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QUEENSLAND AGRICULTURAL JOURNAL

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Event and Comment

Farming in War-time Britain—Stock Food Storage.

CHARACTERISTICALLY, the British farmer has accepted the fact that it is his responsibility to keep food necessities up to the nation and the field forces fighting by speeding up the plough at a rate at which it has never been done before. When the war broke out, plans for increased production were immediately put into operation and pressed forward, with strong and understanding authority behind the drive. The present year's production has been planned with an objective of breaking up 2,000,000 more acres of grassland, and, where and when practicable, cultivation, in season, will go on right round the clock.

In the British farmers' viewpoint, every occupier of agricultural country, more particularly in these days, holds the land in trust for the security of the nation, and the Government is doing its job of providing facilities for the fulfilment of that national trust. The fine spirit of the British farmer is expressed admirably in a letter received recently by this Department from a man who farms a large area in Scotland and is a noted breeder of Ayrshires. He says, *inter alia*: "It is a tremendous source of strength to us to know that the Dominions are so wholeheartedly with the Motherland in the time of need. Our one concern at the moment is to produce as much as possible. . . I venture the opinion

that in the future first place in our markets will go to the home farmer, the second place to the Dominions, and third place for greatly reduced quantities from foreign countries."

Referring to his own activities, this correspondent states: "My own policy is to do my utmost to improve my land by cultivation and fertilization; improve my equipment to reduce labour cost; and to increase my supply of home-grown feed, especially grass silage to provide winter feeding and bridge drought periods.

"I feel confident that Australian farmers could, at little cost and without further dairy acreage, increase their product 40 to 50 per cent. by the general use of grass silage. The fear of drought would pass away, and if prices at home decrease yield will make up the difference. I need not trouble to go into technical details. Your agricultural officers must have all the details which have been circulated through the British agricultural Press. . .

"You may think I am overstating the case for grass silage, so I will briefly detail my own experience. In 1939, I had one portable wooden silo of 35 tons in sections. It was an experiment, as indeed all the grass silos of 1939 were experimental. The results were phenomenal, and in 1940 I wanted to get twelve silos and to use them each twice, i.e., twenty-four silo stacks of 35 tons each. Unfortunately, because of the shortage of timber, I could not carry out my full programme, but I managed to get, in all, thirteen stacks, and this will save hay and feeding. Hundreds of farmers are trying it with all sorts of makeshift silos, and many are using a wire constructure lined with waterproof paper. The grass is cut when 6 to 10 inches long, tramped in the silo and sprayed with a mixture of molasses and water. This ensures the right fermentation and gives a very palatable product. . ."

Gum Trees.

TREES around a farm put a premium on its value. The soil may be no better than that of any other farm in a district, nor the acreage yield higher. The homestead and other farm buildings may be even poorer in construction than those on neighbouring properties, but if surrounded or sheltered by rightly chosen trees the farm takes on a greater value and the prospective buyer is willing to pay the premium. The trees make the farm desirable because of the sheer contrast between it and the treeless places around it. A farm is a place not only to make a living on, but to live on, and there is a world of difference between living and just making a living. The prospect of comfort, shade and shelter, garden and orchard have an appeal that a bare homestead can never give. As to the individual farm so to the whole countryside, trees make a difference that nothing else can. An ornate suburban dwelling transplanted cannot do it; neither can neat furrows on the straight or on contour curves; nor even fine stock. All, of course, are very important, but, from a distance they do not make a place conspicuous like trees; and they never can convey an impression of a complete and cosy home, with

all that it suggests of the contentment and happiness of the people living on the farm. One day, no doubt, most of us will understand that trees, as well as fine fat cattle, add beauty and dignity and worth to the home paddocks. Accordingly, *Gum Trees,* Mrs. E. M. Forgan Smith's recently-published work on our native eucalypts, is welcomed cordially as a notable and timely contribution to knowledge of our unique flora, and as "a tree lover's tribute to the beauty and utility of our forests."

In the course of a beautifully written preface, the author says: "Trees are like people. When unfamiliar we are uninterested, but when we know their names, where they live, what they do, when their appearance has altered, and other details of their existence, our interest is awakened. We are pleased to greet them and tarry awhile. And so it is among the trees. . . Where previously the bush was regarded only as a retreat, it now also becomes a familiar friend; we have a better understanding of it, and are in more intimate touch with forest life.

"Is there an Australian who has not at some time felt moved by the beauty and grandeur of the eucalypts? They form about three-quarters of our vegetation and are typically Australian, whether set in their natural environment (forests of densely-packed towering trunks, sentinels on ridge tops, massive guardians of river flats), or in cultivated avenues, or as ornamental and shade trees in parks.

" 'Gum' trees, as we usually call our eucalypts in Australia, are as peculiar to our own land as are the kangaroo and the wallaby, and we may only think of them as 'bush' trees and be slow to appreciate the value and beauty of this gift of nature. In other countries, however, eucalypts have been planted from Australian seed. I have been told that eucalypts grow in the formal town square at Gibraltar. In Algeria the oil-producing varieties have been cultivated, and the one time malaria-stricken Pontine Marshes, outside Rome, have been freed from the fever by drainage and the growth of eucalypts. They have also been cultivated in France and Abyssinia. In South Africa they are being grown to produce much-needed timber. . . In rebuilding California after the earthquake eucalypt seeds were forwarded from Australia, and wonderful results have been obtained. They are also grown in the warm districts of the Caucasus on the Black Sea coast of the U.S.S.R. The species known as *Eucalyptus globulus* (the Tasmanian Blue Gum) was planted at the Villers Bretonneux War Memorial in France. I have seen eucalypts growing in New Zealand, where they are highly regarded. . .

"Trees on mountains, plains, river and creek banks have an influence on rainfall and check soil erosion in its various forms. . . They also made windbreaks, shelter belts, are very useful in keeping silt out of dams, and in times of drought many species can be used for fodder."

The book contains a description of each species, its common and botanical name, and its timber uses. *Gum Trees,* which is beautifully illustrated, should find a place in every farm home library. All the profits from its sale are going to swell the patriotic funds of Queensland.

Water Blister Disease of Pineapples.

T. McKNIGHT, B.Sc., Assistant to Research Officer, Department of Agriculture and Stock.

FROM the first week in January to the last week in April of 1940, reports from the Committee of Direction of Fruit Marketing recorded losses due to water blister in Southern consignments of pineapples. In addition, investigation showed losses in factory fruit to be quite considerable.

In order to determine the reason for these losses the majority of growers whose fruit had been seriously affected during the period were visited, together with a number of growers who are consistently free from the disease. In all, forty-three growers were visited, their packing sheds examined, and their views on picking and packing technique obtained. It was found that growers suffering from water blister losses fall into three classes—

(i.) Those unaware of the cause of the disease and unacquainted with standard measures for its avoidance.

(ii.) Those occasional losers who are familiar with the disease and the factors influencing its incidence but who, through pressure of work at a critical time or other adverse circumstances, have neglected to use their normal caution.

(iii.) Those more or less consistent losers who are familiar with the disease but who consider the now heavy task of reorganising their packing sheds to be impracticable.

As in past years, a definite correlation between picking and packing shed conditions and the existence of, or freedom from, water blister was quite evident. In cases where freedom from the disease was the rule it was found that the grower had followed Departmental recommendations either wholly or in part. One grower who follows Departmental recommendations faithfully, and uses benzoic acid-kaolin mixture as a stem-end dust, can send consignments to Adelaide in March without loss. Many growers completely avoid the disease by packing shed cleanliness only, coupled with careful handling.

One grower who had suffered severely in past summer seasons, particularly through the month of March, 1939, consented to the use of his packing shed in order to demonstrate the importance of hygiene. The shed was thoroughly cleaned out and sprayed heavily with formalin. A dump of decaying plant material was removed from immediately outside to a considerable distance away. The shed was again sprayed before each picking and no losses were suffered in subsequent Southern consignments. Prior to these operations losses were recorded in factory fruit. These were not repeated. The efficacy of these simple measures for the avoidance of water blister cannot be doubted.

Factors Influencing the Incidence of Water Blister Disease.

The obvious factors governing the incidence of water blister are—

(i.) The presence of pineapple refuse in and around the packing shed. This is most important, for the spores of the water blister fungus develop in huge numbers during humid weather on discarded suckers, tops, fruits, and leaves lying in and around the shed.

(ii.) The condition of the fruit with respect to the presence of wounds, providing invasion points for the fungus. Such wounds are commonly of the following types:—

(*a*) Side injuries or bruises received during handling.

(*b*) Sunburns.

(*c*) Knobs at base of fruit cut or knocked off.

(*d*) Cut or broken multiple tops.

(*e*) Growth cracks.

(iii.) The length of time elapsing before the fruit is actually on the market.

(iv.) Weather conditions prior to picking of fruit—

(*a*) Affecting the presence of the fungus; warm, wet weather, particularly, stimulates the rapid growth of the fungus.

(*b*) Affecting the fruit; wet weather following a dry period is frequently responsible for the production of growth cracks on the fruit.

(v.) Temperature and humidity during transport.

(vi.) Possible infection sites derived from injuries occurring subsequent to packing, as a result, for example, of slack packing or transport over unusually bad roads.

Measures for Control.

A review of the incidence of water blister disease indicates February and March as peak periods for losses, particularly the latter, but growers would be well advised not to relax precautionary measures over the extended period late December to the end of April. Consideration of all the factors influencing water blister disease shows that the following procedure should be adopted if the disease is to be avoided:—

(*a*) Practise strict hygiene in and around the packing shed, involving the constant removal of old planting material, discarded tops, &c., and complete disinfection of the shed, when warranted, with formalin, using a 2 per cent. to 5 per cent. solution.

(*b*) Use care in picking and handling the fruit. Bags are occasionally found in use and this practice should be discontinued.

(*c*) When weather conditions permit packing should be done on the headlands. In this way damage due to handling is minimised, but the necessity for strict sanitation still remains.

(*d*) Avoid, whenever possible, packing fruit while still wet.

(*e*) Avoid delays in transporting fruit.

(*f*) Rigorously exclude all sunburnt or otherwise wounded fruit from Southern consignments. Lightly sunburnt and slightly bruised or "weeping" fruit should be sent to the factory. Any discarded fruit should be collected and buried in the field and never allowed to remain in the packing shed where they invariably rot either with *Thelaviopsis* or yeasts.

(*g*) Second-hand cases which are suspected of being contaminated should be sprayed with a 2 per cent. formalin solution.

(*h*) If consistent attention is given to points (*a*) to (*g*) losses from water blister should be negligible or totally avoided. However, as an additional precautionary measure, especially when weather conditions are conducive to the development of the disease, the stem-ends of the fruit, prior to packing, may be dusted with a benzoic acid-kaolin mixture, prepared by mixing intimately one part of benzoic acid with four parts of kaolin.

Type of Fruit and Susceptibility to Water Blister Disease.

In view of the belief held by some growers that small, hard fruit are less susceptible to water blister than fruit which have received relatively heavy applications of nitrogenous fertilizers, fruit of both types were obtained from a fertilizer experimental plot in the Glasshouse Mountains district in order to make preliminary tests on this question.

Field inoculations were made with spore suspensions sprayed on freshly picked fruit, in each instance the same time elapsing from the picking of the fruit to the inoculation. Laboratory tests were made on fruit forwarded to Brisbane from the experimental plot. The results did not support the contention that fruit receiving heavy applications of nitrogen are more susceptible to the disease. In each trial the extent of the infections was greater in lightly fertilized fruit than in heavily fertilized fruit.

Plate 37.
MORETON BAY, NORTHWARDS FROM RUSSELL ISLAND.

Codling Moth Control.

D. O. ATHERTON, M.Agr.Sc., Research Officer.

CODLING moth is a pest of apples and pears at Stanthorpe where, in spite of the general application of control measures, losses are experienced every year. Research work on the control of this pest has been, and is being, carried out in the more important deciduous fruit-growing countries. The aim is in all cases similar, viz., to discover more efficient, yet economical, insecticides which are less toxic to human beings than lead arsenate and to improve methods of applying them so that unnecessary spray applications are avoided. Progress has been such that changes in spraying practices can be effected by growers in their annual codling moth control programme. These changes can best be discussed after a brief consideration of the insect and its habits.

LIFE HISTORY AND HABITS.

Several fruits are attacked, but for all practical purposes, apples and pears may be considered as the only important hosts at Stanthorpe. During winter the full-grown larva (Plate 38, fig. 2), which is about three-quarters of an inch long, lives in a very tough silken cocoon located in crevices of the bark (Plate 38, fig. 6) on the trunks and branches of the tree, in sheltered spots under the tree, and in the packing sheds. In spring the larvae turn into relatively inactive brown pupae, from which the small greyish-brown moths (Plate 38, figs. 4 and 5) with copper-coloured patches at the tips of the fore-wings later emerge, usually at the end of October. Then follow a few days of inactivity before the eggs are laid on apple and pear trees. Egglaying occurs at dusk on relatively warm evenings, each female laying approximately 100 to 150 scale-like eggs (Plate 38, fig. 1) over a period of about a fortnight. When the very small larva first emerges it may feed slightly on the leaves, but in a few hours it crawls to the fruit and chews its way inside, often entering near the calyx. When growth is completed within the fruit, the larva burrows its way to the outside and seeks a sheltered place in which to spin a cocoon. Pupation takes place within this cocoon, and the adult moth emerges later to continue the life cycle. Development in summer requires approximately seven and a-half weeks—egg, ten days; larva, four weeks; and pupa, two weeks.

The total period elapsing between the emergence of moths in the spring and the emergence of moths in the succeeding generation is approximately nine weeks. The second moth emergence takes place in the early part of January. These moths select either leaves or young fruits for egg laying. The very small larvae hatching from the eggs usually wander about for a short time before attacking the fruit, entrance to which is very often effected where two fruits touch or where a leaf rests on a fruit. Most of the second generation larvae will leave infested fruits towards the end of February or early in March and after spinning cocoons will over-winter in that stage. A small proportion, however, may pupate and emerge as moths before the winter, but these are usually of no consequence at Stanthorpe, for the bulk of the fruit is harvested before they lay their eggs. The periods required for the development of the egg, larval, and pupal stages varies a great deal. Consequently, the spring moth emergence may extend over two or three

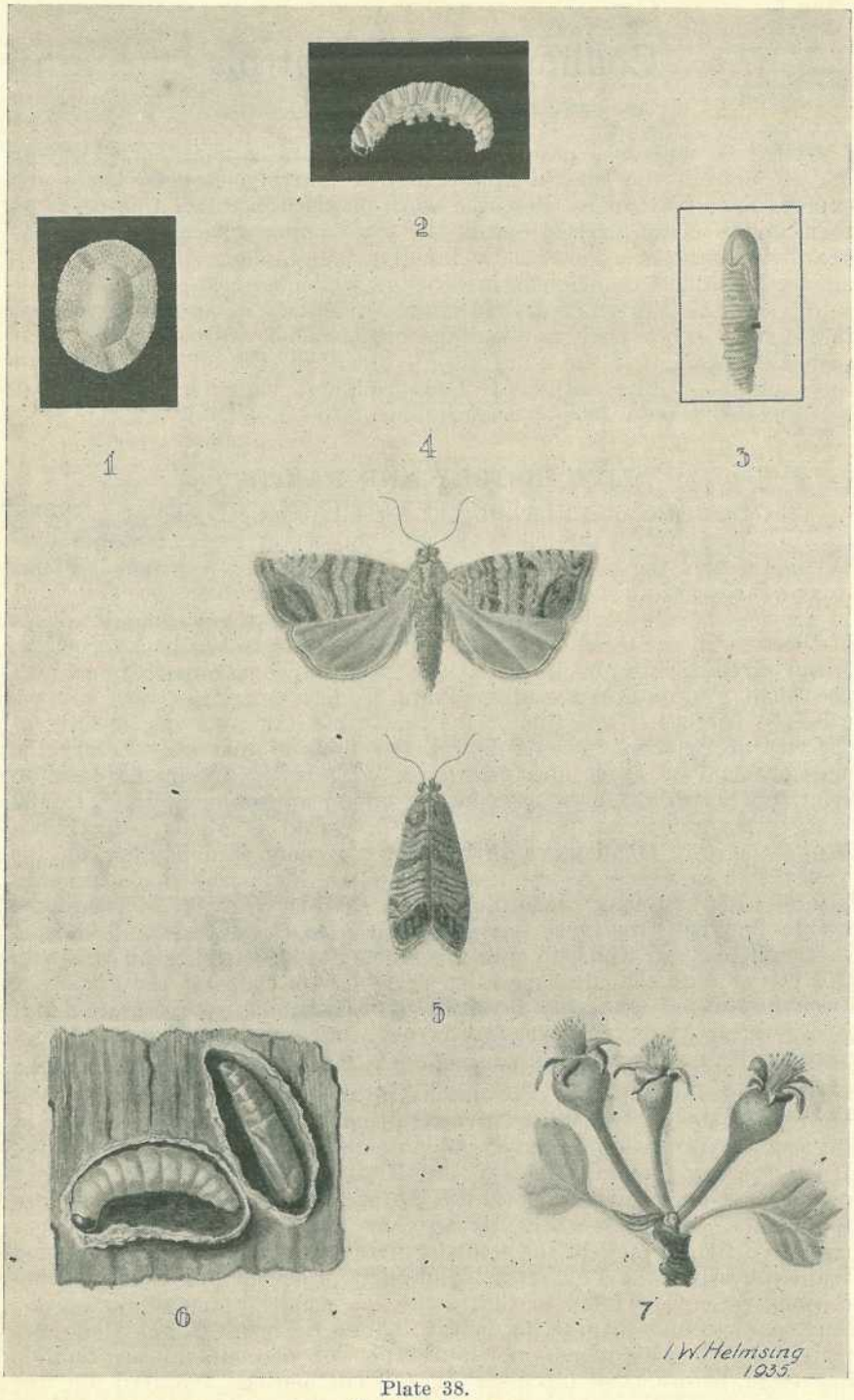

Plate 38.

CODLING MOTH.

Fig. 1.—Egg × 15.
Fig. 2.—Larva × 4.
Fig. 3.—Pupa × 4.
Fig. 4.—Adult with wings spread × 5.
Fig. 5.—Adult with wings folded × 5.
Fig. 6.—Larva and pupa in silken cocoons × 2.
Fig. 7.—Correct time for calyx spray.

weeks, the first summer emergence over a still longer period, and thereafter the pest is present in the orchard in all stages until the winter, when only the over-wintering larvae survive.

Control Recommendations.

Control recommendations may be considered from three points of view—(*a*) orchard hygiene, (*b*) tree banding, and (*c*) spraying.

Orchard Hygiene.

