. Lamke, Gundiah
Young Leonard ..	5	Brown ..	L.T. ..	V. Barsby, Graham's Creek
..	Aged	Black ..	L.T. and Con.	Estate H. E. Garthe, Cross Hill, Oakey
..	4	Black ..	L.T. and Con.	A. Hollman, Kaira
..	Aged	Bay ..	L.T. and Con.	T. Clements, McDesme, Ayr

FOR FENCING IN SWAMP LAND.

Take a piece of timber which two men can lift comfortably—preferably a piece of hardwood from 2 feet 6 inches to 3 inches long. Now secure four arms 3 feet long and about 2 inches thick shaped at one end to fit holes which are bored in this block. Bore two holes on opposite sides, about a third of the distance from the

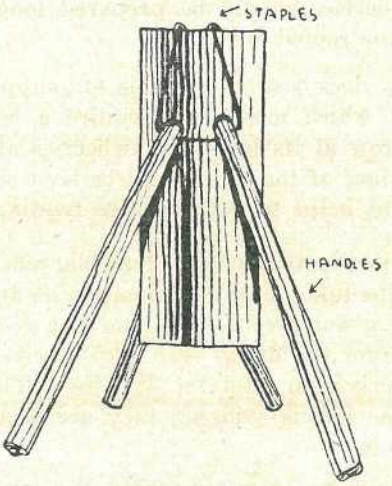


Plate 73.

top, and 4 inches apart. Place them at such an angle that the ends of the arms, when fitted, are about 2 feet apart and 18 inches from the block. Then wire securely as shown in the diagram. This device is very effective when fencing through swampy ground or where it is too wet and soft to dig a post-hole.—S.F.M in "The Primary Producer" (W. Aus.).

Preparing the Strawberry Plot.

W. G. HANCOCK, Inspector, Diseases in Plants Acts.

LAND for strawberries should be prepared long before the time of planting out the rooted runners.

The strawberry does best on a friable soil supplied abundantly with organic matter, of which most soils require a heavy addition if the strawberry is to grow at its best. Strawberries also require plenty of moisture. The surface of the soil should be kept as cool as possible. A high organic content helps to supply these requirements.

The photograph illustrates two plots planted last season. On the left of the spray pipe line a heavy application of dung was ploughed in; on the right no dung was given. The land was good average red-brown loam, and, apart from the dung, each plot received identically similar soil preparation, irrigation, and top-dressing. The superiority of the young plants on the left is evident; they are bigger, of better colour, and there are no misses.

The photograph was taken in early June, before flowering. The crop from the dunged plot was by weight over four times that of the unmanured plot, and the berries averaged a much higher grade.

The moral is that often it is more profitable to work a smaller area intensively than to spread one's efforts over a larger area worked not so thoroughly.

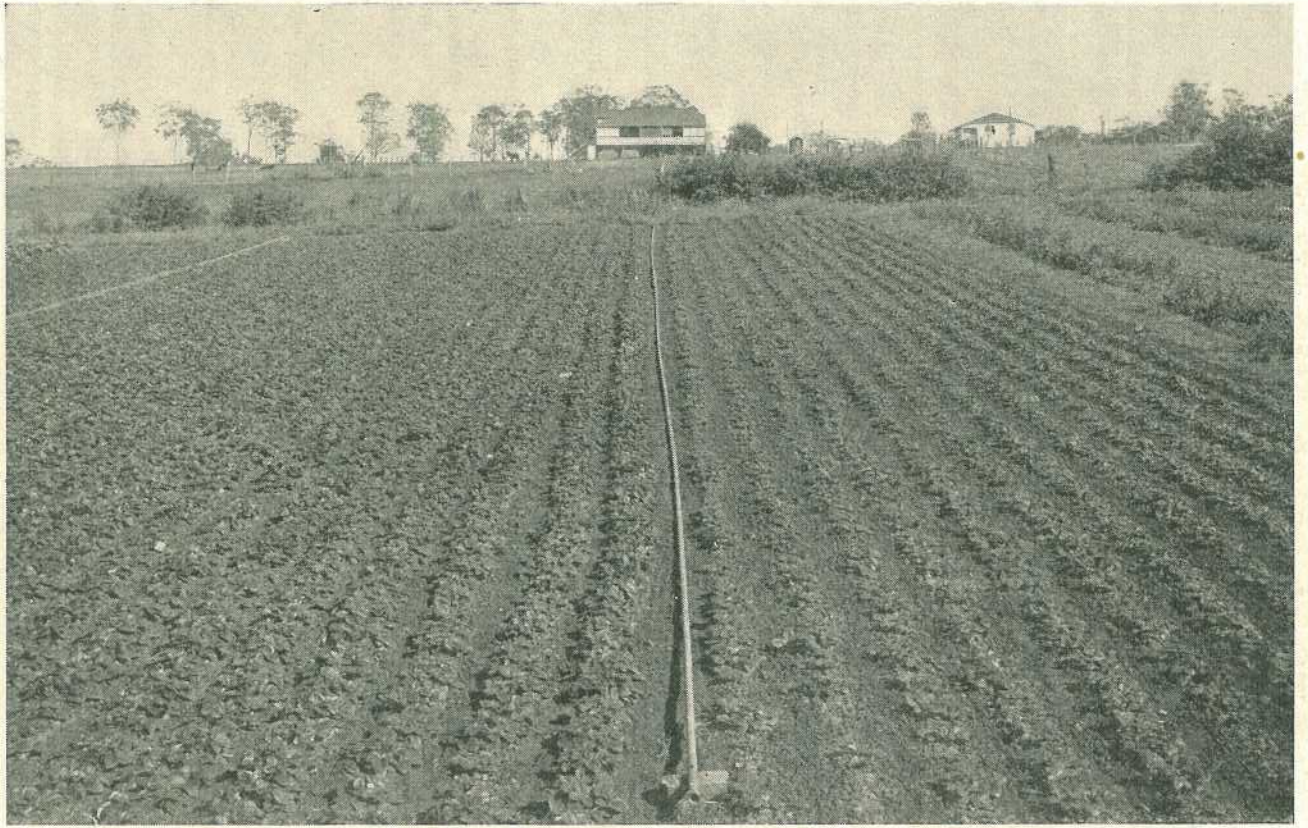


Plate 74.

The Effect of Organic Manuring,—A strawberry plot comparison.

The Leaf-eating Ladybird.

J. HAROLD SMITH, M.Sc., Senior Research Officer.

MOST ladybird beetles are useful insects which prey on aphids and other similar pests. The leaf-eating ladybird, however, possesses quite different habits, and many farmers familiar with typical insects in the group fail to appreciate the fact that some species are definitely harmful to cultivated crops.

The leaf-eating ladybird is a very common pest of potatoes and it also attacks most cucurbitaceous plants, such as the pumpkin and the melon. Spring and early summer crops suffer most severely, and even though the plants may not be completely destroyed, the leaf destruction attributable to the pest can seriously curtail the total yield.

Both adults and larvæ attack the foliage. The beetles eat holes into the leaves, feeding from both the upper and lower surfaces, but the larvæ are only found on the under surface, where they erode a characteristic network between the main veins, though the upper surface layer of cells is left intact. As a result of an attack, the plants acquire a distorted, ragged appearance, which not only looks unsightly, but more or less accurately reflects the potential reduction in the crop yield.

The beetle is a typical ladybird, about ¼ inch in length and rounded in shape. The ground colour is yellow, but a large number of black spots scattered over the hard outer wings and thorax give the insect a characteristic appearance. Yellowish, elongate oval eggs are deposited on the leaves in clusters with the pointed ends uppermost. From these the larvæ hatch and commence to feed. The full-grown larva is somewhat longer than the beetle and yellow in colour, but the upper surface bears several rows of many-branched dark-coloured spines. Pupation takes place on the underside of the leaf, on the leaf stalk or on the main stem of the plant; the pupa invariably retains the cast larval skin at the posterior end of the body.

The whole life cycle is completed in about four weeks, but the generations overlap a great deal, and adults, larvæ, pupæ, and eggs are commonly found together on the one plant.

Outbreaks of this pest are usually sporadic, but if uncontrolled, serious losses may occur. The use of lead arsenate applied as a spray at a strength of 1½ lb. in 50 gallons of water, or as a dust either diluted with a suitable carrier or undiluted is effective. Though this insecticide can be freely applied to crops such as potatoes, care must be used on plants such as the pumpkin which bear exposed edible fruit, otherwise injurious deposits of the poison may accumulate on the fruit. Control measures should therefore be applied when the plants are young before the insect reaches pest proportions. In such crops, arsenicals cannot be safely applied to the crop late in the growing period, but some relief can be obtained by the liberal use of wood ashes or a similar inert dust which acts as a deterrent to the pest.

The Fruit Market.

JAS. H. GREGORY, Instructor in Packing.

AS the holiday season occurs during the peak of production of stone fruits, a marketing problem is presented that will require quite a lot of thought before a satisfactory solution will be found. A noticeable feature of the trade during the annual vacation period was the high prices prevailing for fruit at the holiday resorts. At one important seaside centre peaches could not be obtained for less than eight for 1s. during the whole of the time in which peaches, through oversupply, were practically unsaleable on the market. This is another marketing question awaiting solution.

Bananas show no signs of improving in value. No substantial increase in price can be looked to until the most of the deciduous fruits have disappeared from the market. It is unfortunate that holidays, hot weather, and competition from deciduous fruits should all come at the same time.

New season apples are now in full supply. Unfortunately, old season fruit was held in cold storage too long. While causing loss to growers, this fruit has had a detrimental effect on prices of new apples. Market values at the end of January were:—

TROPICAL FRUITS.

Bananas (Cavendish).

Brisbane.—Nines, 6s. to 10s. tropical case; eights, 4s. to 10s.; sevens, 4s. to 9s.; sixes, 4s. to 7s. 6d.; smalls, 4s. to 5s.

Sydney.—Nines and eights, 13s. to 16s. tropical case; sevens, 10s. to 13s.; sixes, 8s. to 10s. Inferior bananas hard of sale.

