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Part 4

Event and Comment.

Australian Meat In Britain.

ADVERSE seasonal conditions and heavy commitments for supplying Australian and Allied armed forces in the South-west Pacific and other operational areas were reflected in the reduced quantities of meat exported to the United Kingdom last year, according to the annual report of the Agent-General (Mr. L. H. Pike). The total quantity of Australian meat of all kinds placed on the British market during the period under review was approximately 92,000 tons, compared with, say, 94,000 tons in 1944, and about 260,000 tons in the first twelve months of the war. "A welcome feature of the market during 1945," states the Agent-General, "was the resumption of the shipment of Queensland beef in the quarter. The bulk of this excellent consignment was delivered direct to retail establishments in the London area, and it was gratifying to see Australian meat once more displayed in the shops. This is a good augury for the future."

It is further reported that Queensland and Australian pig meat generally has maintained the standard which was making it popular with bason curers before the war, despite the inevitable stimulation of production of quantity rather than quality. For this year, it is estimated that meat shipments will be increased nearly three-fold. This considerable increase in our meat trade should be sufficient to place Australia nearer to the top of the United Kingdom import list.

The future of our meat industry is at present based on the agreement between the United Kingdom and Commonwealth Governments for the sale to Britain of the whole of our exportable surplus of beef, mutton and lamb for the period ending 30th September, 1948. The purchase also covers certain agreed quantities of pig meat.

It is anticipated, the Agent-General says, that within a year or two Danish bacon will have regained "its former pre-eminent position in the United Kingdom market." Nevertheless, a ready outlet may be expected for Australian frozen pigs of the big, lean-bacon type which was attracting much attention just before the outbreak of war. "From an economic point of view, the United Kingdom authorities naturally prefer to import frozen pork for home curing than the finished article—bacon."

Bush Fire Hazards.

Among the more important measures submitted to the State Parliament in the course of the current Session is the *Rural Fires Bill* which is to supersede the *Rural Fires Act of 1927*. In introducing the new measure, the Secretary for Public Lands, Hon. A. Jones, said that its main purposes included more adequate provision for the prevention and control of bush fires, strengthening the organization and extending the powers of the Rural Fires Board and of bush fire brigades, and the imposition of heavier penalties for breaches of the law.

Continuing, Mr. Jones said that all were aware of the enormous damage caused by bush fires in Queensland and other parts of the Commonwealth during recent dry months, and most of them had been caused by carelessness in the use of fire. It was intended to establish rural fire districts over each of which a chief fire warden would have jurisdiction, and local areas within each district under the control of fire wardens. The chief fire wardens would be given authority to approve of fire breaks, receive objections to burning, grant permits to burn, order postponement of burning, forbid burning, take charge of the bush fire brigade, arrest any person refusing to give his name and address, or decide what assistance might be necessary to control a fire, and to carry out all the duties of fire wardens. In districts where fire wardens were appointed, their duties under delegated authority would be largely similar. Under the new legislation, bush fire brigades would be established in various parts of the State and given necessary powers and protection, and the Minister would have authority to declare any area an emergency fire district, in which prescribed penalties would be doubled for breaches of the law.

There are many theories as to unknown or obscure causes of bush fires—lightning striking dry grass, bottles become burning glasses under fierce sunrays, the frictional rubbing of tree bough on bough when a high, dry wind is blowing, spontaneous combustion and other possible causes—but bush fires are usually man-made. The careless camper, the traveller who boils his billy at the butt of a dead stump or against a log with a "pipe" in it and leaves the fire burning, forgetting that a hollow log may act as a funnel for a gusty wind to blow flames through to fan out and set ablaze a whole countryside, are often the culprits.

The proclamation of regional fire districts under the control of experienced men in whom will be vested authority to enforce fire prevention practices and precautions against fire hazards will no doubt, under the decentralized administration for which the Bill provides, go far towards reducing the bush fire menace to a minimum. Embodying all the beneficial provisions of the old Act, the new measure will make for better organization and the practical co-operation of all concerned. It will be welcomed in all parts of Queensland where seasonal bush fire risks are very real.



Canning or Navy Bean Production in Queensland.

J. A. KERR, Senior Adviser in Agriculture.

THE profitable production of navy beans and allied varieties of canning beans, which was commenced during the 1941-42 season, has continued. This should encourage the planting of increased acreages by experienced growers, and new growers may be attracted to the industry in districts where soil and seasonal conditions have proved suitable. The dried mature plants are harvested, and the seed threshed out to be used as food for man.

Relatively low production costs, due to completely mechanical harvesting and threshing, offer an inducement for the establishment of large individual areas, while the high net return per acre makes the crop also suitable for the smaller growers. Beans are of value as a rotation crop, leaving the soil in good tilth, and generally improving the yields of succeeding crops. This is particularly evident when crops are threshed in the field with pick-up threshers.

Season.

Canning beans are a summer crop and mature in from 70 to 110 days, according to variety. As they are susceptible to frost injury, suitable planting months will safely extend from the first frost-free months of the district concerned up to the end of January. The most favoured planting period will vary in different districts. Late December to the end of January is recommended in the South Burnett. Here January planting should result in crops maturing during April, when harvesting weather is usually favourable. Moreover, January planting should conveniently fit in with other farm crop operations, permitting the previous completion of planting and first cultivation of most other summer row crops. Earlier plantings are usually favoured on the eastern Darling Downs.

Susceptibility to Bean Fly Attack.

In areas subject to bean fly infestation, early planting is usually recommended, but in districts where other related bean crops are not extensively grown, early planting, by increasing the bean fly population, tends to increase the risk of damage by fly to the main plantings later in the season. It is, therefore, suggested that avoidance of early planting in districts similar to the South Burnett would be generally beneficial.

Varieties.

Michelite, maturing in approximately 12 to 14 weeks, is probably the most popular variety. It vines somewhat less than the Californian White and Navy varieties, and produces a heavy crop of medium-sized, plump, white seeds. It generally remains more upright in habit than Californian White and Navy and accordingly supports a higher percentage of pods free from contact with the soil, an important feature when rain interferes with the harvest. Navy matures in from 12 to 14 weeks, while the Californian Small White takes a week or two longer.

Pinto is a high yielding variety bearing a mottled seed. It is not favoured for canning, though it should be of value for the dried bean trade. Two strains are grown in America—early and late—the late being a particularly heavy cropper. Only the early strain has been grown in Queensland. Maturing in about 10 weeks, it produced a high yield, less susceptible to weather staining than the white varieties.

Other varieties tested include Otenashi, Asada Pearl, and Great Northern. The first two are not favoured owing to their tendency to shatter when ripe.

Soils.

Friable, well drained soils of average fertility will grow good beans. Poorly drained soils, even if they possess some suitable characteristics, should be avoided wherever possible. High yields have been obtained from soils varying from sandy loams to chocolate soils, including a large range of red loams, but planting on poor soils is not recommended. On the Darling Downs the heavy black soils have not proved so suitable for beans as the lighter loams and scrub soils. Little work on fertilizer requirements of canning beans has been carried out in Queensland, but possibly superphosphate at the rate of 1 to 2 cwt. per acre would prove beneficial in increasing yields and inducing a more even ripening of the crop. An endeavour should be made to avoid intimate contact of the seed with the fertilizer in the seed-bed, otherwise faulty germination may result.

Soil preparation for beans should be in accordance with normal cultural methods designed to conserve moisture, eliminate weed growth, and produce a medium-fine seed-bed. Early ploughing, following a suitable rotational crop, is naturally highly beneficial.

The inoculation of seed with a suitable bacterial culture may be beneficial on soils new to canning beans. The culture can be obtained at a nominal charge from the Department of Agriculture and Stock, Brisbane.

Planting.

Planting may be done with a maize planter or by the use of an ordinary grain drill with the majority of grain runs blocked.

Row spacing generally varies from 28 to 36 inches, the wider spacing being necessary on rich rain-forest soils owing to the prolific foliage developed on these soils. Seed should be planted 2 to 3 inches deep, the shallower planting being advisable for heavy soils. Plant spacing in the row should average about 3 inches. Wider spacing in the row lengthens the period to maturity and results in irregular ripening, thus complicating harvesting.

The rate of planting will vary according to variety and spacing. Small seeded varieties at the wider row spacing may require to be sown at 12 to 15 lb. per acre, while double that quantity may be needed for larger seeded varieties, such as Pinto.



Plate 80.

A TWO-ROW BEAN CUTTER.

Cultivation.

The amount of cultivation required after planting will vary according to soil and seasonal conditions, but clean cultivation improves yields and simplifies harvesting. Late planted crops will generally require less cleaning than early planted crops.

Harvesting.

The stage of maturity of the bean plant at which harvesting should be carried out will depend on the harvesting methods adopted. Where suitable harvesting machinery is not available, the beans may be pulled by hand when the majority of the beans are at least beyond the yellow stage, with a few becoming brittle. The beans will require further drying in the field, and may then be removed to storage sheds or be threshed in the field. Threshing of such crops may be completed in the field by means of a header-harvester, fitted with a pick-up attachment, or the crop may be conveyed to stationary threshing machines. Where mechanical threshers are not available, tramping with horses, or rolling, will give satisfactory results.

The best harvesting method for large areas, particularly where labour is limited, is to cut with a bean cutter and thresh by means of the header-harvester fitted with a pick-up attachment. Either the Robey bean cutter fitted to a tractor or the Harvey bean cutter drawn by horses may be used. These bean cutters cut two rows and direct them to a central windrow. Cutters are available on hire in South Burnett and Darling Downs bean growing districts, at a small charge per acre. When dried to a brittle stage in the field after cutting, the beans are ready for threshing. Where the modified header-harvester is

used, it is recommended that the beans be permitted to reach an advanced stage of maturity, with most of the beans in a brittle stage, before using the cutter.

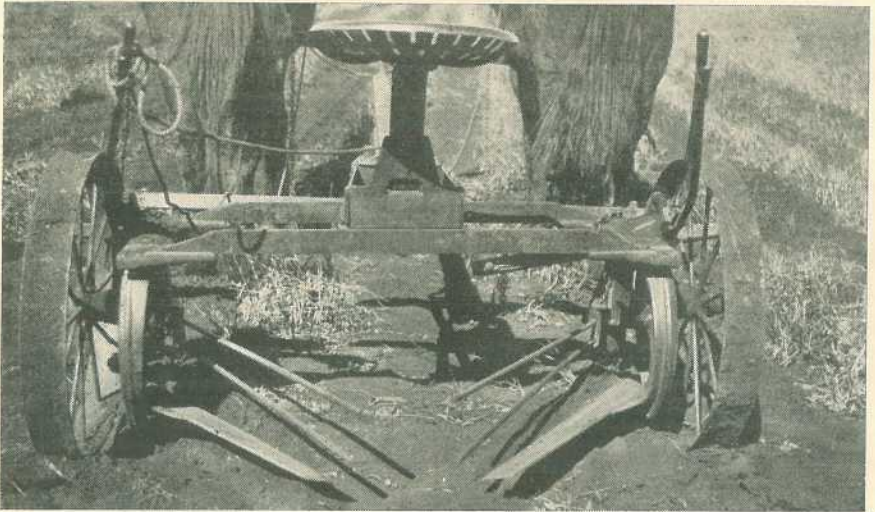


Plate 81.

A CLOSE-UP VIEW OF A TWO-ROW BEAN CUTTER, SHOWING CUTTING BLADES AND GUIDE RODS FOR PLACING BEAN PLANTS INTO A SINGLE WINDROW.

Canning beans of the varieties recommended do not shatter freely nor weather-stain readily, although the pods may blacken when exposed to wet weather. Continued misty rain will result in mouldy beans. Most damage from mould or seed germination occurs when pods are in



Plate 82.

MODIFIED HEADER-HARVESTER PICKING UP CURED BEAN PLANTS.

contact with the soil. Growers are advised not to cut or pull the crop in preparation for threshing unless weather conditions are favourable and the thresher is readily available, thus enabling undue exposure in the field to be avoided.

Yields.

Average yields are in the vicinity of 12 bushels per acre, but many higher yields should be obtained under favourable soil and seasonal conditions.

The Australian crop, which during the past few seasons has been less than the estimated Australian peace-time requirements, is grown principally in the Northern Tablelands of New South Wales and in the Killarney and Kingaroy districts in Queensland.



Plate 83.

REAR VIEW OF HEADER-HARVESTER IN OPERATION, SHOWING TRASH BEING RETURNED TO THE LAND.

Marketing.

A Bean Marketing Board has been formed in New South Wales, and Queensland growers are at present engaged in establishing a Marketing Board to handle the Queensland crop. It is proposed that these two Marketing Boards will, by agreement, adopt similar grade standards and prices.

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Summer Pruning of Grape Vines.

F. L. JARDINE, Adviser in Horticulture.

MOST of the grape vine varieties in the Stanthorpe district will have made sufficient growth by the third week in October to enable growers to make a fair estimate of their crop. Young bunches will then be plainly visible and will give a good indication of the forthcoming crop.

Some of the varieties, especially the Muscat Hamburg, usually show bunches far in excess of what the vines can comfortably support and ripen satisfactorily. Moreover, young cane growth in many instances is so dense that it would be unreasonable to expect the vines to support and ripen good marketable fruit and at the same time produce desirable cane growth.

Late October is the time to commence summer pruning, as the young canes are then sufficiently soft to snap off under pressure of the thumb and forefinger. Winter pruning and summer pruning are so closely allied to each other that one without the other is not sufficient to maintain correctly any given system of pruning—the two must be employed together in order to produce a vine of correct shape and sustained cropping powers.

Each spring, vines produce a number of superfluous shoots which, if allowed to remain, tend to diminish the vigour of the vine. In the case of bearing vines showing too many fruit blossoms, and also young vines, the suppression of young shoots is desirable in order to regulate the crop within reasonable limits. Moreover, these shoots if not summer pruned will have to be winter pruned, and the latter operation inflicts wounds that are more difficult to heal over than those resulting from summer pruning.

Summer pruning serves a dual purpose. In the first instance the crop is regulated according to the age and vigour of the individual vines. This is a matter that can best be decided by the judgment of the grower, as he knows the habits and bearing capacity of his vines. Frequently, two or even three or four shoots arise from each bud; few vines can support such growth, especially if it is fruitful, and at the same time remain healthy. Where more than one shoot occurs, the weaker should be removed, leaving the stronger one to bear the fruit. Two shoots to each spur should be sufficient for good cropping varieties as well as the less vigorous vines. Strongly growing varieties that are less fruitful may support three or even four shoots to each spur.

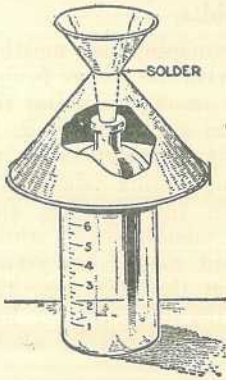
The second object of summer pruning is to remove completely all surplus or unwanted growth, including suckers and water-shoots that may appear anywhere from ground level to the extreme end of the vine. The only shoots which should be retained are those that can be utilized to fill in gaps between spurs and those arising about the base of spurs in cases where the spurs must be re-formed before they become too elongated or knotty. The removal of knotty spurs frequently necessitates the use of a saw and this may adversely affect the future development of the vine.

Time spent on summer pruning is not time wasted, because by regulating the crop and suppressing all undesirable cane growth many of the nutrients of the vine are thereby diverted to the more important parts, with the result that more handsome bunches will be produced, while stronger and better matured cane growth will be available for the following winter pruning.

HOME MADE RAIN GAUGES.

This sketch indicates how a good rain gauge can be made from a graduated bottle and two tin funnels. First remove the spout of the larger funnel and insert that of the smaller one into the opening and solder where indicated. Then place the spout of the small funnel in the neck of the bottle.

In order to determine the amount of rain, the bottle should be marked in fractions of an inch. This can be done with a file or by marking a scale on paper and gluing it to the glass; then coating it with varnish.

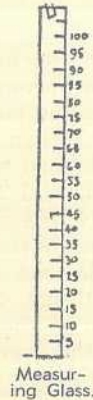


The diameter of the funnel should be the same as the inside of the bottle and the sides of the bottle must be parallel.

Bearing this in mind, any straight-sided bottle or receptacle will do, no matter whether round or square, provided the funnel is the same shape as the bottle or tin.

Of course, if an accurate measure is required, it is better to fix a small upright band around the outside edge of the upper funnel in order to prevent the raindrops from splashing out.

The above gauge will give a rough estimate of the fall, but if a finer estimate is required, obtain a piece of 1-inch glass tube as shown in the right-hand diagram, in which to pour the water from the other gauge.



Twenty-five inches in a 1-inch glass gauge (inside diameter) represents 1 inch of rainfall. It is then an easy matter to divide up this 25-inch tube into separate parts as shown. This scale can be marked by painting a strip of enamel down the tube and cutting the marks with a knife.

Another method of measuring is to obtain an ounce medicine glass with a funnel four and seven-tenths in diameter, as this will be needed in order that 10 points of rain on this surface will equal 1 ounce of water.

There is actually no necessity for the inverted funnel as shown in the accompanying sketch as a funnel inserted into the bottle or tin will do provided, of course, it is a good fit and allows no outside water to run into the bottle.

Also the object in having a funnel at all is mainly to prevent evaporation between showers. To read the gauge, hold the bottle between thumb and first finger with the water at the level of the eyes.

From "Handy Farm and Home Devices and How to Make Them."

(J. V. Bartlett for War Blind Association, Adelaide, S.A.), 1946.

PLANT PROTECTION

Control of the Leaf-Miner in Tobacco.

R. C. CANNON, Assistant Entomologist.

THE tobacco leaf-miner* has been recognized as a serious pest since the introduction of flue-cured tobacco-growing in northern Queensland. It also attacks potatoes—growers know the insect as the potato tuber moth—tomatoes, egg fruit and other plants of the same family. The larva usually feeds in the leaves and may attack tobacco plants at almost any stage of growth. Infestation of plants in the seed-bed may restrict plantings, while infestation of young transplants may seriously impair the stand in the field. Attacks on older plants in the field either considerably reduce the value of the commercial leaf or render it unfit for marketing. The importance of the pest varies from season to season, the heaviest losses usually being sustained in dry periods when growth is slow.

Description, Life History and Habits.

The adult (Plate 84; fig. 2) is a rather inconspicuous, mottled brownish-grey moth, about half an inch in length, with the wings folded over the body when at rest. The moths are usually inactive during the day, when they may be found sheltering in shaded positions, and, if disturbed, rarely fly more than a few yards. Activity commences about dusk and flight continues for several hours, during which egg-laying takes place. The period of egg-laying lasts about three weeks, and a single female may lay several hundred eggs. The smooth, oval, white, iridescent eggs (Plate 84; fig. 1) are usually laid singly on young seedlings, the lower leaves of larger plants, and on the soil near the base of the plant. The incubation period varies with temperature, but in the warmer months in northern Queensland, eggs hatch in about 5 days.

The newly emerged larva, which is only about one-twentyfifth of an inch in length, is colourless to pale pink, with a dark brown head. As it grows, the body-colour changes to grey or yellowish-pink and the mature larva (Plate 84; fig. 3) attains a length of about half an inch. On emergence, the young larvae wander about for some time without feeding, until finally they enter the leaf and commence mining. In doing so, they discard the small piece of surface tissue cut away when the mine is initiated. Mines may occur on any part of the leaf blade but are generally situated near the base of the leaf and adjacent to the midrib or a main vein. Several mines may occur in one leaf. During the period of feeding within the leaves, the larvae produce mines which are irregular in size and shape, and almost colourless. In seedlings, a single leaf may not

* *Gnorimoschema operculella* Zell.

provide sufficient nourishment for the larvae in it and feeding may then take place in adjacent leaves connected by a silken tunnel. Otherwise they only leave the original mines when forced to do so by the death of the leaf in which they are feeding or some such cause. In heavily infested crops, the larvae may attack the stems either directly or through the base of a leaf. In such cases they remain in the outer, green tissues and do not enter the central part of the stem.