Over-wintering larvae should be destroyed wherever they are found —in the packing shed, in old cases which may be retained for the following season, in the crevices on the bark of the trees, on props which have been used for supporting branches heavily laden with fruit in the previous summer, and in any similar more or less sheltered positions frequented by them. This involves (*a*) a thorough winter clean-up both of the packing shed and its equipment, followed by the liberal use of waste sump oil or an insecticide of the oil group in cracks and crevices which cannot be otherwise penetrated, (*b*) bark examination and the destruction of any larvae found on the tree during pruning operations, and (*c*) the removal and burning of all rubbish both in the orchard and packing shed which is of no real service to the grower. The number of larvae spending the winter in the orchard buildings is apt to be high and, if allowed to complete their development, they aggravate the pest position in spring and tend to make control by orchard sprays more difficult.

Tree Banding.

Banding is the term applied to the practice of wrapping a 5-inch double-layer bandage around the trunk of the tree early in the summer and aims at the destruction of all larvae using it as a shelter for pupation. Bandages are of two types—(*a*) hessian, and (*b*) corrugated cardboard impregnated with beta-naphthol. The former must be removed from the tree every ten days during the summer in order to kill the sheltering larvae or pupae by boiling or by some similarly effective method. Properly used, hessian bandages are effective, but, unless the examination of the bandages is regular and thorough, they may do more harm than good. Corrugated cardboard bandages previously treated with a solution of beta-naphthol (1 lb.) in a mineral oil (1½ pints) are placed in position late in October. Their effectiveness gradually decreases, and in mid-January they should be replaced. The second lot of bands should be removed and burnt between early May and the end of September. Such impregnated bands are very attractive hiding places for fully-grown larvae descending the tree and kill most of them before they are able to complete their life-cycle. Chemical bands are more certain in their effect, though somewhat more expensive, than hessian bandages.

Spraying.

Really satisfactory control of the pest depends on the effective application of all available methods, but spraying is unquestionably most important. All sprays used for codling moth control are applied during the period when the trees are in active growth, and include one spray known as the calyx spray and a number of succeeding sprays known as the cover sprays.

Calyx Spray.—The composition and correct application of the calyx spray has been standardised for some years. The formula is as follows:—

Lead arsenate	2½ lb. powder or 5 lb. paste
White oil	¼ gallon
Water	80 gallons

The purpose of this spray is to minimise the fruit loss due to larval entrances through the calyx—a loss which is consistently high if it is omitted. The inside of the calyx cup and the persistent parts of the flower must be sprayed before the calyx has closed (Plate 39). If the spray is applied too early it will be less effective and may affect honey bees as they collect nectar from the flowers. Both risks can be minimised if the calyx spray is applied after the fruit has set, but before the calyx has closed. As the flowers do not all open at the same time, even on the one tree, each grower must use his own judgment, within the limits outlined, as to when the calyx spray is applied to his trees. Obviously, all varieties on any orchard are not ready to receive the calyx spray on the same date and programmes must be arranged accordingly. Occasionally, the period of blossoming is sufficiently extended in a single variety to warrant the application of two calyx sprays a week apart, but justification for such action is extremely rare at Stanthorpe.

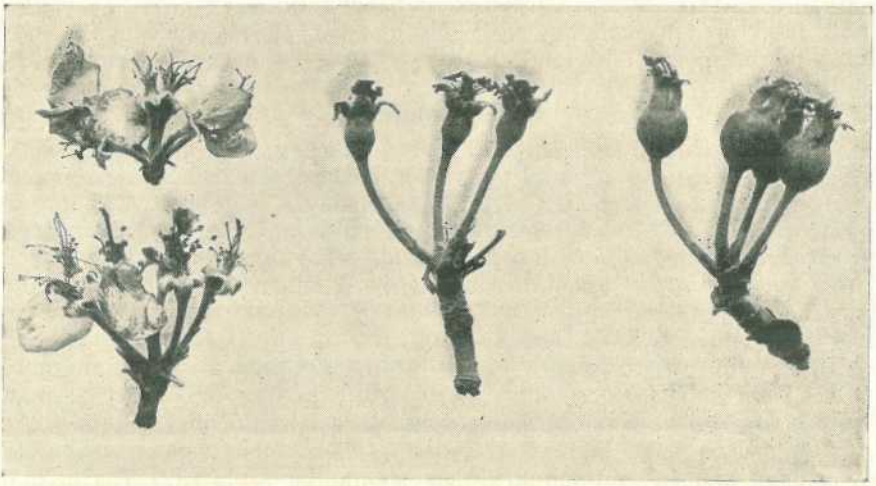

Fig. 1. Fig. 2. Fig. 3.

Plate 39.

WHEN TO APPLY THE CALYX SPRAY.—Fig. 1. Too early—petals present. Fig. 2. Most suitable stage—sepals lifting, fruit beginning to swell. Fig. 3. Too late—calyx cup closed by lifted sepals.

Cover Sprays.—In the past, lead arsenate has been widely used in both calyx and cover sprays. It is reasonably effective and comparatively cheap, but it leaves a persistent deposit which has to be removed before the fruit can be safely marketed, and often causes extensive foliage scorching in the Stanthorpe district when a number of applications are made in the one season. An alternative non-poisonous insecticide is desirable for cover sprays and several have been introduced and tested in recent years. These insecticides are more expensive than lead arsenate,

but they are less harmful to the trees and contain no materials likely to create marketing difficulties. They are at least as effective, and in some cases more effective.

The following cover sprays are suitable for use in Queensland:—

I.	White oil	1⅓ gal.
	Nicotine sulphate	1 pint
	Water	80 gal.
	or	
II.	White oil	¼ gal.
	Nicotine sulphate	1 pint
	Water	80 gal.
	or	
III.	White oil	1⅓ gal.
	Water	80 gal.
	or	
IV.	White oil	¼ gal.
	Bentonite-nicotine (5% nicotine)	4 lb.
	Water	80 gal.

These four alternative cover sprays all give good control of codling moth if properly used. The first is the most expensive, but it gives the best control of codling moth, and is of value in checking woolly aphis, red mites, apple-leaf hopper, and scale insects. The second, though controlling codling moth and checking woolly aphis and leaf hoppers, has little influence on other pests. The third is effective against codling moth, and checks scale insects and the red mite. The fourth alternative cover spray is primarily a larvicide for codling moth control purposes, but successive applications may also keep leaf hoppers in check.

The relative importance of pests other than codling moth in the orchard, together with the relative costs of the various materials at the time of purchase, must be taken into consideration when deciding which cover spray to use.

Timing Cover Sprays.—A study of the life history and habits of the codling moth indicates quite clearly that there are certain periods of the year during which adult moths are more abundant than at others and, if suitable temperature and humidity conditions occur when the moths are numerous, they will lay large numbers of eggs on the trees. Codling moth cover sprays can be effective only if these eggs, or the young larvae emerging from them, are destroyed. Cover sprays must therefore be applied a few days after the period of greatest moth activity occurs.

A reliable method is now available for determining when the moths are most numerous in the orchard, and thus the problem of deciding when to apply cover sprays has been simplified. Codling moths, in common with numerous other moths, are attracted by various sweet or fermented liquids. A series of traps containing a cheap wine and water (wine 1 part and water 10 parts by volume) will, if placed throughout the trees in the orchard and examined regularly twice a week, give a reliable indication of moth activity. Glass jars with wide mouths and a capacity of about one quart make suitable lure traps, because any moths which sink in the lure can be easily found.

Every orchardist is in a position, by using lure trap records on his own property, to determine the most effective time for the application of cover sprays. Ten to twenty traps spaced among 100 to 200 apple trees should be sufficient to provide the required information for any one orchard. When the number of moths caught exceeds an average of one per trap and then diminishes at later examinations, a peak will have been recorded. The cover spray should be applied not earlier than the fifth and seldom later than the twelfth day after the recorded peak of moth activity.

Lure trap records have been kept by officers of the Department of Agriculture and Stock from a number of representative orchards in the Stanthorpe district during the past three seasons. Fortunately, moth activity is much the same in all parts of the Stanthorpe district, and the data has therefore been used to prepare information on spray dates for the guidance of growers. Growers using such information should get good control of codling moth, but as minor differences in moth behaviour doubtless occur, it is desirable that the grower also maintain his own lure traps if the maximum precision is to be given to spray applications.

Fortunately, the habits of the pest and the efficacy of the sprays allow a period of at least a week during which cover sprays should be applied. The efficiency of the lure trap timing method is such that in some years a period of about eight weeks may be allowed to pass without any necessity for the application of a cover spray. Consequently, spray costs are reduced to a minimum by the elimination of sprays which might otherwise be applied for precautionary purposes.

Thorough Spraying.—Particular attention must be given to the thorough application of the sprays. To be effective, every cover spray must cover the leaves and the fruit. If the tree is large enough to require 2 gallons of spray for complete coverage, then it is certain that 1½ gallons will not give good results, and any apparent saving in the cost of spray materials would be fictitious, for fruit losses would inevitably be higher than need be.

Plate 40.
A FRUITGROWER'S HOME ON MAGNETIC ISLAND, NEAR TOWNSVILLE, NORTH QUEENSLAND.

The Scrub Tick (*Ixodes holocyclus*)

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

TICKS cause harm in several ways. Their bite is irritating and may in itself produce ill-effects. They live on blood and, when large numbers are present, the animal attacked may suffer severely from loss of blood. Again, many species of ticks transmit serious diseases. It is in this role as vectors of disease that ticks assume their greatest importance as parasites of livestock.

Of the several different kinds of ticks which attack livestock in Queensland, three are known to cause serious disease. The common cattle tick, *Boophilus australis,* transmits the organisms which cause tick-fevers in cattle. The poultry tick, *Argas persicus,* is a vector of the organism of spirochaetosis, a frequently fatal disease of poultry, while the bite of the scrub tick, *Ixodes holocyclus,* may result in a serious condition of paralysis in nearly all classes of livestock and man.

A B

Plate 41.

THE SCRUB TICK.—(A) Male. (B) Female.

Description.

The scrub tick is found in parts of Australia, New Guinea, and the East Indies. In Australia, its native hosts include the bandicoot and certain other marsupials such as the opossum, kangaroo, native bear, pouched mouse, and wallaby. It will also attack the cow, horse, pig, sheep, dog, cat, chicken, and man.

The male tick (Pl. 41 (A)) is oval in shape and yellowish in colour. It measures about $\frac{1}{8}$ inch in length. This sex does not increase in size to any noticeable extent during its lifetime. The female (Pl. 41 (B)), on the other hand, is capable of considerable distention. The young unfed female is yellowish in colour and about the same size as the male. As the female engorges, the body increases in size, eventually attaining a length of up to nearly $\frac{3}{4}$ inch, the colour changing to dark red.

At the narrow anterior end of the tick are the various structures which form its mouthparts. These consist principally of a pair of cutting organs and a club-shaped body armed with rows of recurved teeth. By means of the cutting organs a hole is cut in the skin into which the club-shaped structure is then inserted. This acts as a holdfast organ enabling the tick to maintain its position on the animal whilst feeding. The rows of recurved teeth on this holdfast organ prevent any removal of the tick by force which, if attempted, frequently results in the "head" of the tick being left behind in the flesh.

Distribution.

In Queensland, the scrub tick is to be found practically throughout the entire length of the coastal areas. In the southern parts of the State it has been recorded as far west as Warwick, Toowoomba, and the Bunya Mountains. It does not appear to be able to exist except under humid conditions and for this reason it is practically confined to scrub country.

Life Cycle.

Four stages are recognised in the life cycle of this parasite, namely, the egg, larva, nymph, and adult. As is the case with all ticks, the larva has only three pairs of legs, whereas both adult and nymph have each four pairs. The nymph differs from the adult in not being sexually mature.

When fully engorged with blood, the female tick drops from the animal on which she has been feeding and finds shelter in some crevice on the ground. After resting here for from eleven to twenty days, she commences to lay eggs. A single female may lay up to 2,500 eggs. In warm weather the eggs hatch in from forty-nine to sixty-one days. The larvæ that emerge become active after about a week and attach to the first suitable animal they encounter. The bandicoot appears to be the favourite host of the larvæ. After feeding for from four to six days the larvæ are fully fed, whereupon they drop to the ground. Here, after a period of rest varying from nineteen to forty-one days, they moult or cast their skins to emerge as nymphs. The nymphs become active after another seven days, attach to a host when opportunity offers, become engorged in four to seven days and then drop off. After a resting period of from three to ten weeks the nymphs develop into adults. These become active after about seven days. The female tick after attaching to a host engorges in from six to twenty-one days, whereupon she drops off and lays eggs.

Economic Importance.

Among its native hosts, the scrub tick is of little importance, but infestation of domestic animals, poultry, and man may incur a condition of paralysis, which is frequently fatal. In the case of the larger animals the disease is usually confined to the young, such as foals, calves, and children, but where the sheep, pig, dog, cat, and chicken are concerned, age is of little significance. Sheep and dogs appear particularly susceptible to tick paralysis.

Paralysis follows chiefly from attack by female ticks, a single female being capable of causing a fatal paralysis in even the largest dog. Every female, however, does not cause paralysis. Cases are also known of paralysis following a heavy infestation of nymphs, but these are of a comparatively mild type. The male tick and the larvæ do not cause paralysis.

Symptoms of tick paralysis are rarely seen before the end of the fourth or beginning of the fifth day after the female tick has attached. The cause of the disease is considered to be a toxin or poison which is pumped into the wound with the saliva of the female. The saliva is a secretion which has the property of preventing the blood from clotting while the tick is feeding. Female ticks feed only slowly at first and

then commence to engorge very rapidly. The onset of paralysis is coincident with the period of rapid engorgement by the tick, which causes a copious flow of saliva and also of the toxin.

The first symptoms of paralysis are to be seen in the hindquarters of the affected animal. The animal is unable to control the movements of its hind legs, which eventually become completely paralysed. The paralysis gradually extends to the forequarters. The animal now cannot stand and is unable to swallow or use its voice. Finally, the muscles which control breathing become paralysed and the animal dies.

Cases of tick paralysis occur chiefly in the spring and summer, particularly during wet humid weather. They can, however, occur at any time of the year for warm periods during the winter may be followed by cases of paralysis. If the weather is dry, on the other hand, the ticks usually remain inactive.

Control.

Dogs.—Dogs should be carefully examined every day and all ticks seen removed. Particular attention should be given to such parts of the body as in the ears, around the eyes, and in between the toes, where ticks are likely to evade detection.

Another method whereby the dog can be protected from attack is to dust the animal with derris powder, working the powder onto the skin, or wash it in an infusion of derris in water. This infusion is made by soaking 1½ to 2 oz. of derris powder in 1 gallon of water overnight or for about twelve hours. Before use, sufficient soap is added to produce a good lather. This wash should be used liberally and allowed to dry on the animal's coat. When using derris either as a powder or a wash, care should be taken to keep it out of the animal's eyes. As the wash will not enter the ears, and is not applied to the eyes, these parts of the body as well as the paws should be carefully examined and any ticks present removed. Derris powder may be applied to the inside of the ears.

Treatment with derris will kill any ticks on the dog and protect it from attack for about four days. As ticks must be attached for at least four days before symptoms of paralysis appear, *it is necessary to repeat treatment at least every seven days for an effective protection.*

Dogs suffering from tick paralysis should be treated by a qualified veterinary surgeon as soon as possible after the first symptoms are seen. The earlier an affected animal is given treatment the greater are its chances of recovery.

In areas where veterinary advice is not available, a supply of immune serum should be kept on hand and applied immediately symptoms appear. This serum is very successful, particularly in cases where the paralysis is not very far advanced. It may be secured from the Commonwealth Serum Laboratories, Royal Park, Melbourne. As supplies of serum have to be obtained from Melbourne and should be used early in the treatment of the disease, it is advantageous to have it on hand. The serum should be stored in a refrigerator.

Other Animals.—Treatment for tick paralysis in such animals as foals and calves is at present not very successful. In the case of these

animals, then, control measures require very careful consideration. If the following measures are adopted losses may be greatly reduced:—

(1) During periods of tick activity spray every seven days with the derris wash as given for dogs. In addition, such parts of the body as inside the ears and around the eyes should be carefully examined and any ticks present removed.

(2) Pastures running calves and foals should be cleared of all scrub and undergrowth which is likely to give shelter to bandicoots and other native hosts of the tick. If possible, also, such pastures should be securely fenced with netting to exclude bandicoots, &c.

Plate 42.

"THE SWIMMIN' HOLE," KINBOMBI GORGE, NEAR GOOMERI.

Maize Varieties for the Lockyer Valley, Part II.

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IN 1934 the results were published (1) of maize variety trials conducted at the Queensland Agricultural High School and College, Lawes, from 1925-26 to 1932-33. The trials have been continued and completed, and this record gives results of the work for the final six seasons. In two of these seasons the trials were lost, one through drought and one because of Wallaby Ear disease, while in 1938-39 two trials were conducted. Thus, there is a series of five results in addition to those earlier reported.

In general, the method of conducting the trials has not changed, the only difference being a progressive decrease in plot size to its final area of 1/110 of an acre. It is of interest to note that the "error" of the experiments has remained fairly constant throughout, so that reduction in plot size has facilitated field operations without lessening the efficiency of the work. In the last two years single seeds were planted 1 foot apart in the rows instead of using hills of three plants 1 yard apart as previously. All results are given on a uniform basis of 14 per cent. moisture.

For the season 1937-38 a perfect stand was obtained and no adjustments for stand differences were necessary. In the other trials yields had to be adjusted for stand differences, using the analysis of co-variance, on the basis of the regression obtained between yield and plant number at harvest. Significant positive correlations were found in every case.

Varieties and Seed Sources.

Varieties introduced into this series of trials since the last report are Funk's 90 Day, Star Leaming, and Reid's Yellow Dent (seed of which was obtained annually from the Queensland Department of Agriculture and Stock), and a selection of Leaming made and maintained at the College from seed originally obtained in 1931-32 from the New South Wales Department of Agriculture.

RESULTS OF INDIVIDUAL SEASONS.

Season 1933-34—

A trial was planted, but was destroyed by "Wallaby Ear" disease.

Season 1934-35—

Plan—10 by 10 Latin Square. Plot Size—Six Rows, 1 chain long.

Planting Date—26th November, 1934. Rainfall over Growing Period—17.31 inches.

Variety.	Bushels per Acre.	Significantly Exceeds	
		5 % Point.	1 % Point.
1. Leaming (College)	41·56	4 *et seq.*	6 *et seq.*
2. Fitzroy (New South Wales)	40·49	6 *et seq.*	6 *et seq.*
3. Improved Yellow Dent (Queensland) ..	38·98	7 *et seq.*	9 *et seq.*
4. Kennedy (New South Wales)	38·45	8 *et seq.*	9 *et seq.*
5. Reid's Yellow Dent (Queensland) ..	37·63	9 *et seq.*	10 *et seq.*
6. Fitzroy (College)	35·90	10 *et seq.*	
7. Red Nib (Queensland)	35·37	10 *et seq.*	
8. Golden Superb (New South Wales) ..	35·15	10	
9. Star Leaming (Queensland)	33·21		
10. Funk's 90 Day (Queensland)	31·81		

S.E. of a mean treatment yield = 1.102 b.p.a. t = 1.994 (5 per cent.) or 2.648 (1 per cent).