Melbourne.—Nines and eights, 12s. to 13s. tropical case; sevens, 10s. to 11s.; sixes, 8s. to 9s.

Pineapples (Smoothleaf).

Brisbane.—4s. to 6s. per case, 1s. 6d. to 3s. 6d. per dozen. Ripleys, 3s. 6d. to 5s. 6d. per case, 9d. to 3s. 6d. per dozen.

Sydney.—6s. to 9s. per case. Heavy stocks of pines are obtainable. Prices are not likely to increase.

Melbourne.—7s. to 9s. per case. Water blister still prevalent.

Papaws.

Brisbane.—Locals, 2s. to 4s. per case, special brands higher; Gunalda, 5s. to 7s. per bushel case.

Sydney.—8s. to 14s. Special quality higher.

Melbourne.—10s. to 14s. per case.

Mangoes.

Brisbane.—Special varieties, 4s. to 6s. per bushel; Locals, 1s. to 3s. per bushel.

Sydney.—8s. to 10s. for selected lines.

Melbourne.—Selected types to 12s. per bushel.

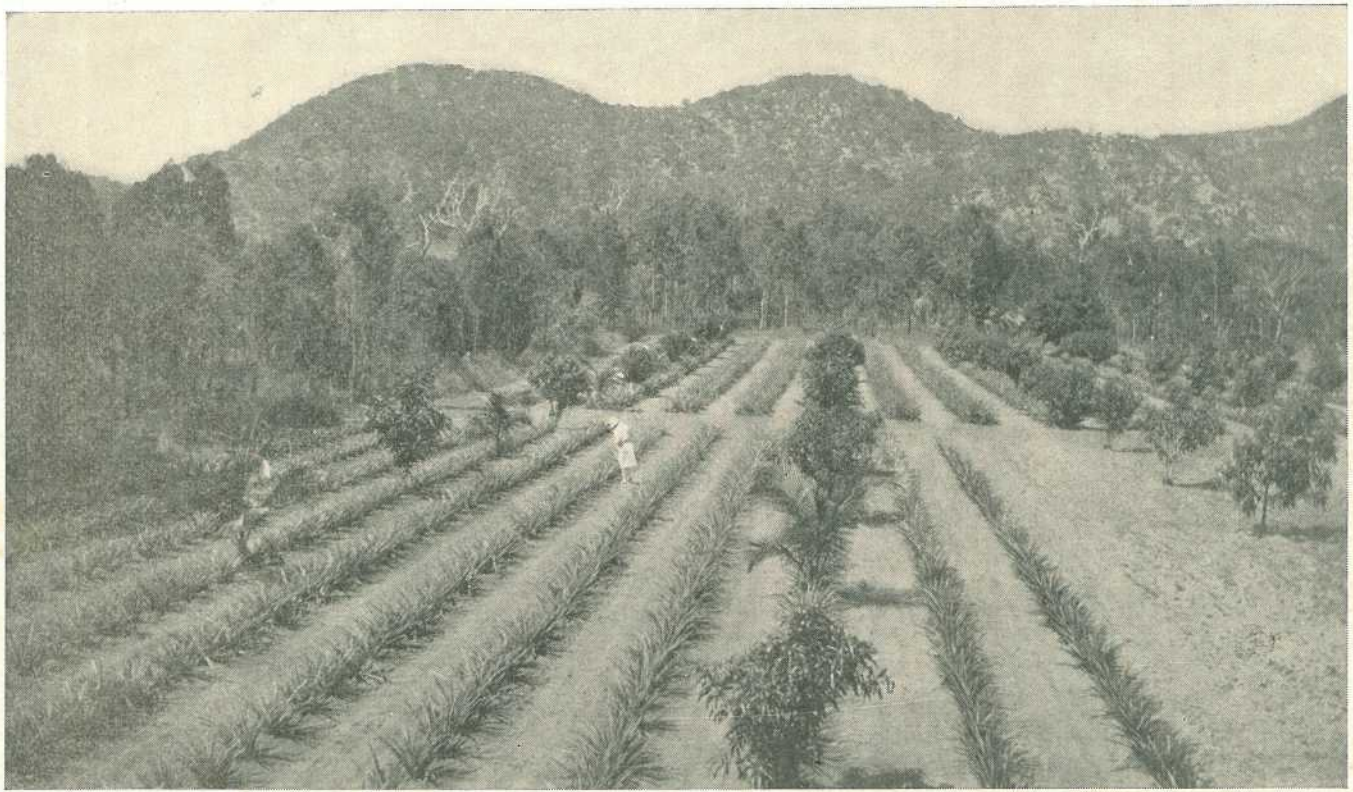


Plate 75.

A PLANTATION ON MAGNETIC ISLAND, NORTH QUEENSLAND.—Avenues of young coconut palms and mangoes, with rows of smooth-leaf pineapple plants between, make a strikingly beautiful picture in this "pocket" on Magnetic Island—the property of Mr. Geo. Lloyd-Apjohn.

Monstera Deliciosa.

Some small consignments have been sent to Melbourne, realising 6s. to 8s. per small case.

Passion Fruit.

Brisbane.—5s. to 6s. per half bushel; seconds, 1s. per case less.

Sydney.—2s. to 5s. per half bushel.

Melbourne.—5s. to 8s. per half bushel.

CITRUS FRUITS.

Lemons.

Brisbane.—Gayndah, 14s. to 18s. per bushel case; Specials, to 20s.; Local, 9s. to 14s. per bushel case.

Sydney.—2s. to 7s. per bushel.

Oranges.

Brisbane.—New South Wales Valencias, 10s. to 14s.; inferior to 7s.

Sydney.—2s. to 9s. per bushel

Grape Fruit.

Brisbane.—Consignments of American and Palestine Grape Fruit have been received and handled at fair prices.

Sydney.—5s. to 10s. per bushel.

DECIDUOUS FRUITS.

Apples.

Brisbane.—Stanthorpe Gravenstein, 8s. to 12s.; inferior, 4s. to 5s. Small sizes hard to sell. Dunns, 3s. to 5s.; Scarlets, 5s. to 8s.

Sydney.—Gravenstein, 3s. to 10s.; MacIntosh Red, 6s. to 10s.; Dunns, 5s. to 7s.

Pears.

Brisbane.—Williams, 4s. to 7s.; Clapps, 4s. to 6s.

Quinces.

Brisbane.—5s. to 6s. per bushel case.

STONE FRUITS.

Brisbane.—Peaches, 1s. 6d. to 3s. per half bushel. Nectarines, 3s. to 5s. per half bushel. Many lines affected with Brown Rot. Plums—Doris, 2s. 6d. to 6s. per half bushel; Narrabun, 2s. 6d. to 6s. per half bushel; October Purple, 3s. to 5s. per half bushel.

Grapes.

Brisbane.—Stanthorpe Chouch, 5s. to 6s. per half-bushel; Muscats, 7s. to 9s. per half-bushel; Roma Muscats, 5s. to 7s. per half-bushel; Purple Conneton, 5s. to 8s.

OTHER FRUITS.

Figs.

Brisbane.—1s. 6d to 2s per tray, 4s. to 6s. per dozen boxes.

Tomatoes.

Brisbane.—Local—ripe, 2s. to 4s. per half bushel; green, 1s. to 2s. per half bushel. Stanthorpe—ripe, 2s. to 4s. 6d. per half bushel; green, 1s. 6d. to 3s. per half bushel.

VEGETABLES.

Brisbane.—Peas, 9s. to 12s. sugar bag. Beans, 7s. to 10s. sugar bag; poor lines less. Lettuce, 9d. to 2s. per dozen. Cucumbers, 3s. to 4s. bushel case.

WASHING OF SOIL IN ORCHARDS.

Surface drainage should be studied before laying out an orchard. In established orchards where it is found that surface wash and scouring is occurring, much can be done to prevent it. All surface water from above the orchard may be diverted by making a wide, shallow contour drain on the top side of the orchard, where the ground may be grassed. With a plough and scoop, this drain can be made usually at a very small cost. Depth and width will be determined by the volume of water to be diverted, but a drain about 4 feet wide and 18 inches deep, with the soil scooped on to the lower side, will do in most cases. This type of drain will not scour nor silt up readily, and if well grassed will need very little attention.

It should be remembered that a fall of 18 inches in every 100 feet is the correct grade for surface contour drains in a cultivated area.

To reduce loss of soil by the action of heavy rains on the cultivated area, the planting of suitable cover crops should receive attention.

If it is not intended or desired to plant cover crops, it should be remembered that badly cultivated land with a hard pan near the surface will wash more severely than if good cultivation has been the rule.

Where the ploughing has been left in the rough it will be found that each furrow will carry its own water, whereas a final cross-ploughing tends to back the water up until it forcibly breaks through at a low point, generally causing a big run and considerable damage.

—*A. M. Richardson.*

PROPPING BANANAS.

Loss of promising and superior fruit as the result of uprooting and breaking down caused during the recent cyclonic weather in the Mons Marie variety shows the necessity for a system of propping that will reduce loss to an absolute minimum.

The method giving the best results is double propping, and it is carried out as follows:—Two stakes, 2 inches by 2 inches and approximately 12 feet long, are tied together about 1 foot from the end, and the tie wire left about 2 feet in length.

The two stakes are opened and the small fork or crotch formed by the union of the two stakes is placed at the correct height on the plant, and the length of wire is drawn round the stem and joined on the props.

When the two legs are firmly placed, and with the aid of the wire tie, it will be apparent that the plant will withstand a great amount of buffeting from the weather.

It is wise to place the props in position as soon as the plants have bunched, as it is noted that at this stage quite a large number are affected.

Another advantage of this method is that the bunch hangs between the two props, thus practically eliminating damage through rubbing.

For Cavendish bananas this method is just as practical, as the one-stake system causes an appreciable loss through rubbing, but for this variety the length may be reduced to 9 feet.

—*J. H. Mitchell.*

VALUE OF BIRD LIFE TO THE ORCHARDIST.