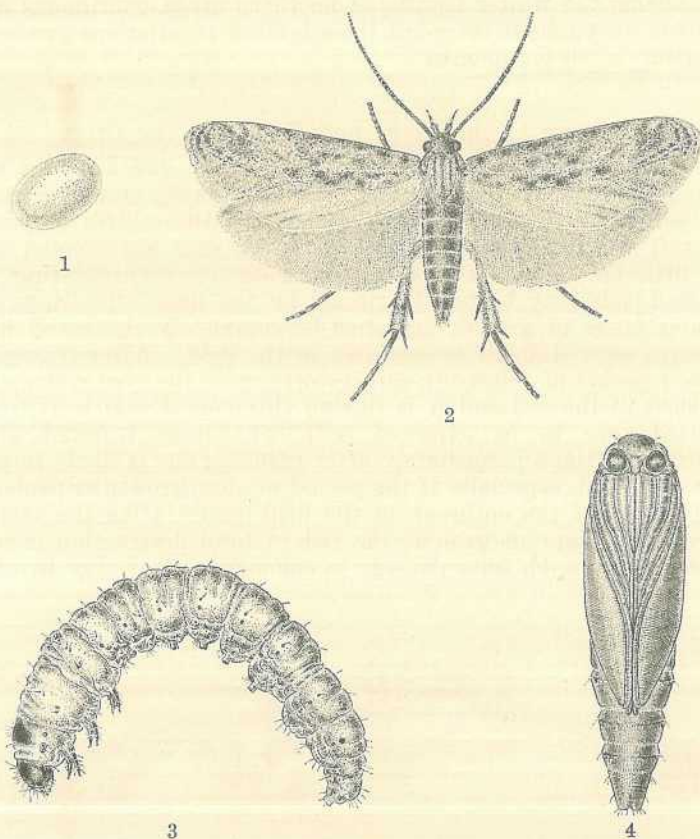


Plate 84.

TOBACCO LEAF-MINER: Fig. 1.—Egg x 25; fig. 2.—Adult x 5; fig. 3.—Larva x 7; fig. 4.—Pupa x 7. [Drawings by William Manley.

When fully fed, after a period of about a fortnight, the larvae desert the mines and spin silken cocoons covered with small particles of earth, debris, or grains of sand. The cocoons formed by larvae developing on a mature plant are frequently found on the plant itself, but when development takes place on small plants in the seed-bed or in the field the cocoons are usually situated on the soil near the stem. Within the cocoon the larva ceases to be active, shrinks somewhat, and pupates within a day or two. At first the pupa (Plate 84; fig. 4), which is about one-third of an inch in length, is light-green in colour but soon darkens to brown and eventually it becomes almost black by the time the adult is ready to emerge. In summer the adult will emerge in about a week and egg-laying may commence within 24 hours of mating.

Seasonal History.

In northern Queensland, the duration of the life cycle ranges from three weeks in summer to seven weeks in winter and it is possible for ten or eleven generations to be produced in one year. In cooler parts of the State the life cycle would be longer and there may be fewer generations each year. As the pest has a wide range of hosts, both cultivated and native, and as crops such as tomatoes and potatoes are grown during the winter months in northern areas, continuous breeding takes place throughout the year, though moth populations are relatively low during the cooler months.

Injury to the Plant and Effect on the Crop.

The leaf-mining activities of the larvae may so reduce the effective leaf area of seedlings that they are unable to make normal growth. In young seedlings, the larvae may tunnel into the midrib of the young leaves and into the terminal growth; in either case, the affected seedlings are of little value, as few of them would survive transplanting. Sometimes seed-beds may be totally ruined by the pest. Seedlings affected at a later stage in growth may not be completely destroyed but they are always more difficult to establish in the field. After transplanting, there is a period of relatively slow growth until the root systems become established in the soil and it is during this period that heavy losses of transplants are to be expected with leaf-miner infested seedlings. Similarly, an attack immediately after planting out is likely to seriously impair the stand, especially if the period of slow growth is prolonged by dry weather. If the outbreak in the field occurs after the transplants have resumed vigorous growth, the risk of total destruction is considerably reduced, though some damage to commercial leaf may be expected.



Plate 85.

TOBACCO LEAF-MINER.—Damaged leaf.

In the field, the lower leaves are usually the first to be attacked and the damage extends upwards, the upper limit being determined by the severity of the outbreak. Frequently several mines are initiated in the one leaf and these increase in size as the larvae feed until they may meet and coalesce. Leaves so damaged (Plate 85) are considerably reduced in value and may even be rendered unsaleable. A less obvious effect of this type of leaf-miner injury is the reduction in plant vigour which lowers the yields of commercial leaf.

During severe attacks, mining sometimes occurs in the main stem of the plant. These mines appear as slightly raised bands, about one-eighth of an inch wide, and may completely encircle the stem, usually

near ground level. They interfere with the nutrition of the plant and weaken the supporting tissues of the stem. Plants damaged in this way are frequently blown down by moderate winds.

Control Measures.

Since the leaf-miner does not feed externally, control by the use of stomach poisons such as arsenate of lead is difficult. D.D.T., which acts as a contact insecticide and only slowly loses its toxicity on exposure, has proved more satisfactory. Good control of the leaf-miner in tobacco can be achieved by the use of D.D.T. as a 0.1 per cent. spray or a 2 per cent. dust. Although there is as yet no experimental evidence available on the point, there is every reason to expect that D.D.T. will give comparable control of the stem-borer.* It is compatible with copper fungicides, which may be required in seed-beds, and can be mixed with them to form combined sprays or dusts.

In the Seed-beds.—As seed-beds are watered frequently, dust residues might be washed off the plants fairly quickly, and for this reason spraying is preferred. The first application should be made when the seedlings are 10 to 14 days old and repeated at fortnightly intervals thereafter. D.D.T. will satisfactorily control most other insect pests in the seed-bed so that it should be unnecessary to apply any other insecticide. The applications should be so arranged that the final seed-bed application is made just prior to transplanting in order to protect the seedlings for the first two weeks in the field.

In the Field.—Provided the seedlings were treated just prior to transplanting, a fortnight may elapse before the first field application is made. Two more applications at three-weekly intervals should be sufficient to give control under most conditions. Should there be a particularly heavy infestation, or should mining become apparent within a lesser period, then the period between treatments may be reduced to two weeks. Though D.D.T. may destroy leaf-miner larvae within the mines, growers would be well advised not to wait until the injury is conspicuous before applying the insecticide. In treating plants in the field the insecticide should be applied to the whole of the plant as it will also give some control of other insect pests. There is experimental evidence to suggest that the spray will also check the tobacco budworm† and the green loopers‡.

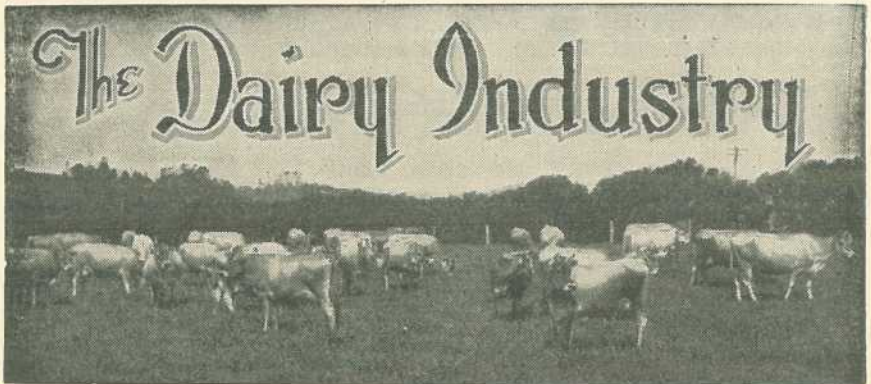
From 24 to 36 gallons of spray or 12 to 48 pounds of dust per acre will be required for each application, depending on the size of the plants at the time of treatment. Good results have been obtained with both sprays and dusts, though sprays may be slightly more persistent than dusts.

General.—In order to reduce the carry-over of this pest on other hosts, winter breeding grounds should be eliminated as far as practicable. Old tobacco stalks should be uprooted and destroyed immediately after harvesting, together with any adjacent weed hosts. Where other susceptible crops, such as potatoes and tomatoes, are being grown appropriate control measures should be applied. Attention to these cultural practices may prevent the leaf-miner population from reaching high levels.

* *Gnorimoschema heliopa* Low.

† *Heliothis armigera* Hbn.

‡ *Plusia argentifera* Gn. and *P. chalcites* Esper.



Improvement of Cream Grades.

V. R. SMYTHE, Dairy Technologist.*

THE warming up of the weather has produced a rather sudden drop in milk and cream quality. In the case of milk this has been shown by an increase in the number of suppliers' milks which fail to reach the required methylene blue standard. With cream this warmer weather has resulted in an increase in gradings down, particularly where deliveries to the factories are no more frequent than, say, three times weekly.

The effect of increased temperature on milk and cream quality works in two ways. In the first place, warm weather means that bacteria lurking on improperly sterilized utensils may multiply rapidly under the warm conditions, with the result that milk is more heavily seeded in passing through milking machines, through vats and pipes and strainers and over coolers. Cans and buckets, too, may contribute to contamination. Then, secondly, warm weather means a higher storage and ripening temperature for the cream in the dairy, with ample scope for bacterial spoilage, which gives undesirable taints and flavours.

It is true that, provided cream is produced cleanly and hygienically, the only factor which will cause undesirable types of ripening will be high storage temperature, particularly when cream has not been quickly cooled immediately after separating. What happens is this: Cream which is cleanly produced still contains considerable numbers of micro-organisms, usually with the souring type predominating. As the temperature rises above 60 degrees, the tendency is to favour the development of undesirable types before they can be suppressed by the acidity of the souring cream. This results in taints which the cream grader refers to as unclean souring.

The importance of rapid cooling of cream cannot, of course, be over stressed. If such cooling is practised assiduously, and the cream is kept cool, it will do more to raise cream grades than any other treatment on the farm.

* In a Country Hour broadcast talk, by courtesy of the Australian Broadcasting Commission.

Cream Ripening.

The subject of cream ripening has received a lot of attention in every country where dairying is extensively practised, and it is realized that a well soured, properly ripened cream yields a butter with considerably more flavour than sweet cream. This is made use of in some countries of the world, particularly in Europe, where a highly-flavoured butter is favoured by most consumers. The procedure is to inoculate the cream with a starter culture of pure lactic souring bacteria, and allow the acidity to develop to the required degree before it is stopped.

Blending and Stirring.

Both blending and stirring of cream done correctly and carefully can considerably improve cream quality. Where under very dry conditions, as at present, production is low and cream deliveries to the factory are made only twice or three times weekly, cream has to stand in the dairy for days. The fat rises to the top, leaving a milky layer below which sours and clots. This can produce a layer of curd on the bottom of the can, and such cream will, of course, be degraded as curdy to second grade. If only to prevent this happening stirring will be of great benefit, but it should be done with a properly constructed metal stirrer. Pieces of wood should not be used.

Stirring may be helpful in another way, too, by allowing aeration of the cream, though the benefit which accrues from this is hard to assess and is not as important as the preservation of even texture throughout the bulk of cream. Any undesirable taints from fermentations, of course, cannot be dispelled by removing some of the gases, because these taints are absorbed by the fat in the cream.

The blending of cream on the farm is for one purpose, that is, to make use of a properly-soured cream to start off the clean souring of another. Blending has to be done to some extent for transport to the factory, but its effectiveness depends on the proper ripening of the older cream, and it would be foolish to attempt to blend a fresh cream with an older one which has not ripened cleanly. This would result in both lots being degraded. Furthermore, in no instance should cold and warm creams be blended. Both should be well cooled before any attempt at blending is made. It is anticipated that when, and if, refrigeration becomes available on dairy farms, blending before storage will become necessary only to economise space in the refrigerator cabinet.

The Health of the Dairy Herd.

Another aspect of cream quality is too important to omit, and that is the health of the cows. Quite recently contagious pleuro-pneumonia has been found in several herds supplying Brisbane with raw milk. Pleuro had not been known in the district for thirty years. The disease was not at first recognised, and was confused with three-day sickness. In almost every instance when the milk from cows sickening of the disease was included in the bulk, the milk was rejected by the factory grader because of a strong taint. If this taint was present in the milk it almost surely would be evident in the cream also. This is mentioned

to emphasise the importance of the health of the stock in relation to cream quality. The dislike which all graders have for mastitis or mammitis milk is well known, and any cow with a swollen infected quarter, or whose milk shows the presence of clots, slime, or blood, should be immediately segregated, milked last, and her milk rejected from the bulk.

The deterioration in cream quality observed during July may be taken as an indication of what may occur during the forthcoming summer. A defect hardly noticeable now will become greatly magnified under warm weather conditions. In order to produce cream of the highest possible quality these points should be kept well in mind:—

Do not use colostrum milk. At least a week should elapse after calving before including the milk in the bulk and longer if the milk is not normal.

Do not keep on milking cows when they should be dried off.

Reject the milk from mastitis quarters.

Use boiling water or steam for sterilising utensils.

Cool cream immediately after separating and keep it cool.

And lastly, be careful when blending creams.

MASTITIS CAN BE CHECKED.

Veterinary advisers say that most cases of mastitis which occur on a dairy farm are contagious or catching. Not only may mastitis infection be transmitted from cow to cow by the milker's hands and by milking machine parts, but it may be transmitted indirectly.

Milk from an infected udder spilt on the floor of the milking shed, or splashed on brooms or shovels used by a milker who has just milked an infected cow, or other articles of equipment, or allowed to contaminate bail partitions, may cause contagion. In fact, any infected material on or in any part of the milking shed may be a means of spreading mastitis.

Therefore, when any form of mastitis is present in a dairy herd, the cow or cows which have the disease should be isolated. Mastitis-infected cows should be hand milked, preferably in bails away from those used by the healthy cows. Cows with mastitis should be milked after the rest of the herd, and the milker should wash his hands thoroughly in a disinfectant solution after he has finished milking.

The milk from a mastitis cow should be drawn into a bucket containing a disinfectant and certainly not, as is sometimes done, on to the floor. If these precautions are not scrupulously observed, mastitis may go quickly through a whole herd. As in everything else, prevention is always better and very much cheaper than cure.

Observations on Dairy Production in New Zealand.

E. B. RICE, Director of Dairying.*

(Continued from page 160, September, 1946.)

Sheds and Yards.

Dairy yards and sheds were observed to be fairly sound structures, though not elaborate or costly. A plan of every shed is required to be submitted for the approval of the local officer of the Dairy Division and, similarly, any alterations must be approved. Every milking machine must likewise be installed in an approved way, and second-hand machines also must be approved before installation and use. A concrete assembly yard is provided on every farm to obviate the mud and dust problem in the vicinity of the milking shed. The "walk through" shed is employed almost without exception. Water is laid on for washing down of floors, cleaning utensils, cooling of milk or cream and use in an electric water-heating appliance. A concrete race for exit from the sheds is a fixture on many farms, and frequently the entry lanes from the pasture paddocks to the cowyard are provided with a narrow concrete strip. Cows will always walk along this concrete strip in wet weather, so minimizing the pugging of the lanes. Milk and/or cream are stored in the milk room or a platform adjacent to the shed; isolated dairy houses of the Queensland type do not exist. An electric water heater, or other approved means of supplying hot water, is compulsory in the milking shed.

Concrete posts for fencing are being increasingly used, as supplies of timber for this purpose are diminishing and are costly.

Electrical Installations.

New Zealand is well equipped with hydro-electric power and it is proposed to considerably extend these services. Rural electrification, which has undoubtedly been a great boon to farmers generally, is being made full use of in New Zealand. Electricity is available on almost every farm for driving the milking machine, heating water for washing up of utensils and for domestic use in the farm home for cooking, lighting, refrigeration, washing machine and radio.

Use of Hedges.

A feature of the New Zealand rural scene which at once impresses itself on the visitor is the use of hedges. These are grown along main boundary fences and often along sub-divisional fences to provide shelter for the stock from the cold winter winds and shade in summer. The general appearance of the property is also made more attractive. The chief hedge plants grown are Lawsoniana, Barberry and African Boxthorn.

Water Supply.

Water abounds in the dairying districts, and is ample for all purposes, both in the shed and for the watering of stock. Water is reticulated to troughs in the different paddocks. Apart from the plentiful supplies from running streams, underground supplies are usually available at comparatively low depths and on many farms visited there were bores, equipped with electric pumps.

Machine Milking.

Machine milking is practised more extensively in New Zealand than in any other dairying country. It is estimated that 87.5 per cent. of dairy cows are milked by machine and that 31,500 milking machines are in use. Machines fitted with a low level milk line about one foot off the floor of the bails are used in many sheds. Because of the lower vacuum pressure which may thus be used, it was believed such installations would tend to minimize the incidence of udder disorders, but investigations, supported by the opinion of practical users, have not substantiated this claim. This is not to be construed as an indictment of low-line milkers; on the contrary, farmers questioned expressed satisfaction with this type of milker. A pump is, of course, necessary in such installations to elevate the milk to the milk vat. This additional potential contaminatory factor should not be overlooked.

Non-Stripping.

Enquiries were made from various sources as to the extent of, and experience with, non-stripping of cows after machine milking. Although the practice gained stimulus in war years, it is not widespread. Possibly 15 per cent. of farmers do not strip. Consensus of opinion among farmers who have adopted it and research workers is that non-stripping is a worthwhile practice, and that 90 per cent. of cows will milk out freely without hand-stripping if the milking machine is in sound mechanical order and is efficiently operated. This accords with Queensland experience in the non-stripping technique. A New Zealand investigation has suggested the possibility of inheritance causing some cows to fail to milk out fully by machine. It was observed that the daughters of some bulls always required hand-stripping to get all milk out of their udders.

Farm Homesteads.

The dairy districts in New Zealand have passed beyond the developmental stage, so most farmers have been able to provide comfortable housing. Farmers now enjoy in their homes most of the amenities of city residents. Farms are, too, usually served by good secondary roads. The intensive dairying on the North Island has, of course, tended towards farms being in relatively close proximity to dairy factories and towns. For instance, the manager of one co-operative milk and cheese factory with a daily intake of 23,000 gallons of milk stated that the supplies were drawn from within a distance of three miles on three sides of the factory and seven miles on the fourth side. On the day of our visit, another cheese factory received 6,100 gallons of milk from 31 suppliers, all within three miles of the factory.

Share Farming.

Share farming, or as it is called in the Dominion, share-milking, is operated in three ways:—

1. Probably the most common system is for the farm owner to provide the farm, herd, implements and equipment. The share-milker, who obtains one-third of the gross returns, is responsible for the milking and care of the herd, as well as for farm maintenance.

2. The share-milker provides his own herd and receives half of the gross income from the farm.
3. The owner provides everything as referred to in (1) and, additionally, is responsible for any cropping and the farm maintenance. The share-milker in this system has to do the milking and incidental dairy shed work only. He receives in return one-fourth of the gross earnings.

Farmers' Veterinary Clubs.

Some co-operative dairy associations have for some years employed veterinarians to assist in the improvement of the health of their suppliers' herds and this system is extending. The Dominion Federation of Farmers' Veterinary Services has now been incorporated. Its main purpose is to ensure a uniform and sound basis for the constitution of new groups. The clubs are financed by each producer authorizing the factory to deduct from his milk or cream cheque a levy on a cow or butterfat basis. A charge, usually 7s. 6d., to cover mileage travelled by the veterinarian, is fixed for each visit made.

Herd Improvement.

The New Zealand Department of Agriculture states that the improvement of dairy stock in the Dominion has proceeded in four main stages:—

1. Before 1920, when concentration on the use of pedigree sires was the main method.
2. From 1920 to 1940, when selection on both male and female sides has been aided by records of production of butterfat of both pedigree and grade cows obtained from a nationwide, co-operatively organised herd recording system and a State aided system for pedigree cows only.
3. Since 1940, when recording was extended to the male side with the organisation of a sire survey service, for the purpose of locating bulls of proven capacity to sire high producing progeny.
4. The period now commencing, when artificial insemination is being employed to permit the more extensive use of proven sires.