Differences exceeding 3.11 b.p.a. are significant (5 per cent. point).

Differences exceeding 4.12 b.p.a. are significant (1 per cent. point).

Season 1935-36—

Plan—9 by 9 Latin Square. Plot Size—Six Rows, 1 chain long.

Planting Date—6th December, 1935. Rainfall over Growing Period—14.68 inches.

Variety.	Bushels per Acre.	Significantly Exceeds	
		5 % Point.	1 % Point.
1. Fitzroy (College)	35·73	6 *et seq.*	6 *et seq.*
2. Leaming (College)	34·17	6 *et seq.*	8 *et seq.*
3. Reid's Yellow Dent	33·82	6 *et seq.*	8 *et seq.*
4. Star Leaming	33·75	7 *et seq.*	9 *et seq.*
5. Kennedy	33·50	8 *et seq.*	9 *et seq.*
6. Improved Yellow Dent	30·52		
7. Fitzroy (New South Wales)	30·43		
8. Funk's 90 Day	29·43		
9. Red Nib	28·83		

S.E. of a mean treatment yield = 1.159 b.p.a. t = 2.000 (5 per cent.) or 2.660 (1 per cent.).

Differences exceeding 3.28 b.p.a. are significant (5 per cent. point).

Differences exceeding 4.36 b.p.a. are significant (1 per cent. point).

Kennedy was discarded at this stage owing to weevil susceptibility.

Season 1936-37—

An 8 by 8 Latin Square was planted, but the trial was a total loss on account of drought.

Season 1937-38—

Plan—8 by 8 Latin Square. Plot Size—Six Rows, 1 chain long.

Planting Date—14th October, 1937. Rainfall over Growing Period—*13.48 inches.

Variety.	Bushels per Acre.	Significantly Exceeds	
		5 % Point.	1 % Point.
1. Red Nib	26·8	2 *et seq.*	2 *et seq.*
2. Leaming (College)	21·8	5 *et seq.*	6 *et seq.*
3. Star Leaming	21·3	6 *et seq.*	6 *et seq.*
4. Fitzroy (College)	20·7	6 *et seq.*	6 *et seq.*
5. Reid's Yellow Dent	17·9	6 *et seq.*	6 *et seq.*
6. Improved Yellow Dent	10·9	8	8
7. Fitzroy (New South Wales)	9·9		
8. Leaming (New South Wales)	6·2		

S.E. of a mean treatment yield = 1.169 b.p.a. t = 2.201 (5 per cent.) or 2.704 (1 per cent.).

Differences exceeding 3.64 b.p.a. are significant (5 per cent. point).

Differences exceeding 4.47 b.p.a. are significant (1 per cent. point).

(*NOTE.—A period of twenty-five consecutive days in December-January with no effective rainfall and no effective rainfall from 2nd February to 21st March.)

Season 1938-39 (*a*)—

Plan—10 by 10 Latin Square. Plot Size—Four Rows, 22 feet long (1/110 acre).

Planting Date—6th December, 1938. Rainfall over Growing Period—*14.91 inches.

Variety.	Bushels per Acre.	Significantly Exceeds	
		5 % Point.	1 % Point.
1. Leaming (New South Wales)	41·56	3 *et seq.*	3 *et seq.*
2. Fitzroy (College)	40·60	3 *et seq.*	3 *et seq.*
3. Leaming (College)	38·04	4 *et seq.*	5 *et seq.*
4. Star Leaming	36·86	5 *et seq.*	7 *et seq.*
5. Reid's Yellow Dent	35·64	8 *et seq.*	9 *et seq.*
6. Fitzroy (New South Wales)	35·38	9 *et seq.*	9 *et seq.*
7. Improved Yellow Dent	35·28	9 *et seq.*	9 *et seq.*
8. Red Nib	34·34	9 *et seq.*	10
9. Lester (Queensland)	33·00		
10. Funk's 90 Day	32·64		

S.E. of a mean treatment yield = 0.4 b.p.a. t = 2.00 (5 per cent.) and 2.64 (1 per cent.).

Differences exceeding 1.12 b.p.a. are significant (5 per cent. point).

Differences exceeding 1.49 b.p.a. are significant (1 per cent. point).

(*NOTE.—Only 5 points of rain fell in December and only 33 points in February.)

Season 1938-39 (*b*)—

Plan—10 by 10 Latin Square.

Plot Size—Four Rows, each 22 feet long (1/110 acre).

Planting Date—26th January, 1939.

Rainfall over Growing Period—19.04 inches.

Variety.	Bushels per Acre.	Significantly Exceeds	
		5 % Point.	1 % Point.
1. Fitzroy (New South Wales)	41·8	4 *et seq.*	5 *et seq.*
2. Fitzroy (College)	40·6	6 *et seq.*	6 *et seq.*
3. Leaming (College)	37·2	6 *et seq.*	8 *et seq.*
4. Improved Yellow Dent	36·6	6 *et seq.*	8 *et seq.*
5. Leaming (New South Wales)	36·4	7 *et seq.*	9 *et seq.*
6. Lester	31·8		
7. Star Leaming	31·4		
8. Funk's 90 Day	30·6		
9. Reid's Yellow Dent	29·0		

S.E. of a mean treatment yield = 1.61 b.p.a. t = 2.00 (5 per cent.) and 2.64 (1 per cent.).

Differences exceeding 4.8 b.p.a. are significant (5 per cent. point).

Differences exceeding 6.0 b.p.a. are significant (1 per cent. point).

Season 1938-39—Composite of (*a*) and (*b*).

Variety.	Bushels per Acre.	Significantly Exceeds	
		5 % Point.	1 % Point.
1. Fitzroy (New South Wales)	43·32	3 *et seq.*	3 *et seq.*
2. Fitzroy (College)	42·4	3 *et seq.*	3 *et seq.*
3. Leaming (College)	37·2	7 *et seq.*	8 *et seq.*
4. Leaming (New South Wales)	36·58	7 *et seq.*	9 *et seq.*
5. Improved Yellow Dent	35·02	9 *et seq.*	9 *et seq.*
6. Lester	34·16	9 *et seq.*	10 *et seq.*
7. Reid's Yellow Dent	32·84		
8. Red Nib	32·46		
9. Star Leaming	29·52		
10. Funk's 90 Day	29·46		

S.E. of a mean treatment yield = 1.32 b.p.a. t = 1.976 (5 per cent.) and 2.609 (1 per cent.).

Differences exceeding 3.69 b.p.a. are significant (5 per cent. point).

Differences exceeding 4.87 b.p.a. are significant (1 per cent. point).

(Apparent discrepancies between this composite result and the two individual trials for this season are due to a lower regression of stand on yield in the case of the composite analysis. There was a highly significant effect of time of planting on varieties.)

SUMMARY OF RESULTS. (Table 1.)

(Bushels per acre—14 per cent. moisture.)

Variety.	1930–31.	1931–32.	1932–33.	1934–35.	1935–36.	1937–38.
Improved Yellow Dent ..	51·0	30·7	53·7	39·0	30·6	10·9
Fitzroy (New South Wales)	49·0	14·2	54·6	40·5	30·4	9·9
Fitzroy (College)	47·3	24·5	32·8	35·9	35·7	20·7
Leaming (New South Wales)	56·2	25·9	49·7	..	..	6·2
Kennedy	45·2	22·7	32·0	38·5	33·5	..
Golden Superb	43·1	19·5	28·7	35·2	..	..
Red Nib	..	..	36·7	33·4	38·8	26·8
Leaming (College)	..	..	..	41·6	34·2	21·8
Reid's Yellow Dent ..	..	..	..	37·6	33·8	17·9
Star Leaming	..	..	..	33·2	33·8	12·3
Funk's 90 Day	..	..	..	31·8	29·4	..
Annual Means	47·3	20·0	44·2	36·9	32·2	16·9

Variety.	1938–39.	Variety.	1938–39.
Improved Yellow Dent ..	35·0	Star Leaming	29·5
Fitzroy (New South Wales) ..	43·3	Funk's 90 Day	29·5
Fitzroy (College)	42·4		
Leaming (New South Wales) ..	36·6	Annual Means	35·4
Kennedy	..		
Golden Superb	..		
Red Nib	32·5		
Leaming (College)	37·2		
Reid's Yellow Dent	32·8		

Composite Results.

It will be noted that as varieties were shown to be inferior they were eliminated and new varieties introduced from time to time. Thus, the composition of the trials with respect to varieties varied from season to season. To determine the value of each variety used, groupings were made of all varieties which were tested together over a series of seasons. All such possible composites were made.

The method followed in the previous report (1) of using the annual means of each variety for analysis, a season being treated as a single block, failed to give any significant result. The method, therefore, adopted in this paper was to use every replication of every variety in each season, thus increasing the number of degrees of freedom available. This procedure is considered justifiable when the number of replications in each season and the number of seasons are both reasonably large, and, in this case, resulted in useful differentiation between varieties being made.

PERIOD 1930-31 TO 1934-35 (FOUR TRIALS), No. 1.

Variety.	Bushels per Acre.	Significantly Exceeds	
		5 % Point.	1 % Point.
1. Improved Yellow Dent	45·8	3 *et seq.*	2 *et seq.*
2. Fitzroy (College)	41·1	4 *et seq.*	4 *et seq.*
3. Fitzroy (New South Wales)	40·3	4 *et seq.*	5
4. Kennedy	39·0		
5. Golden Superb	33·8		

S.E. of a mean treatment yield = 1.25 b.p.a. t = 1.978 (5 per cent.) or 2.613 (1 per cent.).

Differences exceeding 3.5 b.p.a. are significant (5 per cent. point).

Differences exceeding 4.6 b.p.a. are significant (1 per cent. point).

PERIOD 1930-31 TO 1932-33 (THREE TRIALS), No. 2.

Variety.	Bushels per Acre.	Significantly Exceeds	
		5 % Point.	1 % Point.
1. Improved Yellow Dent	46·9	4 *et seq.*	4 *et seq.*
2. Leaming (New South Wales)	45·3	4 *et seq.*	5 *et seq.*
3. Fitzroy (College)	42·8	5 *et seq.*	5 *et seq.*
4. Fitzroy (New South Wales)	39·6	5 *et seq.*	6
5. Kennedy	34·6		
6. Golden Superb	31·8		

S.E. of a mean treatment yield = 1.6 b.p.a. t = 1.98 (5 per cent.) or 2.62 (1 per cent.).

Differences exceeding 4.5 b.p.a. are significant (5 per cent. point).

Differences exceeding 5.9 b.p.a. are significant (1 per cent. point).

PERIOD 1930-31 TO 1935-36 (FIVE TRIALS), No. 3.

Variety.	Bushels per Acre.	Significantly Exceeds	
		5 % Point.	1 % Point.
1. Improved Yellow Dent	43·0	3 *et seq.*	3 *et seq.*
2. Fitzroy (College)	40·1	4	
3. Fitzroy (New South Wales)	38·3		
4. Kennedy	35·8		

S.E. of a mean treatment yield = 1.172 b.p.a. t = 1.979 (5 per cent. point) or 2.616 (1 per cent.).

Differences exceeding 3.3 b.p.a. are significant (5 per cent. point).

Differences exceeding 4.3 b.p.a. are significant (1 per cent. point).

PERIOD 1932-33 TO 1938-39 (SIX TRIALS), No. 4.

Variety.	Bushels per Acre.	Significantly Exceeds	
		5 % Point.	1 % Point.
1. Fitzroy (College)	38·5	4	4
2. Improved Yellow Dent	37·3	4	4
3. Fitzroy (New South Wales)	36·4	4	
4. Red Nib	33·4		

S.E. of a mean treatment yield = 0.975 b.p.a. t = 1.975 (5 per cent.) or 2.607 (1 per cent.).

Differences exceeding 2.7 b.p.a. are significant (5 per cent. point).

Differences exceeding 3.6 b.p.a. are significant (1 per cent. point).

PERIOD 1934-35 TO 1938-39 (FIVE TRIALS), No. 5.

Variety.	Bushels per Acre.	Significantly Exceeds	
		5 % Point.	1 % Point.
1. Fitzroy (College)	35·3	Not significant	
2. Fitzroy (New South Wales)	34·5		
3. Leaming (College)	33·3		
4. Reid's Yellow Dent	32·9		
5. Improved Yellow Dent	32·6		
6. Red Nib	32·0		
7. Star Leaming	31·6		

PERIOD 1934-35 TO 1935-36, 1938-39 (FOUR TRIALS), No. 6.

Variety.	Bushels per Acre.	Significantly Exceeds	
		5 % Point.	1 % Point.
1. Fitzroy (College)	37·6	6 *et seq.*	6 *et seq.*
2. Fitzroy (New South Wales)	37·1	6 *et seq.*	6 *et seq.*
3. Leaming (College)	36·4	6 *et seq.*	8
4. Improved Yellow Dent	36·1	7 *et seq.*	8
5. Reid's Yellow Dent	35·5	8	
6. Star Leaming	33·2		
7. Funk's 90 Day	32·6		
8. Red Nib	31·8		

S.E. of a mean treatment yield = 1.056 b.p.a. t = 1.97 (5 per cent.) or 2.596 (1 per cent.).

Differences exceeding 2.9 b.p.a. are significant (5 per cent. point).

Differences exceeding 3.9 b.p.a. are significant (1 per cent. point).

PERIOD 1930-31 TO 1932-33, 1937-38 TO 1938-39 (SIX TRIALS), No. 7.

Variety.	Bushels per Acre.	Significantly Exceeds.	
		5 % Point.	1 % Point.
1. Fitzroy (College)	39·3	4	Not significant
2. Improved Yellow Dent	38·0		
3. Leaming (New South Wales)	37·6		
4. Fitzroy (New South Wales)	34·8		

S.E. of a mean treatment yield = 1.194 b.p.a. t = 1.976 (5 per cent.).
Differences exceeding 3.3 b.p.a. are significant (5 per cent. point).

SUMMARY OF COMPOSITE RESULTS. (Table 2.)

The composite results may be summarised thus:—

Variety.	Superior to.	Inferior to.	Class.
1. Improved Yellow Dent	8–11	..	Good
2. Fitzroy (College)	7–11	..	Good
3. Fitzroy (New South Wales) ..	7–11	..	Good
4. Leaming (College)	7–9	..	Good
5. Leaming (New South Wales) ..	10·11	..	Good
6. Reid's Yellow Dent	9	..	Fairly good
7. Star Leaming	..	2–4	Intermediate
8. Funk's 90 Day	..	1–4	Inferior
9. Red Nib	..	1–4·6	Inferior
10. Kennedy	..	1–3·5	Inferior
11. Golden Superb	..	1–3·5	Inferior

Red Nib.—Ears low, rather short and dumpy. Grain very variable, but generally deep, rough, starchy, and slightly dull.

The order of maturity (earliest to latest) has been—Red Nib, Funk's 90 Day, Reid's Yellow Dent, Star Leaming, Leaming (College), Improved Yellow Dent, Fitzroy College, Leaming (New South Wales), and Fitzroy (New South Wales).

The Relation of Climatic Factors to Yield.

An effort has been made to determine the relation of climatic factors, chiefly rainfall, to final yield. With cotton, in Queensland it is known that winter and spring rainfall plays an important part in determining yields. Martin and Hershey (2) have shown in Iowa that in the first thirty to forty days after planting most of the differentiation of structures and tissues in the maize plant is completed, and that the following thirty-five days are spent in the enlargement of already differentiated structures. Thus, in the first thirty-five days of growth the upper limit of yield is determined. They conclude that "it follows that influences which have stunting effects in maize plants tend to be most serious when they operate early," though they recognise "that unfavourable conditions and cultural methods during the later periods can render ineffective the advantages of a perfect structural organisation developed during a favourable formative period."

Accordingly, attention was paid to winter and spring rainfall, to rainfall thirty days after planting, and to rainfall in the 30-60 and 60-120-day periods after planting. As may be seen from the table below, these rainfall groupings do shed some light on the matter but

are not entirely satisfactory. It is, therefore, suggested that final yield in maize is governed largely by the incidence of unfavourable weather periods. Thus, a comparatively brief heat wave at a critical stage in the life history of the crop may be of greater importance in determining final yield than all the rest of the season.

Table 3.

Season.	Yield of Fitzroy and I.Y.D.	Rainfall Data.					
		June to Sept. 30.	Oct. 1 to Planting.	June 1 to Planting.	After Planting.		
					30 Days. Period 1.	30-60 Days. Period 2.	60-120 Days. Period 3.
	Points.	Points.	Points.	Points.	Points.	Points.	Points.
1. 1929–30	71	333	794	1,127	360	400	340
2. 1927–28	61	469	1,465	1,934	320	1,250	810
3. 1928–29	59	351	668	1,019	320	570	850
4. 1932–33	54	539	890	1,429	310	750	470
5. 1930–31	50	896	399	1,265	840	200	420
6. 1926–27	42	455	1,000	1,455	1,200	270	440
7. 1934–35	40	565	450	1,015	290	660	670
8. 1938–39*b*	37	395	1,234	1,639	290	1,210	280
9. 1938–39*a*	35	395	856	1,251	119	542	1,364
10. 1935–36	30·5	551	611	1,162	290	640	450
11. 1931–32	22	397	1,010	1,407	180	40	450
12. 1925–26	19	701	905	1,606	0	60	340
13. 1937–38	10·5	356	413	769	319	268	728
14. 1936–37	Loss	409	615	1,024	270	67	750

1. 1929-30.—Very favourable rainfall. No heat waves.

2. 1927-28.—Very favourable rainfall. No heat waves.

3. 1928-29.—Favourable rainfall. Twelve days of severe heat in the second period, immediately relieved by 2 inches of rain.

4. 1932-33.—First period was unfavourable but was preceded by a winter and spring with 12 inches of rain. A dry period of twelve days at the beginning of the second period was followed by 7 inches of rain over the second half of this period. Rainfall in the third period was scanty but well distributed.

5. 1930-31.—Planted after a long, dry period. Scanty rain, but regular in the first period, followed three weeks after planting by very heavy rains. This supported the crop during the subsequent twenty-seven consecutive dry days, which might otherwise have been disastrous. Rainfall in the third period was scanty but well distributed.

6. 1926-27.—Conditions for the first period were very favourable. In the second period there was no effective rainfall but moderate temperatures relieved the situation; 4 inches of rain fell in the first thirty-five days of the third period, followed by two completely dry months.