The economic value of bird life is not generally realised, and often little appreciated by orchardists, who may adopt an indifferent or careless attitude towards its preservation.

It has been said that about 5 per cent. of the birds known to the fruitgrower as common visitants to his orchard are destructive in some way; but even these may be among the useful species, being insectivorous as well as fruit-eating. Some birds, while being more or less destructive during the fruit season, may do useful work in pest control the whole year round.

Because of their insectivorous habit, birds are Nature's agents in preserving balance by keeping insect pests from attaining plague proportions. Every orchardist should, therefore, assist in their protection, prevent as far as possible their indiscrimate slaughter for food or "sport," and preserve, where practicable, their breeding grounds.

—*A. M. Richardson.*

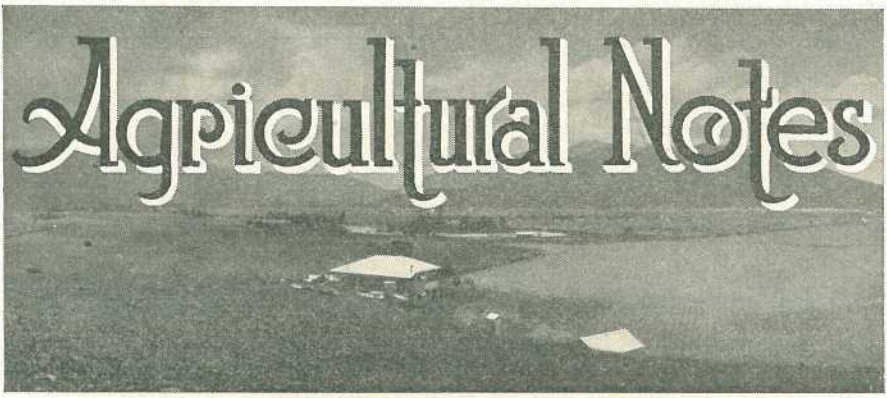
TO SUBSCRIBERS.

Subscribers to the Journal are asked to write their names legibly on their order forms. The best way is to print your surname and full christian names in block letters, so that there shall be no possibility of mistake.

When names are not written plainly it involves much tedious labour and loss of valuable time in checking electoral rolls, directories, and other references. This should be quite unnecessary.

Some subscribers write their surname only, and this lack of thought leads often to confusion, especially when there are other subscribers of the same surname in the same district.

Everything possible is done to ensure delivery of the Journal, and subscribers would help us greatly by observing the simple rule suggested, and thus reduce the risk of error in names and postal addresses to a minimum.



Cotton Cultivation.

THE cotton crops generally were showing the effect of the droughty conditions that had existed in most areas since the middle of December until the recent rains relieved the position considerably.

Cotton growers are fully aware that further periods of dry and hot weather are probable throughout February and until about the middle of March. They are therefore reminded of the necessity of thorough cultivation for the control of weeds, and particularly for the conservation of moisture.

The maintenance of clean cultivation in the cotton fields not only assists in the proper development of the plants, but also helps to prevent attacks from insect pests such as the corn ear worm. The moth of this insect sometimes makes a heavy laying of eggs on growths such as pigweed, so that clean cultivation should be maintained for as long as possible. It is suggested that the best work can be done with a two-row cultivator of the type which the driver steers with his feet the carriage on which the tynes are fastened, rather than depending entirely on guiding the horses. There are several makes of this type, all of which can be equipped with tyne-sweeps and duck feet. By using such a machine, not only can better work be done, but a greater acreage can be cultivated in a day.

Cultural methods used at the Cotton Research Station, Biloela, indicate that it is advisable to continue the cultivation between the rows until late in the season. For this purpose a one-horse scuffler equipped with long traces and a short spreader behind the horse is used. Hessian is wrapped around the ends of the spreader so as to prevent damage to the branches. This cultivation helps in checking weed growth in the middle of the rows and in maintaining a moisture retaining mulch during the period when the top crop of bolls is developing. It is believed that this extra cultivation, especially in dry times, assists in the development of these bolls and allows of a better class of cotton being produced in that portion of the crop.

Cotton growers are strongly advised to cultivate as soon as possible after the fall of further rains, so as to maintain a clean cultivation and form a surface mulch that will reduce moisture evaporation to a minimum.

—*R. W. Peters.*

Lupins for a Winter Cover Crop.

N. J. KING.*

MANY canegrowers practise spring planting in South Queensland and thus have a fallow period from the time of harvesting until August or September of the following year. The usual practice is to grow a Poona pea crop in the summer, and then leave the land in bare fallow

Plate 76.
Crop of winter grown New Zealand Blue Lupin, Bundaberg Station.

until required for planting. Several growers have attempted to grow a winter crop of field peas as well as the Poona pea crop, but the poor weight of material obtained has been disappointing. The Manager of Windermere Plantation (Mr. C. Colquhoun) this year planted some blocks with the New Zealand Blue Lupin in an endeavour to find a suitable winter crop. So far as is known this is the first planting of this seed on Queensland cane country. A trial planting was also made at the Bundaberg Experiment Station. The success of the crop has now been proved, and for those who prefer a second green crop to a bare fallow there is little doubt that the lupins will be successful. The illustration is from the block on the Experiment Station. The photograph was taken in the heaviest corner of the block, and a section was cut down here prior to turning under to obtain the weight of green material. This amounted to nineteen and one quarter tons per acre. The crop was ploughed under when in flower. It is a very succulent crop, easy to plough, and is in no way fibrous. The disc cuts through it easily. Owing to its succulence it will probably rot quickly. It should be mentioned that as the seed was planted in early June when the land was very dry the sprays were put on the block for a germination. Another spraying was given when the crop was about nine inches high.

* In the "Cane Growers' Quarterly Bulletin" for October (Bureau of Sugar Experiment Stations).

A reasonable argument against the growing of a winter green crop is that should a dry spring be experienced there will be no moisture left in the soil after the crop has rotted. Planting would then have to be postponed. This note on lupins, however, is not a recommendation to grow winter crops, but a suggestion of crop worth trying for those farmers who favour this method of agriculture.

We have had no experience of the value of the blue lupin as a fodder crop in Queensland, but a strain of this plant is now being grown extensively as a fodder crop in Western Australia. It has proved itself particularly well adapted to light sandy soils under the conditions of winter rainfall obtaining in that State. It has proved particularly suitable for sheep grazing; the sheep will eat the young plants but will not eat the further growth until the seed is ripe, when they eat the seeds with relish.

SEEDS OF NATIVE GRASSES.

WITHIN the past year a considerable amount of interest has been shown both by pastoralists and by dairymen in the sowing-down of pastures of drought-resistant native grasses. Many of the graziers who have sought information concerning the availability of native grass seeds have desired to utilise the seed for the artificial reseeding of natural pastures which have been thinned out by drought. Numerous other sheep and cattle raisers have been eager to sow down on their own properties drought-resistant native grasses from other parts of the State. The heavy losses sustained in many dairying districts during the recent drought stimulated a desire in many dairy farmers to test out the most renowned of the native pasture grasses under their local conditions.

The grasses in most demand for the purposes outlined above are the Mitchell grasses. There are four distinct types of Mitchell grasses (Curly Mitchell, Hoop Mitchell, Barley Mitchell, and Bull Mitchell), and of these, perhaps, the best one for general purposes is the Curly Mitchell.

Seed of Curly Mitchell is now being collected in large quantities for commercial purposes, and the current retail price is between 2s. 6d. and 3s. 6d. per lb. Since the seed is very light and generally of fair germinating capacity, this price is considered to be reasonable. If sown broadcast about 4 lb. an acre should suffice to give a good stand; and this quantity may be reduced by half if the seed is sown in drills with a combine.

In some circumstances one or more of the other three types of Mitchell grasses are to be preferred to the Curly Mitchell, but so far as can be ascertained no seeds of these types are yet available.

While the purchaser of Mitchell grass seed has at present little choice in the matter of the origin of the seed (practically all of the seed being harvested in northern New South Wales), he should bear in mind that seed collected in his own district or in a district with similar climatic conditions is likely to be better for local sowing than seed from other sources.

Seed of Australian blue grass has been on the market for many years. This also is harvested in New South Wales, and consequently may not be as valuable as locally collected seed for sowing in Queensland.

—C. W. Winders.

Plate 77.

STUDENTS OF THE QUEENSLAND AGRICULTURAL HIGH SCHOOL AND COLLEGE ON THE OCCASION OF AN INSTRUCTIONAL VISIT TO THE LABORATORIES OF THE DEPARTMENT OF AGRICULTURE AND STOCK.

Back Row (left to right.—J. Hardcastle (Boonah), C. V. Cameron (Millmerran), A. W. Webster (Maleny), G. H. Allen (Salisbury), J. L. Horn (Calliope), M. Rocks (New South Wales), O. G. Callum (Kabra), A. W. May (Ipswich), R. E. Osborn (Bundaberg), J. M. Newman (Caboolture), A. Ferris (Wynnum).

Middle Row (left to right).—C. C. Harrington (Brisbane), L. Ward (Tambo), N. L. Harpham (Macalister), C. J. Burgess (Tasmania), Mr. P. J. Skerman (Agriculturist), Mr. R. A. Price (Herdsman), H. M. Ziegler (Tasmania), S. V. Petherick (Lockyer), J. E. Coaldrake (Brisbane), M. T. Stuart (New South Wales).

Front Row (left to right).—R. T. Bell (Ipswich), J. H. L. Armitstead (Warwick), C. S. Andrew (Crow's Nest), C. E. Kelly (Inglewood), C. E. Maxwell (Longreach), W. C. H. Ross (Rockhampton), R. M. Salisbury (Sandgate).

LUCERNE HAY.

In recent years lucerne hay values have been maintained at a high level because of a general scarcity of stored fodder. Baled lucerne hay or lucerne chaff and maize grain are now recognised as the basis of all supplementary or drought feeding, if the fodder has to be transported over long distances. Increased attention is therefore being given to the production of good quality lucerne hay. Good hay containing 45 per cent. to 50 per cent. of leaf will always command a good price, while a weathered or sweated consignment will be hard to sell.