The necessity for some system of measuring butterfat production of dairy cows in order to effect improvement through breeding was recognised early in the Dominion. The first organised system was instituted by the Department of Agriculture among a group of dairy farmers in 1909. This was similar to the scheme now in existence in Queensland. The farmers weighed the milk of the cows in their herds, took samples and sent them to a butter factory or departmental officer for estimation of butterfat content. The farmer's sample testing scheme served the industry well in the beginning and enabled farmers to appreciate the merits of testing. However, the rapid progress in machine milking caused difficulties for the farmer who continued to do his own weighing and sampling, so the group herd testing system was commenced in 1922. Thenceforward the numbers of herds under test was greatly increased. Under this system herd testers are employed, each tester handling about 25 herds. He visits the herds in rotation once monthly,

weighs and samples the milk and carries out the butterfat test by the Gerber or Babcock method. Under the New Zealand group herd recording system all clerical work is done in each association's office.

After the introduction of grade herd testing, the necessity for improved production bred sires soon led to a system for recording the production of pedigree stock. The first system was inaugurated in 1912 and another system was adopted in 1927. The different systems for production testing of pedigree and other stock are outlined below.

Testing of Pedigree Dairy Cows.

The New Zealand Department of Agriculture controls the systems of testing pedigree dairy cows. These systems are known as the Certificate of Record Testing, and Government Official Herd Testing. The Certificate of Record Testing, started in 1912, provides for cows registered in the New Zealand Herd Book of the several breed societies. This system resembles in most respects the systems of testing of pure bred dairy stock in Australia, but while in the Australian advanced register testing systems the testing extends over a 273 day period, the New Zealand Certificate of Record Tests are in two divisions, namely, the 365 day or yearly test and the 305 day or ten-month test.

Testing is done by officers whose duties comprise solely Certificate of Record and Government Official Herd Testing. They make a surprise visit to the farm once monthly, checking the milk weights and taking samples for butterfat testing. The owner must also weigh and record the milk yielded at every milking. Strict identification of cows by the testing officer at each visit is insisted upon. There are prescribed conditions with respect to calving dates after test and butterfat yield for the award of certificates. The testing fees are £8 8s. for the first cow entered by a breeder each year and £3 3s. for each subsequent entry in that year.

The Government Official Herd Test, which was commenced in 1927, is really complementary to the Certificate of Record Test. Its object is to enable stud dairy cattle breeders who test one or more cows by the Certificate of Record System to have all other pedigree cows in the herd production-tested. The fee is 5s. a cow. Testing is done by the officer at the same time as he carries out the Certificate of Record Testing each month and the test is conducted over 305 days. No specific provision is made in respect of calving or production standards or the weighing of cow's milk yields at each milking. A composite sample is used for butterfat estimation. The monthly butterfat production is computed from the weight of milk and fat test on the day of the testing officer's visit and the season's yield by adding up the monthly estimates.

Group Herd Recording.

This system was introduced in 1922 to replace the previous system whereby the farmer weighed and sampled the milk of his herd. As previously stated, the extensive use of the milking machine in New Zealand was largely the reason for the necessity for the farmer being relieved of weighing and sampling milk. Although primarily intended for the testing of grade herds, membership of a herd improvement association, as the organisations controlling group herd recording are known, is not restricted to owners of grade herds; in fact, a high proportion of the cows under group test are pure bred, including those of

some of the more progressive breeders who appreciate the valuable guidance of sire surveys, prepared by the Dairy Board from group herd testing results, in maintaining or improving herds already well above average productivity.

The control of group herd testing in New Zealand comes under the New Zealand Dairy Board, which defines the policy through the Herd Recording Council.

Before the Dairy Board assumed control of group herd testing in 1936, there were some 27 individual herd testing associations in operation, and all were affiliated to a Dominion Group Herd Testing Federation which controlled policy matters. The weakness was that the Herd Testing Federation had no statutory powers, and there was nothing to prevent private individuals setting up in opposition to herd improvement associations. Since the establishment of control by the New Zealand Dairy Board, the six herd improvement associations operate under an annual license issued by the Board, and this can be revoked at any time in the event of an association failing to carry out its work in accordance with the policy laid down.

The following notes* deal with the operation of group herd testing, with particular reference to the activities of the Auckland Herd Improvement Association, which is the largest and tests roughly one-third of the total cows under test.

There are six herd improvement associations in New Zealand—five in the North Island and one in the South Island. There is not much dairying in the South Island, and one association covers the whole territory, with headquarters at Christchurch.

In the North Island one association, with headquarters in Whangarei, operates from the North Cape down to about 50 miles north of Auckland.

The next association, with headquarters in Hamilton, operates from about 50 miles north of Auckland down to south of Taumarunui, taking in the following dairying districts: South Auckland, Waikato, King Country, Thames Valley, Rotorua.

The third operates over the Bay of Plenty and East Coast, with headquarters at Whakatane.

The fourth covers Taranaki province, with headquarters at New Plymouth.

The fifth covers Wellington and Hawkes Bay districts, with headquarters at Palmerston North.

The scope of the associations ranges from 20,000 cows to 100,000 cows. Each association is an incorporated society incorporated under the *Incorporated Societies Act*, and is controlled entirely by the dairy farmers, who are testing members of the organisation.

A committee of management controls each individual association, and its members are elected by the testing members and by the dairy companies in the territory over which the association operates. The basis is 50-50 representation of testing members and dairy companies.

* Information supplied by Mr. S. J. Sheaf, General Manager, Auckland Herd Improvement Association.

As the associations do not operate for pecuniary gain, and are of an educational and scientific nature, they are not liable for any taxes.

Each association divides its territory into groups, the idea being to give a community of interest to the testing members. The groups are merely geographical and bear no relationship to the officers who are carrying out the work. The groups may therefore vary in size from, say, 10 herds up to 70.

The members of each group elect a group committee at the annual district meeting, and the group committee holds office until the conclusion of the following dairying season, the group committees being elected in March and April each year.

The object of a group committee is to act as a connecting link between the management and the members, but in practice its duties are very light, and it is seldom called on by the management. It can, however, be of considerable use to a new testing officer in explaining district conditions, drawing up testing routine, and giving advice concerning the care of horses, and in other ways.

There is no annual general meeting of members, but the annual meeting consists of the conveners of the various group committees or their proxies. The group committees vary in number from two to six according to the size of the group, and the convener is appointed by the members themselves. In practice, because of small attendances at many district meetings, the group committees are frequently appointed by the management committee under its constitutional powers.

Finance.

An annual Government subsidy was paid during the seasons 1927-28 to 1934-35. Apart from that subsidy, all the income derived by the herd improvement associations came from their testing members in testing charges for the work performed. When the Dairy Board took control, the Government subsidy, as such, was discontinued, but the Dairy Board has paid each association annually grants under certain headings for services actually performed by testing members through their associations for the benefit of the dairying industry as a whole. The grants have varied from season to season, and the Dairy Board increased its levy on dairy produce to finance the Dairy Board herd improvement plan which was put into effect in 1939-40. The Government makes an annual contribution because of the national importance of herd improvement work, and this is paid to the Dairy Board, for which allowance is made when grants are provided for individual associations.

Herd improvement associations receive a clerical grant of 10s. per herd and 6d. per cow tested, in consideration of the data collected. This clerical grant is retained, of course, by the associations.

A small herds grant is also allowed to enable associations to keep down the cost of testing to the small dairy-farmers. The grant is on the basis of £3 10s. for a herd of 20 cows, diminishing by 3s. per cow for each cow over 20 and under 44, the grant ceasing at 44 cows. This small herds grant is also retained by the association.

A successive recording grant on the basis of 10 per cent. of the testing charges is made to members who have tested for three or four years in succession, and this grant is deducted from members' testing fees.

The Dairy Board also makes a payment to associations of 60 per cent. on testing fees for returned servicemen in their first year of testing, provided they have served overseas during the 1939-45 war. After the first year 40 per cent. discount is allowed for the second successive year, and 10 per cent. for the third successive year, which means one year's free testing in three. This grant, however, is subject to annual review because of its having a snow-balling effect.

Income from Testing Fees.

The greater portion of associations' incomes (approximately 80 per cent.) comes from the testing fees paid by members, and approximately 20 per cent. from the Dairy Board grants. The Dairy Board granted a special additional "war costs allowance" of 60 per cent. and 40 per cent. in 1943-44 and 1944-45 respectively. The average cost of carrying out the work of the associations last season was about 6s. 9d., and the average testing charge to the farmer was 6s.

The average size of the herds tested is about 60. The testing charges are based on a herd fee payment, plus a per cow charge according to the size of the herd. Most testing members pay their testing fees by an irrevocable order on their dairy company cheques. Herd testers' wages account for over 50 per cent. of the expenditure and office salaries for about 20 per cent. Every member is required to sign a membership form with an order form attached, agreeing to be bound by the rules set out in the regulations and also by all the rules issued by the Dairy Board.

Herd Testers.

All herd testers commence as junior officers, some of whom have taken the herd testing course at Massey College. These juniors work under the control of a senior officer at one or other of the five central testing training depots. They simply weigh and sample the milk, and then send or bring their samples into the depot, where the testing is actually done by the depot officer. The depots are attached to a factory, and testing at the depots is carried out by the Babcock method, with the exception of one depot where there is an electric Gerber. The juniors assist the depot officer when they are in the depot, and thus learn the testing procedure.

All promotions are made from the ranks of the juniors, and a testing officer is in charge of his own district of 26 herds, and does the whole of the weighing, sampling and testing. All testing carried out other than at the five depots is done on the farm by the Gerber method. Approximately one-third of the staff are juniors working at the depots, and two-thirds are testing officers testing in the field. Their other duties include tattooing of calves and collection of mastitis data from those farmers who are prepared to co-operate. (The number of farmers co-operating varies from 33½ per cent. to 70 per cent.) Collection of this information is based on members' shed observations of cows suffering from udder trouble. Particulars of all cows leaving the herd—i.e., through cullings and deaths—are collected right through the season by the herd tester entering on the rough sheets the specific reason for cullings, or the specific cause of deaths. Particulars of all cows leaving the herd between the member's last test in the old season and his first test in the new season are obtained by recording the information on a special winter wastage form.

Herd testers collect from every member during the months of August to February (inclusive) the number of cows actually milked at the time of their monthly visit, together with the number of cows on the farm, for the purpose of ascertaining the effective average production per cow.

All herd testers are expected to advise members to have their bulls surveyed, but it has been found from experience that direct contact from head office with the member usually gives better results in actually getting the information. Herd testers, however, are always told of the names of members from whom they should endeavour to obtain surveys. Full details of the system of sire surveys of bulls and merit register classification of cows are obtained.

Herd testers send to the head office their rough sheets showing the p.m. and a.m. milk weights, together with the tests for every cow.

All calculations are made at head office, and a typed test sheet is forwarded direct to the member, usually the day after the receipt of the member's rough sheets. Members are entitled to a carbon copy of the rough sheets showing the milk weights and tests. The record kept at head office is an exact duplicate of the sheet sent to the member, and it is also pasted in a folder in exactly the same way as the member's test sheets.

Members' seasonal testing returns are not filed together under the name of the member, but are filed each season in their respective groups. This method has been found the most satisfactory as all statistics are based on groups.

Intermediate and Lifetime Merit Registers.

Members with registered pedigree cows in their herds are advised to enter their animals which have qualified in either of these registers. To qualify for the lifetime merit register, a cow must produce a minimum of 2,500 lb. butterfat in not more than eight seasons.

For the "Elite" class, a cow to qualify must produce not less than 4,000 lb. butterfat in not more than ten successive years. Only 79 cows in New Zealand have so far qualified.

To qualify for the intermediate merit register, a cow must produce 1,200 lb. butterfat in the first three lactations; reduced to 1,150 lb. for a cow which first calved under $2\frac{1}{2}$ years.

Sire Procurement Service.

The Auckland Association issues an annual bull catalogue with a view to inducing intending purchasers of herd sires to buy the bull on the farm.

Consulting Officers.

The Dairy Board appoints a consulting officer to each of the herd improvement association's territories, and they are under its direct and complete control. Their work brings them into close contact, however, with the management of the herd improvement associations, and they co-operate fully in the activities of the individual associations. The consulting officers each possess a degree in agricultural science or a diploma from a dairy college.

A review of the work of its herd improvement department is published in each annual report of the Dairy Board. Undoubtedly its progressive policy and work is making an important contribution towards raising the standard of dairy husbandry in New Zealand.

A few informative extracts typical of many contained in these reports follow:—

“The bull is important as approximately 12 to 15 heifer calves will be sired by the average bull annually, and as he has a working lifetime of about three to four years, it follows that some 40 to 50 heifer calves would be available from the average bull as compared with two or three heifers from the average cow. Therefore the bull is about twenty time more important than the average cow in determining the quality of future generations of dairy stock.”

“You will spend five years milking the daughters of your herd sire.”

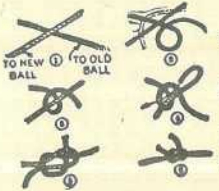
“The next best bull to a proven bull is the son of a proven bull from a line of sound female ancestors.”

“It pays to insist on a series of butterfat records for the dams” (of bulls).

In 1943 the Dairy Board appointed a sub-committee to make a critical review of sire survey work and herd improvement through breeding. An illuminating report was presented.

[TO BE CONTINUED.]

HINTS ON JOINING BALL TO TWINE SUPPLY.

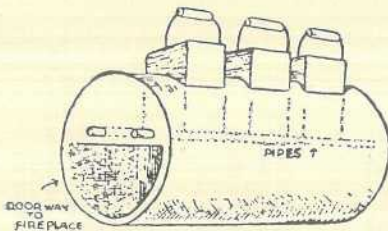


This is one useful way of joining a new ball of twine to the twine supply in the binder.

If you are not used to this method just try practising the knot illustrated in figures 1 to 6 in these drawings.

It is quite a good procedure and one found very successful by quite a number of farmers—it being quick and very effective.

A USEFUL METHOD FOR HEATING WATER.



First take an empty drum and at one end cut a good large hole for a doorway.

Then get two $\frac{3}{4}$ in. pipes, and run them through the centre of the drum from end to end, placing them about 6 in. apart.

Next, cut three square holes in the top of the drum to allow the buckets to come down and rest on the pipes. A good fire can then be placed beneath the buckets of water which will rapidly come to the boil.

From “Handy Farm and Home Devices and How to Make Them.”
(J. V. Bartlett for War Blind Association, Adelaide, S.A.), 1946.

PRODUCTION RECORDING.

List of cows and heifers officially tested by officers of the Department of Agriculture and Stock, which qualified for entry into the Advanced Register of the Herd Books of the A.I.S., Jersey, Ayrshire, and Friesian Societies, production records for which have been compiled during the months of June and July, 1946 (273 days unless otherwise stated).

Name of Cow.	Owner.	Milk Production.	Butter Fat.	Sire.
		Lb.	Lb.	
AUSTRALIAN ILLAWARRA SHORTHORN.				
MATURE COW (STANDARD 350 LB.).				
Trevor Hill Twinkle 2nd	G. Gwynne, Umbiram	11,126.62	421-980	Corunna Supreme
Alfa Vale Dandy 10th	W. H. Thompson, Nanango	11,075.4	401-002	Reward of Fairfield
Arolla Velvet 2nd	J. Crooke, Allora	8,891.5	390-837	Parkview Limerick
Wandegong Joyce 15th	J. Redhead, Indooroopilly	9,578.11	384-996	Alfa Vale Evidence
SENIOR 4 YEARS (STANDARD 330 LB.).				
Bileena Bonnie 8th	W. F. Hemmings, Warwick	11,013.25	378-346	Tara Governor
JUNIOR 4 YEARS (STANDARD 310 LB.).				
Alfa Vale Model 22nd	W. H. Thompson, Nanango	11,841.0	484-888	Penrhos Pansy's Pride
Rosenthal Dove 25th	D. Robinson, Warwick	8,625.45	343-356	Rosenthal Perfection
SENIOR 3 YEARS (STANDARD 290 LB.).				
Bileena Buttercup 9th	W. F. Hemmings, Warwick	10,390.9	381-975	Tara Governor
Bunya View Dulcie	I. B. Skerman, Kainkillenbun	9,202.45	345-173	Trevor Hill Reflection
Sydmouth Nancy	T. Vayro, Flagstone Creek	8,257.8	329-476	Mount Blow Security
White Park Polly 25th	W. T. Savage, Barnesmore	7,746.2	316-070	White Park Ronald
JUNIOR 3 YEARS (STANDARD 270 LB.).				
Rommoc Cinderella 3rd	N. J. Larson, North Bundaberg	9,823.0	459-629	Rommoc Emblem
Wandegong Mayflower II.	J. Redhead, Indooroopilly	9,334.46	338-244	Alfa Vale Evidence
Royston Evelyn	P. R. Emery, Dallarnil	8,351.9	331-871	Sunnyview Royal Chief
Navillus Charm 17th	C. O'Sullivan, Ascot	7,534.15	308-255	Greyleigh Eros
Arolla Venus 3rd	J. Crooke, Allora	7,090.75	307-412	Parkview Highbrow
Ennismore Bessie	E. W. Jackson, Nobby	7,137.25	272-099	Navillus Prince Henry
SENIOR 2 YEARS (STANDARD 250 LB.).				
White Park Linnette 32nd	W. T. Savage, Barnesmore	9,034.1	332-582	White Park Skipper
Bingleigh Ettie 4th	J. C. Meier, Mount Mort	6,810.35	324-796	Blacklands Emblem
Aynesley Jane 4th	G. Francis, Kumbia	8,307.65	316-064	Alfa Vale Pride 6th
White Park Melba 23rd	W. T. Savage, Barnesmore	7,976.4	310-878	White Park Skipper
Fairthorn Pidgeon 12th	H. G. Watson, Killarney	7,357.2	298-872	Parkview Red Prince
Mt. Camp Coupen (236 days)	Madge Brothers, Southbrook	6,306.5	276-213	Rosenthal Red Major
Rhodesview Handsome 7th	W. Gierke and Sons, Helidon	6,446.95	273-188	Alfa Vale Nigel
Aynesley Gwen 5th	G. Francis, Kumbia	6,463.15	252-742	Alfa Vale Pride 6th
Wenlock Beauty 3rd	H. G. Watson, Killarney	6,032.4	250-099	Alfa Vale Repeater

JUNIOR 2 YEARS (STANDARD 230 LB.).				
Bantry Rose	D. Sullivan, Pittsworth	9,170-36	375-454	Pearhos Blossom's Prince
Bingleigh Fanny 2nd	J. C. Meier, Mount Mort	7,048-15	323-567	Blacklands Jean Victory
Bingleigh Ettie 7th	J. C. Meier, Mount Mort	7,042-61	321-290	Blacklands Jean Victory
Trevor Hill Aster 4th (260 days)	A. H. Webster, Helidon	7,391-3	301-794	Balater Czar
Corunna Luster	H. L. and C. I. Bruggemann, Kulpi	7,606-15	297-049	Corunna Supreme
Sunnyside Gentle 50th	R. Moore, Kingaroy	7,330-45	291-117	Cosey Camp Isaac
Ennismore Freda	E. W. Jackson, Nobby	7,591-3	290-396	Navillus Prince Henry
Bingleigh Ettie 5th	J. C. Meier, Mount Mort	6,762-88	280-360	Blacklands Jean Victory
White Park Edna 30th	W. T. Savage, Barnesmore	6,873-1	267-482	White Park Skipper
Navillus Gem (253 days)	C. O'Sullivan, Greenmount	5,744-0	253-930	Alfa vale Re Neil
Springlea Florrie 4th	J. E. Heath, Murgon	7,149-55	246-468	Alfa Vale Standard
Arolla Polly 8th	J. Crookey, Allora	6,005-4	240-365	Parkview Highbrow

AYRSHIRE.

MATURE COW (STANDARD 350 LB.).				
Leafmore Kits Daisy	J. P. Ruhle, Motley	9,912-7	453-261	Myola Jellicoe
Leafmore Selee	J. P. Ruhle, Motley	8,818-76	371-181	Myola Bessemer
JUNIOR 3 YEARS (STANDARD 270 LB.).				
Myola Vestage	J. P. Ruhle, Motley	7,357-9	306-027	Leafmore Bonnie Boy
SENIOR 2 YEARS (STANDARD 250 LB.).				
Myola Marion	J. P. Ruhle, Motley	5,770-85	273-439	Myola Jellicoe

FRIESIANS.