7. 1934-35.—Planted after a winter and spring of fairly low rainfall. Thereafter rainfall was well distributed, scanty in the first period and moderate in the second, with moderate temperatures.

8. 1938-39b.—Planted late in January after heavy rains, preceded by two very dry months. The first period was unfavourable but the second very favourable, and in the third rainfall was well distributed but low.

9. 1938-39a.—Planted after very favourable winter-spring rainfall. The first period was very unfavourable with twenty-six dry days and extreme heat; 1 inch of rain fell at the end of the period. The second period was no more favourable, but, after eighteen dry days with an extreme heat wave, 5½ inches of rain fell. Rain was plentiful in the third period.

10. 1935-36.—Planted after a moderate winter and spring rainfall. The first period was favourable and in the second period a severe heat wave occurred during a dry period of fourteen days, but ill-effects were lessened by good rains before and after this hot, dry spell. Scanty, well distributed rains fell in the third period.

11. 1931-32.—Planted after a good spring rainfall. In the first period a very hot, dry spell of twenty-two days occurred. After this 1 inch of rain fell. The last twenty-four days of the second period passed without rain and included two heat waves. The dry weather continued for a month after the end of the second period.

12. 1925-26.—Planted after a winter and spring of very heavy rainfall. The first and second periods were hot and dry, with groups of thirty-six, six, and twelve consecutive dry days. Rainfall was very low but well distributed in the third period.

13. 1937-38.—Planted after a dry winter and only fair spring rainfall. Fair conditions in the first period; in the second period fifteen consecutive dry days with a heat wave, followed by fifteen days with no effective rainfall. Heavy rain in the middle of the third period was too late for the crop.

14. 1936-37.—Planted after dry winter and spring. Rainfall very low and insufficient to maintain growth.

Discussion of Results.

The results in general confirm those previously reported—that is, Improved Yellow Dent, Fitzroy, and Leaming have maintained their superiority over other varieties tested. These varieties averaged about 42 bushels per acre.

It is often considered that early to midseason types are better suited to such moderate rainfall areas as the Lockyer, but the results over this series of fourteen years definitely establish the fact that higher average yields are obtained from the varieties with a fairly long growing season. Earlier varieties of the type of Reid's Yellow Dent and Funk's 90 Day may have a place when considered in relation to other farming requirements, but not if maximum maize yields are the prime consideration.

Variety trials in this and many other South-Eastern Queensland areas are complicated by extreme seasonal variability. Thus, the range in mean yield of Improved Yellow Dent, which was included in each of the twelve trials, was from 10·9 to 67·6 bushels per acre, while that of Fitzroy (New South Wales) was 9·2 to 73·6. Annual means (mean of all varieties) varied from 16·4 to 61·3 bushels per acre. The co-efficients of variability of Improved Yellow Dent, Fitzroy (New South Wales), and annual means were 41·8 per cent., 47·8 per cent., and 39.4 per cent., respectively. This high variability makes differences between varieties difficult to establish and also indicates the need for testing over several seasons before a result can be accepted. However, it is considered that the classification of varieties as given in Table 2 is sound.

Considering individual varieties, Golden Superb, discarded in 1935, is shown in composite analyses 1 and 2 to be definitely inferior to Improved Yellow Dent, Fitzroy, and Leaming. Kennedy, rejected in the following year, is also shown in analyses 1, 2, and 3 to be inferior to the same varieties. Kennedy is probably superior to Golden Superb, but it has not been possible to demonstrate this statistically. Golden Superb has red grain, while the grain of Kennedy is fairly soft and susceptible to weevil attack.

The other varieties tested in 1934 were retained until the conclusion of the trials. Composite analysis No. 4 shows Red Nib to be definitely inferior in yield. Analysis No. 6 establishes the inferiority of Funk's 90 Day and Star Leaming, while it leaves Reid's Yellow Dent in an intermediate position as the best of the mid-season types.

It is to be noted that the New South Wales strains of Fitzroy and Leaming while in reasonable seasons as good as the Queensland strains are definitely inferior in drought years. The Queensland strains are, therefore, to be preferred.

It must be emphasised that these results are only proved for the black soils of the Lockyer Valley. While it is expected that they will be capable of wider application, it is known, on the other hand, that some of the varieties which were unsuccessful here are quite useful elsewhere.

Summary.

In a series of maize variety trials on the black soils at the Queensland Agricultural College over a period of fourteen years (1925-26 to 1938-39) the varieties Improved Yellow Dent, Fitzroy, and Leaming have been shown to be the highest yielding of twenty varieties and strains tested. Reid's Yellow Dent has given slightly lower but satisfactory yields.

Contrary to some expectations, early varieties (3½ to 4 months) have, on the average, given low and unsatisfactory yields.

In the trials there was extreme variability from season to season, indicating that such trials need to be conducted over several seasons before the results are fully accepted. In these trials it is considered that sufficient seasons have been covered and the trials, in consequence, have been brought to a conclusion.

An attempt has been made to indicate the effect of conditions during growth upon yield.

The findings should be applied to other regions and other soil types with some caution.

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NOTE.—Supplies of pure seed of Improved Yellow Dent, Reid's Yellow Dent, and Star Leaming are maintained by the Department of Agriculture and Stock, Brisbane, and of Fitzroy and Leaming by the Queensland Agricultural High School and College, Lawes.

FARM MACHINERY.

Modern farm machinery is usually complicated, with many different yet interdependent working parts, which require close attention in order to ensure mechanical efficiency when it is brought into use in the field.

A breakdown at harvest time must be avoided as far as humanly possible. A detailed inspection of every part of the machinery before commencing operations is, therefore, essential. All loose bolts should be tightened, broken or worn parts replaced, bearings packed and adjusted where required, pulleys aligned, grease cups cleaned and filled, and belting overhauled and oiled. Castor oil is useful for making leather-work pliable, besides being a good lubricant for a bearing tending to run hot.

There also should be on hand an assortment of bolts, nuts, spring washers, lubricating oils, and graphite—the latter for mixing with water and painting the sprockets, chain belts, and cogs, for which it is far superior to oil.

Health and Nutrition in the Tropics.

DOUGLAS H. K. LEE, Professor of Physiology, University of Queensland.

(Based upon a lecture to the Sugar Agriculture School, January, 1941.)

To assist in the improvement of the conditions of settlement in tropical Australia by a study of the effects of working in hot climates was the chief research aim of the Department of Physiology, University of Queensland, as stated by Professor Lee in the course of his Inaugural Address in October, 1936. *This was made possible by his studies in London, America, and Singapore, following his early life in the tropical regions of Australia. The work was helped on by the equipment obtained for the Department of Physiology, partly through the direct assistance of the Government of Queensland and research funds provided by the National Health and Medical Research Council. This lecture forms part of a wider attempt to make available to the community in general the immediate practical benefits coming from this work. It is impossible to do much in one lecture, so Professor Lee has remained content to sketch the highlights, leaving details for later occasions.*—Ed.

The Stresses of Tropical Climates.

BEFORE setting out gaily to kill a dragon it is just as well to know that there is a dragon, where he lurks, and how big he is. So I must first make a list of the ways in which life in tropical climates puts a special burden on the body.

First, there are all the ordinary trials of life encountered anywhere. A few of these ease off a bit in hot countries, but, for the most part, they are always with us. It is important to realise this, for it often happens that the body, somewhat tired by the special demands of tropical life, has less reserve in hand to meet them. Pneumonia, heart disease, or appendicitis will not be any easier to fight when one is exhausted by hot weather.

Next come the more or less direct effects of hot climates upon the human body. I cannot discuss details here, but the living body is always producing heat and this heat has to be got rid of. In cold climates this is easy—the trouble is to keep it in. In hot climates, however, it may become very difficult. The human body has a number of tricks up its sleeve, so to speak, such as sweating, but these all exact their price. Moderate prices may not worry a body in reasonable funds of health, but the body has its ups and downs and there are taxes that even the rich find difficulty in paying. The collapse may come in a spectacular way—as an unexpected bankruptcy or as a slow, gradual decline.

There are three types of spectacular collapse. First of all there is heat stroke or *heat apoplexy*. This, fortunately, is rare. It is due to a very high rise of body temperature and is often fatal. It probably occurs only in old or sick persons, people putting forward a tremendous effort under severe emotional urge, or under very hot industrial conditions—such as in stokeholds. Next, there is the common *heat exhaustion*. For all practical purposes this is a condition of faintness brought about by heat, but helped on by other things—sickness, alcohol, overwork, worry, bad nutrition. The patient usually recovers by himself, but, if there is any other cause, it should be removed if cure is to be obtained. Thirdly, there is *heat cramp*. While rare in hot, wet climates it is by no means uncommon in hot, dry climates and in stokeholds, especially in a

man new to the conditions. Violent cramps in leg and body muscles are due to a loss of salt in the sweat, which has not been given back to the body. Extra salt in the food—or beer—will both prevent and cure.

The slower effects are less spectacular, but are probably responsible for a greater loss of efficiency because they are so slow and common. No one likes to "crack-up" and no one likes to have their employees "crack-up." Both decide to ignore it instead of looking for the cause and removing it. There are different types of complaint, though they fade one into another. Firstly, there is *general depression* or tiredness. Everyone suffers at some time, but if it becomes too frequent—I almost said a habit—it is worth examining. Prolonged overwork, bad surroundings, anxiety, or bad nutrition, combined with heat, are the usual causes. Next comes *mental instability* or neurasthenia. Too much or too little work is the usual cause, often combined with bad social conditions. The worrying type of person is, of course, liable to develop in this way. A *reduced capacity for work* is often seen. It is often not the really hard work that causes the most suffering, however, but the moderate grades of work for which the worker sets his own pace. A certain slowing up of work is probably inevitable and necessary, but this can easily degenerate into laziness. *Kidney and bladder stones* are said to be more common in the tropics, probably because less water is left over after sweating to be passed out through the kidneys.

Parasitic Diseases.

The third group of trials imposed by hot climates contains the special infectious diseases and parasites of tropical countries. To go into these would, of course, take many pages. They include the germ diseases like typhoid, leprosy, typhus (including many of the coastal fevers), dengue; the protozoal diseases like malaria, Weil's disease, amoebic dysentery; parasites and pests like flies, fleas, mosquitoes, hookworms, and filaria; and the fungi causing ringworms and prickly-heat. The prevention of these depends, very largely, upon the general hygiene described later on.

Social Conditions.

Only too often "tropical diseases" are dismissed as something caused by a germ and prevented by sanitation. On such grounds we often hear it said that Queensland has no tropical diseases. It is true that we have very little malaria and dysentery and no small-pox, yellow fever, plague, or cholera, but to say we have no tropical disease is just closing our eyes to facts. I have mentioned the diseases caused directly by climate; equally, if not more important, are the diseases—for they are diseases—caused by the bad social conditions so very often found in this land of ours.

Foremost amongst these social evils is isolation. So much of our population is scattered about in small groups of families, single families, or even single individuals. This cannot be helped in a primary producing State, but man was not made to live alone. Man has a brain above that of the beast, and, if this brain is not kept occupied, trouble must occur. The way in which trouble occurs will be different in different cases. Some people are said to talk to their hat on a fence post, others just lose interest, others get quite unbearable. With all this usually goes a growing carelessness about everything, including the simple rules for keeping

healthy. Isolation at any time is a strain, but in a hot climate it can be the very devil. Mental, moral, and physical carelessness—what, in the army, is called losing morale—grow on one very slowly and unnoticed and pave the way for all kinds of ill-health. Spaniards call it "mañana," Malays "tid'apa." Australians call it many things, but the net result is the same—lost opportunity—and we cannot afford to lose any opportunities, especially now.

Much has been said in recent years about the nutrition of Australian people—I have said much myself. This same isolation makes the nutrition of the country family a very difficult matter. It costs money to transport food to outback places, especially if they are off the railway lines. Speed of transport is also important, as most of the good foods are perishable foods, which must be eaten while fresh. There is also the other point of view, that people by and large do not properly realise what the best foods are or how to get the best out of them. We can, and are spreading this knowledge in the cities, and Queensland is well to the fore in this respect, but it is difficult to get at the small country groups. General weakness, lack of resistance, anaemias, nervous troubles, loss of appetite, and similar conditions, due mainly to poor nutrition, are far more common than they need be. From this list you will see that poor nutrition is not going to improve the body's attempts to cope with the climate.

Improving our Lot.

By this time you are probably getting impatient with this list of troubles, and saying to yourself, "All right, I suppose we aren't the best, but what can we do about it?" Here, again, I can, in the space available, only give you hints. To get the most into this space I am going to stop playing about and give it to you machine-gun fashion. If you are still reading, you must be interested—or have very little to do. In either case, you can "take it."

There are four types of self-help—personal hygiene, domestic hygiene, nutrition, community hygiene.

Personal Hygiene.—This is much more important than in colder climates. Frequent washing; regular bowel action; regular exercise, but not overdone; mental discipline to prevent slothful habits of mind and body; use of light, scanty clothing to allow the greatest amount of air to play over the skin and evaporate the sweat (this applies mainly to humid coastal climates); a sufficient amount of drinking water; avoidance of excesses of alcohol or venery.

Domestic Hygiene.—Liberal use of doors, windows, and verandas to allow the greatest amount of air movement (this again applies mainly to humid coastal climates); fitting of properly-designed ventilators and fans; thorough cleanliness throughout the house; plenty of light other than direct sunlight; careful disposal of all kitchen refuse, kitchen wastes, and stable manure; the most strict care in the use of lavatories and disposal of human excreta; protection of all food from flies at all stages of its use; the proper design of kitchens with regard to the sun, winds, ventilation, ceiling, and conveniences.

Nutrition.—Each day and, if practicable, in each meal include one foodstuff from each of the five classes of foundations food—meat, milk,

the dairy products, fruit, and vegetables. This is particularly important for children. To this advice add four rules:—

Rule 1.—Reduce the amount of protein and fat in diet in hottest months—one meat meal a day is sufficient for all except those engaged in the heaviest labour. Partially make up the quantity of food by increasing the use of potato, sweet potato, pumpkin, onion, peas and beans, salad vegetables, and juicy fruits (if available).

Rule 2.—Make sure of the vitamin content of the diet—whole cereals (wholemeal bread), citrus fruits, mangoes, papaws, dried apricots, prunes, guavas, rough-leaf pineapple. Dried peas soaked and allowed to sprout are a valuable source of vitamin C.

Rule 3.—Take plenty of fluid—water, milk, tea, fruit drinks.

Rule 4.—Keep valuable foods from deteriorating—buy frequently in small amounts, store in a refrigerator, cooler, or wrapped in paper (or cellophane) in sealed tins.

Community Hygiene.—In large cities many of these necessary things are done for you and you do not think about the service—until you get the rate assessment. In the small villages, however, you have to depend very much more upon yourself and your duty towards your neighbour. When disposing of human excreta, burying is the usual way, but it must be *deep* burying if you and your neighbour are going to prevent typhoid, hookworm, and other diseases from starting or spreading. You would be a bit annoyed if someone left gelignite lying about, but typhoid can be just as destructive of life.

In big cities, again, it is easy to meet friends, play games, go to the pictures, but in the country you have to go to some trouble to arrange such things, but that trouble is very necessary—in fact, it does nearly as much good as the final pleasure you propose to have. Getting out of yourself, creating an interest, joining in with somebody else are very important antidotes for many of the ills that hot climates and isolation may threaten to bring your way.

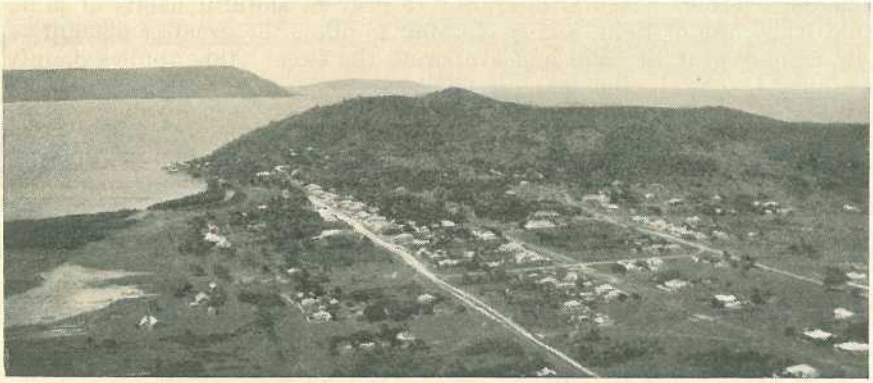
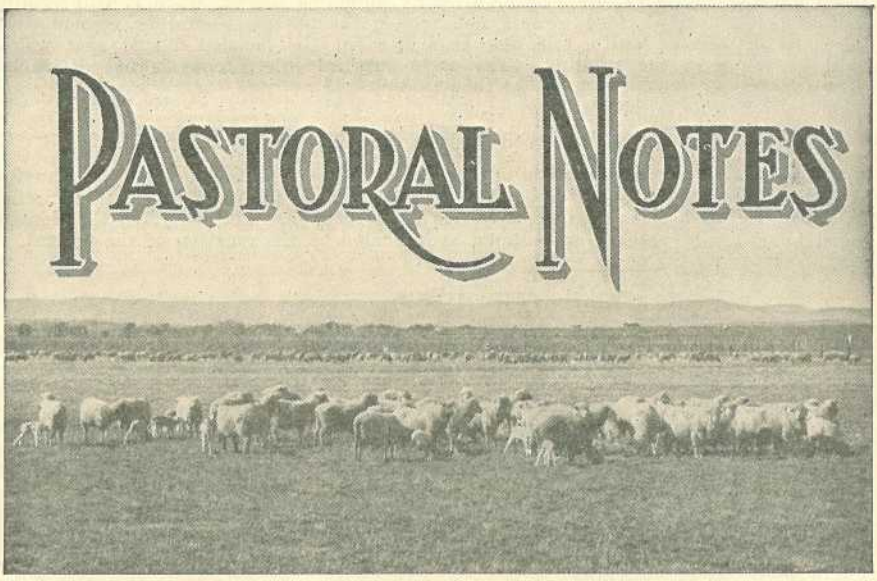


Plate 43.

COOKTOWN TO-DAY.—This view accentuates the scenic attraction of Queensland's tropical coast.



Strangles.

THIS is an acute, contagious, febrile, catarrhal disease affecting horses, mules, and asses. Young animals are usually attacked and acquire an immunity which may be lifelong, although aged animals are sometimes affected, the disease following a mild course.

Strangles is caused by a streptococcus, which is found in the lymph glands and nasal discharges of affected animals.

There are two forms of the disease—simple strangles, which runs a relatively mild course of from three to four weeks, and a much more serious form in which the catarrh leads to broncho-pneumonia and, at times, an abscess may burst internally and set up gangrenous pneumonia, or the organism infects the blood stream and sets up abscesses in the lungs, liver, spleen, and kidneys, causing death within a few days.