Very careful handling is required from the time lucerne is cut until it is stacked or baled for market. Prime lucerne hay should be green in colour, dry, free from weeds or rubbish, and should contain a high proportion of leaf. Prevailing climatic conditions are naturally an important factor, and whenever possible cutting should commence in bright, fine weather. Lucerne should be cut shortly after the first flowers have appeared, when numerous young shoots will usually be observed at the base of the crowns. When the plants are allowed to become over mature, actual loss of weight and feeding value occur, as leaf will be lost, and the stems will harden, thereby becoming largely indigestible. It is customary to commence mowing in the morning, as early as possible, after any heavy dew has evaporated. During fine, hot weather, raking may commence about midday. Raking into windrows should, if practicable, be completed by nightfall, as much leaf may be lost if the lucerne is left too long in the swath. After wilting for a few hours in the windrows, fork into high narrow cocks which encourage the natural transpiration of moisture better than if broad flat cocks are made. If rain occurs the lucerne will require turning to prevent the formation of mould, but during fine, hot weather it is possible to stack within two days of cutting. Excess moisture will induce mould, and possibly combustion in the stack, while if the lucerne is allowed to become too dry it will lose appreciably in palatability, weight, and appearance. Before carting the stems should be tested by twisting them between the hands, when any excess moisture will become evident.

Wherever possible, lucerne hay should be stored in sheds, but if it becomes necessary to stack it in the field a frame-work of logs should be laid down, care being taken to keep the centre of the stack high during building. Large stacks which are likely to be held for some years may be protected by thatching or by a temporary galvanised iron roof.

Proximity and accessibility to the chief markets is obviously an important factor in the profitable production of lucerne hay for direct sale.

—H. W. Ball.

GRASS HAY IN THE MARANOA.

With the recent drought so fresh in memory, there should be no need to stress the value of building up fodder reserves when conditions are favourable. On many properties, a start can be made at the present time by storing excess grass. If the surplus of nutritious grass is not cut soon, it will mature and lose much of its feeding value.

Excellent hay can be made from common native grasses—such as love grasses, early spring grass, and star or windmill grasses. Where good stands exist on cleared areas—such as old cultivation paddocks

and creek flats—and a mower and rake are available, the grass can be conserved at little cost and will prove of value when natural feed again becomes scarce.

The grass cures very quickly and, in most cases, should be in the stack the day after cutting. Harvesting is, consequently, a relatively simple operation. The palatability and keeping qualities of the hay may be improved by sprinkling the several layers with a small quantity of salt as stacking proceeds. The merits of this cheap method of fodder conservation are realised by many farmers and graziers, but its more general adoption is warranted in view of its dual advantages of elimination of waste of good feed and inexpensive provision of fodder reserves.

—*C. H. Defries.*

JERUSALEM ARTICHOKE.

Like the sweet potato, the Jerusalem artichoke is a crop which should receive much more attention than it does at present, more particularly by those engaged in pig-raising in the drier farming districts, for not only is it very drought-resistant but its tubers are highly nutritious as well. The yield, which is controlled by the soil and seasonal conditions, may range from six to eight tons or more per acre, and although the plant does best on good friable loams, it will thrive on sandy, gravelly, or clayey soils, which enables the poorer patches of soil on the farm to be put to a profitable use.

The area intended for Jerusalem artichokes should be prepared in much the same way as for potatoes. The crop may be planted in early spring in furrows three feet apart, with the sets two feet apart. This spacing with medium-sized tubers will entail the use of between 4 and 5½ cwt. per acre.

As with maize and potatoes, until the crop is 4 inches high, all cultural operations can be carried out with tined harrows working across the drills. Afterwards the cultivator will have to be used, as the condition of the soil and weed growth necessitates.

When the tops die, the crop is fit for harvesting, which can be accomplished most profitably by turning pigs on to the field. If it is intended to plant the same area in the succeeding season, it will be necessary to remove the pigs before all the tubers have been eaten, if replanting is to be avoided. The area should be cultivated in the spring. Subsequent working will be similar to that of the first season. The white and red varieties are considered to be the most hardy and prolific.

In France—as many ex-A.I.F. readers will remember—feeding pigs on artichokes is an old-established custom. The tubers are grown specially for pigs, cooked and fed in admixture with mill offals, residue of cheesemaking, and, when available, crushed cereals. That the mixture suits the pigs is fully borne out by the length of time it has been in use. As to the meat it produces, no Digger ever questioned the quality of Somme pork in the spring and early summer of 1918.

KILLING JOHNSTON GRASS.

As some doubt exists as to the right kind of soap powder to use in the preparation of a sodium chlorate spray for the destruction of Johnston grass, Mr. W. J. McBaron (Corinda) has courteously supplied an extension of his note "Killing Johnston Grass," which was published in the *Journal* for December (page 691). He writes:—"..... I have had several inquiries, the last from Atherton, North Queensland, all of them wanting particulars as to the brand of soap powder to use. . . Some who have written have tried the first spraying and are evidently having trouble in getting the second to spread and stick—being a more difficult job on the second growth.

"Any type of common soap powder will do—I used Hudson's. Use soft water and only mix enough soap powder to make the water slightly soapy before mixing the sodium chlorate. The only need of the soap is to make the spray spread and stick to the leaves of the grass. This can be greatly helped by spraying on a hot day after the morning crispness has gone out of the grass, and not spraying too late in the afternoon."

PRODUCTION RECORDING.

List of cows and heifers officially tested by Officers of the Department of Agriculture and Stock which have qualified for entry into the Advanced Register of the Herd Books of the Australian Illawarra Shorthorn Society and Jersey Cattle Society, production charts for which were compiled during the month of December, 1937 (273 days unless otherwise stated).

Name of Cow.	Owner.	Milk Production.	Butter Fat.	Sire.
		Lb.	Lb.	
AUSTRALIAN ILLAWARRA SHORTHORNS.				
JUNIOR, 2 YEARS (STANDARD 230 LB.).				
College Ettie 5th	Queensland Agricultural High School and College, Lawes	6,229·52	250·488	Trevlac General
JERSEY.				
MATURE COW (STANDARD 350 LB.).				
White Rose of Hamilton	J. Wilton, Raceview	11,099·74	668·02	Retford May's Victor
SENIOR, 2 YEARS (STANDARD 250 LB.).				
Glenview Palatine Sultane	F. P. Fowler and Son, Glenview, Coalstoun Lakes	5,198·6	286·159	Trinity Governor's Hope
JUNIOR, 2 YEARS (STANDARD 230 LB.).				
Glenview Lady Lynn 4th	F. P. Fowler and Son, Glenview, Coalstoun Lakes	5,150·35	264·834	Trinity Governor's Hope

The Tropics and Man

Growth and Form.

Second Series: No. 7.

DOUGLAS H. K. LEE, M.Sc., M.B., B.S., D.T.M., Professor of Physiology, University of Queensland.

"Mens sana in corpore sano" (a sound mind in a sound body) has been an excellent motto ever since the days of the Roman poet, Juvenal. The idea of a sound body has always been associated in men's minds with height, weight, and physical form. These "specifications"—to borrow the engineer's term—should of course be satisfied; but it is quite possible to satisfy these and still have an unsound body. The bronzed god of the surf, all too frequently, has a mouth full of dental decay, and I have seen many of the gigantic Slav wood-cutters in Western Australia suffering from "barcoo rot," a disease brought about by a lack of vitamin A. It must be borne in mind that the achievement of outward physical perfection is not an end in itself, nor is it a guarantee of bodily fitness in the true sense.

Throughout this series we have tried to look at the essential causes of different bodily functions in order that we can understand better how hot climates may affect them. Now, upon what does physical form depend? As in all bodily development, two sets of factors interplay—hereditary and environmental. The tendencies derived not only from one's immediate ancestors but from the whole line of development of the human race have an essential say in the form one develops. These tendencies, however, can be very greatly modified by one's own living conditions. The external forces moulding the plastic clay of heredity operate from the moment of conception.

Raw Materials for Growth.

Every single one of the myriads of tiny cells in the body has to be built up out of food—food to the mother, food to the child, food to the adolescent boy or girl. Every one of the infinitesimal molecules in those cells—and there are millions in each cell—have to be obtained from food. They must be selected and built together in exactly the right proportions—not too much of one substance, nor too little of another. Growth, obviously, is going to be most economically carried out, and the final results achieve the best form when the food is made to supply a sufficiency of each of these requirements in their *correct proportions*. When food does this, the diet is said to be correctly balanced. Certain items are more frequently neglected than others in diets in common use. Amongst these Cinderellas of diet are mineral salts (especially lime and phosphates) and vitamins; and it is a tragic comedy that these, above all, are the items most concerned in growth. With the exception of vitamin D, these deficiencies occur in the Queensland diet to as great an extent, if not greater, as they occur in English dietaries.

Importance of Good General Health.

No one would expect the satisfactory production of a first-class article from a factory in which discontent was rife, working conditions poor, or equipment insufficient. Similarly, good growth and physical

perfection cannot be expected from a body pulled down by chronic ailments, kept under insanitary conditions, or malnourished from insufficient or ill-balanced food. The general health of the body is essential for the welfare of any one process in the body, just as it depends upon the healthy carrying-out of the process. The body is a commonwealth of nations, each with its own job to do, and its own working conditions, and yet dependent upon all the other members for a continued happy existence. Any one member by faulty working can destroy the harmonious relationship so essential for unity. In the absence of a general agreement to settle opposing interests, unity is impossible.

To what extent does tropical life affect this co-operation which we know as health and through it the attainment of physical perfection of form? If one sets aside for the moment infective diseases peculiar to the tropics, disturbances are not likely to fall upon the growing person. Mental stresses, in an enlightened community, do not fall heavily upon the immature. Physical stresses are largely offset by the great recuperative and adaptive power of the young. Both of these impose their main burden upon the adult, whose bodily form is more or less set. They may bring about deterioration of this, but that is more difficult and of somewhat less importance than the prevention of its attainment by interference with growth.