JUNIOR 2 YEARS (STANDARD 230 LB.).				
Tarata Whaka	D. Young, Kingaroy	8,901-65	313-551	Mahoe Wolseley
Tarata Erenola De Kol	D. Young, Kingaroy	8,439-0	303-226	Tarata Improver

JERSEY.

MATURE COW (STANDARD 350 LB.).				
Treearne Chimes 5th	T. A. Petherick, Lockyer	9,772-45	485-692	Jerseylea Golden Duke
Westwood Volunteers Lotus	F. Porter, Maleny	7,008-9	443-475	Hunstrete Emperor's Volunteer
Carnation Blossom 2nd	T. Little, Clifton	7,798-35	423-234	Carnation Peers Laddie
Ashview Fancy	C. Huey, Sabine	6,725-75	408-737	Treearne Butter Queen's Officer
Westwood Golden Dancer	F. Porter, Maleny	7,205-6	407-763	Westwood Emperor's Volunteer
Brookland Golden Drop	W. S. Conochie, Sherwood	7,321-25	406-267	Oxford Golden Peer
Westwood Barbara (258 days)	F. Porter, Maleny	6,856-35	402-073	Westwood Emperor's Volunteer
Brookland Choice Rose	W. S. Conochie, Sherwood	8,171-95	394-434	Brookland Choice Peer
Jersey Park Golden Thread	R. J. Browne, Yangan	7,985-8	384-470	Trinity Pioneer
Balwyn Ginger Lass	R. J. Browne, Yangan	6,908-5	375-493	Oxford Darcy
Glenrandie Fair Lass	P. Kerlin, Killamey	6,698-53	350-459	Bellgarth Stylish
SENIOR 4 YEARS (STANDARD 330 LB.).				
Westwood Sapphire	F. Porter, Maleny	8,255-05	485-301	Westwood Palatines Volunteer
JUNIOR 4 YEARS (STANDARD 310 LB.).				
Trinity Crowning Lady	Estate J. Sinnamon, Moggill	8,146-30	407-463	Trinity Crowning Effort
Fauvic Recoil (254 days)	H. Cochrane, Kin Kin	5,541-6	344-329	Shepstone Gallant Lad
Ashview Fashion	C. Huey, Sabine	6,777-8	315-546	Treearne Victor 4th

PRODUCTION RECORDING—continued.

Name of Cow.	Owner.	Milk Production.	Butter Fat.	Sire.
		Lb.	Lb.	
<i>JERSEY—continued.</i>				
SENIOR 3 YEARS (STANDARD 290 LB.).				
Tecoma Duchess	H. J. Ellis, Kingaroy	7,184.4	379.582	Trinity Golden Royal
College Linda 5th	Queensland Agricultural High School and College, Lawes	6,918.75	331.93	Richmond Stalwart
Palen Blue Bird	Prison Farm, Palen Creek	6,578.65	312.324	Banyule Silvermine Oxford
Trearne Toddles 4th	T. A. Petherick, Lockyer	4,922.75	305.470	Jerseylea Golden Duke
Kingsford Prim	J. W. Evans, Rosewood	5,251.8	291.714	Kingsford Reliance
JUNIOR 3 YEARS (STANDARD 270 LB.).				
Westwood Dixie	F. Porter, Maleny	7,496.3	450.999	Westwood Combination
Glenrandie Nisa 2nd	P. Kerlin, Killarney	7,662.8	405.105	Bellgrath Stylish
Palen Guem	Prison Farm, Palen Creek	6,662.1	338.860	Palen Governor
Le Nid Pearl	W. C. Paroz, Biloela	5,158.1	275.305	Westbrook Aster's Lad 39th
Trearne Some Eileen	T. A. Petherick, Lockyer	5,147.55	274.958	Trearne Some Duke
SENIOR 2 YEARS (STANDARD 250 LB.).				
Westwood Daydream	F. Porter, Maleny	4,430.8	304.266	Westwood Nobleman
Palen Golden Glow	Prison Farm, Palen Creek	5,889.2	285.524	Oxford Cardo
College Pearl 3rd	Queensland Agricultural High School and College, Lawes	5,700.15	264.703	Richmond Stalwart
JUNIOR 2 YEARS (STANDARD 230 LB.).				
Brookland Cream Flake (365 days)	W. S. Conochie, Sherwood	8,649.95	507.583	Englorie Cunning Victor
Glenrandie Larkspur	P. Kerlin, Killarney	8,089.4	449.737	Bellgrath Glory King
Mayfair Star 3rd	J. W. Carpenter, Helidon	6,521.65	370.377	Trearne Golden King 2nd
Lermont Duchess 2nd	J. J. Ahern, Conondale	5,748.35	356.674	Selsey Sanares Hallmark
Brookland Merry Jingle Belle	W. S. Conochie, Sherwood	7,059.75	352.803	Bulby Maria Keepsake
Oxford Feodora (258 days)	Burton Brothers, Wanora	6,415.63	352.394	Oxfords Maids Victor
Westwood Locket	F. Porter, Maleny	5,693.75	342.446	Westwood Combination
Lermont Show Bell 2nd	J. Schull and Sons, Oakey	5,530.25	324.342	Lermont Peer
Glenrandie Fairy Queen	P. Kerlin, Killarney	6,261.4	318.580	Bellgrath Glory King
Oxford Leona	Burton Brothers, Wanora	5,958.01	310.116	Oxford Ajax
Oxford Fenella	Burton Brothers, Wanora	6,060.44	309.280	Oxford Ajax
Lermont Pearl	J. Schull and Sons, Oakey	5,338.2	291.837	Lermont Peer
Trearne Ryebread 3rd	T. A. Petherick, Lockyer	5,232.6	281.089	Trearne Some Duke
Pinegrove Betty	J. W. Evans, Rosewood	4,678.5	273.115	Glenview Victor
College Tulp	Queensland Agricultural and High School College, Lawes	4,885.8	263.711	Richmond Stalwart
Ashview Locket 2nd	C. Huey, Sabine	5,429.75	258.507	Trearne Victor 4th
Woodview Jerseygirl	P. H. Schull, Oakey	5,506.35	254.572	Woodview Officer
Ashview Milkmaid	C. Huey, Sabine	4,963.65	250.410	Trearne Victor 4th
Lermont Shamrock	J. Schull and Sons, Oakey	4,515.0	246.843	Lermont Peer
Oxford Creole	Burton Brothers, Wanora	5,509.75	245.308	Oxford Winston
Tecoma Precious	A. L. Semgreen, Coolabunia	4,418.75	239.372	Tecoma Golden Royal



Plate 86.
HEREFORD BREEDERS IN THE GOONDIWINDI DISTRICT.

Queensland Cheese Production 1945-46.

E. B. RICE, Director of Dairying.

THE production, yields and official grading results for all Queensland cheese factories during 1945-46 are submitted for the information of factory directorates and suppliers. Favourable seasonal conditions in the main cheese-producing district—the Darling Downs—for most of the year were responsible for the production of 12,023 tons of cheese, a production exceeded only by the peak output year of 1942-43.

Table 1 shows the effect of the increased demand for cheese in the war years in stimulating production in Queensland.

TABLE 1.

Year.	Tons.
1938-39	7,031
1939-40	6,179
1940-41	5,237
1941-42	7,292
1942-43	12,730
1943-44	10,733
1944-45	10,101
1945-46	12,023

Of the total manufacture of 26,931,781 lb. (12,023 tons) 18,250,974 lb. (8,148 tons), representing 67.8 per cent., was officially graded either for export or local sales.

The gradings are summarized hereunder:—

Percentage ..	Grade.		
	Choice and 1st.	Second.	Third.
..	70.46	.. 28.06	.. 1.48

Despite expansion of the industry in the war years, and the then current disabilities on farms and in factories, cheese quality has shown a marked improvement in recent years, as shown in Table 2.

TABLE 2.

QUEENSLAND CHEESE QUALITY.

Year.	Grades.		
	Choice and First.	Second.	Third.
1938-39	Per cent. 40.45	Per cent. 59.45	Per cent. ..
1939-40	41.01	(2nd and 3rd) 58.99	..
1940-41	63.36	(2nd and 3rd) 36.64	..
1941-42	73.15	(2nd and 3rd) 34.83	2.02
1942-43	73.17	26.32	0.51
1943-44	75.65	24.33	0.02
1944-45	72.6	26.39	1.01
1945-46	70.46	28.06	1.48

The above results may be regarded as a satisfactory sequel to a campaign for the rehabilitation of the cheese industry commenced in 1938, which involved the rebuilding and re-equipping of factories, intensive farm instruction, the further improvement of many factories during the cheese expansion drive in 1941-42, the systematic grading of cheese and improved technical services by the Department. Any further marked improvement can possibly be expected only if a system of compulsory grading of milk supplies is adopted. This forward move is supported by the industry, and voluntary milk grading schemes, by which differential prices are paid for qualified and unqualified milk, are operated by three Associations. Grading is carried out by the Methylene Blue Test.

Pasteurization of milk, which is most desirable for the manufacture of sound quality cheese, has increased notably in the past few years until at the present time only five small cheese factories are not equipped with a pasteurizer. The cheese produced in these factories is, with one exception, of unsatisfactory quality and the non-pasteurizing cheese factories contribute largely to the proportion of low grading cheese.

Although the manufacture of varieties of cheese, other than Cheddar, is of comparatively small quantity, nevertheless the manufacture and demand for these varieties is steadily increasing. In addition to Gruyere, Roman and Cottage Cheese, one factory has recently produced Gouda, a Dutch type cheese.

During the year whey separators were installed in three cheese factories for the recovery of butterfat from whey. Whey separation is proving economically sound and additional whey separators may be expected to be installed in larger factories.

The investigations on the manufacture of cheese from homogenized milk will continue during the year. Modifications in plant layout and treatment have simplified the technique. This product which does not exude fat at high temperatures is expected to prove very acceptable in warmer climates. The investigations were possible through the co-operation of the Queensland Butter Board and the South Burnett Co-operative Dairy Association, in whose Murgon factory the work was carried out and whose staff afforded every facility throughout the investigations.

RADIO TALKS TO FARMERS
(Australian Broadcasting Commission)

4QR AND REGIONAL STATIONS

THE COUNTRY HOUR—Daily from 12.15 to 1.15 p.m.

THE COUNTRYMAN'S SESSION—Every Sunday at 9 a.m.

YIELDS AND GRADES OF CHEESE IN ALL FACTORIES FOR TWELVE MONTHS ENDED 30TH JUNE, 1946.

Factory.	Milk. Received.	Production and Yield.					Gradings of Cheese.				
		Cheese, Green Weight.	Butterfat.	Cheese.	Yields.	Average Test.	Total Submitted.	Choice.	First.	Second.	Third.
				Per 100 Lb. Milk.	Per Lb. Butterfat.						
	Lb.	Lb.	Lb.	Per cent.	Per cent.	Per cent.	Lb.				
Aubigny	2,115,641	222,601	81,054	10.52	2.75	3.83	214,022	..	192,631	21,032	859
Biddeston	9,173,871	971,321	341,694	10.50	2.84	3.72	729,285	..	90.01%	9.83%	1.6%
Coulostoun Lakes	1,731,307	174,395	65,300	10.07	2.67	3.77	16,047	..	704.480	23.266	1,539
Daredale	2,530,962	250,046	94,465	9.88	2.65	3.73	246,805	..	96.6%	3.19%	0.21%
Downs, Boodua	2,950,015	298,704	112,802	10.13	2.65	3.82	245,283	..	..	7.536	8,511
Downs, Toowoomba	31,507,832	3,173,024	1,216,250	10.07	2.61	3.86	2,350,815	..	..	46.96%	53.04%
Dundarra	1,174,403	113,703	43,502	9.68	2.61	3.70	14,922	..	129.287	104.459	13,059
Felton	6,117,051	674,770	222,738	11.03	3.03	3.64	371,315	..	52.38%	42.32%	5.30%
Greenmount	3,047,898	369,563	129,306	12.13	2.86	4.24	195,973	..	102,850	139,426	3,007
Highgrove	2,631,611	271,628	101,379	10.32	2.68	3.85	217,212	..	41.93%	56.84%	1.23%
Irongate	5,315,143	582,344	206,755	10.96	2.82	3.89	511,068	..	865,697	1,366,788	118,330
Kelvinhaugh	2,311,708	247,308	90,311	10.70	2.74	3.91	292,914	..	36.83%	58.14%	5.02%
Kooroongarra	4,989,515	522,445	184,192	10.47	2.84	3.69	508,386	..	..	14.922	..
Lilyvale	3,326,026	362,024	129,512	10.88	2.80	3.89	354,560	..	..	100.0%	..
Maclagan— Maclagan	10,145,002	1,051,704	385,755	10.37	2.73	3.80	706,152	..	328,464	42,851	..
Kulpi	8,088,720	827,037	306,895	10.22	2.69	3.79	833,026	..	88.46%	11.54%	..
Malling	6,739,751	683,319	256,326	10.14	2.67	3.80	..	..	25,095	170,878	..
Maryborough— Tansey	5,198,071	537,057	216,763	10.33	2.48	4.17	273,454	..	12.81%	87.19%	..
Wondai	1,145,203	104,497	44,694	9.12	2.34	3.90	48,396	..	1,890	191,014	24,308
Maxam, Cooranga North	6,683,158	742,168	272,439	10.84	2.66	4.08	687,176	..	0.87%	87.94%	11.19%
Moola	5,446,624	554,491	197,748	10.18	2.80	3.63	271,922	..	2,101	471,409	36,118
Mount Sibley	3,429,434	374,601	131,309	10.92	2.85	3.83	346,658	..	0.41%	92.24%	7.07%
Mount Tyson	7,780,012	820,402	294,971	10.54	2.78	3.79	440,161	..	..	242,049	49,299
								..	82.63%	16.83%	0.54%
								..	6.840	380,409	120,492
								..	1.35%	74.83%	23.70%
								..	..	280,812	73,748
								..	..	79.20%	20.80%
								..	..	539,288	165,969
								..	..	75.10%	23.50%
								..	2,720	437,400	384,519
								..	0.33%	52.51%	46.16%
							
								..	..	243,996	29,458
								..	..	80.23%	10.77%
								..	..	48,386	..
								..	..	100.00%	..
								..	..	631,820	73,347
								..	..	89.33%	10.67%
								..	..	210,673	60,470
								..	..	77.48%	22.24%
								..	..	344,474	2,184
								..	..	99.37%	0.63%
								..	12,100	390,651	35,965
								..	2.75%	88.75%	8.17%
								..	..	..	1,445
								..	..	..	0.33%

Pittsworth— Pittsworth	9,691,280	1,022,154	387,236	10.55	2.64	4.00	704,941	105,105 14.91%	575,454 81.63%	24,382 3.46%	..
Brookstead	3,130,894	330,925	121,031	10.57	2.72	3.88	324,932	..	232,790 71.64%	90,705 27.92%	1,437 0.44%
Linthorpe	4,975,044	515,295	193,861	10.23	2.03	3.90	398,259	..	199,028 49.97%	194,020 48.87%	4,611 1.16%
Scrubby Mountain ..	3,650,781	371,283	140,837	10.17	2.64	3.86	351,990	..	83,691 23.78%	254,597 72.33%	13,720 3.89%
Springside	3,900,870	409,907	149,416	10.27	2.74	3.74	348,235	116,451 33.44%	230,821 66.28%	963 0.28%	..
Yarranlea	5,730,306	584,432	216,404	10.20	2.70	3.70	317,547	588 0.19%	315,682	..	1,277 0.40%
Port Curtis— Bracewell	3,909,647	382,553	144,646	9.78	2.64	3.70	242,495	..	197,430 81.42%	43,225 17.83%	1,840 0.75%
Theodore	2,694,703	282,599	104,084	10.49	2.72	3.86	..	..	..	..	..
Kraft, Quinalow	9,254,893	925,272	344,009	10.00	2.69	3.72	807,504	..	619,546 76.72%	185,638 22.99%	2,320 0.29%
Ramsay	2,779,636	288,240	108,116	10.37	2.67	3.89	266,846	..	215,886 80.90%	50,960 19.10%	..
Rockview	2,829,866	294,255	110,921	10.40	2.65	3.92	278,786	1,607 0.58%	257,850 92.49%	19,329 6.93%	..
Rocky Creek	3,663,615	385,942	136,437	10.53	2.83	3.72	346,236	5,436 1.57%	283,422 81.86%	55,783 16.11%	1,595 0.46%
Rosemount	4,230,189	467,564	179,897	11.05	2.60	4.25	235,314	..	154,781 65.78%	76,434 32.48%	4,099 1.74%
Southbrook	9,453,725	982,790	357,721	10.40	2.75	3.78	691,948	1,120 0.16%	641,974 92.78%	48,854 7.06%	..
South Burnett— Goomeri	5,931,683	617,631	236,064	10.41	2.62	3.98	528,487	..	382,368 72.35%	144,359 27.32%	1,760 0.33%
Murgon	6,290,484	623,213	238,503	9.91	2.61	3.70	317,773	..	234,792 73.89%	82,981 26.11%	..
Sugarloaf	2,082,833	243,673	94,401	11.70	2.58	4.53	153,780	..	130,938 85.15%	22,514 14.64%	328 0.21%
Sunnyvale	2,765,688	281,907	108,063	10.19	2.61	3.91	174,680	..	6,551 3.75%	147,483 84.43%	20,646 11.82%
Warwick— Greymare	2,817,204	277,640	118,208	9.86	2.35	4.20	124,497	..	100,099 80.40%	24,398 19.60%	..
Talgai	1,659,535	176,489	66,416	10.63	2.66	4.00	57,927	..	8,309 14.34%	38,775 66.94%	10,843 18.72%
Victoria Hill	959,360	102,930	35,116	10.73	2.93	3.66	35,389	..	1,919 5.42%	33,158 93.70%	312 0.88%
Mill Hill	25,360,397	2,323,540	865,608	9.16	2.68	3.41	637,939	..	579,906 90.90%	58,033 9.10%	..
Woodleigh	2,484,597	243,518	93,230	9.80	2.61	3.75	285,944	..	92,745 32.43%	185,833 64.99%	7,361 2.58%
Yamsion	3,708,299	425,317	150,179	11.47	2.83	4.05	399,183	..	209,218 52.41%	185,403 46.45%	4,562 1.14%
Yargullen	4,321,884	459,805	167,644	10.64	2.74	2.88	344,800	..	305,222 88.52%	39,114 11.34%	464 0.14%
Queensland Agricultural High School and College, Lawes	16,216	1,755	693	10.82	2.53	4.27	..	..	..	..	..
Totals	261,962,587	26,931,781	9,995,501	10.42	2.69	3.87	18,250,974	254,068 1.39%	12,605,192 69.07%	5,121,269 28.06%	270,445 1.48%

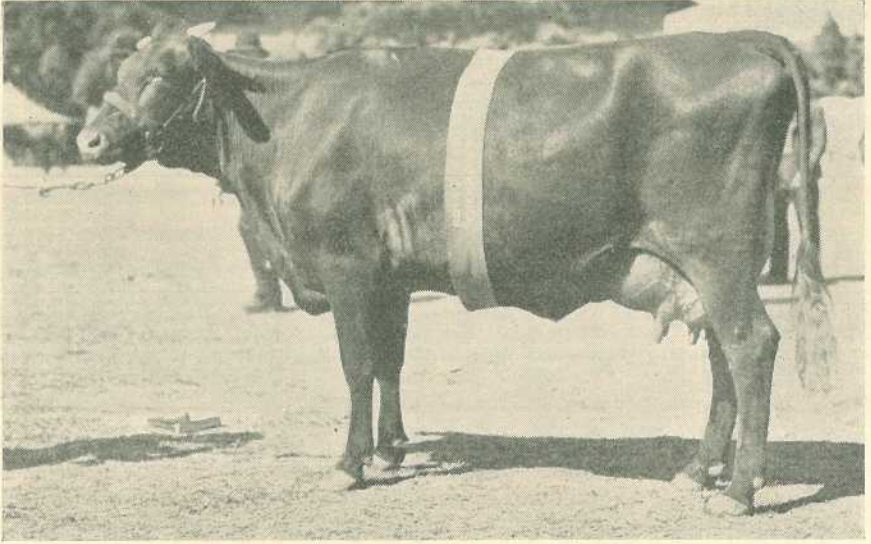
BEEF AND DAIRY CATTLE CHAMPIONS.**R.N.A. SHOW, BRISBANE, 1946.**

Plate 87.