Simple strangles is characterised by inflammation of the upper air passages, evidenced by a cough with a nasal discharge, at first clear and watery, and, later, thick and yellowish, with fever, and abscess formation in the lymph glands situated in the angle of the jaws (submaxillary).

The eyes become reddened and discharge, respiration is increased, and the pulse later becomes rapid and weak. The animal is listless, with staring coat, and refuses food.

Treatment.—The patient should be made comfortable in an airy shed or box, and, if cover is not available, should be rugged and allowed to remain untied in an open yard, but in strict isolation from other young animals.

Feed should be offered in a box on the ground, and the appetite tempted with green stuff, bran mashes, &c., in small quantities at a time, with water constantly available, to which may be added nitrate of potash—one ounce to three gallons of water which has had the chill taken off it in cold weather.

Discharges from the eyes and nose should be removed daily with cotton wool soaked in a mild disinfectant—such as peroxide of hydrogen, permanganate of potash, or boracic, in weak solution—after which the nostrils may be moistened with olive oil, which prevents discharges from drying around the parts.

Feed boxes and buckets should be kept disinfected and free from discharges.

The development of the abscess may be hastened by the application of hot fomentations, mustard poultices, or of weak biniodide blister, when it will usually burst spontaneously. If this does not happen the abscess should be opened with a sharp disinfected knife, selecting as a site for the incision a soft spot which will be found in the swelling. Too early surgical interference is not desirable. The contents of the abscess should then be squeezed out and the wound disinfected, and kept open until the discharge ceases.

With careful nursing and good feed recovery in most cases is rapid.

Preventive treatment consists of three inoculations with Commonwealth strangles vaccine at intervals of four days. Treatment of infected animals with this vaccine is valuable, but the services of a veterinary surgeon are necessary, as the dosage must be carefully watched and altered as indicated by the reaction of the patient.

DRENCHING OF HORSES.

Requirements for drenching horses—

(1) A good, strong bottle with a tapering neck, such as a beer or a methylated spirit bottle, or a "Champion" vinegar bottle is particularly suitable. In order to minimise the risk of breaking, a piece of hose may be fitted to the neck.

(2) A conical metal container. This being metal and having a reinforced neck is safer to use than a bottle. It should be about 1 pint capacity.

(3) A drenching bit. This is fitted in the mouth in the same way as an ordinary bit. The drench is poured into a funnel attachment and flows through the hollow bit, entering the mouth through a hole in the centre.

Drenching.—A quiet horse may be drenched without any restraint. The man at the head should have one hand on the horse's nose, to prevent the animal from throwing its head too high.

The person administering the drench keeps the head horizontal by applying the pressure to the lower jaw. The container is moved to and fro while in the mouth, thus causing movement of the tongue, promoting swallowing movement. The neck of the container should be kept just within the angle of the mouth.

The following points should be observed when drenching:—

(*a*) Do not hold the head too high, as there is a danger of the drench passing down the windpipe to the lungs and setting up pneumonia.

(*b*) Do not drench a horse when lying down.

(*c*) Do not drench through the nostril, as the greater portion of the drench will pass to the lungs.

(*d*) Do not apply pressure to the throat to force the horse to swallow.

(*e*) Do not drench a horse suffering with tetanus, or if affected with a sore throat or strangles, as then the animal may be unable to swallow.

(*f*) Do not put a horse to heavy work immediately after giving linseed oil, or, for that matter, any purgatives, as over-purging and death may follow.

DISPOSAL OF AGED SHEEP.

There is a growing tendency among small flock-owners to hold on to wethers until they become unprofitable. An average wether passes the age of usefulness and profit at five or six years, according to breeding. Apart from depreciated wool there is another reason for disposing of wethers before that age, and that is the added difficulty of fattening a sheep after it becomes broken-mouthed.

There should be a ready market for ageing sheep among wheat farmers. Cultivated crops are necessary to make marketable sheep which have fulfilled their usefulness as wool producers. It would be profitable, therefore, for the farmer to buy sheep of this class, because of the reasonable price at which they are usually obtainable, and a sound policy for the grazier to sell them for replacement with younger sheep.

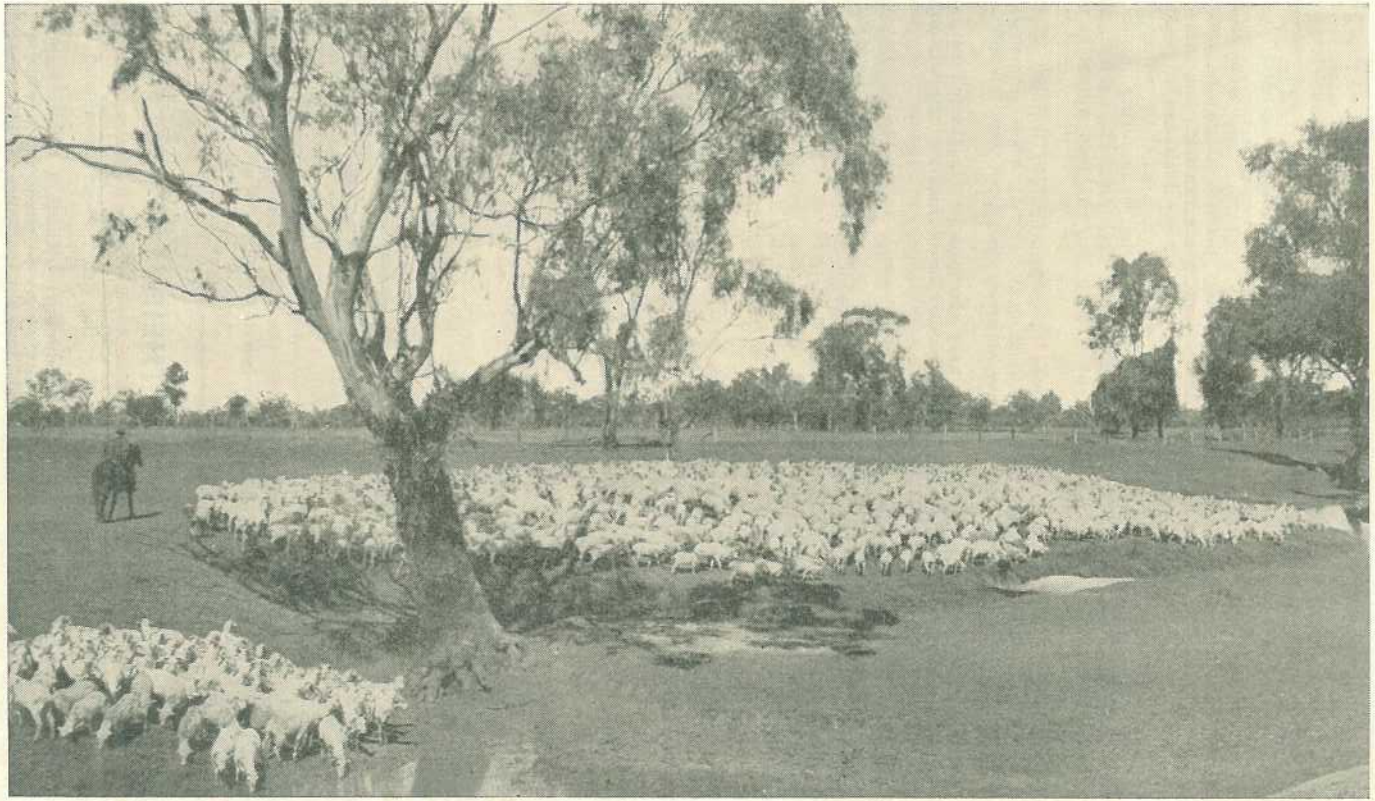


Plate 44.
Off Shears—A Pastoral Scene near Dalby.

RESTING STOCK BEFORE SLAUGHTER.

The importance of resting stock before slaughter cannot be stressed too strongly.

Considerable loss is incurred annually through partial and total condemnation of carcasses at slaughter-houses and bacon factories for bruised and fevered conditions resulting from the slaughter of animals immediately on their arrival.

Sometimes in the yarding of pigs whips or sticks are used, and a troublesome pig may receive quite a few hits before it is actually penned. Pigs are usually fat and soft and are, therefore, easily bruised. Very severe bruising, too, may be caused behind the jaws of pigs as a result of their having their heads jammed when they are being drafted into various pens. In such cases as these, where the pigs are slaughtered almost immediately upon arrival, the slaughtering inspector may find it necessary to remove large areas of bruised flesh from the carcass, and may have to remove the head and, perhaps, cut up high into the neck, almost to the shoulder.

Practically all such partial condemnations of pigs would be avoided if the owners of slaughter-yards made provision for spelling the animals a few days before slaughter, so that any bruising which may have occurred shall have time to vanish.

With cattle, it is also important not to have the animals slaughtered as soon as they have been delivered, more particularly if they have travelled long distances either by rail or road.

When cattle are trucked they may be bruised, either by the horns of other beasts or by bumping against the sides of the truck while the train is in motion. Likewise, when cattle travel by road they may arrive at their destination in a condition of semi-exhaustion, because of weather conditions and the distances they have been required to travel on the hoof. When these cattle are slaughtered immediately on delivery, the inspector has almost invariably to condemn a certain amount of meat, and sometimes a whole carcass, for fever or bruising.

These condemnations would, in most cases, be avoided if the cattle were rested for a few days after their journey in order that they may recover from an injury or exhaustion before they are slaughtered.

FLOCK MANAGEMENT.

Some flock-owners show a tendency at times to leave sheep too long in the one paddock. It is no rare thing, for example, to see sheep shorn, driven to a certain paddock, and left there until next shearing.

Sheep respond quickly to change of pasture, and the change is noticeable both in their health and condition.

A flock will often benefit, even if placed in a comparatively worse paddock than that on which it has been running for a brief period. On a breeding property, provision should be made for the ewes and lambs by spelling a paddock well before lambing time. Should rain fall while the paddock intended for the ewes and lambs is spelling, it is all to the good, as the succulent new growth so much to be desired for ewes and lambs will be in evidence. At weaning time there is again a necessity for fresh feed, for it should be fully realised that as a weaner a sheep is going through its most tender period. Grass seed country should be left severely alone where weaners are concerned.

HORSES EARN THEIR SALT.

A good farm horse is well worth his feed. Most farmers realise this, but all too frequently plough horses may be seen licking the dried sweat from each other.

Working horses are incapable of sustained effort without a liberal supply of salt, and when the food is low in this mineral they try to remedy the deficiency by licking the saline deposit from evaporated sweat round the collar, saddle, and other gear of a team mate.

It is, therefore, sound practice to keep rock salt in a convenient place for working horses.

EWES FOR FAT LAMBS.

The greatest handicap in the production of fat lambs on the Darling Downs in larger numbers has been, and still is, the difficulty of purchasing good crossbred ewes as the mother flock.

If a start has to be made with merinos, the best ewe for fat lamb raising is bred by the introduction of one of the long wools, such as Border Leicester, Lincoln, or Romney Marsh into the strong-woolled, robust type of merino ewe. The ewe lambs of this drop should then be retained as the future dams of the lamb-raising flock.

As to suitable ewes for the fat-lamb industry, it is believed that graziers on the fringe of the Darling Downs or further out would find it profitable to join long-woolled rams of British breed with their cast-for-age ewes with the idea of selling the progeny annually as fat lambs ewes on the Downs. Into the crossbred ewes flock, as described, should be introduced a ram of the Downs type. Opinions necessarily differ in the matter of crosses. The Southdown is the fashionable lamb at the present time, but it should be remembered that this cross must suffer no check from birth to block. The Dorset Horn gives a very nice lamb, early maturing and hardy. The use of the Border Leicester should be encouraged in every way. In addition to producing an early maturing lamb that fills every want, it must be remembered that the skin value of this lamb is worthy of consideration to a far greater extent than either the Dorset or the Southdown.

Pure-bred Corriedale ewes are hard to come by, but should the opportunity occur a farmer would be well advised not to let it slip. Pure Corriedales are hard to beat, good mothers and heavy milkers, besides growing a profitable fleece.

Generally, the wool from a flock retained for fat lamb breeding is a secondary consideration when compared with the production of fat lambs.

MERINO EWES FOR FAT LAMB RAISING.

Fat lamb raisers may be handicapped in their industry by the scarcity of the right type of ewe. This disability applies not only in Queensland, but, to a lesser degree perhaps, in all the other States.

In Queensland, 98 per cent. of the sheep are merinos. It becomes necessary in nearly all cases, therefore, to start breeding for fat lambs with ewes of this breed.

The grazier could help the fat lamb industry and, at the same time, obtain a profitable price for ewes culled for strength of fibre on his property by supplying suitable ewes to the fat lamb raiser. This applies especially where very strong woolled merinos are bred. There is nearly always a line of strong wool running to roughness when the type indicated is used.

The fat lamb industry can stand this roughness in the ewes, provided size and constitution are there, and both the grazier and fat lamb raiser would be well served—the grazier as to price and the lamb raiser as to type—if they could come to a business relationship.

The ewes described are really valuable to the farmer, but, unfortunately, are often slaughtered because of lack of realisation of their usefulness in the fat lamb industry.

A HORN-TIPPING TIP.

Much time and energy is often wasted in the practice of tipping the horns of cattle. Some owners of stock are slipshod in their methods of removing the points of horns. In doing the job, care should be taken to ensure that the cut does not slant. Oblique or slanting saw cuts defeat the object of the operation, for, although the tips are removed, sharp, chisel-like edges remain on the horns, leaving an animal still capable of inflicting a nasty injury to another. Even when cut squarely across, tipped horns remain capable of causing severe bruises. Horns with chisel-shaped points are a menace to all other animals within reach of their possessor, and, consequently, a probable cause of reduced profit to the stockowner.

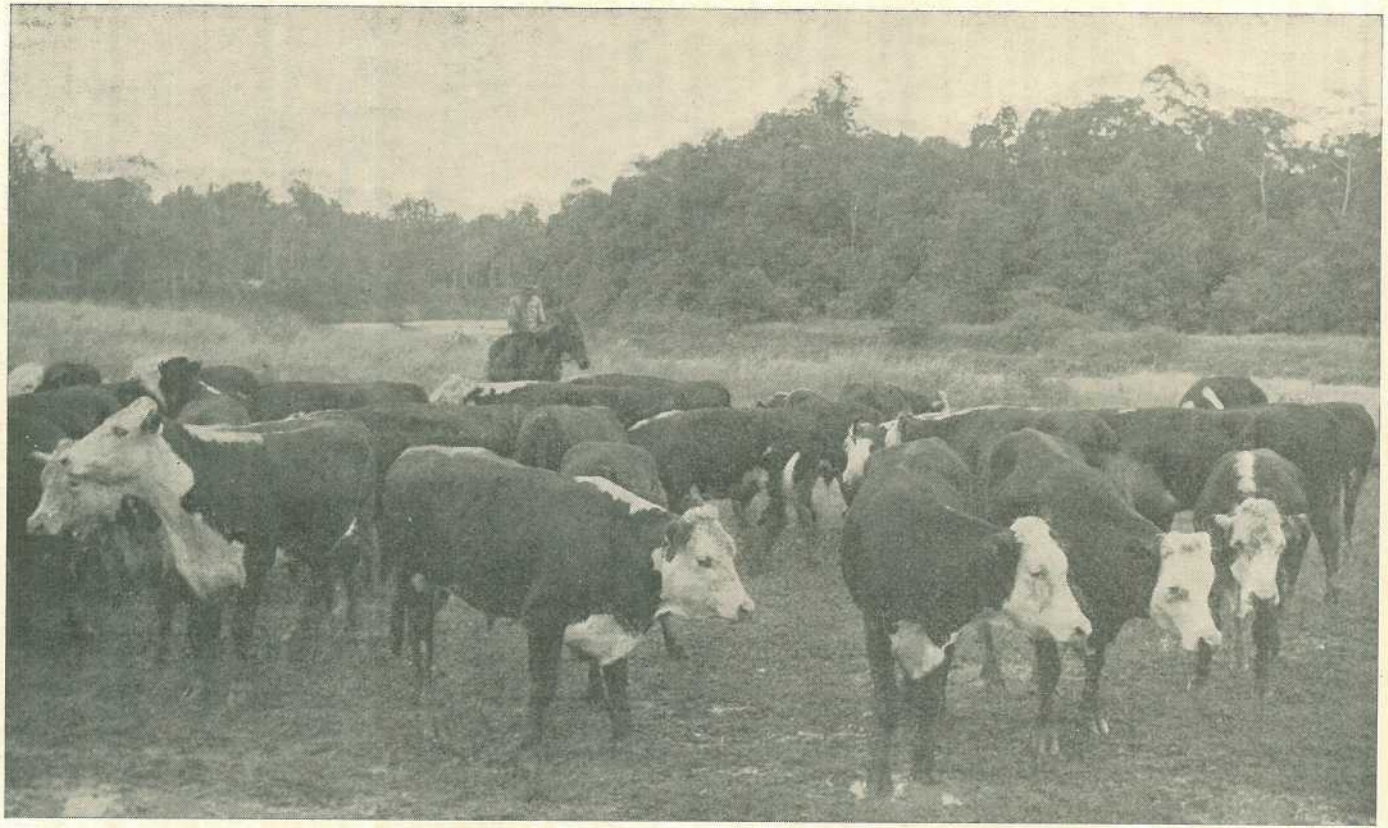


Plate 45.

STORE CATTLE FOR TROPICAL COASTAL COUNTRY.—Some of a mob brought from the interior for fattening on Tully River pastures, North Queensland.

USE OF DIPPING FLUIDS.

Dipping is a routine practice throughout the heavily tick-infested areas of the State, and all solutions used contain arsenic as their base. No other substance has been found to equal arsenic in the treatment of ticky cattle.

The dipping solutions, which are used under Government control, and are applied to cattle moving from ticky to clean country, must, by law, contain 8 lb. of arsenic per 400 gallons of solution. It has been shown, however, that this solution has a reasonably wide margin of safety and that for all ordinary purposes a solution containing 6 lb. of arsenic is effective in the treatment of ticks. It is of interest to note that the South African authorities require a solution to contain just over 6 lb. per 400 gallons.

A cheap and effective dipping solution can be made up by using arsenic and caustic soda. Six lb. of arsenic require somewhere about 2 lb. of caustic soda to dissolve it. If the two ingredients are placed in the bottom of a drum, one on each side, and water added slowly with a cup or pannikin, and the two substances slowly mixed together with a stick, it will be found that the water commences to boil and bubble. This is due to a chemical action taking place between the arsenic and the soda and the former is soon dissolved. Water may then be added up to 400 gallons. A dipping solution such as this is very efficient and cheap.

If washing soda is used, is is necessary to boil the solution before the arsenic goes into solution. This, however, is a disadvantage as it takes time.