In many tropical countries disease attacks the growing person with intense vigour. In Australia, thanks to many factors, of which the absence of a native population is an important one, this aspect is less prominent, and the *general health* of our growing children is as good as, if not better than, elsewhere.

Particular Tropical Stresses.

Two factors apparently exercise particular effects in determining bodily form in the Australian tropics. The first of these is activity. In common with that of other pastoral and grazing countries, a large section of our tropical population is engaged upon a life of great and free activity.

The pursuit of occupations in these primary industries calls for activity by a very wide range of muscles in the body. This leads not merely to the development of particular localized muscles and bones, but to the general development of the skeleton and muscles. Moreover, activity and not merely great strength is required, so that large masses of muscle are not developed; they would hinder rather than help in the activity required. For these reasons, a well-built but relatively slender type of bodily form is favoured.

The second factor is heat. Small young animals kept in hot atmospheres under healthy conditions usually show an enlargement of certain portions of their anatomy. Rats, for example, develop large ears and longer tails. At the same time, the average bodily weight is often reduced. In this way, a larger skin surface for a given size of body is exposed to the air, and a greater opportunity is enjoyed by the animal of getting rid of its body heat. It appears to have been satisfactorily established that the bodily form in North Queensland tends to be of the "lanky" type. This has been explained on the basis of these rat experiments as due to heat. I am not convinced that this is altogether due to heat, as the nature of the occupation probably has a large "say," and in any case the rat's heat regulation is on a very different footing

from man's. Loss of bodily weight in man often occurs in the tropics, and this, I think, is referable to heat, which causes loss of body water and reduction of appetite. On the other hand, loss of weight does not always occur, particularly in the "overseer" class and in housewives controlling native servants, in whom physical activity is reduced.

Conclusion.

Bodily form is the result of many interesting factors. There is a danger that lime, phosphate, and vitamins may be deficient in the raw materials supplied in the usual diets. General health is a most important factor. The active life and, to a certain extent, climatic conditions in Queensland favour the development of a slender wiry type, which should be regarded as the more normal condition for this State.

[*Photo. Main Roads Commission.*

Plate 78.

ON THE DESCENT FROM MOUNT OSSA TO KUNGURRI.—One of the many picturesque rain-forest roads in the Mackay District, Central Queensland.

TREATMENT OF COWS WITH SORE TEATS.

Wire cuts and wounds on cows' teats are among the disagreeable experiences in dairying. Milking irritates a wound and often causes bleeding, besides being painful. In such cases, absorbent cotton wool placed over the wound so as to make a soft pad between the milker's hand and the teat will give relief and arrest bleeding. After milking, an antiseptic ointment should be applied.

Answers to Correspondents

BOTANY.

Replies selected from the outgoing mail of the Government Botanist, Mr. C. T. White, F.L.S.

Tulip Satinwood.

N. Mc.C., Camp Mountain—

Your specimen is *Rhodosphaera rhodanthema*, the deep yellow wood, a small tree fairly common in South-Eastern Queensland. It has a rather decorative wood, suitable for general fancy woodwork, but has a tendency to split, and the logs are small and usually faulty. The Queensland Forest Service have given the name of tulip satinwood as the commercial name of the timber. Chinaman's cedar and yellow cedar are names often given to it.

Hedge Mustard.

J.H.B. (Ipswich)—

Your specimen is *Sisymbrium officinale*, the hedge mustard, a native of Europe but now spread very widely in most warm temperate countries. It is moderately common in Queensland, and is not known to possess any poisonous properties. It is not eaten by stock to any extent, but if eaten by cows gives rather a strong flavour to milk and cream.

A Smartweed and a Saltbush.

G.W.A. (Nanango)—

1. *Polygonum lapathifolium*, a smartweed.
2. *Salsola Ka'i*, a saltbush.

At various times the smartweeds have been suspected of poisoning stock, but the evidence has not been conclusive, and nothing has yet been proved against them.

Salsola Kali (saltbush), is mostly regarded as of fodder value. No poisonous properties have been attributed to it.

Poisonous and Other Plants.

J.A.R. (Yeerongpilly)—

1. *Cucumis myriocarpus*, wild cucumber.
2. *Swainsona galegifolia*, Darling pea.
3. *Amarantus paniculatus*, an Amaranth.
4. *Solanum esuriale*, a native solanum, the fruit of which is eaten by the blacks.

Of these, 1 and 2 are poisonous to stock, the first causing blindness, and the second causing nervous symptoms. Nos. 3 and 4 are not known to be harmful.

A Suspected Plant.

G.A.F. (Clermont)—

The specimen you sent has been determined as *Scævola æmula*, a native plant which has been found previously at Springsure and parts of North-west Queensland. It appears to be a fairly common species in western areas. Some of our specimens also show a hardened root stock as exhibited by your specimen. As far as we are aware, this is the first complaint we have had of this plant as a pest. Your specimen has been placed in our records, together with your remarks as to the possibility of the plant's causing trouble.

General Notes

Staff Changes and Appointments.

Messrs. St. G. Thorn, Bacteriologist, and J. A. Rudd, Government Veterinary Surgeon, Department of Agriculture and Stock, have been appointed members of the Veterinary Medicines Board.

Messrs. H. Keefer (Pittsworth) and H. Cairns (Scarness, Pialba) have been appointed honorary protectors of fauna.

Mr. J. V. Johnson, Lucinda, has been appointed an honorary ranger under the Animals and Birds Acts.

Messrs. K. M. Grant, B.V.Sc. (Mosman, N.S.W.), I. L. Johnstone, B.V.Sc. (Armidale, N.S.W.), and R. D. Chester, B.V.Sc. (Binnaway, N.S.W.) have been appointed Government Veterinary Surgeons, Department of Agriculture and Stock.

Mr. A. H. Taylor, mechanical engineer, Stanley River Works Board, Somerset, and Mr. C. Passinetti, Mourilyan, have been appointed honorary rangers under the Animals and Birds Acts.

Constable J. H. Clay, Dobbyn, has been appointed also an inspector under the Brands Acts.

Mr. B. Funnell, banana agent, Cairns, has been appointed also an inspector under the Diseases in Stock Acts, the Diseases in Plants Acts, and the Tobacco Industry Protection Act.

Messrs. W. D. Edwards (West Hill) and J. E. Barnes (Orkabie) have been appointed honorary protectors of fauna.

The Officer in Charge of Police, Stewart's Creek (Constable A. W. L. Ryan), has been appointed acting inspector of stock and inspector under the Slaughtering Act.

Mr. L. H. Roles, Clerk of Petty Sessions, Boonah, has been appointed also an acting inspector of stock at that centre in succession to Mr. F. B. Bergin.

The Officer in Charge of Police, Sapphire (Constable H. H. Eiser), has been appointed also an acting inspector of stock and an inspector under the Brands Acts.

Tomato Levy.

A Regulation has been issued under the Fruit Marketing Organisation Acts, empowering the Committee of Direction of Fruit Marketing to make a levy on growers of tomatoes in any part of Queensland with the exception of the Stanthorpe district, the sums raised by such levy to be expended in the interests of the tomato section of the fruitgrowing industry. Tomatoes grown in the Granite Belt area are covered under the Fruit and Vegetables General Levy operating in that district.

The levy shall be as follows:—

(*a*) On tomatoes sold or delivered by rail, road, or boat to factories at the rate of 5s. per ton;

(*b*) On tomatoes sold or delivered by rail to persons or firms other than factory at the rate of 1s. 8d. per ton, with a minimum of 1d., but no levy shall be collected on consignments of less than four cases.

(*c*) On all tomatoes sold or delivered other than by rail to persons or firms except factories at the rate of ½d. per case, with a minimum of 1d.

The Commissioner for Railways may collect the levy on behalf of the C.O.D. on tomatoes consigned from certain railway stations, to the extent of 1s. 8d. per ton, with a minimum of 1d.

Wild Life Preservation.

An Order in Council has been issued under the Animals and Birds Acts, declaring the property of Mr. H. W. Bond and the adjoining camping and water reserve at Gladstone to be a sanctuary for the protection of animals and birds. Mr. J. E. Trihy, of "Cranleigh," Gladstone, has been appointed an honorary ranger for this property.

The property of Mr. J. H. C. Waddell, "The Cedars," North Mackay, has been declared a sanctuary under the Animals and Birds Acts. Mr. Waddell has been appointed an honorary ranger for this sanctuary.

Egg Board.

The following is the result of the Egg Board election:—

District No. 1.

	Votes.
Aubrey Cyril Mafeking Smith, Gooroolba	90
Ronald Benjamin Corbett, Woombye	73

District No. 2.

Frederic Stanley Morrison, Kenmore	128
Matthew Hale Campbell, Albany Creek	90

District No. 3.

Tom Hallick, Wynnum	198
John Peter O'Hagan, Carina, Belmont	114

District No. 4.

Johannes De Vries, Rosewood	108
Oliver George Millwater, Boonah	79

District No. 5.

Orton Augustus Windeyer Evans, Warwick	79
Walter Thomas Hughes, Toowoomba	48

Successful candidates will be appointed for a term of one year as from 1st January next.

Cotton Board Election.

Following is the result of the Cotton Board election:—

District No. 1.

	Votes.
Harry Reeves Brake, Wowan	201
Charles George Young, Wowan	78

District No. 2.

Ernest Schuenemann, Goovigen	199
George Herbert Bradley, Argoon	45

District No. 3.

James William Fleming, Biloela	163
Godfrey Francis McRae, Biloela	82

Messrs. Brake and Schuenemann have been re-elected to the Board, but Mr. McRae will be replaced by Mr. J. W. Fleming. The present members—Messrs. Basson, Lindenmayer, and Kajewski—have been returned unopposed for districts 4, 5, and 6 respectively. The new Board will be appointed for a term of three years as from 1st January, 1938.