CHAMPION BUTTER-FAT COW.—“Fairvale Laurel II.” Mr. W. C. Henschell.

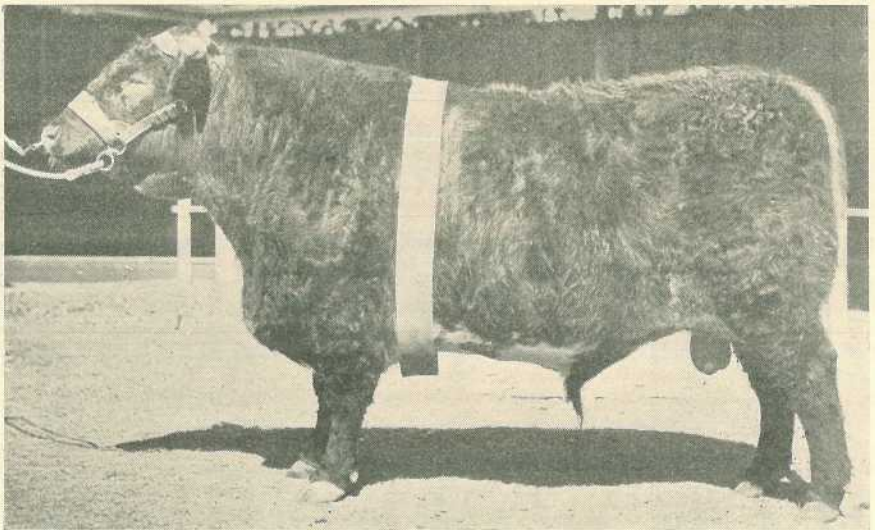


Plate 88.

CHAMPION BEEF SHORTHORN BULL.—“Woomargama Jarnac.” C. P. Fairbairn & Co.

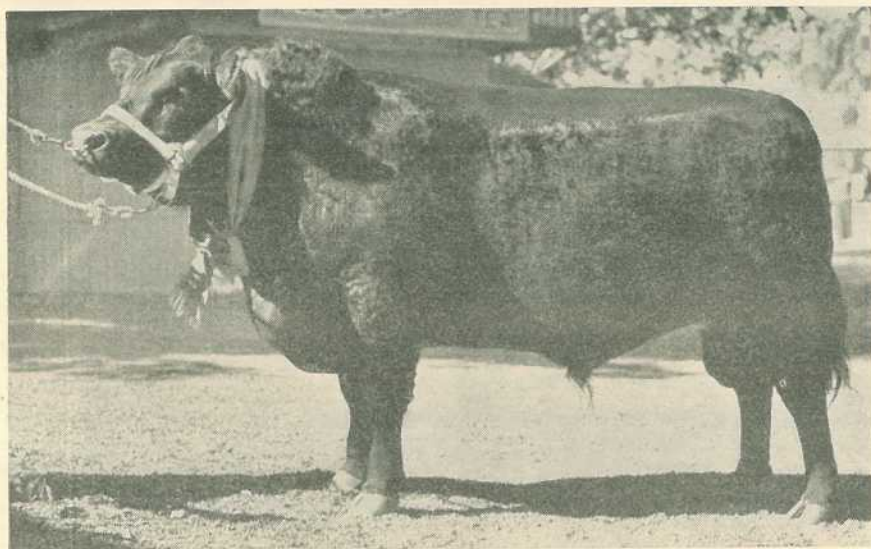


Plate 89.

CHAMPION ABERDEEN ANGUS BULL.—“Booroomooka Ossian.” Mr. H. G. Munro.

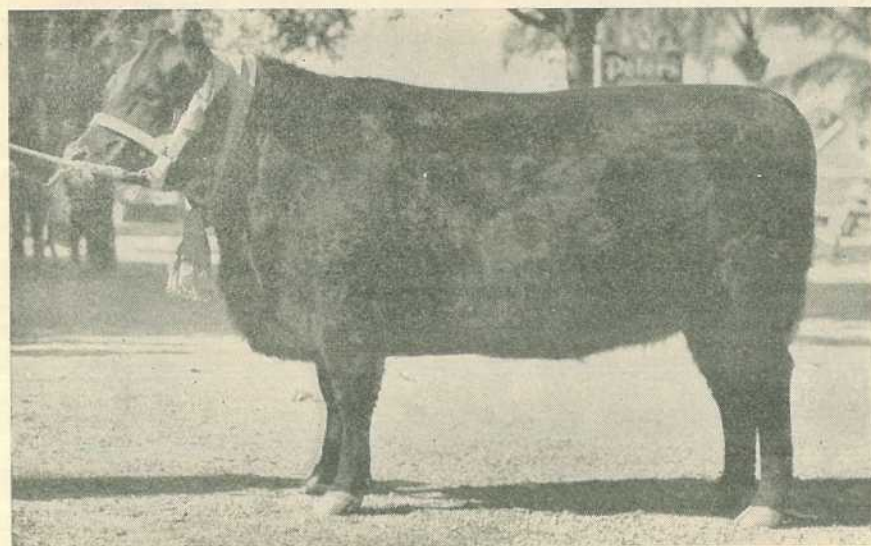


Plate 90.

CHAMPION ABERDEEN ANGUS COW.—“Booroomooka Noon.” Mr. H. G. Munro.

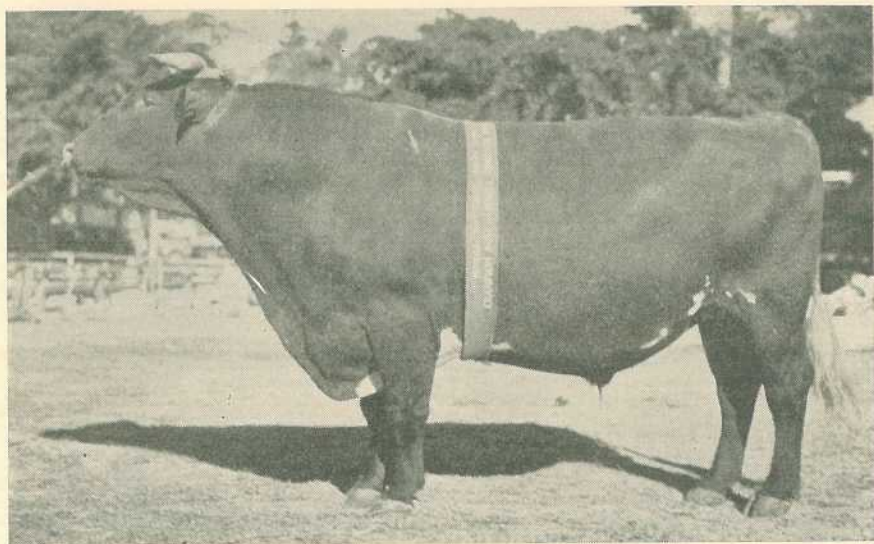


Plate 91.

CHAMPION AUSTRALIAN ILLAWARRA SHORTHORN BULL.—“Sunny View Premium.”
Mr. R. R. Radel.

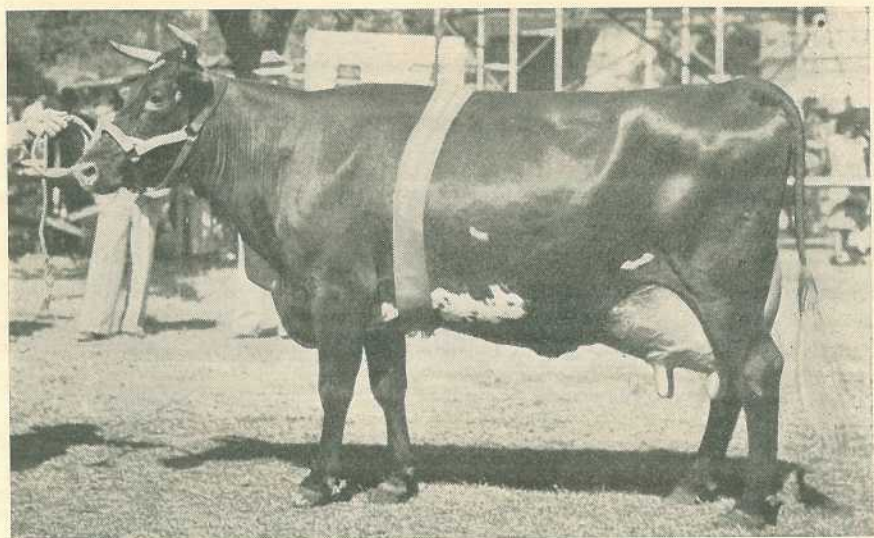


Plate 92.

CHAMPION AUSTRALIAN ILLAWARRA SHORTHORN COW.—“Blacklands Miss Jean XVI.”
Messrs. J. C. Meier & Sons.

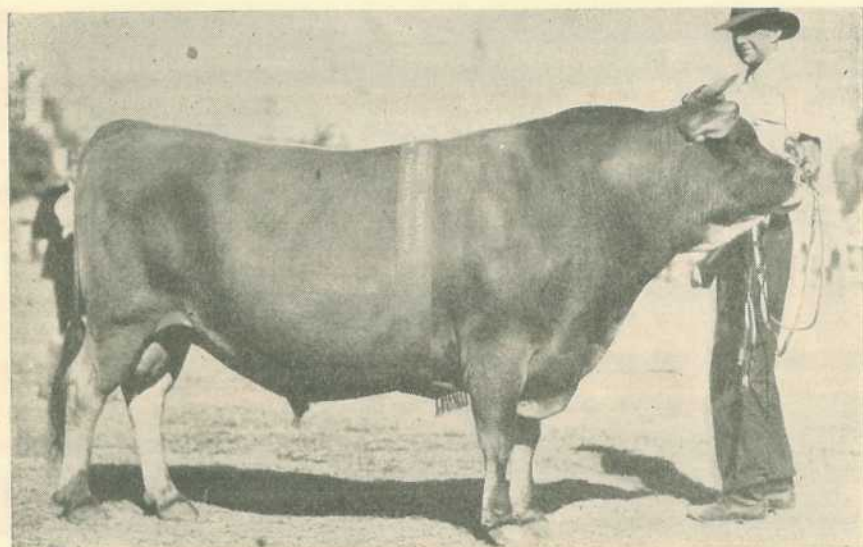


Plate 93.

CHAMPION JERSEY BULL.—“Navua Designing Star.” Messrs. W. J. and M. Dunning.

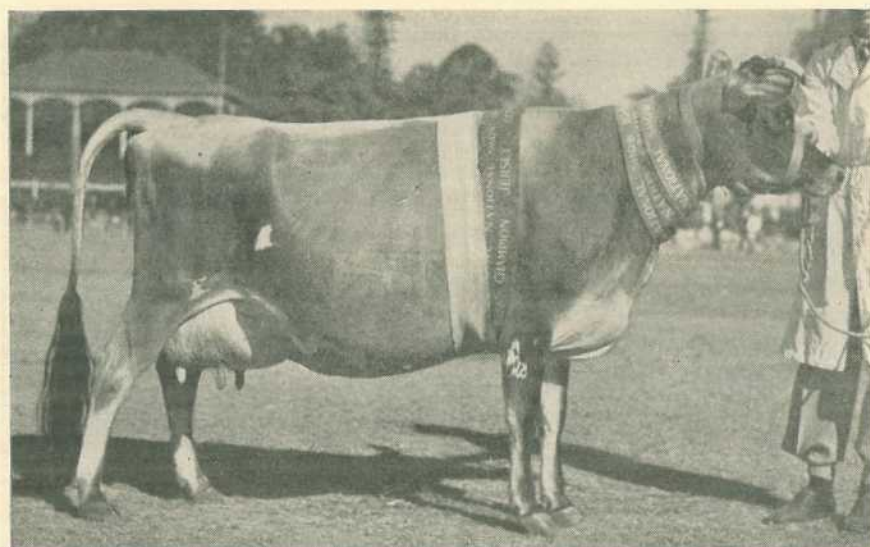


Plate 94.

CHAMPION JERSEY COW.—“Oxford Carolyn.” Messrs. E. Burton & Son.

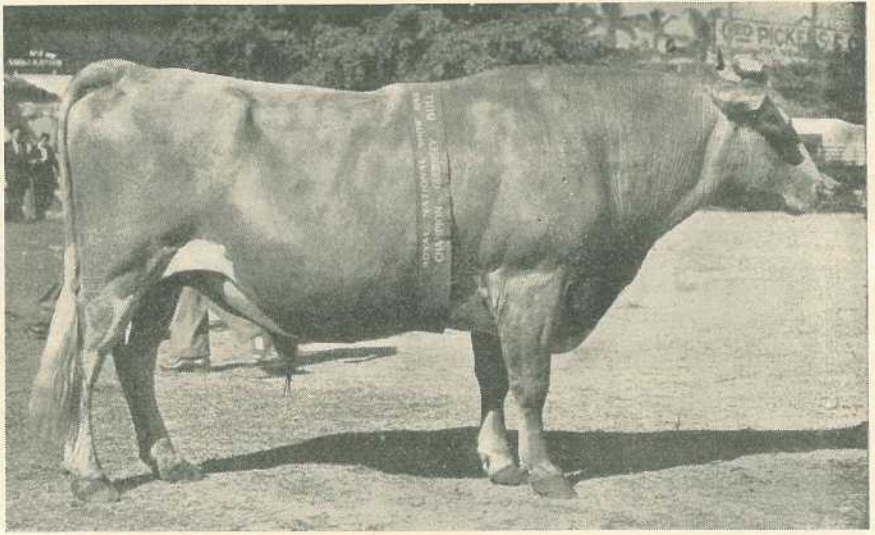


Plate 95.

CHAMPION GUERNSEY BULL.—“Wollongbar Rosipheles Laddie.” Mr. J. T. Collett.

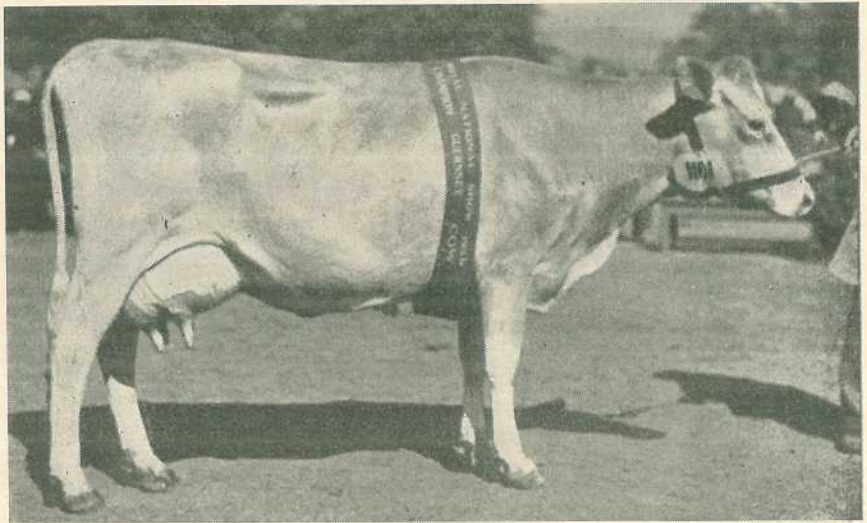


Plate 96.

CHAMPION GUERNSEY COW.—“Laureldale Duchess.” Mr. W. Cook.

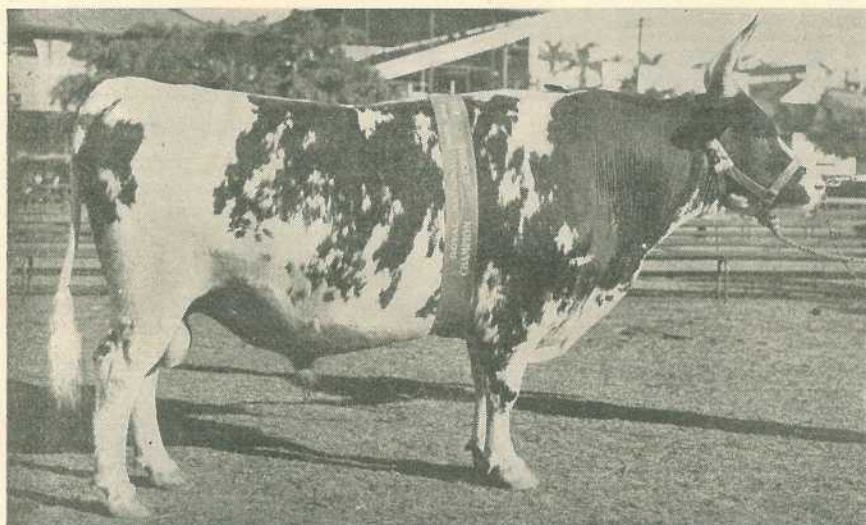


Plate 97.

CHAMPION AYRSHIRE BULL.—“Myola Perfection.” Mr. J. P. Ruhle.

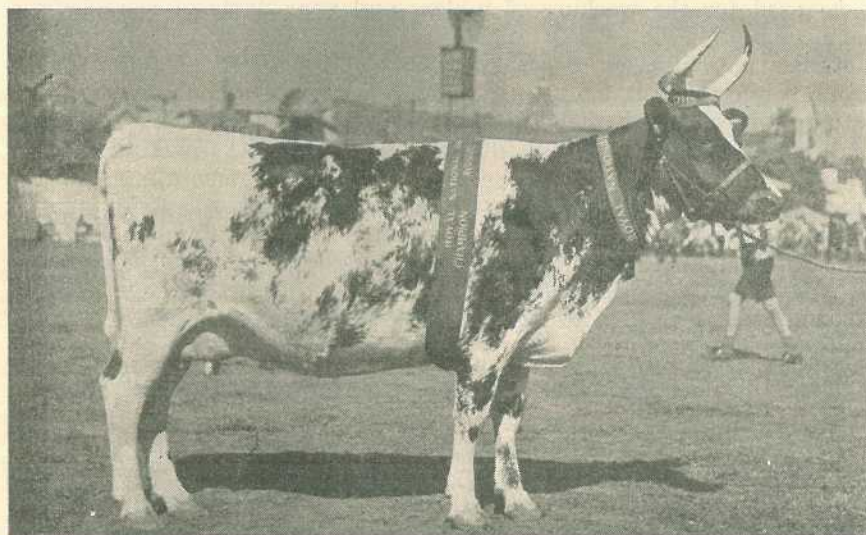


Plate 98.

CHAMPION AYRSHIRE COW.—“Myola Marion.” Mr. J. P. Ruhle.

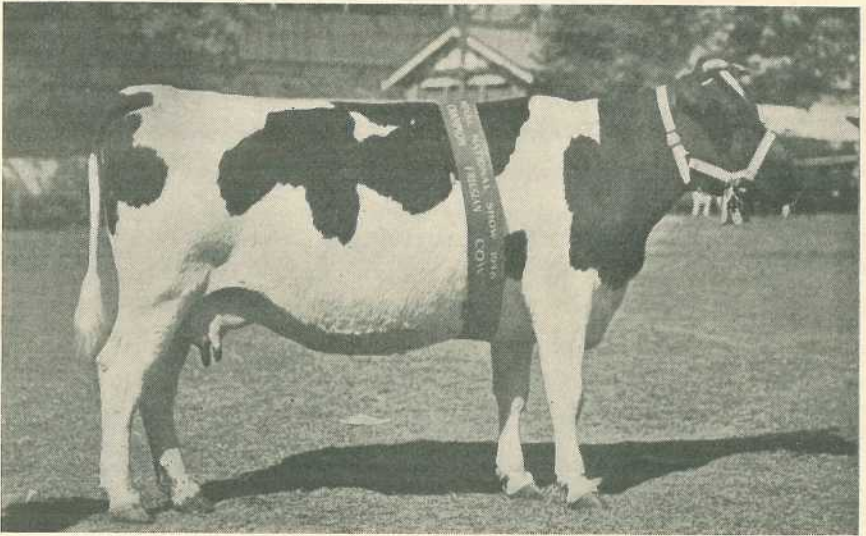


Plate 99.