Where owners use caustic soda it is very necessary to keep the container closed very tightly so that air does not enter. If exposed to air, the caustic soda is changed chemically by the absorption of moisture, and sodium carbonate or washing soda is produced. Properly sealed containers prevent this.

WATER ON THE GRAZING FARM.

It is not every grazing farmer who is fortunate enough to have surface water on his property. Consequently, provision has to be made for water supply by bore drain delving, well-sinking, or tank-making.

Much money may be wasted in attempted provision of surface water. It is a common experience to see as many as three or four tanks, ranging in capacity from 1,000 up to 1,500 cubic yards, on a single property. These earth tanks provide water in good seasons, but may be quite empty when water is most wanted in a dry time. If the whole of the money invested in "pot holes" had been expended on one large tank, the supply would probably be adequate and permanent, more or less.

A mistake is often made by fencing a paddock and then trying to water it adequately. If, first, a large tank is excavated at a central site and country then subdivided for convenient watering money would be saved, security obtained, and value added to the property.

TALLYING SHEEP.

It may be taken as a fact that unless one is born with or has developed an aptitude for this work he will never make a first-class sheep counter.

There are many methods of counting. The novice will try and count them singly as they come—one, two, three, four, and so on. This is a very slow process, and the gate has to be very narrow if an accurate tally is to be obtained.

Some count in twos—two, four, six, eight, and so on. This again is slow where big flocks have to be dealt with, and the sheep would be better on grass than in the break.

A successful method is to count in groups of three, one up to thirty-three, and let a single sheep go and tally 100.

It is astonishing to observe the speed and correctness of two good counters, one giving delivery and the other taking delivery.

It is a rare thing when two good men are engaged to see a check count, and this applies where thousands of sheep have to be correctly tallied. Constant practice is necessary to keep in form. To this cause may be attributed the fact that many drovers excel in counting sheep.

Washing Milking Utensils.

THE general principles underlying the proper cleaning of all metal milk utensils are very simple, and once understood they can be adapted to the requirements of individual vessels and apparatus used in dairying. For this purpose it is essential to understand something of the nature and composition of milk and its products. Milk is a complex substance consisting of water, butterfat, lactose, or milk, sugar, casein, albumen, and mineral salts. Cream contains the same constituents in different proportions, so that the problem of cleaning is confined to finding effective methods for the complete removal of fats, sugar, proteins, and salts.

The sugar and mineral salts, being mainly in solution, are almost entirely rinsed away in cold water, which will also remove a large part of the fat and proteins. Butterfat, however, occurs in the form of minute globules, and some of these adhere to the surface of milk vessels and require heat and emulsification before they can be washed off. Of the proteins, casein is in suspension in fresh milk (giving milk its white appearance), but it can be coagulated by acid or by rennet to form a solid curd, the hardness of which is increased by heating; albumen is in solution, but, like egg-white, it is readily and permanently solidified by the action of heat. Both these milk proteins possess considerable adhesive properties (casein is used commercially in the manufacture of paints and glues) and they will, *if the preliminary cold-water rinsing is omitted*, stick firmly to dairy utensils, where hot water washing and subsequent sterilisation will only harden them on to the surface. Once fixed there, even in a very thin film, they form a protective layer where bacteria become lodged and breed, and where the sterilising heat cannot reach them, to the detriment of milk and cream quality. Similar protection is afforded by a layer of fat in the form of grease, which can be tested for by passing a finger over the surface of dairy equipment, and which is caused by using insufficient hot water, water at too low a temperature, or the lack of some soap or soda compound to free the fat.

There are, then, three stages necessary to the thorough cleansing of dairy utensils, as distinct from the sterilising, which must follow in order to destroy the harmful bacteria. These three stages are:—

(1) *Cold Water Rinsing.*—Utensils should be well-rinsed as soon as possible after use. This is very important, for milk once allowed to dry is much harder to remove completely. Soaking in cold water for a reasonable time is advisable if washing is not to be done immediately—this will loosen all milk solids and facilitate washing.

(2) *Hot Water and Soda.*—Washing soda, caustic soda, soap, or soap powder are suitable cleansers for farm use (besides many proprietary preparations sold under trade names). Care should be taken to avoid cleansers containing any gritty substance, for this will permanently

damage the surface by scratching, and will rapidly remove tinning. The water should be really hot, and enough soap or soda should be used to emulsify the grease, so that no globules of fat can be seen floating on the surface of the water. A stiff brush should be used on each utensil, and all loose parts such as taps and strainer discs should be dismantled for scrubbing.

(3) *Hot Water Rinsing.*—A final rinse, using fresh hot water, is needed to remove the soda water before sterilising.

Milk utensils, if not properly cleaned and sterilised, are by far the most fruitful sources of contamination in the course of milking and handling milk and cream, and it should be remembered that both processes are equally essential, for satisfactory and complete sterilisation is not possible without first thoroughly cleansing along the right lines.

ARITHMETIC IN THE DAIRY.

Many dairy farmers supplying milk have cows capable of giving more than the one or two gallons they produce, but an owner is often sceptical as to whether the extra food required will be paid for out of increased production.

A simple trial lasting a fortnight will show how to rearrange both feed and production. Arrange for those cows which can be reasonably expected to produce more to get the extra feed. It should take the form of concentrates. A simple mixture for the production of an extra gallon is 3 lb. of maizemeal and of high-quality meat meal. Gradually bring the animals under test on to the full feed—usually a week is adequate. Test over a further week.

The cost would not exceed sevenpence daily per cow. The increased yield in terms of cash then determines whether the particular cows under test are worth the extra feed. If they are, then it may pay to pension off low producers and apply the cost of their food to the purchase of concentrates for the proved animals.

In practically all cases the food for two half-gallon cows or one one-gallon cow costs more than the extra feed which is to produce an extra gallon from a better milker.

The saving in labour also is worth consideration.

MILK STRAINING.

On the most carefully managed farm a certain amount of visible dirt finds its way into the milk. The term "visible dirt" covers such matter as dust, cow hairs, flies, and manure, as distinguished from bacteria, which are not visible to the naked eye. Bacteria may be present in milk which appears perfectly clean, fresh, and pure—and their presence may not be realised until souring begins several hours after contamination. If visible dirt is present in the milk, however, bacteria will be there also, hence the necessity for straining through a suitable strainer. The cotton wool disc type prescribed by the Dairy Regulations is preferable to any other. It can only be used once, and there is no risk of contaminating fresh supplies of milk, as sometimes happens with a cloth strainer which has not been properly washed.

It is better to keep visible dirt out of the milk than to strain it out. Early straining is better than last-minute straining, for to some extent the longer dirt is allowed to remain in the milk the greater will be the number of organisms passing into the liquid. The process may be understood more clearly by a rough analogy with making a brew of tea. If the tea leaves are removed soon after the addition of the hot water, the tea remains weak. If they are stirred in the teapot, or left for any length of time, the brew becomes much stronger. Similarly, if dust and dirt are left in the milk, undesirable bacteria, with which every particle of dirt is teeming, pass into the milk and increase the tendency to early souring.

The milk from each cow should be removed immediately milking is commenced and tipped through the straining disc into the receiving tank above the cooler. It will not require a second or even a third straining, for one straining, together with proper cooling, will be sufficient to give the milk a satisfactory keeping quality.

WET OR DRY MILKING?

Many dairy workers, careful in every other way to avoid contamination, still continue the unhygienic practice of wet-handed milking. Moistening the hands with milk direct from the teat or, worse, by dipping into the milk pail, is a deplorable habit, which is responsible for much contamination as well as loss of quality of milk and cream. It is, of course, more serious if washing of the udder and of the milker's hands have been neglected, for then the dirt becomes intimately mixed with and well distributed throughout the milk. A glance at the accumulation between the fingers of a worker engaged in milking an unwashed cow wet-handed will be sufficient evidence of the truth of this statement.

Where washing of the udder and teats and discarding of the foremilk have been carried out and the milker's hands have been washed, "wet" milking is less objectionable, but the fact remains that all the cleanest and most efficient up-to-date dairy farmers milk dry-handed, and this is a necessity for the production of milk for sale as "Tuberculin Tested" or "Accredited" in England, and for the majority of organised milkers' competitions. "Dry" milking means that the hands are washed immediately before starting to milk and after completing each cow, being left slightly moist after washing, and kept as free from milk as possible.

Some farmers, mostly those who have not persevered with dry milking long enough to give it a fair trial, object to it as being slow and difficult, especially as regards stripping. It has, however, been found by hundreds of others to be equally rapid and simple after a little practice, provided that the hands are left damp and the teats sufficiently moist after washing to make them pliable.

It is true that there are individual cows with badly-formed abnormal teats, or with one or more sore teats, which are difficult to milk dry-handed. For dealing with these, the clean milker uses a small quantity of ordinary vaseline applied to each teat after washing, which not only serves as a lubricant but also assists in the healing of the damaged skin, and helps to prevent particles being rubbed off into the milking pail. Teat sores should be treated with some antiseptic ointment between milkings. This also prevents their becoming more serious through being worried by flies. Great care should be taken by the milker to wash his hands thoroughly after each cow, for, obviously, this is a great factor in checking the spread of infectious sores, and the transfer of bacteria picked up from the cow's coat, leg ropes, stool, walls, &c., to the freshly-washed udder of the next animal. (If a towel is used, it should be changed often enough to make sure that it is an asset to the hygiene of the milking shed. The clothes of the milker may also constitute a source of danger to milk quality—if, for instance, the same clothes are worn for milking as for feeding the pigs, grooming the cows, and removing manure. A pair of overalls or a sugar-bag apron, kept for milking only, and washed out at least once a week, is within the reach of all.)

Vaseline may be found of assistance to the man who has made a long practice of wet-handed milking when he first attempts the "dry" method, especially in stripping. It is preferable to use vaseline if, by thus easing manipulation, it prevents excessive downward jerking of the teats, which is often resorted to by an impatient milker, and which is not only quite unnecessary, but ruinous to the delicate udder tissues. After a time, however, it will be found that dry milking can be carried out easily and rapidly with no lubricant other than the moisture supplied by washed teats and hands.

This is being done on hundreds of modern dairy farms, where greater efficiency and increased keeping quality are aimed at, and, once established, this method is seen to be far superior to the old, which appears unhygienic, messy, and insanitary by comparison.

SCUMMY CREAM.

It often happens that when cream is being put through the strainer into the vat at a factory, a quantity of thick, greasy substance is retained by the strainer. In most cases, this is due to the inclusion of the thick scum from the interior of the separator bowl with the cream. This is a practice which cannot be condemned too severely and results frequently in the cream being graded down.

ANTISEPTICS.

Antiseptics are useful in the treatment of a wound and can be applied in two ways:—

1. As a weak solution to wash out the interior of the wound.
2. As dressings impregnated with the antiseptic to absorb any discharge and prevent the further growth of germs. They also prevent contamination from outside sources.

Stockowners frequently use antiseptics at too great a strength, and do more harm than good. Some tissues are very susceptible to injury, and solutions should not, therefore, be used at more than the recommended strength.

Antiseptics are particularly valuable for cleansing the hands before touching a wound, and in concentrated form some can be used to sterilise instruments when boiling water is not available.

After shaving off the hair surrounding a wound, the skin requires treatment with an antiseptic solution before any surgical operation.

In emergencies, a wound should first be cleaned, then treated with an antiseptic, and protected from contamination.

Some common antiseptics are:—

Tincture of iodine—invaluable for immediate application to cuts and scratches.

Methylated spirits—used in undiluted form causes smarting, but has no ill effect on the tissues.

Permanganate of potash (commonly, though not correctly, known as Condy's fluid) can be added to boiled rain water to make a deep pink antiseptic fluid which is mild in its action.

Boric acid—a saturated solution is made by adding two teaspoonfuls to each pint of boiled rain water, and allowing the undissolved material to settle. A useful eye lotion can be prepared by mixing equal parts of the saturated solution and water.

Peroxide of hydrogen—an antiseptic and a deodorant. It is usually used at a 3 per cent. strength, and may be purchased as such. The stronger 30 per cent. solution must first be broken down to a milder form by adding 9 parts of water to 1 of the solution.

PEANUT RESIDUES FOR DAIRY CATTLE.

In preparing peanut residues for market, the shells, small particles of kernel, leaf and stalk or root attachments are separated and represent offal.

The shells and stalky parts are only low-grade roughage, but when, as often happens, the leaf and kernel fragments form an appreciable part of the bulk, the offal has a feeding value comparable with fair hay.

A sprinkling of water sweetened with molasses induces dairy cattle to eat their fill.

Dairy farmers seeking a cheap source of roughage are recommended to use the abovementioned product of a Queensland industry.

THE BULL RUN.

The bull should be kept away from the rest of the herd in a separate run securely fenced and provided with water and shelter. A small service yard and a crush to facilitate the handling of the bull when necessary should also be provided.

The advantages gained by keeping the bull away from the herd are:—

1. Calving can be regulated.
2. It is easier to decide whether or not the cow is in calf.
3. The bull's services are controlled and not wasted.
4. There is less likelihood of the cows having to return to the bull.

If the run is placed well away from a public road any annoyance caused by a neighbour's cows breaking into the bull or the bull breaking out is avoided.

Suppurative Ear Disease of Pigs.

SUPPURATIVE Ear Disease is one in which an abscess forms in the deep-seated portion of the ear. It is serious when it makes its appearance in a piggery because it interferes with an animal's ability to walk straight and to feed. It checks the rate of growth and may even cause loss of condition. Once established in a piggery it may affect many of the young pigs reared.

Cause: The cause of this disease is a special micro-organism which invades the throat producing an inflammation which spreads along the narrow passage connecting the throat with the middle ear and leading to an abscess in the latter. The pus formed presses on the organ of balance, which is situated close by, interferes with its function and so causes the characteristic symptoms.

A pre-disposing cause is the presence of catarrh of the nose or throat. This permits the ready entry of the organism through the tissues of the throat and so the disease is often seen in pigs which are suffering from disease of the respiratory tract; for example "snuffles," and "pants" (pneumonia).

Popular opinion is that the condition results from infection passing in through the ear, this being brought about by liquid foodstuffs, especially hot swill, being accidentally poured into the ear as troughs are being filled. This is not so; the disease commences in the throat and when a discharge comes from the ear it is because the abscess inside the ear has broken out through the ear-drum.

Symptoms: The symptoms of this disease are so characteristic that there can be no mistaking them. The pig holds its head to one side, usually with the snout somewhat raised, in an attitude that can best be described as "listening." It is the lower ear which is affected and at times it may show a discharge, but this is not always so. The animal is unable to walk in a straight line and may circle around making more than one attempt before it can reach the feed trough. Sometimes it will pass the trough on one side, sometimes on the other, apparently unable to judge direction.

Effects: The results of this disease are unthriftiness and lessened growth-rate, and so unprofitable pigs. It is obvious that any pig which is as consistently late at meal-times as these "listeners" will be unthrifty. Such a handicap is too great to allow it to compete with its pen-mates for its proper share of food; its growth-rate suffers due to this underfeeding and it takes months longer to reach marketable weights, so leaving little or no profit in rearing it. Meanwhile it has been acting as a reservoir of infection increasing the risk of other pigs catching the disease.

Treatment: There is no effective treatment for Suppurative Ear Disease as the condition is too deep-seated. Bad cases should be destroyed as they prove too unthrifty to be profitable. Other cases should be penned separately both to check the spread of the disease and also to enable them to be fattened by removing them from competition with sound pigs for food. Their disposal for slaughter as soon as possible is essential.

Control: This is a disease where the soil and surroundings become contaminated with the causative organism and so indirectly infect fresh subjects. It can be checked if not entirely eliminated by attention to hygiene and diet.

1. All affected animals should be isolated as soon as noticed, this applying not only to "listeners" but also to cases of catarrh and "pants." This isolation should be in pens well removed from the main piggery the drainage of which does not contaminate other pig pens or pastures.
2. All pens should be well drained and kept free of mud-holes, dung, litter, and rubbish. Most conditions favour survival of bacteria, and when the yards are kept free of rubbish they receive the full benefit of the drying, as well as of the disinfecting action of the sun's rays.
3. Feeding should be done from clean troughs, on clean concrete platforms, to reduce as far as possible the chance of the causative organism being taken in with the food.
4. Diet should be liberal and nourishing. Green feed is necessary to keep the membranes lining the respiratory passages in such a condition as to resist infection.
5. Good housing, provision of warm, dry, sleeping quarters, and protection from inclement weather, prevents much of the cold and catarrh which predisposes to ear disease.
6. Overcrowding is to be avoided since it not only predisposes to colds and catarrh but also hinders the maintenance of good hygienic conditions in the yards. Provision of fresh paddocks on clean, uncontaminated ground and the constant use of the rake and the shovel are steps to improving hygiene in the average piggery.

Finally, the provision of adequate good food, clean water supplies, exercise, and clean, dry, warm, sleeping quarters keeps the animals in the best possible condition to resist infections of any kind.

POINTS IN PIG FEEDING.

Grain feeding enters largely into successful pig raising; consequently, the form in which it is fed is important. Pigs which have been fully fed with corn through their growing period usually make good use of the whole grain, and corn-in-cob feeding may be adopted. Animals fed with corn only occasionally may not masticate it thoroughly, and a waste is incurred. For these, a preliminary cracking is advisable.

Well-ground grain is usually fed only to stud animals or stock for exhibition. The appearance of whole grain in the dung may induce pigs to eat excreta. This is a clear-cut case for grinding.

Milling by-products are usually fine, and this may be a disadvantage when the pens are in an exposed position or during windy weather. The waste may be considerably reduced by wetting.

There is no need to prepare pumpkins or squashes, beyond the breaking of hard-skinned varieties, e.g., ironbark pumpkins.

Most tubers may be fed as harvested, or the pigs may be allowed to harvest them for themselves. It is advisable to cook potato "culls."

Milk, milk products, seed cake preparations, meat and blood meals, and cereal by-products require no preliminary treatment.

Lucerne or other roughages are usually well masticated by older pigs, and young pigs eat such small quantities that there is no point in chaffing.

LITTER LOSSES.

Of all the difficulties with which the pig raiser has to contend, none involves such heavy financial loss as that associated with mortality in young pigs prior to the stage, and age, at which they are ready for market. Probably 25 per cent. of the average litter of pigs is lost before the weaning age (eight weeks).

The commonest cause of death before weaning is lack of attention at the time of farrowing, a number of pigs being suffocated at birth or killed by the sow. Premature birth also causes considerable loss.

It must be remembered that pregnant sows may be underfed and improperly prepared for farrowing in several ways. Lack of succulent green food, drinking water, mineral matter, readily digestible food, and also want of exercise are frequent causes of trouble at farrowing time.

The remedy on many farms lies in providing the necessary supplements to the food supply.

Strict limitation of the food supply a day or two before farrowing is necessary. Careful feeding, a clean, dry, nicely bedded pen with suitable farrowing guards and quiet surroundings in which the sow can settle down are very important.