Plywood and Veneer Boards—Terms Extended.

Orders in Council (two) have been issued under the Primary Producers' Organisation and Marketing Acts extending the operations of the Plywood and Veneer Board and the Northern Plywood and Veneer Board, respectively, for the period from 3rd May, 1939, to 2nd May, 1942.

Plague Grasshoppers Extermination Act.

An Order in Council has been issued under "*The Plague Grasshoppers Extermination Act of* 1937" abolishing the districts comprising the pastoral districts of Moreton and Darling Downs, which at the time of the passing of the Act were declared to be the districts in which the Act should be in force, and declaring that the Act shall extend to and be in force in the districts of Moreton, North-Eastern Darling Downs, North-Western Darling Downs, and Southern Darling Downs, described more fully in the Schedule to the Order in Council.

Rural Topics

Stock Poisoned by Yellowwood.

In a recent report the Government Veterinary Surgeon at Rockhampton advises that on several properties in the Emerald district cases of poisoning by yellowwood have occurred, and in some instances the proportion of animals affected was high. The poisonous nature of this tree was investigated in 1933 by the Department of Agriculture and Stock, the results being published in the *Queensland Agricultural Journal* for December, 1934. It was shown that whilst the leaves are not unpalatable to sheep, the continued eating of them leads to the sheep developing a peculiar type of nervous disorder accompanied by fits. As a result sheep are likely to collapse amongst fallen logs, or in stony country, or, again, in water holes, &c., from which they are unable to extricate themselves. In such circumstances, the animals, unless rescued, will die.

The sheep are prone to eat the leaves when these are shedding, as they do in dry weather, and when other fodder is relatively scarce. No antidote of the poison is known, but as the ill-effects are in part due to the very dry nature of the feed causing impaction and constipation, the provision of a laxative lick is indicated.

This tree, Yellowwood (*Terminalia oblongata*), is fairly common in parts of Central Queensland, but is not to be confused with the large timber tree common in South-Eastern Queensland and known by the same local name. The leaves are mostly an inch to an inch and a half long, the flowers are small and insignificant, and the fruit is flat on one side, ridged on the other, and developed on the sides into broad, thin wings. The whole fruit, including the wings, measures an inch to an inch and a half inch across.

How Much Water do Sows Drink?

From results published in the "Farmer and Stockbreeder" (England), it is learned that over a period of two years the water consumption of thirty-seven large white sows, tethered on grass, was measured. There was considerable individual variation, but the average rate during the suckling period was 4½ gallons per head per day. This was about half a gallon more per day than in the week before farrowing. The seasonal difference was slight and the correlation of water consumption with rainfall and weight of litter at weaning was not significant.

Water for Suckling Pigs.

Investigations at Wye College, England, indicate that sty-reared suckling pigs will drink water from two weeks of age, because, it is inferred, they do not obtain sufficient liquid from their dam.

Growth rate curves indicate that many piglings outgrow the milk supply of their dam when between three and six weeks old. This may result in the development of anæmia and a disinclination to eat at six weeks old. Mortality in such litters may be extremely high.

The supply of clean, cool drinking water to very young pigs, therefore, is a sound practice, conducive to rapid and economical growth.

Pig Management.

In some experiments at Bristol in England it was noted that in a total of 482 litters the average number of pigs per litter born alive was 8·7 and the average number weaned was 7·5, so that the weaning loss was 14 per cent., and from birth to market about 22 per cent. Out of 400 deaths from recorded causes (in England) erysipelas claimed 121, swine fever 91, scour and anæmia 113, chills and pneumonia 37.

In another report from Wye, England, on one farm the average number of pigs born per litter (179 litters) was 8·7, and the average number weaned per litter (177 litters) was 7·7 for three consecutive years, showing an average loss of one pig per litter. On the average of four farms 8·7 pigs per litter (188 litters) were born and 7.3 pigs weaned (171 litters), compared with another year showing 9.6 pigs (216 litters) born and 7·9 pigs weaned per litter, with an average loss over the two years of 1·6 pigs per litter.

Orchard Notes

MARCH.

THE COASTAL DISTRICTS.

IF the weather is favourable, all orchards, plantations, and vineyards 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. 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. Weedy overcrowded suckers will only give small bunches of undersized fruit hard to sell, even at a low price.

Cooler weather may tend to improve the carrying qualities of the fruit, but care should still be taken to see that it is not allowed to become over-developed before it is packed, otherwise it may arrive at its destination in an over-ripe and consequently unsaleable condition. The greatest care should be taken in grading and packing fruit. Small or inferior fruit should never be packed with good large fruit.

There has been a marked increase in the banana thrips population in some districts in which this pest is well established. Growers who consider it necessary to deal with banana thrips are advised to apply to the Department for the latest information on how to deal with this pest.

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 surface worked and brought into a state of nice 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.

As blue mould is likely to cause heavy loss in coastal citrus, especially in long-distance consignments, special precautions should be taken for minimising this loss.

It must be remembered that the blue mould fungus will only attack bruised or wounded fruit; hence it is necessary to be careful that no injuries are given by the clippers or finger nails during picking. Fruit should be cut and not pulled. Long stalks which may injure other fruit must be cut away.

The fruit must be carefully handled and accurately packed so as to avoid bruising. Any injured fruit should be discarded. In order to reduce the number of fungus spores present in the plantation, all waste fruit in the orchard or packing shed should be collected at frequent intervals and destroyed by fire or burying.

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 standard bushel case, the inside measurements of which are 18 by 11½ by 10½ inches, is the best for citrus. 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 blue mould to be removed prior to despatch.

Growers are reminded that the control of the bronze orange bug is best achieved by spraying with the resin-caustic soda-fish oil mixture normally either late in March or early in April. Applied at this time of the year, the spray can give a mortality of 98 per cent. of the bronze bugs, which are then present solely in the very young stages. This spray is also very effective against several of the important scale insects infesting citrus.

Red scale is a pest to which citrus growers will shortly have to give attention, it being considered that control is best established from the middle of March to early in April. Fumigation with hydrocyanic acid gas is most effective against red scale, but success may also be achieved with white oils or with the resin-caustic soda-fish oil mixture evolved for the control of the bronze orange bug. Red scale, of course, is pre-eminently a pest of the hotter, drier citrus districts.

Strawberry planting may 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.

THE 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 followed carefully. 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 growers to market their produce in a much more attractive form.

The same care is necessary in the packing of grapes. Those who are not expert cannot do better than follow the methods of the most successful packers.

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 the want of water, they should be given an irrigation during the month, but if the fruit is well developed and approaching the ripening stage, 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 moisture is apt to produce a large, puffy fruit of poor quality and a bad shipper. A light watering 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.

A PRODUCTION-PROTECTION SURVEY.

Statistics prepared for the basic wage case emphasised once again the seriousness of drought losses. These losses brought sharply under notice the importance of the pastoral lands belonging to the State and the necessity for some form of action to preserve the Crown estate and to maintain its value. The grazing areas are amongst the most valuable assets which the State possesses. The investigations of the Bureau of Industry revealed that fodder conservation for the West was too big and costly an undertaking for the individual or even for groups of individuals. Yet drought losses recur with sinister regularity—and, so far, an acceptable scheme of fodder conservation, even for the dairying districts, has not been propounded. As to the pastoral lands of the Crown, I suggested to the Minister for Lands that the problem might be approached from a fresh angle and that he might utilise the services of his field staff in the making of a "production-protection" survey. Mr. Pease approved the suggestion and put action in train. The scheme is fraught with possibilities, and indicates a genuine desire to evolve some practical measures to minimise drought losses in the pastoral areas and to preserve and protect the Crown estate in respect of both feed and water.

—From the Annual Report of Mr. J. D. Story, I.S.O., Public Service Commissioner.

Farm Notes

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 succeeding few months, and, as a consequence, the young lucerne plants will have an excellent opportunity of becoming well established.

Seed wheat should be treated with copper carbonate for the control of bunt. For oats and barley seed the use of formalin or a reliable mercury dust is advisable.

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 the potato crop is subject to Irish blight it is advisable to spray the plants for the control of this disease. Bordeaux mixture of 4.4.40 strength should be applied at least three times at intervals of ten days to a fortnight, commencing when the plants are about six weeks old.

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 thirty-six hours and subsequently aerated and stored in airtight containers. The germination of the maize is not normally affected by this treatment if dry and mature when treated.

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. Picked cotton showing any trace of dampness should be exposed to the sun for a few hours on tarpaulins, bags, or hessian sheets, before storage in bulk or bagging or baling for ginning. Sowings of prairie grass and *Phalaris tuberosa* (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 show no promise of returning satisfactory yields of grain would be well advised to convert these into silage to be used for winter feed. This, especially when fed in conjunction with lucerne or cowpea, is a valuable fodder. Where crops of Sudan grass, sorghum, white panicum, Japanese millet, and liberty millet have reached a suitable stage for converting into silage, it will be found that this method of conserving them has much to recommend it. If permanent storage facilities are not available on the farm the stack method offers a practical alternative. 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 cave and held in position by means of weighted wires.

Our Babies.

Under this heading a series of short articles, by the Medical and Nursing Staffs of the Queensland Baby Clinics, dealing with the care and general welfare of babies has been planned in the hope of maintaining their health, increasing their happiness, and decreasing the number of avoidable deaths.

MEAN WHAT YOU SAY.

IT is most important that parents should mean what they say in dealing with their children, and that the children should know this. It is worse than useless to allow a child to do something one day and punish him for doing the very same thing next day. How is he to know what to expect? Last week mother did not allow him to play out on the street, but one day the week before she did. Naturally, being a clever, reasonable child, he thinks he will risk it again. Mother may not punish him.

Bribes and threats are wrong means of teaching a child to obey. If you tell a child that you will give him something nice if he does what you ask you are bribing him, and before long you will find he will do nothing unless he gets something out of it.