CHAMPION FRIESIAN COW.—“Glendalough Clydella V.” Hickey & Sons, Pty., Ltd.

MILKING SHED HYGIENE.

It is a requirement under the Dairy Regulations for water and cloths to be used for the washing of udders and near parts of cows before commencing to milk. This, if done carefully, is a definite aid in reducing bacterial contamination from dust, hairs and manure particles which may fall into the milk bucket. It is, however, sometimes observed in the course of farm instructional visits that a tin of water is left standing after use in the bails to be used again during the next milking period. The soiled wash-cloths, too, are sometimes allowed to remain in the dirty water from one milking period to another. Such practices carry their own condemnation, for they not only nullify the advantage of washing udders, but add greatly to the bacterial contamination which their use, in the first place, was designed to avoid. So it would be better to neglect washing altogether than to use dirty water and dirty cloths.

After each milking period at least, clean cloths and water should be used. In fact the water should be changed as often as it becomes dirty during milking time. The cloths should be rinsed and wrung out, and changed, too, if they have become soiled; they should be boiled after each milking and hung to dry in a place protected from cowyard dust, yet in the sterilizing rays of the sun. A few Condy's crystals or a little of a chlorine compound added to udder wash waters would be an advantage.

—E. B. RICE.

Export Baconer Pigs.

BRISBANE ROYAL NATIONAL SHOW, 1946.

F. BOSTOCK, Officer in Charge, Pig Branch.

AFTER a lapse of four years, because of the war, the policy of offering inducement to pig raisers to produce a first class export baconer pig was again instituted by the Royal National Agricultural and Industrial Society of Queensland at its 1946 Exhibition, by providing a class for these pigs, conditions being similar to those of former years. Prize money of £40 was provided for this class, of which £25 was presented by the Department of Agriculture and Stock. An additional prize of a half-ton of Meggitts oil meal was presented by Messrs. Meggitts Ltd. for the exhibitor of the pen of pigs awarded the highest aggregate of points in the two judgings, i.e., alive and as carcasses.

Each entry consisted of three baconer pigs either pure bred or sired by a pure bred boar, and each pig between 180 and 200 lb. live weight. Seven entries were submitted for judging alive at the Show Grounds on 10th August and the judge, Mr. C. Shelton, used a score card which provided 45 points for condition, 45 points for uniformity of type and 10 points for general appearance.

The pigs were slaughtered at the Brisbane Abattoir on 12th August and after being chilled were judged by the writer, judging being based on the system of carcass judging evolved in England.

A feature of the competition was that the live judging corresponded closely to the carcass awards in respect to the first three placings—first in the live judging was also first in carcass award; second and third places when judged alive were third and second when judged as carcasses, but only half a point separated these entries.

The pigs when judged alive were of particularly good quality, no pen scoring below 90 points, while only two points separated the first and third pen.

In the carcass appraisal, eye muscle development was good in the majority of cases and averaged 59 per cent., while the first prize exhibit scored 89 per cent. There were no obviously overfat pigs, the average score being 83 per cent., with the lowest 70 per cent. and the highest 100 per cent. Body length was very fair, but improvement in this point is indicated as desirable; the average was 57, with a top score of 70 per cent. Leg length also needs attention. One pig did not score and one obtained only 20 per cent. in this section, both being too long in the leg, indicating excessive bone throughout the body. However, one exhibit scored 100 per cent., while the average was 60 per cent.

The marks awarded in each section both in live and in carcass appraisal are given in detail in the accompanying table, thus affording a good means of comparison of each feature.

Illustrations of one side with the section of the opposite side at the last rib afford another means of comparison and provide information of value to interested farmers.

DETAILED RESULTS OF "SPECIAL EXPORT BACONER PIGS" COMPETITION, ROYAL NATIONAL SHOW, 1946.
MIDDLE WEIGHT PIG APPRAISAL AT THE BRISBANE ABATTOIR.

Weight Range 180-220 Lb.	Points for Live Pig.							Carcass Appraisal.*											Grand Total.	Award Aggregate.		
	No. of Entry.	Live Weight.	Dressed Weight.	Per cent Loss in Dressing.	Condition.	Uniformity and Type.	General Appearance.	Total.	Skin.	Fat.	Hams.	Shoulders.	Streak.	Total.	Eye Muscle.	Back Fat.	Body Length.	Leg Length.			Total.	Total Appraisal Points.
..	..	..	..	45	45	10	100	5	10	8	7	12	42	28	20	20	5	73	115	215	..	
409	220	..	80.1	44	44	9	97	5	9	7½	6½	9	37	52 mm. 25	28 mm. 14	840 mm. 13	585 mm. 5	57	94	191	First	
6	..	179	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
405A	202	..	77.2	44	43	8	95	5	9½	7	6½	10	38	45 mm. 19	19 mm. 18	800 mm. 13	575 mm. 4	54	92	187	Second	
7	..	156	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
406	201	..	78.6	44	44	8	96	5	10	7	6½	9	37½	43 mm. 17	21 mm. 20	795 mm. 12	580 mm. 4	53	90½	186½	Third	
2	..	158	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
407	222	..	69.8	42	41	7	90	5	9½	7½	6½	9	37½	46 mm. 20	23 mm. 18	805 mm. 14	620 mm. ..	52	89½	179½	Fourth (Head off)	
3	..	155	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
411	199	..	78.4	42	41	7	90	5	9½	7½	7	8½	37½	40 mm. 14	22 mm. 19	800 mm. 13	580 mm. 4	50	87½	177½	Fifth	
0	..	156	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
408	198	..	74.7	42	42	8	92	5	9½	7	7	9	37½	39 mm. 13	25 mm. 14	780 mm. 13	595 mm. 1	41	78½	170½	Sixth	
4	..	148	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
414	204	..	77.0	43	41	7	91	5	9½	6½	7	9	37½	37 mm. 9	26 mm. 14	765 mm. 6	500 mm. 3	32	69½	160½	Seventh	
8	..	157	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

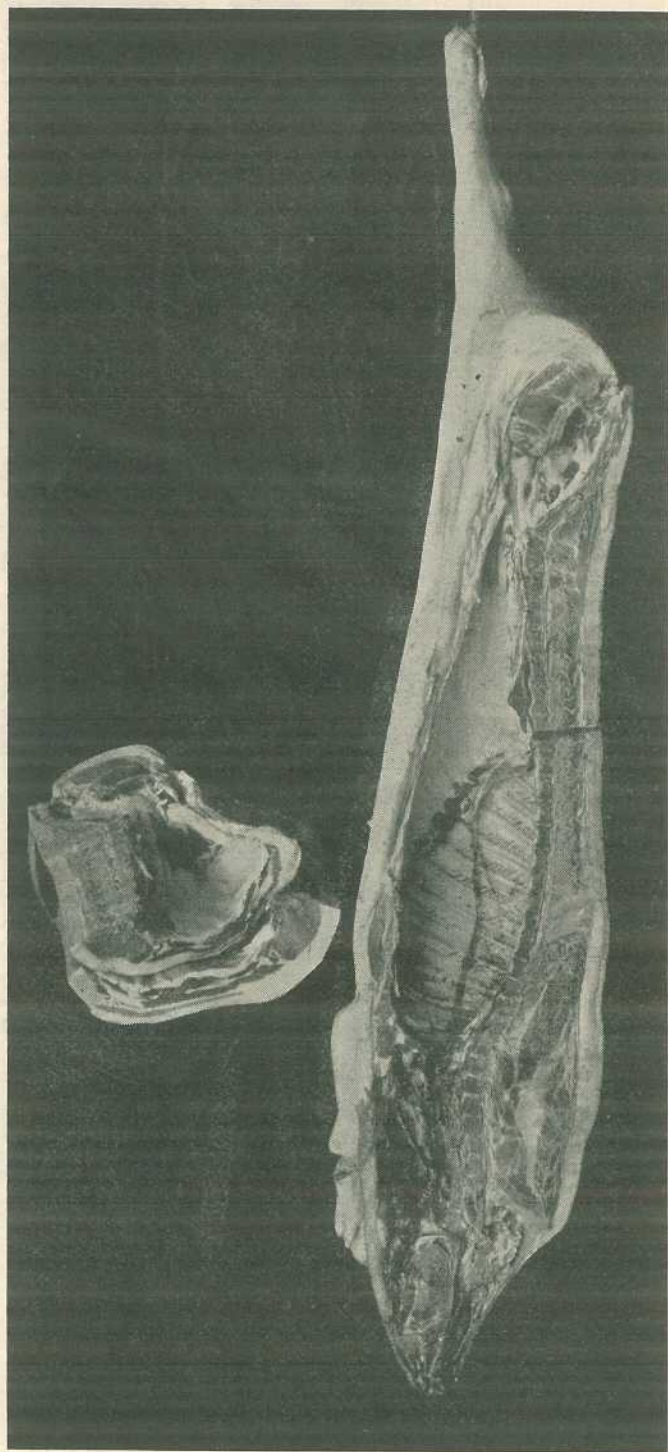
* Measurements are given in millimetres. 1 inch = 25 millimetres.



Plate 100.

FIRST PRIZE.—Large White × Berkshire.

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Plate 101.
SECOND PRIZE.—Large White × Berkshire.

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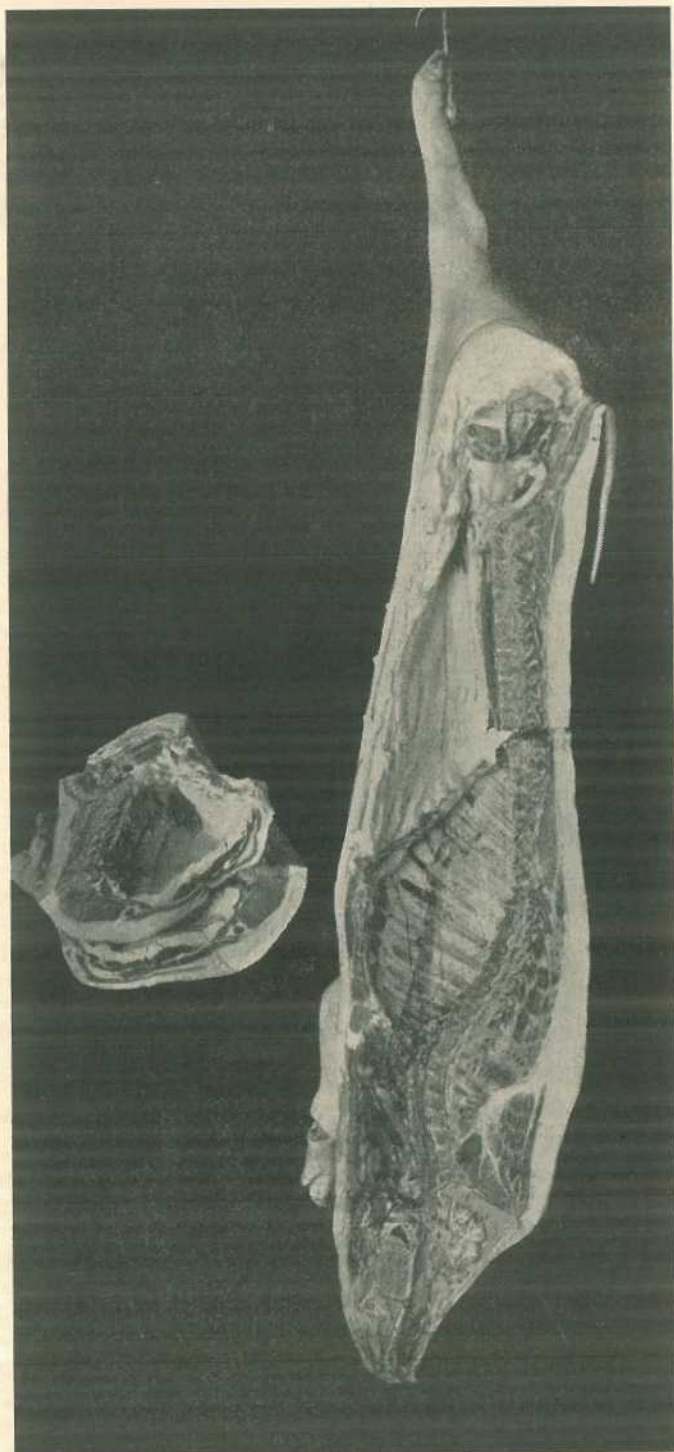


Plate 102.

THIRD PRIZE.—Large White × Large White.

MARKETING

Co-operative Marketing in Queensland.

H. S. HUNTER, Director of Marketing.*

SINCE the Co-operative principle was initiated in England by the Rochdale pioneers just over a hundred years ago, the tremendous and romantic growth of co-operation throughout the world has been associated for the most part with consumers' buying co-operatives and manufacturing co-operatives. Co-operatives have rendered good service to producers in providing them with the facilities essential for production, including finance; and variants of the principle have been adopted with great success in providing co-operative or mutual assurance and insurance. But co-incident with successful development in these various fields of activity, there have been but partial successes and many failures in co-operative projects established for the selling of commodities. Failures of co-operative selling or marketing organisations have been most numerous where there have been many producers and therefore many sellers of the commodity concerned, such as in agriculture. The prime reason for the failure, or at best the partial success, of a producers' selling co-operative is that a very small proportion of the commodity concerned sold independently of the co-operative's operations is capable of affecting the whole market for that commodity and of depressing its market price to a degree, through competitive selling, which would place the co-operative always in a disadvantageous position. Except where the commodity concerned is in chronic short supply, or where the co-operative has a monopolistic control of some essential marketing facility such as storage, transport or processing, the co-operative, unless it defeats its own objective by competitive price cutting, is left with its goods still on its hands while the independent seller reaps the advantage of market stability to the cost of which he has not contributed. The buying co-operative and the manufacturing co-operative are not confronted with this disability merely because they do not command the whole field of their particular activity.

A means was provided by the Queensland Government after the world war of 1914-18 to make selling co-operatives for agricultural products operate effectively. This paper, under the title of "Co-operative Marketing in Queensland," will deal in a brief way with developments in this State with the co-operative, or as it is better known and perhaps more accurately described, the organised marketing of agricultural products.

What has become known as the "Queensland plan" for the marketing of agricultural products represented a revolutionary departure from orthodox agricultural co-operation in that a principle was introduced

* A paper read at the annual conference of the Co-operative Union of Queensland, Brisbane, 8th August, 1946.

by means of which the producers comprising a small dissenting minority were compelled to conform to the decision of the industry as represented by the votes of a majority of not fewer than 66 $\frac{2}{3}$ per cent. of the voters. In later years, this was reduced to a 60 per cent. affirmative vote, but, to guard against the possibility that through apathy on the part of growers a marketing scheme may come into being with the support of only a minority, it was provided additionally that at least 50 per cent. of those entitled to vote would have to exercise that privilege before the decision would be accepted as an affirmative decision.

It is to be noted that this element of compulsion is applicable for the specified duration of the scheme to all in the industry, i.e., to the voters who comprised the affirmative majority as well as to the negative minority. Primary producers' voluntary selling co-operatives, especially those which adopt the pooling principles, have failed as much from defections from their own ranks as from the operations of producers who have never been members of them.

State Pools.

Where a voluntary selling co-operative has to rely on seasonal contracts with its members, it is placed in an extremely precarious position. After the First World War, during which wheat was sold through the medium of State pools, the pools were continued as voluntary organisations in certain of the Australian States. Only in Western Australia was any success achieved. It was during that war that wheat growing first became an agricultural industry of prime importance in Western Australia, and consequently the post-war voluntary pool did not have to contend with competition from established wheat selling organisations and customs to the same degree as in the other wheat exporting States of the Commonwealth. In fact, the co-operative which managed the Western Australian pool was the sole agent for the receipt and handling of wheat during the four years of war. Furthermore, active local co-operative committees in the wheat growing areas have done much to ensure the pool's measure of success. Nevertheless, the percentage of the total marketable wheat received by the Western Australian voluntary pool gradually declined from 96 per cent. in the 1921-22 season to 28 per cent. in 1938-39.

In New South Wales the pool received 58 per cent. of the marketable wheat in 1921-22, but by 1927-28 its share of the crop had fallen to 5 per cent., and in the two succeeding seasons no pool was conducted. There was a partial recovery in 1930-31 when, with wheat a drug on the market, the pool handled 26 per cent. of the grain. The improvement was not maintained, for by 1933-34 the pool's proportion had again fallen to less than $\frac{1}{2}$ per cent.

The Victorian and South Australian voluntary wheat pools were able to show better records than New South Wales, but the percentages in different seasons fluctuated widely. For example, the Victorian pool's percentages included, 78, 60, 34, 50, 12, 55, 15, 3 and the South Australian pool received wheat representing percentages in different seasons of 36, 44, 12 $\frac{1}{2}$, 30, 60, 18.3, 1 $\frac{1}{2}$. In these two States the voluntary wheat pools, after some seasons of experience, were forced to adopt a system whereby a minimum percentage of the total crop in the State had to be contracted in advance to the pool or it did not operate.

Queensland, by contrast, enacted *The Wheat Pool Act of 1920*, whereby the State Wheat Board was constituted and a compulsory pool was established to take the place of the wartime wheat marketing system. That pool operated with great success and continued during the years between the two world wars. The principles contained in *The Wheat Pool Acts* were in 1923 enacted in another measure, *The Primary Products Pools Acts*, an enabling Act which provided the necessary machinery which growers of certain primary commodities could, by their own initiative and with the consent of the prescribed percentage of their fellow growers, use for the orderly marketing of their particular commodity.

This Act has since been brought up to date and merged into *The Primary Producers' Organisation and Marketing Acts, 1926 to 1941*. They have been availed of by a wide range of primary producers and marketing schemes have been inaugurated and boards established for the State's production of arrowroot, barley, broom millet, butter, cheese, cotton, honey, peanuts, canary seed and ginger, while regional boards have been set up for the marketing of maize and pigs in North Queensland; eggs in South Queensland; and plywood in North and South Queensland. Fruit and vegetables have been organised under *The Fruit Marketing Organisation Acts, 1923 to 1945*. These commodities are not pooled, as is the case with commodities subject to the operations of *The Primary Producers' Organisation and Marketing Acts* and *The Wheat Pool Acts*. The activities of the fruit and vegetable industry's executive body, the Committee of Direction of Fruit Marketing and its six Sectional Group Committees, are for the greater part of a voluntary nature. The C.O.D. (as it is commonly called) is clothed with statutory authority and the element of compulsion comes into operation only when, with the consent of a three-fifths majority of the growers concerned, a "direction" is issued in respect to the manner in which any particular kind of fruit or vegetable may be marketed.

Of all of the marketing schemes which have been inaugurated under the various Queensland marketing Acts, none has been voted out of existence by the growers at any of the periods when the question of the continuance of a scheme has been placed before them. The operations of the Canary Seed Board, which was inaugurated in January, 1925, came to an end because of the lack of grower support and was allowed to expire by effluxion of time on 30th June, 1943. All other schemes are still in operation.

Boards have Obligations.

While the marketing legislation confers powers upon marketing boards, they also impose upon them certain responsibilities and obligations. For example, a marketing board is obliged to accept from any growers any of the commodity of merchantable quality delivered to the board by the grower. The board is charged with the responsibility of selling that commodity on behalf of the owner, i.e., the grower, and of returning to the grower his proportionate share of the net proceeds of sales. All growers of the commodity concerned are obliged to deliver to the board all of the commodity grown by them (excepting such small quantities as may be required on the farm for seed and feed). Marketing boards are charged with the responsibility of, as far as practicable, providing the commodity for consumption in Queensland and for its supply during any period of shortage to those places within

Queensland wherein a shortage is experienced. They may make such arrangements as they deem necessary with regard to sales of the commodity for export or for consignment to other States. A marketing board is required to receive and consider any petition signed by not fewer than one hundred consumers of the commodity in respect of which it has been established. To fulfil their functions marketing boards have been given certain powers including the power to enforce delivery by the grower to the board of his commodity and to levy a charge upon that commodity to meet the board's administrative expenses including marketing costs.