Losses after weaning also are unusually heavy where management is slack. The period dating from the eighth to the twelfth week after birth is one of the most susceptible in the life of a pig. The system adopted should aim at feeding the young pig in such a way that there will be no check in growth before, at the time of, or after weaning. Care should always be taken to minimise the "shock" of the change over from the sow's milk to other foods by providing, for instance a separate pen in which the young pigs can feed apart from the sow.

The greatest check in growth results from the young pigs having to contend with older pigs at the feeding trough. Additional hindrances are overcrowding, filth, dampness, parasite infestation, and lack of clean drinking water.

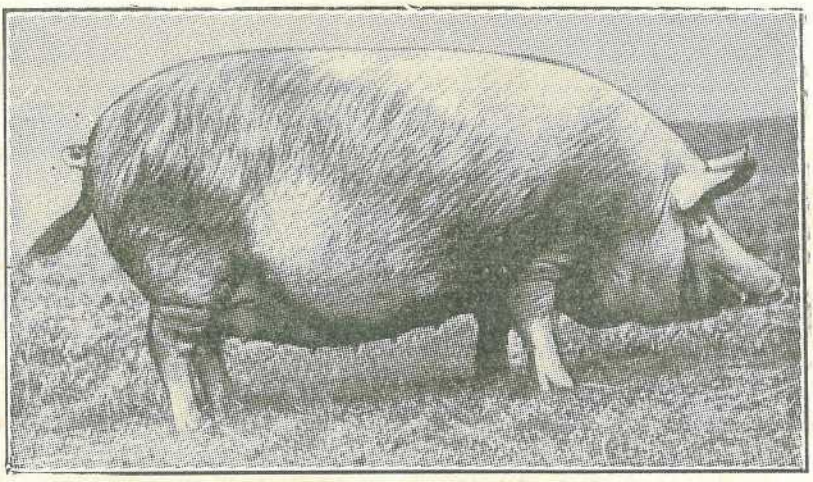


Plate 46.

THE MODERN TYPE OF TAMWORTH PIG.—A prize-winning sow carrying many desirable features, including light forequarter and small head, deep roomy body, well-proportioned hams and a deep level underline with well-developed teats. Note also fine skin and hair and evidence of careful breeding and development.

A GOOD BACONER.

The most important single attribute of a good bacon pig, provided, of course, the pig is in suitable condition and is very fleshy, is length of body. Measurements have shown that at about 120 lb. dressed weight, long-bodied pigs possess as thick, if not thicker, streaks of lean meat than short pigs. Lengthy pigs tend to have that leanness throughout which now is in such great demand. Long-bodied pigs have, generally, lighter shoulders than short pigs at the same weight. Undue length, of course, has disadvantages, but not as many as undue shortness, because the shorter pig always has a tendency to become overfat, while the longer pig carries more lean meat.

The framework of the pig tends to become coarser, and the hams not so fully developed, if the pig is kept growing. There is a tendency also for the flesh to be not so well proportioned throughout the thicker portions of the carcase.

It is false economy to hold pigs until they become over-fat.

MANGE IN PIGS.

Caused by a minute, worm-like mite which lives in the hair follicles and sweat glands of the skin, the condition described as demodectic mange in pigs is one which the pig-raiser ought to know all about, because its presence sometimes results in the de-grading of carcasses, especially of those submitted for export.

The mites are microscopic in size, measuring only one-hundredth of an inch in length.

The lesions of demodectic mange first appear, as a rule, on the snout, eyelids, elbows, and knees. In the initial stages, the areas attacked have a reddened, scurfy appearance with numerous small, hard nodules scattered over them. These become infected with bacteria and begin to ooze pus and serum. The disease gradually spreads over the throat, breast, abdomen, and elsewhere where the skin is soft and thin.

In its early stages demodectic mange may be checked by frequent applications of crude oil. The disease, however, is very difficult to cope with, and once it appears it is best to get rid of infected animals and to isolate all other animals which have been in contact with them for at least a fortnight. In addition, the sties should be cleaned out thoroughly with boiling water and soda, and then disinfected.

A CHEAP PIG OILER.

Plate 47.

To make a practical pig oiler, set a round post in the ground, leaving 3 or 4 feet exposed. Wrap with one or two old bags, then cover the bags with old rope, starting from the ground and working up. Be sure to fasten ends of rope securely and be sure the spirals of rope are wound tightly against each other. Saturate rope and bags with old crankcase oil and you have a practical oiler that will last a long time.

Name and Address.	Name of Hatchery.	Breeds Kept.
F. J. Akers, Eight Mile Plains ..	Elmsdale ..	Australorps
W. Brown, Waterworks road, The Gap, Ashgrove	Strathleven ..	White Leghorns
J. Cameron, Oxley Central ..	Cameron's ..	Australorps and White Leghorns
M. H. Campbell, Albany Creek, Aspley	Mahaca.. ..	White Leghorns and Australorps
J. L. Carrick and Son, Manly road, Tingalpa	Craigard ..	White Leghorns and Australorps
J. E. Caspaney, Kalamia Estate, Ayr	Evlinton ..	White Leghorns
W. Chataway, Cleveland ..	Wilona ..	White Leghorns and Australorps
N. Cooper, Zillmere road, Zillmere	Graceville ..	White Leghorns
R. B. Corbett, Woombye ..	Labrena ..	White Leghorns and Australorps
Mrs. M. M. Cousner, The Gap, Ashgrove	Progressive Poultry Farm	Australorps and White Leghorns
Dr. W. Crosse, Musgrave road, Sunnybank	Brundholme ..	White Leghorns, Australorps, Rhode Island Reds and Whites
O. M. Dart, Brookfield	Woodville ..	White Leghorns, Australorps, Langshans, and Rhode Island Reds
Dixon Bros., Wondecla	Dixon Bros. ..	White Leghorns
T. Duval, Home Hill	Athalie ..	White Leghorns and Rhode Island Reds
E. Eckert, Head street, Laidley	Laidley ..	Australorps, Langshans, and White Leghorns
Elks and Sudlow, Beerwah ..	Woodlands ..	White Leghorns and Australorps
F. G. Ellis, Old Stanthorpe road, Warwick	Sunny Corner ..	Australorps
B. E. W. Frederich, Oxley road, Corinda	Glenalbyn ..	Australorps
W. H. Gibson, Manly road, Tingalpa	Gibson's ..	White Leghorns and Australorps
Gisler Bros., Wynnum	Gisler Bros. ..	White Leghorns
G. Grice, Loch Lomond, via Warwick	Kiama	White Leghorns and Australorps
J. W. Grice, Loch Lomond, via Warwick	Quarrington ..	White Leghorns
Mrs. M. Grillmeier, Milman ..	Mountain View	Australorps and Minorcas
C. and C. E. Gustafson, Tannymorel	Bellevue ..	White Leghorns, Australorps, and Rhode Island Reds
C. Hodges, Kuraby	Kuraby ..	White Leghorns and Anconas
H. Hufschmid, Ellison road, Geebung	Meadowbank ..	White Leghorns, Brown Leghorns, Minorcas, Australorps, and Rhode Island Reds

Name and Address.	Name of Hatchery.	Breeds Kept.
S. W. Kay, Cemetery road, Mackay	Kay's Poultry Stud	White Wyandottes, Light Sussex, Rhode Island Reds, Australorps, White and Brown Leghorns
W. A. Lehfeldt, Kalapa ..	Lehfeldt's ..	Australorps
F. W. R. Longwill, Birkdale ..	Nuventure ..	Australorps, White Leghorns, and Light Sussex
J. McCulloch, Whites road, Manly	Hinde's Stud Poultry Farm	White and Brown Leghorns and Australorps
W. S. McDonald, Babinda ..	Redbird ..	Rhode Island Reds and Anconas
F. W. McNamara, Vogel road, Brassall, Ipswich	Franmara ..	White Leghorns and Australorps
A. Malvine, Junr., Waterworks road, The Gap, Ashgrove	Alva	Australorps and White Leghorns
H. L. Marshall, Kenmore ..	Stonehenge ..	White Leghorns and Australorps
W. J. Martin, Pullenvale ..	Pennington ..	Australorps, White and Black Leghorns
C. Mengel, New Lindum road, Wynnum West	Mengel's ..	Australorps
J. A. Miller, Charters Towers ..	Hillview ..	White Leghorns
F. S. Morrison, Kenmore ..	Dunglass ..	White and Brown Leghorns and Australorps
Mrs. H. I. Mottram, Ibis avenue, Deagon	Kenwood Electric	White Leghorns
J. W. Moule, Kureen	Kureen ..	Australorps and White Leghorns
D. J. Murphy, Marmor	Ferndale ..	White and Brown Leghorns, Australorps, Silver Campines, and Light Sussex
A. C. Pearce, Marlborough ..	Marlborough ..	Australorps, Rhode Island Reds, Light Sussex, White Wyandottes, and Langshans
E. K. Pennefather, Douglas street, Oxley Central	Pennefather's ..	Australorps and White Leghorns
G. Pitt, Box 132, Bundaberg ..	Pitt's Poultry Breeding Farms	White Wyandottes, White Leghorns, Brown Leghorns, Australorps, Rhode Island Reds, Langshans, and Light Sussex
G. R. Rawson, Upper Mount Gravatt	Rawson's ..	Australorps
J. Richards, P.O., Atherton ..	Mountain View	Leghorns and Australorps
W. G. Robertson, Bilsen road, Nundah	Ellerslie ..	Australorps, Light Sussex, and Plymouth Rocks
C. L. Schlencker, Handford road, Zillmere	Windyridge ..	White Leghorns
S. E. Searle, New Cleveland road, Tingalpa	Tingalpa Stud Poultry Farm	White Leghorns and Australorps
W. B. Slawson, Camp Mountain	Kupidabin ..	White Leghorns, Australorps, and Light Sussex
Mrs. A. Smith, Beerwah	Endcliffe ..	Australorps and White Leghorns
A. T. Smith, Waterworks road, Ashgrove	Smith's ..	Australorps and White Leghorns
T. Smith, Isis Junction	Fairview ..	White Leghorns and Australorps
H. A. Springall, Progress street, Tingalpa	Springfield ..	White Leghorns
A. G. Teitzel, West street, Aitkenvale, Townsville	Teitzel's ..	White Leghorns and Australorps
W. J. B. Tonkin, Parkhurst, North Rockhampton	Tonkin's ..	White Leghorns, Australorps, and Rhode Island Reds
P. and K. Walsh, Pinklands, via Cleveland	Pinklands ..	White Leghorns
W. A. Watson, Box 365 P.O., Cairns	Hillview ..	White Leghorns
G. A. C. Weaver, Herberton road, Atherton	Weaver's ..	Australorps, White and Brown Leghorns, Anconas, Minorcas, Rhode Island Reds, Indian Game, and Bantams
H. M. Whitty, Boundary road, Kuraby	Witty's ..	White Leghorns and Anconas
P. A. Wright, Laidley	Chillowdeane ..	White Leghorns, Brown Leghorns, and Australorps

EARLY LAYING PULLETS.

The marking of early laying pullets provides a practical method of selection where the trap nest is not used.

Records obtained by trap nesting in various parts of the world show that—

(1) Early laying pullets are, as a rule, the highest producers;
(2) Birds that lay late into the autumn and are late in moulting are also high producers.

As the early layers and late moulters are high producers, a marking system will assist in distinguishing between profitable and unprofitable fowls.

In one convenient system of marking, a coloured leg band is placed on the left shank of all pullets that start to lay before six months of age. A band of another colour is attached to the left shank of pullets starting to lay when six and seven months of age, and a third coloured band is used for fowls which commence to lay in the eighth month. Pullets that do not lay until after the eighth month should be eliminated from the flock, or kept in a pen by themselves, and forced for egg production.

Pullets which are early layers show the following characteristics:—

(1) A large red comb;
(2) An active disposition and a ravenous appetite;
(3) Roominess between the keel and pelvic bones;
(4) An occasional disappearance of the yellow coloration round the vent in some yellow shanked varieties.

In small flocks, individuals showing the above characteristics may be caught in the nest and then marked.

During the following season, all fowls that were marked as late maturing the previous autumn and moult in December, January, and February can be culled. All the early laying birds and those that moult after 1st March may be kept for layers or placed in a special breeding pen and mated to a male known to have come from a high laying hen that has been trap nested. In this way the egg production of the offspring may be raised.

The method outlined is simple and, if properly employed, will raise the level of production in a flock.

EGG PRODUCTION.

In breeding poultry the farmer should exercise the utmost care in order to establish and maintain a high-quality flock. Considerable progress has already been made in the improvement of breeding practice. Egg production has been increased from about 60 eggs to over 200 eggs per bird per annum, many individual pullets laying over 300 eggs in a year.

In dealing with the egg production in a flock of birds consisting of an equal number of pullets and hens, many authorities quote twelve dozen as a fair average annual production. It is doubtful, however, whether there are many poultry farmers in Queensland who obtain an average production per bird of less than thirteen dozen eggs yearly. In some experiments conducted at the Animal Health Station, using White Leghorns purchased from a poultry farmer as day-old chickens, the average production over the two years was 181 eggs per bird, the variations being—pullet year, from 194 to 209 eggs; second year, from 155 to 162 eggs. In these experiments 116 pullets were used, and the average of the two years was over fifteen dozen eggs, and even these birds in their second year laid over thirteen dozen. The birds were kept under poultry farm conditions.

The poultry farmer should be able to obtain an average production at least equal to those figures. A constant high average production is only obtainable by good breeding in conjunction with good mnaagement and feeding.

The chief considerations in establishing standards of good breeding are:—Type, constitutional vigour, action, and laying characteristics. Having selected birds reasonably true to type, care must be taken to see that they are of strong constitutional vigour. This is indicated by the vitality, stamina, health, brightness, and alertness of the bird, and is of equal importance to the knowledge of the actual number of eggs laid. As an example, some years ago the first three birds in a laying test laid 302, 296, and 294 eggs, respectively. An examination of these

birds at the conclusion of the test showed that the first and second birds were weak in constitution, whereas the third bird was very strong. All these birds were used as breeders, but while the progeny of the first and second hens were disappointing layers, the descendants of the third bird have performed very well in laying tests every year since. That example should emphasise very clearly the necessity for rejecting birds that are weak constitutionally.

Admittedly, it takes courage not to breed from a 300-egg bird. If such a bird produced the eggs without a heavy drain on her body she would be constitutionally strong. If, however, the bird rapidly loses condition during the year, she is obviously weak in constitution and, consequently, would probably be an indifferent breeder. Any bird that is unable to stand up to a heavy season's laying without losing condition cannot be expected to give high-laying progeny and should be discarded, irrespective of other characteristics.

FEEDING CHICKENS.

Feeding of chickens is important in maintaining size of body and the establishment of a flock of birds which will have the stamina to lay large numbers of eggs, and at the same time have the capacity to transmit the characteristic of egg production to their progeny. Attention to detail in the management and feeding of chickens is just as important as the ration fed.

Experiments conducted by the Department of Agriculture and Stock indicate a ration which gives excellent results, producing rapid growing, strong, vigorous chickens. The ration was are follows:—Maizemeal, 40 lb.; pollard, 20 lb.; bran, 20 lb.; dried buttermilk, 10½ lb.; meatmeal (containing bone), 7½ lb.; fine salt, 1 lb.; cod liver oil, 1 lb.

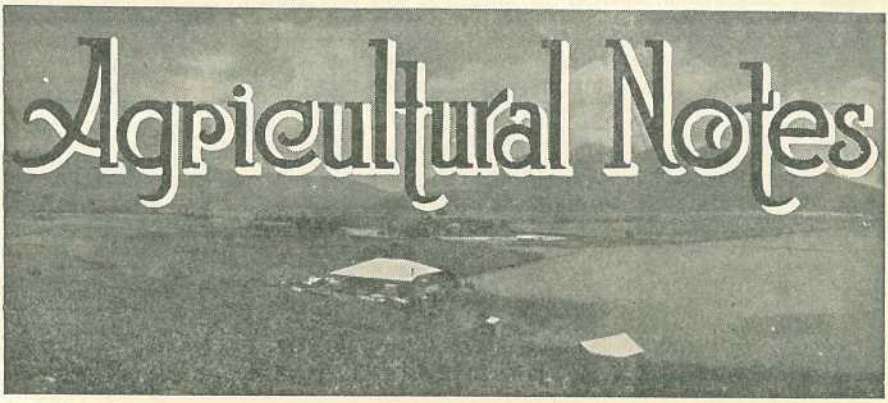
This was an all-mash ration and was fed in troughs in a dry state from the first meal until the chickens were eight weeks old. Grain or chick food was not given. Young succulent greenstuff is the only additional food that should be fed with such a ration.

The troughs or trays should vary in size in accordance with the number of chickens, but should be only about 1 inch high for chickens under one week old. From the first to the third weeks the sides of the troughs should be 2 or 3 inches high, and at least 4 inches high for older chickens. To prevent wastage, cut wire netting 1-inch mesh so as to fit loosely inside of the trough and place it on top of the mash. These troughs can be easily and cheaply made, and it is important that a number is provided for each lot of chickens, thereby ensuring plenty of feeding room. A good supply of feeding vessels allows the chickens to feed in comfort, thereby stimulating consumption and growth.

The old saying of feeding chickens "a little and often" has been lost sight of since the adoption of the practice of dry feeding. However, the continuance of this time-honoured practice is strongly recommended. It is advisable to have a bucket of mash in each pen and on every visit to the chickens to add a small quantity of mash to each trough. Chickens will immediately become interested and eat the fresh food.

A constant supply of fresh, clean, cool water should be provided in containers which do not permit of the chickens getting wet.

Grit in the form of coarse sand, or hard flint grit, also should be provided.



Fodder Crops in the Maranoa.

THE last dry spell brought home to many farmers and graziers in the Maranoa the necessity for making full use of summer rains to provide a supplement to natural pastures and to accumulate reserves of fodder in order to avoid the stock losses that have been experienced.

This lesson has resulted in a wide-spread interest in the possibilities of sorghum and, in view of the confusion that exists both as regards nomenclature and the uses of the different varieties, these notes may assist in clarifying the position.

Nomenclature appears to be giving trouble, and there appears to be an impression in some cases that some sorghums are poisonous and others are non-poisonous. This is not so. The confusion appears to be due to a tendency to refer to the varieties of sorghum such as Wheatland Milo or Saccaline as something quite distinct from sorghum itself. This is perhaps inevitable because of the fact that the crop is comparatively new to the Maranoa district, and, to make the matter clear, the following simple classification of the sorghum group should be kept in mind.