Very few of the parents who threaten their children mean what they say. A mother may say to her naughty child: "I will ask the policeman to come and take you to gaol." She knows it is not true. At first her threat frightens the child; then he learns that it is not true, and before long he takes no notice. Threats may turn him into a coward; every mother who wants her child to be brave should avoid them. On the other hand, if the threats are never carried out the child may grow indifferent. It is best never to threaten.

Children do not obey people whom they cannot trust, and parents who break promises to their children cannot expect to be trusted or obeyed by their children.

Speak Quietly.

Here is another point. When your child is not obedient do you become angry and raise your voice? That excites the child, and some children like such excitement very much. They will even do things they know are naughty just for the sake of seeing mother lose her temper. If parents can manage not to get angry they will find it much easier to teach their children to be obedient. Loud talking is a strain to listen to, and is bad both for children and for grown-ups. It makes the home noisy; noise makes everyone in the home nervous and irritable. Parents who always speak quietly find that their children will listen to them more willingly.

Be Reasonable.

A toddler's doings, which seem so trivial to many grown-ups, are really very important indeed to him; and the things that grown-ups think so very important mean nothing at all to him. He does not think, for example, it is important to give up his play and come to dinner as soon as he is called.

It is a good plan to allow the child a few minutes to finish what he is doing before you expect him to obey a command. Let him have five minutes' grace before mealtime and before bedtime, for instance. There are some things little children really cannot do, and yet they are often asked to do them—for instance, to sit still for a long time, to keep from making a noise for a long time. It is not fair to expect little children to do these things, which adults can, of course, do quite easily. The child's muscles are too busy growing to allow him to sit still for a long time. They need constant exercise—by wriggling and other means which sometimes annoy tired mothers—in order to grow. Only an adult, whose muscles have reached their final stage of growth, can discipline his muscles so that he can sit still for a long time. And making a noise is a part of the business of growing. The toddler's chattering and shouting are just as important to healthy growth as is the lusty crying of the healthy infant.

It is not really hard to teach a child to obey the first time you speak if you always speak quietly, never angrily; if you let the child find by experience that everything is pleasant when he takes notice quickly but not so pleasant if he does not obey. When the little child is good and obedient it is right for mother to show that she is pleased to allow some little treat.

Teach Children to Think for Themselves.

If people are to be happy when they grow up they must have learned to obey certain rules when they were children; but they must have learned to think for themselves. Children must be taught to think for themselves what is right for them to do. There are children who never do anything by themselves. They never think for themselves. They have to wait until someone tells them what to do. When they grow up they are very unhappy because they cannot be independent.

Let us teach our children to think for themselves, encourage them when they plan to do things without help, when they attempt to fasten their own shoes, to put on their own socks, to do up their buttons, to wash their faces. They may seem to be getting on very slowly. It takes time to let them make the effort to help themselves, but try to be patient while they accomplish what they are trying to do. Praise them for trying to help themselves. It will be all the better for them if they learn to be independent, and in the long run all the better for mother.

IN THE FARM KITCHEN.

VARIETY IN VEGETARIAN FARE.

In hot weather vegetarian dishes often make an acceptable change from a meat menu. Here are a few suggestions:—

Vegetable Omelette.

Take 4 eggs, 3 tablespoonfuls butter, 1½ tablespoonfuls chopped onion, 1½ tablespoonfuls sliced, cooked mushrooms, 1½ tablespoonfuls milk, ½ cupful cooked green peas, pepper and salt to taste.

Beat egg-yolk with milk till well mixed. Beat egg-whites to a stiff froth. Melt one tablespoonful of the butter in an omelette pan. Fold egg-whites into egg-yolks, with salt and pepper to taste. Pour into the buttered omelette pan. Cook till set below, lifting edges with a palette knife to allow the liquid to run below and set. When still moist on top, slip the well-drained vegetables, cooked in remainder of butter, and seasoned with salt and pepper, on top of the omelette. Fold and serve at once. Vegetables should be ready before you prepare the omelette.

Potatoes and Cheese.

Take 1 lb. boiled potatoes, 3 oz. grated cheese, 2 tablespoonfuls milk, 1 oz. butter, breadcrumbs, salt and pepper.

Mash the potatoes while hot, adding milk, cheese, seasoning, and half the butter. Butter a piedish with the remainder, strew it thickly with breadcrumbs, fill up with potato and cheese, and bake for half an hour in a good oven. Turn out and serve hot.

Curried Vegetables.

Take ½ oz. curry powder, 1 oz. butter, 1 small peeled apple, 2 teaspoonfuls lemon juice, ½ pint water, 1 small cooked cauliflower, ½ pint cooked peas, salt to taste, ½ oz. flour, 1 teaspoonful chutney, 1 teaspoonful black treacle, ½ gill cooked beans, 2 raw tomatoes, 1 cupful rice.

Chop apple and onion. Melt butter in a saucepan and fry onion lightly. Stir in flour and curry powder. Fry for a moment or two. Add apple, salt, lemon juice, and water. Bring to boil. Skim and simmer for half an hour. Stir in beans, sprigs of cauliflower, peeled, raw tomatoes, chutney, and treacle. Cover and simmer very slowly for twenty minutes. Throw rice into a saucepan of boiling water, and boil till nearly soft, then salt to taste, and finish boiling. Drain and hold underneath hot-water tap to separate grains. Add peas to curry. Serve in a hot dish surrounded with the rice.

Corn Rarebit.

Take 1 cupful tinned corn, 1 egg, small piece onion, 1 heaped tablespoonful grated cheese, 2 cupfuls tinned tomatoes, ½ tablespoonful butter, ¼ teaspoonful salt, pepper to taste, rounds of fried bread.

Melt the butter in a saucepan. Add chopped onion and tomatoes. Simmer till mixture is reduced to half the quantity. Stir in corn and simmer for ten minutes. Beat egg lightly and add. Stir over a stove, heat for one minute. Season to taste with salt and pepper. Heap on to rounds of fried bread, sprinkle with grated cheese, and brown under the griller. If not wanted strictly vegetarian, garnish each with grilled rolls of bacon. Serve very hot.

Vegetarian Cutlets.

Take 3 carrots, 3 turnips, 3 onions (cooked), ½ pint cooked lentils, curry powder, minced parsley, 2 eggs, breadcrumbs, salt and pepper to taste.

Mash the carrots, turnips, and onions together; then mix with the lentils, which have been drained as dry as possible. Flavour with curry powder, parsley, salt and pepper to taste; then bind the mixture with a beaten egg, taking care not to make it too moist. Mould into cutlets, brush over with egg, and coat with breadcrumbs. Fry in deep fat until brown. Serve immediately.

Cauliflower and Tomato Souffle.

Take 1 cold cauliflower, 1 lb. tomatoes, 1½ oz. butter, 1 oz. flour, 3½ oz. grated cheese, 2 eggs, 1½ gills milk, salt, pepper, 1 tablespoonful breadcrumbs.

Slice the tomatoes and divide the cauliflower into sprigs. Put the tomato and cauliflower into a fireproof dish, and season them with salt and pepper and 2 oz. of the cheese. Melt 1 oz. of the butter, stir in the flour, and add the milk gradually. Stir till it boils. Take the pan off the gas, and add 1 oz. of cheese and the beaten egg-yolks. Stir in the stiffly-beaten egg-whites, and pour over the cauliflower. Sprinkle with breadcrumbs and the rest of the cheese, and place the remainder of the butter in small dabs on the top. Bake in a moderate oven for forty-five minutes. Serve in the same dish.

Small Cauliflower Salads.

Cold cauliflower, salt and pepper, 1 dessertspoonful Worcester sauce, 1 tablespoonful chopped parsley, French salad dressing.

Put the cauliflower on a plate, season with salt and pepper, and sprinkle with a little French dressing. Leave it for an hour or two to become well flavoured. Wash the parsley, squeeze it dry in the corner of a cloth, and chop finely. Mix the Worcester sauce with three tablespoonfuls of salad dressing. Put the cauliflower daintily on small individual dishes, and sprinkle well with the mixture of sauce and dressing. Decorate with a little chopped parsley. One medium cauliflower will be sufficient for five or six salads.

Cauliflower Fritters.

Take ¼ lb. flour, 1 egg-white, ¼ pint water, 1 cauliflower, salt, seasoning, vinegar, deep fat for frying.

Sieve the flour and salt, and mix to a smooth batter with the water. Whisk the egg-white until slightly frothy, and stir in. Beat well for a few minutes, then leave the batter to stand for at least one hour. Take the cauliflower—use only the white. Break it into small, neat branches, and soak them well in cold salted water. Then put them into boiling water to which a little salt has been added, and cook gently until tender, but take care it does not break. Drain them well, then sprinkle with pepper and a few drops of vinegar. Take a deep pan about half-full of dripping, and put it on to heat; it will be sufficiently hot when a faint blue smoke rises from it. Dip each piece of prepared cauliflower in the batter, coat them well, then lift them into the hot fat and fry until golden brown. Then drain well on paper. Only fry four or five pieces at a time. Remember to lift them into the fat with an iron skewer. Reheat the fat before frying the next batch. When all are cooked, serve on a dish-paper at once, and sprinkle with salt.

Viennese Cauliflower.

Take 1 cauliflower, 1 hard-boiled egg, butter, breadcrumbs.

Clean the cauliflower well, and boil it in salted water until tender, but fairly firm. Take out carefully, so as not to break it. Allow to drain, then place in a buttered casserole dish. Over the top sprinkle some breadcrumbs, which have been previously browned in a little butter. Chop finely the hard-boiled egg, and sprinkle this over the top, covering it with a few nuts of butter. Put into the oven for ten to twenty minutes, and serve. This is a good way of serving cauliflower for those people who are not fond of too many sauces.

To Keep Cauliflower Fresh.

To keep cauliflower fresh, split the stem in four, slip a string around it, and hang the flower downwards. To avoid breaking a cauliflower whilst cooking, wrap the vegetable in a square of butter-muslin, tying it corner to corner, with a knot at the top. The vegetable may then be lifted out of the pan with a fork and left to drain in a colander, and it will come out whole just as before cooking.