Boards may purchase, hold and dispose of land and buildings. They may appoint and employ officers and servants; appoint and employ agents, and arrange for financial accommodation with banks or the Government. Marketing boards may sue and be sued in their official names. They may study markets and disseminate correct marketing information, and generally do all such things necessary to effect a sale of the commodity. Marketing boards are not authorized to utilize the commodity and engage in processing or manufacturing or in other way risk the growers' money—the proceeds of sales—except where processing may be essential to selling as with the Cotton Board's ginning of seed cotton and the subsequent extraction of by-products from the cotton seed.

Marketing boards may adopt different methods to effect the organized marketing of the commodity with which they are concerned. For example, some boards take physical possession of the commodity and employ the necessary staff to receive, store and distribute it to the market in an orderly manner over the full cycle of the season until a new crop is available, thus levelling out fluctuating price extremes to the advantage both of the producer and of the consumer. Other boards employ agents, usually established and experienced commercial houses, to do this on the board's behalf. In still other cases where the nature of the commodity indicates it, as with butter and cheese, the boards achieve the necessary market stability by acting merely as licensing and price regulating authorities.

Boards do not Represent the Crown

It is evident that many of these powers could be exercised only with the authority of Government, and such Government authority has been delegated by Parliament, by means of the marketing Acts, to the boards established under them. Responsibility to the people for the manner in which these delegated powers are used, however, is still a responsibility of the Government and therefore provision has been made in the Acts for the appointment to every board set up under them of a Government representative in the person of the Director of Marketing or his deputy. Thus the interests of the consumer are safeguarded. The Queensland Government, it might be recalled, retained its power between the two world wars to fix maximum prices by the machinery provided in *The Profiteering Prevention Act of 1920*. It should be added that there is no instance on record in the quarter of a century of experience since the marketing schemes were first inaugurated where a marketing board has had to be arbitrarily restrained in the matter of prices. Under Australian conditions, at all events, the measure of collective bargaining, which has been placed in the hands of the producers by the schemes set up under the marketing Acts, has merely tended to place the producers as sellers on somewhat equal terms with the buyers.

In the rare instances where boards have withheld the commodity from the market in an effort to obtain a higher price their own growers have suffered loss. Experience has shown also that contrary to fairly widely held belief, marketing boards, selling as they do to the wholesale trade, can exercise very little, if any, influence over retail prices; as in the absence of arbitrary and effective price control measures to limit retail selling margins, the natural economic law of supply and demand will determine retail prices, notwithstanding that a marketing board may reduce its selling price to wholesale distributors.

The Director of Marketing and, in his absence, his deputy may exercise a vote on such questions as are decided by a marketing board. He, as an appointed member, has the same status on the board as a member elected by the growers, with the additional power that he may, at his discretion, refrain from voting on any question. The Government thus retains the right to exercise one vote on every marketing board, but otherwise the boards are entirely producer-controlled. The growers through their elected representatives determine their own selling policy. Marketing boards established under Queensland marketing laws do not represent the Crown for any purpose whatsoever.

The Queensland Plan.

The Queensland plan of organised marketing of agricultural products is a compound of the co-operative principles of Robert Owen and Horace Plunkett; the American populists' scheme of the 1890's by which farmers were advanced 80 per cent. of the market value of their produce delivered for storage in central warehouses pending sale; and Queensland's particular contribution of an enforced adherence to a scheme of marketing by all producers of a given commodity when the adoption of such a scheme has been decided upon by a 60 per cent. majority of the producers.

Many countries where this principle has since been adopted in agricultural marketing schemes have given credit to Queensland for having given something new to the world, as South Australia once gave to the world the Torrens system of land titles and land conveyancing.

This new conception of organised marketing for agricultural products was not introduced with universal acclaim, but far from it. In addition to the natural opposition from proprietary interests about to be displaced, there also was a certain amount of opposition to the principle, of critical comment concerning it, from orthodox agricultural co-operative circles, particularly those in the United Kingdom. The orthodox, or voluntary, co-operator saw in the new concept a danger that a tendency may develop for reliance to be placed more and more upon the assistance of Government, to the neglect of the voluntary co-operator's ideal of self-help, and so result in a weakening of the fibre and spirit of true co-operation. The danger was seen also that the Queensland plan may eventually prove to be but a first step towards governmental control of marketing. Actually it may have been an alternative to it. The early critics in the United Kingdom may not have realized the urgent necessity which existed, particularly in countries exporting agricultural products, for the co-operative principle to work effectively in agricultural marketing. Even at that early date the extent to which agriculture had fallen out of adjustment with the general economy of

the country was being acutely felt in those countries which were predominantly producers of primary products. In countries with a protected economy, such as Australia, there was vital need to protect the level of domestic prices of agricultural products from the influence of what was happening overseas. The existence of the marketing schemes provided a foundation which enabled the producers themselves to so arrange that fluctuating overseas values and the costs of transport from Australia to overseas markets would effect only the produce to which such things had any true relation, i.e., the exportable surplus. In New Zealand, as the years went by, the same result was obtained for the dairying industry by the Government taking up all exportable surpluses of butter and cheese.

Voluntary and Compulsory Co-operation.

As the need for a correction of the lack of balance between the price levels for agricultural products and for other goods and services became more apparent, so the attitude of orthodox co-operators towards organized marketing with statutory powers yielded to modification.

The Year Book of Agricultural Co-operation had shown how an investigator, who had been deputed by the Horace Plunkett Foundation to examine and report on the development of agricultural co-operation throughout the British Empire in 1927-28, had had his co-operator conscience shocked by what he had found in Queensland. In later years, when there was a more universal acceptance of the inclusion of the principle of compulsion in co-operative marketing schemes to make them work effectively, the Horace Plunkett Foundation acknowledged that the marketing schemes are operated on the same principle of majority rule as that on which all of our democratic institutions and Parliament itself are based. The following is a quotation from the book *Co-operation and the New Agricultural Policy* published by the Horace Plunkett Foundation in 1935:—

“The marketing schemes have one strong claim on co-operative sympathy. They are democratic. This has been called in question on two grounds, the compulsory element and the absence of real control by members. There is little in either objection, seeing that compulsory citizenship is the almost unnoticed essential of political democracy, and that pattern of industrial democracy, the consumers’ co-operative movement, has admittedly a very small active electorate.”

Meanwhile, following upon the economic blast which struck all countries, and particularly their agricultural industries, with the onset of the great depression in the early thirties, the Queensland type of organised marketing or some variant of it, was adopted in many countries throughout the world. New South Wales and Victoria had already passed marketing Acts on the Queensland model. The British Parliament passed its first *Agricultural Marketing Act* in 1931 and marketing boards were set up for a number of commodities. This principle of compulsory co-operation was introduced into grower-controlled agricultural marketing schemes in South Africa and in parts of Canada. It influenced the New Deal legislation of the United States, and it was adopted, or adapted, in some degree in countries of Europe and of South America.

In Australia, marketing boards of the type here referred to have proved on the whole to be most successful, notwithstanding that their operations have been hampered by their inability to exercise control

over interstate trade, because of the provision in Section 92 of the Commonwealth of Australia Constitution that "Trade and commerce and intercourse between the States shall be absolutely free." This constitutional provision in its application to the marketing of agricultural products has caused much litigation, including the Peanut case and the James case, the latter being concluded in the Privy Council.

The type of grower-controlled collective marketing board which we have been discussing is often confused with war-time boards which were set up by the Commonwealth Government under the authority of *The National Security Act*. The latter boards were administered by appointees of the Government and very frequently all they could do was to make the best of a bad situation, as, for example, when the season's market for Australian apples was reduced overnight from 12,000,000 bushels to 6,000,000 bushels. These emergency boards could not do a normal job of marketing, but could only do what was possible to ease the blow to the industry caused by the dislocations of war. However, they also were known as marketing boards, and consequently there has been an unfortunate tendency in the public mind to associate all marketing boards with disorganised conditions.

Marketing Boards Need Co-operative Spirit.

The future of grower-controlled statutory marketing boards will depend to some extent on the wisdom with which they are administered. Not only must they establish the right to exist by being more efficient than other marketing systems, but they must retain and inculcate through the ranks of their growers the spirit of co-operation. Their delegated governmental powers must be used with a due sense of responsibility and those who direct their activities must resist any tendency for the boards to degenerate from the business directorates, which they should be, to mere pressure groups. Efficiency of management is an essential, but dictatorship in management a danger, particularly in view of the boards' extensive statutory powers. The use of such powers should be subject to the democratic checks of an effective board of directors in full control of policy.

A discussion group on the sale of agricultural requirements, appointed by the Imperial Conference on Agricultural Co-operation held at Glasgow in July, 1938, reported as follows:—

"In ordinary business it is not easy to get qualified managers, but for a farmers' society it is twice as difficult, as the man must not only have a good commercial training and market experience, but he must also have faith in the co-operative ideal."

The discussion group suggested that:

"A register should be compiled and kept at some central 'clearing house,' so that when young people are introduced into the co-operative movement and trained up their names could be entered, and when societies required managers or additions to their staff they would thus be able to obtain suitable people from the register. Actually this would mean that the larger societies—with greater financial reserves—would be training managers for the smaller ones."

There may be food for thought in this suggestion for both voluntary and compulsory co-operatives in Queensland.

At the Glasgow conference referred to, one great co-operative champion, Professor A. W. Ashby of the University of Wales, crystallized his attitude towards the introduction of the element of compulsion into selling co-operatives, i.e., the United Kingdom agricultural marketing board, as follows:—

“The bedrock of co-operation is the element of voluntary association in mutual protection and endeavour and without it no co-operative system can function effectively or for very long. But it must be effective, and in most cases it is not effective without the aid of philanthropists or the State.”

We should be able, by education, to clothe the structure of agricultural marketing, which we have built up in Queensland through grower-controlled statutory marketing boards, with the spirit of co-operation as preached by the late Sir Horace Plunkett.

The formation of a Co-operative Union of Queensland and occasions such as that which we celebrate to-day should prove of great assistance in that task.

THE CARE OF EGGS ON THE FARM.

Eggs stored on the farm while awaiting despatch to market should be kept in a place free from mouldy or musty smells, which, while being sufficiently ventilated, should not be draughty. The temperature of the egg-storage room also is important, for eggs should be kept as cool as practicable. Where a cool room is not available, the best thing to do is to pack the previous day's eggs early in the morning. Eggs should not be exposed too much to the air; they should be covered over after packing and pending transport. Exposure to air leads to rapid evaporation, resulting in eggs often being rejected as stale.

A LONG-TERM LIVESTOCK POLICY.

Most dairy farmers will agree that it is better to have a high-level “lifetime” yield per cow and regular breeding performance, than to have short-period or isolated spectacular yields. That suggests the need of a long-term livestock policy so as to establish confidence and provide the facilities for raising herd standards, individually and nationally. Good houses and other farm buildings, skilled labour, extension of veterinary services, electricity, adequate water supply, modern equipment and an improved herd recording system would be covered by a well-balanced, long-range policy for the farming industry, which would enable all concerned to have confidence in its future development.

BROOM MILLET SEED FOR SALE.

To growers desirous of obtaining a pure and reliable strain of White Italian Broom Millet seed, the Department is offering a limited supply of seed raised from a specially selected strain.

Applications for seed, with accompanying remittance, should be addressed to—

**The Under Secretary,
Department of Agriculture and Stock,
BRISBANE.**

Postal address and name of railway station should be given.

Price.—The seed is being retailed at **6d. per lb.**, freight paid to purchaser's nearest railway station. Each applicant is limited to 10 lb.

GENERAL NOTES

Staff Changes and Appointments.

Mr. Fielding Chippendale, M.Sc.Agr., Adviser in Agriculture, has been appointed Analyst, Agricultural Chemical Laboratory, Department of Agriculture and Stock.

Mr. N. A. H. Smith, B.Sc. (Melbourne), has been appointed Soils Survey Officer, Agricultural Chemical Laboratory.

Mr. C. R. Mulhearn, B.V.Sc., Divisional Veterinary Officer, at present stationed at the Animal Health Station, Oonoonba, will take up duty at Kingaroy, and Messrs. L. G. Newton, B.V.Sc., and O. H. Brooks, B.V.Sc., Veterinary Officers, will be transferred from Atherton to Oonoonba and from Oonoonba to Atherton, respectively.

Mr. K. W. Brown, B.V.Sc., Assistant Veterinary Officer has been transferred from Brisbane to Southport.

Testing of Stock for Disease.

Regulations have been approved under the *Diseases in Stock Acts* which provide for the control of the testing of stock for disease. The regulations provide that no person except a veterinary surgeon registered under *The Veterinary Surgeons Act* of 1936 or a person authorized in writing under the hand of the Chief Inspector of Stock shall subject any stock to a test involving the use of tuberculin, antigen or other biological product. Any person who has subjected stock to a test involving the use of these agents shall within two days furnish a detailed report in writing to the Chief Inspector of Stock, Brisbane, on the results of such test. No person may vaccinate cattle with living abortion bacilli unless a permit is granted by the Chief Inspector of Stock. Similarly, a report on such vaccination, giving the name of the vaccine used, must be furnished within two days.

Burdekin River Trust.

Mr. A. M. Taylor, Stipendiary Magistrate, who has been transferred from Ayr to Bundaberg, has tendered his resignation as Chairman of the Burdekin River Trust. Executive approval has been given for the appointment of Mr. J. C. Mathison, Northern Divisional Engineer, Main Roads Commission, who is also Chairman of the Herbert River Trust, to be Government Representative and Chairman of the Burdekin River Trust, as from 1st July, 1946. This appointment is made pursuant to the provisions of *The Burdekin River Trust Act* of 1940.

Banana Board Levy.

An Order in Council has been issued under *The Banana Industry Protection Acts, 1929 to 1937*, providing for a levy on banana growers, to be used for the maintenance of the Banana Industry Protection Board. The levy is at the rate of 1½d. per case containing one and a-half bushels or less on all bananas marketed in the case, and 2d. in the £1 sterling or part thereof on the proceeds of sales of all bananas marketed in the bunch. The present assessment, which operates annually, came into operation on the 26th August, 1946.

Trans-Border Stock Passings.

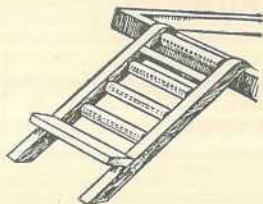
An Order in Council has been issued under the *Diseases in Stock Acts* appointing Beebo to be a crossing place for stock introduced into Queensland from New South Wales. In this connection, Mr. W. Mutch, New South Wales Assistant Inspector of Stock at Beebo, has been appointed also an inspector under the *Queensland Diseases in Stock Acts*.

GADGETS AND WRINKLES

LIFTING AND LOADING UNSEWN BAGS.

The following are some very practical suggestions. It is often necessary to load unsewn bags in transporting wheat to and from the paddocks and to lift bags of super into drills, etc., and the following home-made arrangements might prove useful to any who find this sort of work difficult; in fact, any one of them will minimise labour and thus help in the day's work.

A ONE-MAN LOADER FOR TRUCKS.



This is a one-man loader. It consists of two pieces of timber, with about four rollers and a platform about 3 inches wide, one foot from the lower end.

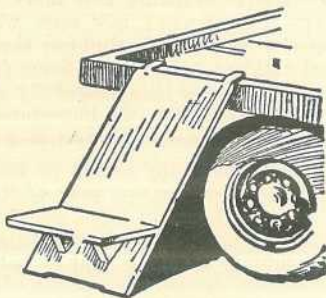
It is placed against the side of the truck, and, by using two bag hooks, the bag of wheat can be lifted on to the platform. The extra foot from the ground brings the top of the bag about level with the truck body.

ANOTHER SIMPLE TRUCK LOADING HELP.

Procure a piece of board, about 1 inch thick, and 12 to 14 inches wide, and long enough to reach the level of the truck body when placed at about a 20 to 25 degrees angle. Plane the face of the board very smooth and on top of the board fix two small iron brackets made to go over the side rail of the truck, with a small flange bent over the top to grip the side.

At about 8 to 12 inches from the bottom of the board attach a shelf. With the aid of two bag hooks, any ordinary man will have no difficulty in placing a bag of wheat on this shelf; and, as the board is smooth, it is surprising how easy it is to pull the bag up it when standing on the truck.

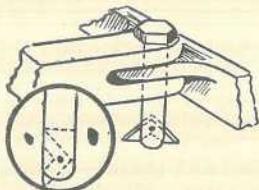
By pulling up to a well-built dump where the bags are, say, three wide, the bags are then always near the boards. By moving the boards along the body of the truck, as required, loading can be done quickly.



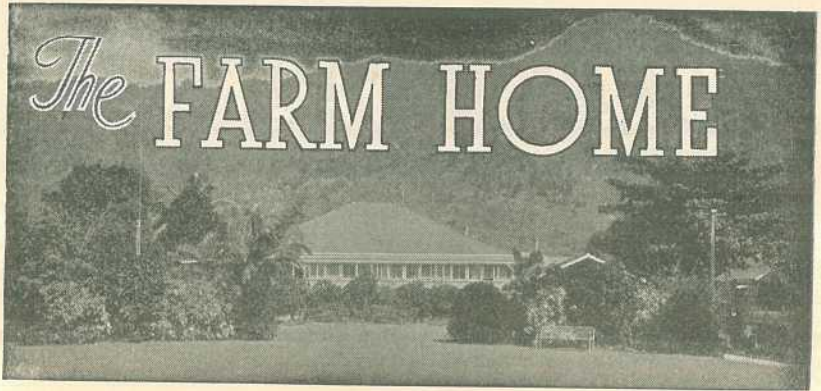
A NOVEL TRAILER HITCH PIN.

A very useful trailer hitch pin may be made with a steel bolt and a triangle key, as shown here. The bolt is slotted, and the triangle key held in place by a pin.

The shape of the triangle key causes it to hang in a horizontal position, with the ends projecting from either side of the pin to stop the bolt from bouncing out of the hitch. This saves a lot of time hooking up and unhooking.



The items on this page have been extracted from "Handy Farm and Home Devices and How to Make Them," a recent notable work by J. V. Bartlett, published in Adelaide on behalf of the War Blinded Association. This useful book will soon be on sale in Queensland.



Care of Mother and Child.

Under this heading an article supplied by the Maternal and Child Welfare Service of the Department of Health and Home Affairs, dealing with the welfare and care of mother and child, is published each month.

THE BABY'S SLEEP IS IMPORTANT.

CONSIDERING that all mothers and fathers know the value of sleep for themselves—realizing how much better they feel after a night of quiet unbroken sleep—it is amazing how some will deprive their babies and toddlers of this great necessity without the slightest thought. It is commonplace nowadays to see fretful, tired children being taken home from picture shows and other entertainments, when they should have been peacefully asleep in their cots for several hours. Many young mothers have learnt the importance of feeding baby correctly, but not many realize that sufficient sleep and rest in a quiet airy room is very important also.

The small baby should be trained to sleep at the same time every day and all night. *During the first year of life baby's brain grows to be two and a-half times as large as it was at birth, and his body three times as large.* While he is growing so fast he must have plenty of sleep because sleep aids growth. A baby who sleeps peacefully is usually a healthy baby.

Amount of sleep required.

1. A healthy new-born baby should sleep nearly all of his time except when he is feeding or being bathed.
2. During the second and third months he should sleep from eighteen to twenty hours.
3. From the sixth to the twelfth month he should sleep twelve hours at night with a two-hour nap in the morning and afternoon.
4. In the second year of life a child should sleep twelve hours at night, with at least one hour nap during the day.

The baby's position in bed should be such that he has plenty of room to stretch. Gently changing a young baby from one side to another once or twice during a long sleep helps him to sleep longer and get more rest. As he gets older he will, of course, turn over himself. The room should be well ventilated and shaded—if the baby sleeps on the veranda the cot should be shaded from glare. Sleeping in a perambulator, or in his mother's arms in the close atmosphere of a picture show or public hall, is neither healthy nor restful, and no parent with the baby's welfare at heart would subject a helpless child to these conditions.

Causes of Sleeplessness.