Whiteness is a sign of freshness and quality in cauliflowers. Once they begin to "yellow," the flavour goes, too. Always trim away the outer leaves, and cut the stalk quite close. As the cooking proceeds, touch this stalk with a fork now and then. If it is tender, the vegetable is done. Over-boiling of cauliflower only destroys the nutritive properties and valuable salts, and causes it to be tasteless.

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF DECEMBER IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALL DURING 1937 AND 1936, FOR COMPARISON.

Divisions and Stations.	Average Rainfall.		Total Rainfall.		Divisions and Stations.	Average Rainfall.		Total Rainfall.	
	Dec.	No. of years' records.	Dec., 1937.	Dec., 1936.		Dec.	No. of years' records.	Dec. 1937.	Dec., 1936.
North Coast.	In.		In.	In.	*Central Highlands.*	In.		In.	In.
Atherton	7·33	36	6·07	11·34	Clermont ..	3·83	66	0·80	3·08
Cairns	8·74	55	4·55	8·95	Gindie	2·81	38	..	2·56
Cardwell	8·27	65	2·08	12·22	Springsure ..	3·25	68	2·47	2·20
Cooktown ..	6·64	61	2·64	7·53					
Herberton ..	5·75	51	4·72	7·07					
Ingham	7·05	45	0·66	12·98					
Innisfail	11·88	56	1·87	16·77					
Mossman Mill ..	10·51	24	2·18	15·04	*Darling Downs.*				
Townsville ..	5·51	66	0·06	7·03					
					Dalby	3·37	67	1·37	5·10
Central Coast.					Emu Vale ..	3·51	41	2·28	3·35
					Hermitage ..	3·01	31	0·95	4·68
Ayr	4·03	50	..	8·16	Jimbour ..	3·33	49	1·53	5·56
Bowen	4·46	66	0·61	10·29	Miles	3·17	52	2·17	3·38
Charters Towers ..	3·29	55	1·81	3·56	Stanthorpe ..	3·61	64	3·10	5·59
Mackay	7·14	66	1·20	10·25	Toowoomba ..	4·46	65	4·10	5·91
Proserpine ..	7·83	34	0·74	8·87	Warwick ..	3·46	72	2·69	5·72
St. Lawrence ..	4·76	66	1·74	3·93					
South Coast.									
					Maranoa.				
Biggenden ..	4·73	38	2·31	5·19					
Bundaberg ..	5·11	54	3·77	3·01	Roma	2·57	63	1·44	4·96
Brisbane	4·90	85	4·53	1·80					
Caboolture ..	5·25	50	4·47	1·87					
Childers	5·69	42	6·84	5·12					
Crohamhurst ..	7·21	44	6·00	2·27					
Esk	4·72	50	3·05	3·43					
Gayndah	4·20	66	2·92	2·96					
Gympie	5·44	67	4·23	3·76	*State Farms, &c.*				
Kilkivan	4·57	58	4·94	2·25					
Maryborough ..	5·11	66	3·23	3·93	Bungeworgorai ..	3·01	22	..	6·10
Nambour	6·80	41	5·16	1·38	Gatton College ..	3·77	38	3·37	..
Nanango	3·82	55	3·20	2·93	Kairi	6·30	21	..	..
Rockhampton ..	4·82	66	3·24	2·64	Mackay Sugar Experiment Station	8·13	40	1·96	10·55
Woodford ..	5·57	50	3·45	2·18					

A. S. RICHARDS, Divisional Meteorologist.

CLIMATOLOGICAL TABLE—DECEMBER, 1937.

COMPILED FROM TELEGRAPHIC REPORTS.

Districts and Stations.	Mean Atmospheric Pressure, at 9 a.m.	Shade Temperature.						Rainfall.	
		Means.		Extremes.				Total.	Wet Days.
		Max.	Min.	Max.	Date.	Min.	Date.		
Coastal.	In.	Deg.	Deg.	Deg.		Deg.		Points.	
Cooktown	29·77	89	77	94	29	72	17, 18	264	6
Herberton	..	85	63	91	6, 10	59	20	472	8
Rockhampton	29·84	92	73	101	9	67	1, 3	324	8
Brisbane	29·88	85	68	94	12	63	3	453	14
Darling Downs.									
Dalby	29·85	91	64	100	13	58	3	137	9
Stanthorpe	..	83	59	90	21	47	13	310	15
Toowoomba	..	84	62	92	14	57	2	410	14
Mid-Interior.									
Georgetown	29·79	98	75	102	6, 9, 10	68	19, 21, 22	481	8
Longreach	29·75	102	73	111	7	65	10	17	4
Mitchell	29·78	98	68	104	8, 13	55	10	61	6
Western.									
Burketown	29·76	98	79	105	6	73	6	1	1
Boulia	29·76	103	74	113	10	67	10	16	4
Thargomindah	29·73	99	73	112	24	60	12	6	2

ASTRONOMICAL DATA FOR QUEENSLAND.

TIMES COMPUTED BY A. C. EGLINTON.

TIMES OF SUNRISE, SUNSET, AND MOONRISE.

AT WARWICK.

	February. 1938.		March. 1938.		Feb. 1938.	Mar. 1938.
	Rises.	Sets.	Rises.	Sets.	MOONRISE. Rises.	Rises.
					a.m.	a.m.
1	5·25	6·47	5·45	6·24	5·46	4·32
2	5·26	6·46	5·46	6·23	6·42	5·28
3	5·27	6·46	5·47	6·22	7·37	6·25
4	5·28	6·45	5·47	6·21	8·32	7·22
5	5·28	6·44	5·48	6·20	9·29	8·21
6	5·28	6·44	5·48	6·19	10·28	9·22
7	5·29	6·43	5·49	6·18	11·28	10·24
					p.m.	
8	5·30	6·42	5·50	6·17	12·36	11·28
						p.m.
9	5·30	6·42	5·50	6·16	1·40	12·28
10	5·31	6·41	5·51	6·15	2·36	1·27
11	5·32	6·40	5·51	6·13	3·35	2·20
12	5·32	6·39	5·52	6·12	4·28	3·10
13	5·33	6·39	5·52	6·11	5·18	3·55
14	5·34	6·38	5·53	6·10	6·1	4·36
15	5·34	6·37	5·53	6·9	6·42	5·15
16	5·35	6·37	5·54	6·8	7·21	5·52
17	5·36	6·36	5·54	6·7	7·58	6·31
18	5·36	6·35	5·55	6·6	8·35	7·8
19	5·37	6·34	5·55	6·4	9·14	7·48
20	5·38	6·33	5·56	6·3	9·55	8·29
21	5·38	6·32	5·56	6·2	10·36	9·13
22	5·39	6·31	5·57	6·1	11·20	10·0
23	5·40	6·30	5·57	6·0	..	10·49
					a.m.	
24	5·41	6·29	5·58	5·59	12·7	11·41
25	5·42	6·28	5·58	5·58	12·56	..
						a.m.
26	5·43	6·27	5·59	5·57	1·50	12·34
27	5·44	6·26	5·59	5·56	2·39	1·27
28	5·45	6·25	5·60	5·55	3·38	2·20
29			5·60	5·54		3·16
30			5·61	5·53		4·9
31			5·61	5·52		5·9

Phases of the Moon, Occultations, &c.

8th Feb.	☽	First Quarter	10 33	a.m.
15th „	○	Full Moon	3 14	a.m.
22nd „	☾	Last Quarter	2 24	p.m.

Perigee, 12th February, at 4.0 p.m.
Apogee, 24th February, at 11. 0 a.m.

Venus in its revolution around the Sun of 224 days will, on 4th December, arrive at a part in its orbit where it will be on the opposite side of our Luminary, with regard to the Earth, lost in its overpowering light. Shortly afterwards it will appear a little to the east of the Sun, and we may then look for its reappearance as an evening star. In spite of predictions it will be as surprising as ever when we see the beautiful white planet as though it had suddenly come from the depths of space within our vision.

The near approach of Mercury and Jupiter will occur below our horizon. Both planets set before the Sun.

Mercury rises at 4.42 a.m., 1 hour 43 minutes before the Sun, and sets at 5.26 p.m., 1 hour 21 minutes before it, on the 1st; on the 14th, it rises at 4.17 a.m., 1 hour 17 minutes before the Sun, and sets at 5.49 p.m., 1 hour 19 minutes before it.

Venus rises at 5.21 a.m., 1 hour 4 minutes before the Sun, and sets at 6.47 p.m., with the Sun, on the 1st; on the 14th it rises at 5.22 a.m., 12 minutes after the Sun, and sets at 6.50 p.m., 12 minutes after it.

Mars rises at 9.11 a.m., and sets at 9.19 p.m. on the 1st; on the 14th it rises at 8.37 a.m., and sets at 8.27 p.m.

Jupiter rises at 5.17 a.m., and sets at 6.43 p.m. on the 1st; on the 14th, it rises at 4.39 a.m., and sets at 6.1 p.m.

Saturn rises at 9.13 a.m., and sets at 9.25 p.m. on the 1st; on the 14th, it rises at 8.26 a.m., and sets at 8.38 p.m.

About the middle of the month the Southern Cross will reappear in the south-east with the Pointers just above the horizon. Northward the constellations will form a luminous arch. The most conspicuous stars being Canopus in Argo, above the Cross; Sirius in Canis Major; Rigel and Betelgeuse in Orion; Aldebaran in the V-shaped cluster; Capella in the great five-cornered constellation; Auriga near the northern horizon and in the north-east Procyon in Canis Minor; and Castor and Pollux in Gemini; all in fine colour-contrast. Among all these the fascinating little star-group, the Pleiades, will not be overlooked, seen as it were through a nebulous veil.

2nd Mar.	●	New Moon	3 40	p.m.
9th „	☽	First Quarter	6 35	p.m.
16th „	○	Full Moon	3 15	p.m.
24th „	☾	Last Quarter	11 6	a.m.

Perigee, 11th March, at 6.0 p.m.
Apogee, 24th March, at 7.0 a.m.

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 somewhat 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.