1. Wrong food.
2. Too much or too little food.
3. Feeding irregularly or too often.
4. Wet or soiled napkins.
5. Baby too warm or not warm enough.
6. Uncomfortable position.
7. Not enough fresh air.
8. Uncomfortable bed or bedding.
9. Illness.
10. Too much excitement before bedtime.
11. Bad training, such as—
 - (a) Petting baby whenever he wakes and cries;
 - (b) Giving food to stop baby crying.

If the baby sleeps badly the sister at the Welfare Centre will help to find out the cause and suggest a remedy. Do not give soothing syrups or powders to make a baby sleep. If these are necessary in cases of illness, the doctor will order them.

Remember that if a baby is to be well and have a stable nervous system he must have all the sleep he needs, and to obtain this he must be wisely trained and go to bed in an atmosphere of peace and love and security.

Any further information may be obtained by communicating personally with the *Maternal and Child Welfare Information Bureau*, 184 St. Paul's terrace, Brisbane, or by addressing letters *Baby Clinic, Brisbane*. These letters need not be stamped.

IN THE FARM KITCHEN.

Dishes for Dinner.

Lamb Terrapin.

Cut fat from left-over cold lamb and mince into dish. Measure 2 cups and put aside. Melt 2 level tablespoons butter or good dripping in saucepan, and 1 level tablespoon flour, 1 teaspoon dry mustard, a little salt and paprika. Cook a little, add 1 tablespoon Worcestershire sauce and 1½ cups stock or left-over gravy and cook 5 minutes. Add the diced meat and the sieved yolks of 2 hardboiled eggs; allow mixture to become piping hot, but do not boil. Lastly, add the chopped whites and serve on rounds of buttered toast. Sprinkle with finely chopped parsley mixed with a little shredded and fried bacon.

Baked Parsnips.

Serape or pare parsnips discarding centre core if it seems dry and tough. Cut into pieces of suitable serving size. Cook in rapidly boiling salted water or meat stock until thoroughly tender. Drain. Lift pieces carefully and place in a flat baking-serving dish. Add bits of butter unless there was sufficient fat in the cooking liquid, and dashes of white pepper. Sprinkle buttered crumbs over and between the pieces and bake in hot oven for 15 minutes. Serve while hot.

Steak and Kidney Pie.

Required: 1 lb. shoulder steak, 2 sheep kidneys, 1 tablespoon of flour, 1 minced onion, salt and pepper, stock or water. Cut the steak and kidneys into very small pieces. Mix the flour and seasoning. Dip the meat in flour. Pack a pie-dish loosely to a little above the level. Fill with water and cover with flaky pastry. Make a small opening and bake in a hot oven.

Bacon Rolls.

These are especially good if served very hot. Prepare some pastry with ½ lb. self-raising flour, 2 lb. cooked and mashed potatoes, 4 oz. of dripping. Salt and pepper to season, add sufficient water to bind to a nice consistency. Flour a pastry board and roll the mixture out thin and smoothly. Cut the pastry into strips, and upon each strip place a slice of bacon from which the rind and edge have been cut. Roll up the pastry and bacon, put on a well-greased pan, and bake for half an hour.

QUEENSLAND WEATHER FOR SEPTEMBER.

During an unsettled period between the 17th and 20th of the month a very opportune rain distribution was received over the South-East Divisions of the State. Over-average district totals were recorded as follows:—296 points, South Coast, Moreton; 370 Darling Downs East; 266 Darling Downs West; 125 Maranoa and 101 Warrego. Many stations in the southern half of the Downs and the Moreton district registered good soaking falls of 3 to 5 inches, which should ensure, for the time being, welcome recovery in farming and dairying prospects from the rainless conditions since the beginning of April. Approximate district averages of 1 inch in the Warrego and Maranoa were slightly above the normally dry figures for September. The clearing variable storm distribution on the 20th in the Port Curtis and adjacent Central Highlands also aggregated approximately the same amount but 18 per cent. below normal. Benefit in these districts would be mainly in the form of tank water, &c. Any freshening growth of pastures and crops would need to be consolidated by a series of early October storms totalling some inches before the parched conditions resulting from the protracted dry spell are alleviated. Abnormally dry weather was still maintained in the Central and Tropical Coast Divisions where, apart from isolated coastal showers, nil reports were received from many places. Over the Tropical and Central Interior as well as the Lower West it has been rainless since February. Practically all pasture land needs not only early storm benefit but a favourable monsoonal summer soaking to regain normal carrying capacity. Some stock losses followed in the rain benefited areas through cold and bogging. In the wheat areas rain was too late for normal cultivation and commercial grain yields, though a small percentage of dry sown areas would benefit for other purposes.

Pressure.—During the greater part of the month the continental high pressure belt continued its fine weather control as the main centres passed from west to east across inland Australia. Towards the third week the centres moved further southward allowing a shallower isobaric dip control in northern Australia. This formation became more pronounced by the 17th when a closed centre formed at the foot of the dip in south-west Queensland and north-west New South Wales, with fairly stable supporting high pressure areas to the south and along the eastern coastline of the Continent. Slow general south-east movement of the unsettled area with the first useful north-east to northerly warm air stream brought the good rains in south-east Queensland and northern New South Wales till the 20th. Fine weather controls then prevailed as far as Queensland was concerned, but low pressure activity continued round the south-east of the Continent with a marked southerly front on the 22nd and 23rd, bringing cold air throughout Queensland. Moderate to rather rough weather was experienced on the Sub-tropical Coast 20th and 21st, with squally north to north-west winds and rain.

Temperatures.—Average maximum temperatures fairly normal, from 0.5 degrees below at Thargomindah to 1.8 degrees above at Boulia. A few daily recordings over 100 degrees in the West 16th/18th. Boulia, 102 degrees (17th). Average minimum temperatures were slightly above normal in the south-west quarter, but in other districts from 4.0 degrees below at Mitchell to 5.1 degrees at Stanthorpe and Palmerville. Cold night conditions were accompanied by frosts in the south-east quarter, Mitchell 17 nights (29 degrees screen 21 degrees grass, 18th) and Stanthorpe 19 nights (22 degrees/15 degrees, 1st).

Brisbane.—Pressure 30.084 inches (normal 30.050 inches). *Temperatures.*—Mean maximum 74.5 degrees (normal 75.5 degrees), mean minimum 53.7 degrees (normal 54.8 degrees); mean temperature 64.1 degrees (normal 65.2 degrees). Highest daily 85.7 degrees (14th), lowest 43.9 degrees (1st), lowest since 13th September, 1939, when 43.9 degrees. *Rain.*—367 points on four days (average 196 on eight days), highest since 394 points, September, 1943 (360 points fell on three consecutive days). *Sunshine.*—26.79 hours (average 2,474 hours). Maximum wind gust, 46 miles per hour westerly on 22nd.

The rain position is summarised below—

Division.	Normal Mean.	Mean Sept. 1946.	Departure from Normal.	Aggregate 5 mths. Totals May, June, July, Aug., and Sept.	Average May, June, July, August, and September.
	Points.	Points.	Per cent.	Points.	Points.
Peninsula North	13	Nil	100 below	183	270
Peninsula South	24	Nil	100 "	11	150
Lower Carpentaria	17	Nil	100 "	3	136
Upper Carpentaria	36	Nil	100 "	1	244
North Coast Barron	92	6	93 "	403	825
North Coast Herbert	155	12	92 "	318	1,220
Central Coast East	108	7	93 "	75	658
Central Coast West	70	5	93 "	18	396
Central Highlands	102	49	52 "	77	588
Central Lowlands	65	2	97 "	17	399
Upper Western	29	1	97 "	2	204
Lower Western	44	3	93 "	3	269
South Coast Port Curtis	141	116	18 "	210	891
South Coast Moreton	206	296	44 above	437	1,248
Darling Downs East	167	370	122 "	458	818
Darling Downs West	104	266	156 "	295	635
Maranoa	118	125	6 "	139	651
Warrego	88	101	15 "	114	516
Far South-west	56	19	66 below	38	372

RAINFALL IN THE AGRICULTURAL DISTRICTS.

SEPTEMBER RAINFALL.

(Compiled from Telegraphic Reports.)

Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.		Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.	
	Sept.	No. of years' records.	Sept., 1945.	Sept., 1946.		Sept.	No. of years' records.	Sept., 1945.	Sept., 1946.
<i>North Coast.</i>					<i>South Coast—cont'd.</i>				
Atherton	In.		In.	In.	Gatton College	In.		In.	In.
Cairns	0.74	42	0.45	Nil	Gayndah	1.43	44	1.90	5.20
Cardwell	1.65	61	0.28	0.17	Gympie	1.47	72	3.08	2.23
Cooktown	1.47	71	0.61	Nil	Kilkivan	2.02	73	1.67	1.48
Herberton	0.56	67	Nil	0.01	Maryborough	1.61	62	1.31	0.96
Ingham	0.55	57	0.49	Nil	Nambour	1.84	72	3.14	0.76
Innisfail	1.51	51	0.66	0.52	Nanango	2.26	47	2.84	3.25
Mossman	3.52	62	2.32	0.11	Rockhampton	1.71	61	1.81	2.19
Townsville	1.93	19	0.46	0.24	Woodford	1.22	72	2.84	1.23
	0.70	72	0.09	0.01					
<i>Central Coast.</i>					<i>Darling Downs.</i>				
Ayr	1.21	56	0.21	Nil	Dalby	1.61	73	0.97	1.61
Bowen	0.77	72	0.98	Nil	Emu Vale	1.66	47	0.92	3.85
Charters Towers	0.75	61	Nil	0.10	Jimbour	1.52	64	1.72	1.64
Mackay	1.60	72	1.31	0.12	Miles	1.26	58	1.39	1.72
Proserpine	1.89	40	1.17	0.09	Stanthorpe	2.19	70	1.78	4.48
St. Lawrence	1.19	72	3.57	0.32	Toowoomba	2.01	71	1.34	3.65
					Warwick	1.75	78	0.93	4.49
<i>South Coast.</i>					<i>Maranoa.</i>				
Biggenden	1.38	44	3.15	1.13	Roma	1.32	69	0.07	0.84
Bundaberg	1.48	60	3.26	1.08	St. George	1.03	62	0.35	2.29
Brisbane Bureau	1.96	94	3.17	3.67					
Caboolture	1.76	67	2.23	3.96					
Childers	1.64	48	2.58	0.71					
Crohamhurst	2.49	50	1.43	3.22					
Eak	1.94	56	3.66	4.26					
					<i>Central Highlands.</i>				
					Clermont	0.95	72	0.27	0.01
					Springsure	1.22	74	0.44	0.23

CLIMATOLOGICAL TABLE FOR SEPTEMBER.

(Compiled from Telegraphic Reports.)

Divisions and Stations.	Atmospheric Pressure at Mean 9 a.m.	SHADE TEMPERATURE.		EXTREMES OF SHADE TEMPERATURE.				RAINFALL.	
		Mean Max.	Mean Min.	Max.	Date.	Min.	Date.	Total.	Wet Days.
<i>Coastal.</i>									
Cairns	In.	Deg.	Deg.	Deg.		Deg.		Pts.	
Herberton .. ..	..	82	64	86	21, 23	58	30	17	3
Townsville .. ..	..	77	52	86	26				
Rockhampton .. ..	..	81	62	91	21	55	7, 10, 2	Nil	1
Brisbane	30.10	82	54	91	14	42	1	123	1
	..	75	54	86	14	44	1	367	4
<i>Darling Downs.</i>									
Dalby .. ..	..	76	46	92	14	32	1	161	3
Stanthorpe .. ..	..	68	36	83	13	22	1	448	6
Toowoomba .. ..	..	71	44	86	14	33	1	365	5
<i>Mid-Interior.</i>									
Georgetown	30.02	91	59	99	15, 16	51	13	Nil	..
Longreach	30.12	87	55	100	16	44	8	Nil	..
Mitchell	30.12	79	41	91	13	29	8	31	2
<i>Western.</i>									
Burketown .. ..	..	88	61	95	30	56	11, 27	Nil	..
Boulia	30.03	88	56	102	17	45	9	Nil	..
Thargomindah	30.10	78	52	100	17	41	8	15	2

A. S. RICHARDS, Divisional Meteorologist.

Commonwealth of Australia,
 Meteorological Bureau, Brisbane.

ASTRONOMICAL DATA FOR QUEENSLAND.

NOVEMBER.

Supplied by the Astronomical Society of Queensland.

TIMES OF SUNRISE AND SUNSET.

At Brisbane.			MINUTES LATER THAN BRISBANE AT OTHER PLACES.					
Date.	Rise.	Set.	Place.	Rise.	Set.	Place.	Rise.	Set.
	a.m.	p.m.						
1	4.59	6.05	Cairns	46	11	Longreach	42	23
6	4.55	6.09	Charleville.. ..	29	25	Quilpie	33	37
11	4.52	6.12	Cloncurry	61	38	Rockhampton	17	3
16	4.50	6.16	Cunnamulla	28	31	Roma	18	15
21	4.48	6.20	Dirranbandi	17	21	Townsville.. ..	37	12
26	4.47	6.24	Emerald	26	13	Winton	49	31
30	4.46	6.27	Hughenden	46	24	Warwick	3	6

TIMES OF MOONRISE AND MOONSET.

At Brisbane.			MINUTES LATER THAN BRISBANE (SOUTHERN DISTRICTS).							
Date.	Rise.	Set.	Charleville 27; Cunnamulla 29; Dirranbandi 19; Quilpie 35; Roma 17; Warwick 4.							
			MINUTES LATER THAN BRISBANE (CENTRAL DISTRICTS).							
Date.	Rise.	Set.	Emerald.		Longreach.		Rockhampton.		Winton.	
			Rise.	Set.	Rise.	Set.	Rise.	Set.	Rise.	Set.
1	a.m.	a.m.								
2	10.04									
3	11.56	12.19								
	p.m.									
4	12.55	1.41	1	29	11	45	25	20	0	52
5	1.54	2.17	6	20	16	37	32	11	8	42
6	2.54	2.52	11	11	28	26	43	1	19	29
7	3.57	3.27	16	13	26	29	42	3	17	32
8	5.02	4.03	21	21	15	38	31	12	7	43
9	6.10	4.42	26	29	10	45	25	20	0	52
10	7.20	5.25	30	27	12	43	27	18	2	51
11	8.31	6.14								
12	9.39	7.09								
13	10.42	8.09								
14	11.37	9.14								
15		10.20								
	a.m.									
16	12.25	11.24								
	p.m.									
17	1.06	12.25	1	53	5	67	34	50	20	44
18	1.42	1.23	3	47	8	62	36	47	22	38
19	2.14	2.19	5	38	17	56	43	41	27	32
20	2.46	3.14	7	27	28	49	49	33	34	23
21	3.16	4.08	9	14	40	41	57	23	42	14
22	3.48	5.02	11	7	49	36	63	21	49	8
23	4.20	5.56	13	5	53	35	66	20	51	6
24	4.56	6.51	15	10	49	38	63	23	49	10
25	5.35	7.46	17	14	41	41	58	26	43	14
26	6.19	8.39	19	24	31	47	51	32	36	21
27	7.06	9.29	21	34	20	54	44	38	29	29
28	7.57	10.16	23	44	11	60	38	45	24	36
29	8.51	10.59	25	51	5	65	34	49	20	42
30	9.46	11.39	27	54	4	67	34	51	20	44
			30	49	10	63	38	48	23	40

Phases of the Moon.—First Quarter, November 2nd, 2.40 p.m.; Full Moon, November 9th, 5.10 p.m.; Last Quarter, November 16th, 8.35 a.m.; New Moon, November 24th, 3.24 a.m.

On November 15th the sun will rise and set 20 degrees south of due east and true west respectively, and on November 7th and 20th the moon will rise and set approximately true east and true west respectively.

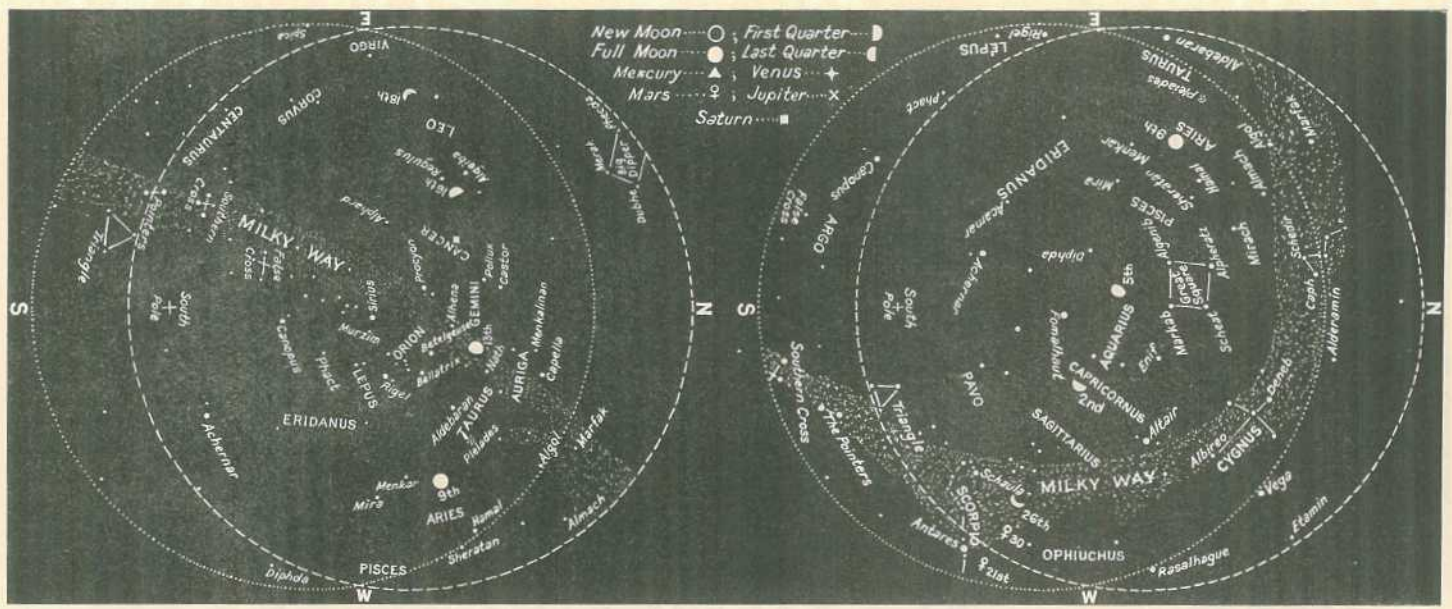
Mercury.—At the beginning of the month, in the "head" of Scorpio, will set about 2 hours after the sun. It will pass 3 degrees to the north of Venus on the 1st and 1 degree to the south of Mars on the 15th. It will be in line with the sun on the 21st, after which it will become a morning object, and on the 30th will rise about 1 hour before the sun.

Venus.—Setting between 8.10 p.m. and 9.15 p.m. on the 1st, Venus will be in line with the Sun on the 17th and will then set at sunset and rise at sunrise. After this date it becomes a morning object and on the 30th will rise between 3.30 a.m. and 4.30 a.m.

Mars.—Now too close in line with the Sun for observation.

Jupiter.—Also too close in line with the Sun for observation at the beginning of the month, but by the end of the month it may be seen low in the east in the morning twilight. It will then rise between 3.30 a.m. and 4.30 a.m. about 15 degrees south of true east.

Saturn.—Will rise a little after midnight on the 1st and between 10.30 p.m. and 11.30 p.m. on the 30th.



Star Charts.—The chart on the right is for 7.15 p.m. in the south-east corner of Queensland to 8.15 p.m. along the Northern Territory border on the 15th November. (For every degree of longitude we go west, time increases 4 minutes.) The chart on the left is for 8 hours later. On each chart the dashed circle is the horizon at Cape York and the dotted circle is the horizon along the New South Wales border. When facing north hold "N" at the bottom; when facing south hold "S" at the bottom and similarly for the other directions. Only the brightest stars are included and the more conspicuous constellations named. The stars which do not change their relation to one another, moving east to west, arrive at any selected position about 4 minutes earlier each night. Thus, at the beginning of the month the stars will be in the positions shown about 1 hour later than the time stated for the 15th and at the end of the month about 1 hour earlier than that time. The positions of the moon and planets, which are continually changing in relation to the stars, are shown for certain marked days. When no date is shown the position is for the middle of the month.



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