Five main types may be considered. They are—

1. The grass sorghums which include Sudan grass and Johnstone grass.
2. The dwarf grain sorghums for harvesting with a header—e.g., Wheatland Milo, Kalo, Hegari.
3. Tall grain sorghum which includes Feterita and Milo.
4. Saccharine sorghum which includes Saccaline, Planters' Friend or Imphee, Italian, Amber Cane.
5. Broom millet.

It is emphasised that these sorghums are all, to some degree, poisonous at certain stages of growth, but any risks associated with the feeding of the green crop can be minimised by careful management and, in fact, the general experience to date does suggest that the value of these fodders far outweigh the risks. Stunted crops should not be grazed in any circumstances, and care should be taken to ensure that hungry stock are not turned in at any time. When the plants are well in head the danger has passed.

Sudan grass is the most favoured summer crop for hay, and good quality material can be obtained, provided that a fairly close spacing is used. If sown with a wheat drill through every run, fine-stemmed plants will develop which are, therefore, not only more palatable but cause less strain on the cutting mechanism of the binder and are easier to cure than the coarse stems resulting from wide spacing.

All varieties of sorghum will make a good quality silage, provided that the crop is cut at the correct stage and there is no delay in carting the material to the silo. Under the dry, atmospheric conditions of the Maranoa extra care should be taken to ensure that cutting is commenced when the crop is flowering. If grain is allowed to form, the material dries out too rapidly when cut and not

only is the resultant silage likely to be tough but also mould may develop because of the difficulty of excluding air when the material is being tramped down. Mould is, of course, objectionable in any circumstances, but this matter is of particular significance to the sheep grazier. Mouldy silage is especially fatal to sheep and the smaller animals may find it difficult to handle the tough material.

Although, as their name implies, the grain sorghums are primarily intended for grain production, they are quite suitable for feeding off when the grain has formed. Moreover, the stover or dry stalk which remains when the grain has been harvested is a useful standby and has an appreciable feeding value. The dwarf types are of proved drought and heat resistance, and this renders them specially valuable in the Maranoa where both phenomena are all too frequently encountered. From this it will be clear that, although varieties such as Saccaline may give and, in fact, have given satisfactory results where sufficient rain has fallen to ensure full development, as in the late summer of 1940, the dual value of the grain types as sources of both grain and green fodder cannot be neglected. Growers should, in fact, be warned against making wide generalisations as to the value of particular varieties, such as Saccaline, from the results of an exceptional season. Some varieties of feed sorghum are under trial in the district, and it is hoped that among these will be found a suitable tall-growing variety for feed alone.

Of the grain sorghums, Wheatland Milo or Kalo are recommended for the main planting and Hegari for late planting.

In view of the growing interest in silage, following the highly successful results achieved this year at Roma, Dulacca, and Chinchilla, it is stressed that it is a mistake to concentrate on one form of conservation of fodder. Silage gives best results when it is fed in conjunction with hay and grain. A more balanced ration is thus given, and a more economic and efficient utilisation of each type of feed is achieved. For this reason, all those who intend putting down silage during the coming season are urged to make provision for storing hay and grain. Sudan grass may be used for hay, but, by summer fallowing, it should be possible to establish winter fodders, such as Ford or Warput wheat, in March or April, and to utilise the crop partly for green feed and partly for hay. If, in addition, grain sorghum is harvested and the grain stored, there is no reason why any purchase of feed should be necessary during a drought.

The questions naturally arise—how much is to be stored, and what acreage should be set aside for conservation? It is essential that there should be sufficient for any probable requirements, and more harm than good is done if the fodder runs out before the drought ends.

Conditions will vary in each part of the district and in individual properties, but, as a very rough guide, the following basis might be worked out:—

Assume a ration of 2 lb. hay, 2 lb. silage, and ½ lb. grain per sheep—but, remember, that this is an assumption not a recommendation, and settlers should seek further information in regard to suitable rations in accordance with their individual requirements. Assume yields of 1 ton hay per acre, 6 tons silage per acre, and 20 bushels grain sorghum per acre. On this basis, the acreage required for 1,000 sheep for one month's feeding would be 25 acres hay, 5 acres silage, and 10 acres grain. Where dry grass of good quality is available, the amount of hay could be reduced, and, of course, yields of crops are subject to such wide variation that the figures given must be regarded as no more than a foundation on which to build up an estimate in each individual case.

THE SWEET POTATO.

The sweet potato is not cultivated in Queensland to-day to the extent that its usefulness warrants.

When questioned about the shortage of sweet potatoes for table use, the farmer usually replies, "There is no demand for them." This is true only in part, but the demand still exists for the right varieties. A dry, floury, or a moderately moist potato will suit the consumer best. No doubt, some of the good varieties in use in the past are not now available, owing to droughts and irregular planting, but many are still to be found in certain localities. If the planting is confined to varieties which have proved popular with the consumer, and which could be sold on name, the demand for them should be continuous. Under present conditions a householder may buy sweet potatoes which are unpalatable. If, however, consumers realised that there were different types and varieties of sweet potatoes, they would learn very soon to purchase only types which they like.

Market gardeners might, therefore, cultivate varieties for which they could readily find buyers. Some market gardeners are already doing this with good results. Very watery or stringy varieties are both undesirable. It is a mistake for a grower to allow a portion of his crop to stand over after maturing, as the tubers then begin to deteriorate in quality.

Sweet potatoes are easy to grow and can be raised on a variety of soils, the period of growth from planting to harvesting being approximately three months. The period of planting is dependent very largely on the locality; in most parts along the coast it may extend from October until the end of February. The crop must mature before the frost commences. The crop does not require a big rainfall—in fact, excessive moisture is detrimental to good results, in that it increases the growth of vines, and lessens the crops of tubers.

The most satisfactory method is to plant a few medium-sized tubers in a nursery bed of good friable soil, which is mulched in order to retain moisture and promote rapid growth, and to pick cuttings as growth progresses. A bed of fifty selected tubers planted in this way will provide many thousands of cuttings. The alternative, and less satisfactory, method of obtaining planting material is to procure cuttings from an old plot, which is usually neglected. The terminal cutting from the vine is generally regarded as giving the best results. The land is set up in ridges 3 feet apart. The cuttings should be 12 to 15 inches in length, and planted on the ridge to a depth of approximately 6 inches, cuttings to be set from 20 to 24 inches apart. On well-prepared soil weeds should not be troublesome, and little attention will be necessary until harvesting.

A good crop of sweet potatoes will yield 20 tons of tubers to the acre. Several of the old varieties were known by different names in various districts. A classification of all varieties grown in Australia was carried out in recent years by an officer of the Department of Agriculture and Stock, and cuttings of a known type, together with a number of new seedling varieties, were distributed in different agricultural districts of the State. Some recommended varieties for planting for table use are Gold Coin, Seedling No. 3, Brook's Gem, and Snow Queen.

It is advantageous to the grower to market the tubers in a clean and attractive condition.

AN ANIMAL'S MAINTENANCE RATION.

All livestock rations are divisible into two parts—the part used for maintaining the body in a healthy condition and the part used for production, whether it be for hair, wool, fat, meat, milk, or progeny. Under severe winter or drought conditions, the livestock owner is more concerned with a maintenance standard of feeding, and it becomes important to know where economies may most effectively be introduced.

A short consideration of an animal's reactions to starvation will supply the answer. Take the dairy cow in full lactation: the first defence which nature attempts is a conservation of material and the milk yield falls rapidly. Supplies to the body covering are restricted, and a dull, shaggy, lustreless coat develops. The body reserves of fat are called on and the animal becomes thinner. Horns and hooves become brittle. As starvation advances, some encroachment is made on the last defences—the muscles and vital organs. At this stage the animal weakens rapidly and collapse followed by death results. It is, therefore, clear that the last defences of the body—i.e., the muscles and vital organs—must be protected. For this purpose, the animal must be supplied with protein. In other words, drought feeding should centre round protein-rich foods. Where the stock are close to the source of such foods, the relative merits of each should determine which is to be fed, but on distant properties where freight charges are high it becomes important to buy the most concentrated and most digestible preparations.

Producers often remark that nature gave the sheep a commodious intestinal tract which must be filled, and they usually buy roughage of only moderate protein content. The argument is fallacious when the question is one of maintenance for limited periods only. It is surprising how well sheep can keep their condition on as little as two ounces of cotton seed meal and four ounces of maize daily.

The mineral requirements of stock should be provided for, but the excessive quantity of salt in many licks is unnecessary. Animals are capable of retaining enough salt for normal body functions from a very restricted intake, but lime and phosphate are continuously excreted and must be supplied in greater quantities. More than 30 per cent. of salt in a lick is rarely necessary, and in most cases it could well be less. Lime and phosphate are supplied in a number of forms, but on current prices well prepared sterilized bone meal containing about 20 per cent. protein is, apparently, the best.

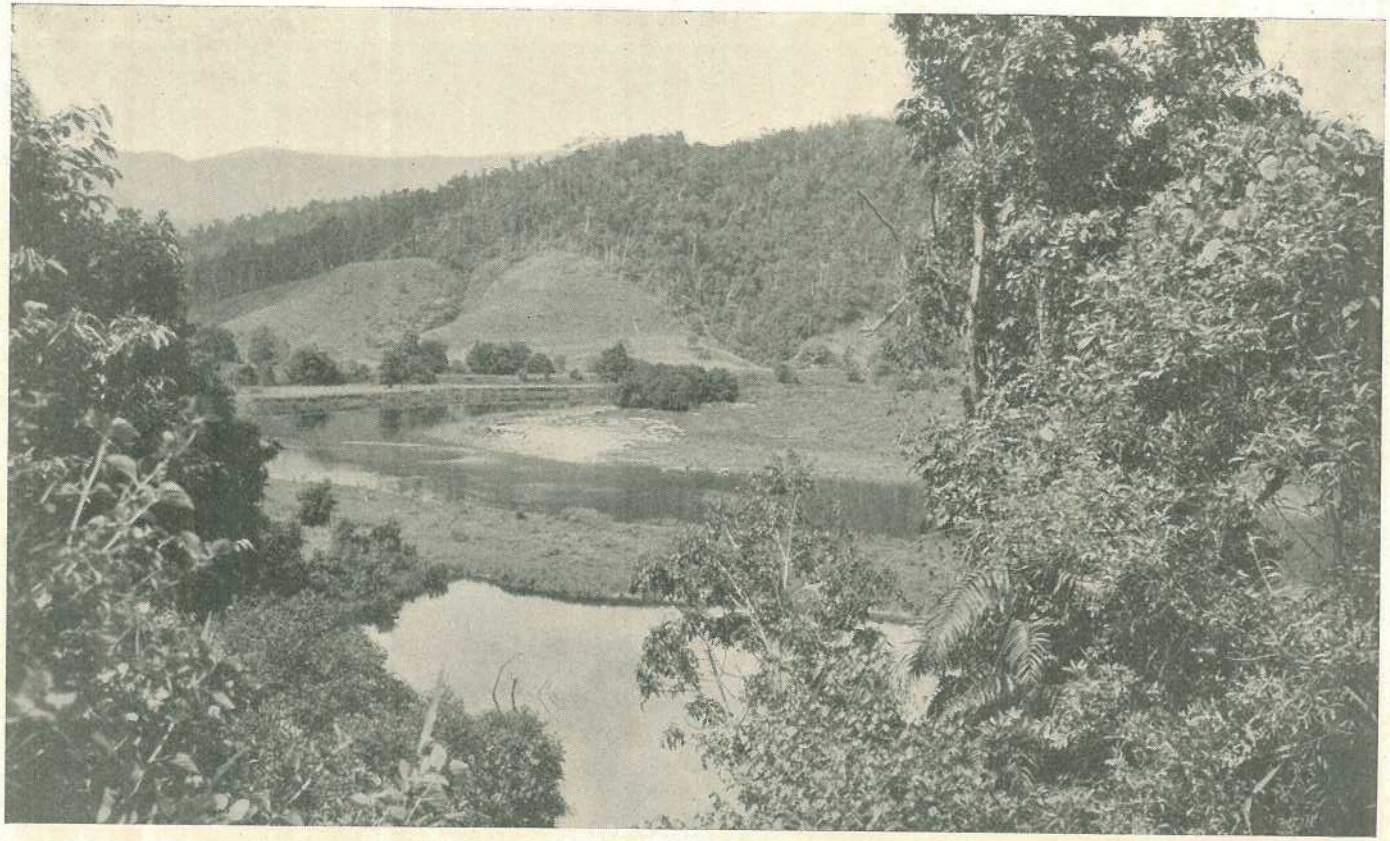


Plate 48.
ON THE DAINTREE RIVER, NORTH QUEENSLAND.

Plate 49.
THE CONDAMINE RIVER AT LYNDHURST.

Tomatoes in the Central District.

NORMALLY with tomato patches on scrub burns, weeds do not trouble the young crop unduly, but it is advisable to check the weed growth which sometimes becomes serious at picking time. The soil around the base of the plants should be kept loose, at the same time, with the hoe. In cultivated areas the land should be kept well stirred and free of weeds, which both rob the soil of valuable moisture and encourage the breeding of pests such as the corn-ear worm and the tomato mite.

Old plants may be cut back profitably if the root systems are reasonably sound and a bunch of fresh growth is shooting from the main stem; if excessive, this flush of new shoots may be thinned lightly. Severe thinning is undesirable, as it is necessary to retain sufficient foliage to keep a reasonable balance between the root system and the parts of the plant above the surface.

A handful of a 4:11:10 chemical fertilizer, containing sulphate of ammonia, superphosphate, and sulphate of potash should be applied to old plants and backward young plants in order to stimulate new growth and blossoming. When the first fruit has set, a dressing of 50-60 lb. of sulphate of ammonia per acre will help to keep the plants moving.

Tomato mites spread rapidly as the warm weather approaches, and quickly cause a dying-back of the foliage from the centre of the plant. Loss of foliage exposes the stems and the fruit to the hot sun with harmful results. For the control of the mite the plants may be sprayed with lime sulphur at a strength of one in eighty. Alternatively, a dust composed of flowers of sulphur and a good quality hydrated lime in the proportion of 1:1 can be used. If mites already are numerous on the plants, spraying is preferable to the dusting. However, if the plants are treated with a sulphur—lime dust from the seed-bed onwards—a satisfactory control of the mites will be obtained.

Damage by the corn ear worm also increases rapidly in the spring, and may be the cause of heavy losses of fruit if not checked at an early stage. Lead arsenate is the most reliable insecticide for this pest, and may be used as a spray or dust. A suitable spray can be prepared by adding 3 lb. of lead arsenate to 100 gallons of water and including a spreading agent. If mites are troublesome at the same time, colloidal sulphur may be included with the lead arsenate. As a dust, the lead arsenate is used diluted 1:1 with either a good quality hydrated lime or sulphur, the latter diluent having the additional advantage of controlling the mite.

Lead arsenate leaves an objectionable spray residue, and should not be used after the plants have commenced to fruit. Constant attention to the control of the corn ear worm up to this stage, however, gives an excellent chance of a reasonable crop.

Leaf diseases and black spot on the fruit frequently appear as the plants age and lose their vitality. Correct manuring, cultivation, and pest control all help considerably to prolong the life of the plant.

When a fungicide is necessary, either a Bordeaux spray or a copper dust may be used to hold the diseases in check. To control pests and diseases with a combination spray, lead arsenate and a colloidal sulphur preparation may be added to the Bordeaux. Lime sulphur cannot be included in sprays containing either lead arsenate or Bordeaux, as such mixtures are liable to injure the plants.

Various proprietary dust mixtures containing lead arsenate, sulphur, and a copper compound are marketed for the purpose of controlling pests and diseases in one operation.

THE EGG PLANT.

The egg plant is easily grown and produces an excellent culinary vegetable. It is grown similarly to the tomato and, like that plant, is very sensitive to cold. It requires a light, rich, loamy, well-drained soil, and poorer ground may be improved by the addition of a 1-4-1 mixture of sulphate of ammonia, superphosphate, and sulphate of potash at the rate of about 5 cwt. to the acre, or by heavy dressings of well-rotted stable manure to which a small quantity of superphosphate has been added.

For an early crop the seed may be sown under cover during July and August; and, when all danger of frost is over, the plants should be set out about 2 feet apart in rows 3 feet apart. Difficulty may be experienced with transplanting, and it is sometimes desirable to sow the seed in the permanent positions for the plants after all danger of cold weather has passed.

Cultivation and plenty of water are necessary for the plants, as they do not recover readily after a check in growth. The plants may be staked like tomatoes. As soon as the fruits are formed, they should be thinned out to leave only eight or ten to each plant. The fruits are picked when from 4 to 6 inches in diameter. The time from seed planting to transplanting is approximately two months, and from seed planting to mature fruit five months. The best variety is the New York Purple Spineless.

For cooking, the fruit should be cut into slices, salted, and fried in batter. In boiling or baking, the fruit should be seasoned with butter, pepper, and salt.

PARSNIP GROWING.

Although the parsnip is a native of England and must therefore be classed as a temperate climate vegetable, it may be grown with reasonable success in the tropics during the winter season.

Soil for growing this vegetable should be deep, rich, and free. A good sandy loam gives excellent results. The soil should be prepared some months previously by trenching or cultivating deeply, and incorporating a heavy dressing of stable manure. Organic manures should never be applied in considerable quantities immediately before planting this crop, as they frequently induce forking of the roots. At the end of the wet season the ground should be thoroughly worked up and reduced to a very fine tilth. The seed is then sown thinly and very lightly raked over, after which the soil should be rolled or well packed down with the back of a spade along the drills. The packing is necessary to ensure close contact between the seeds and the soil. A light covering of old horse manure well crumbled or old sawdust will assist germination by preventing the caking of the surface soil.

As soon as the seedlings are well up, thin them out where they are over-crowded, and when about 4 to 6 inches high thin out finally to about 8 inches apart.

Parsnip seed is usually of rather poor germinating capacity, and is practically useless unless quite fresh.

RE-WORKING DECIDUOUS TREES.

Too much care cannot be bestowed on the selection of scions to be used for grafting. Just as the grower expects to receive good trees from the nursery, so should he, in proposing to rework trees, take care to see that his scions are the best procurable, for the life of a reworked tree should be, if the job is done properly, just as long or even longer than if it had not been regrafted.

The scions should be obtained for preference when the wood is quite dormant, and since "like begets like," they should be taken from selected trees that are healthy in all respects and, if possible, proved good croppers, or they may be taken from reworked trees, the scions of which had been in their turn carefully selected.

Scion wood can be taken from anywhere in the tree, but it should be but one year old—that is, of the previous season's growth—and with apples and pears free from flower buds. With stone fruit this is not always possible, because, in addition to the simple wood buds, they usually have multiple buds—i.e., both flower and a wood bud at the one location; this does not matter, because the outside flower buds will fall off, leaving the dormant wood bud in the middle.

Medium-sized wood is the best. Overgrown, coarse growth with long internodes should be avoided. Small thin growth also is undesirable.

As the grower usually has plenty of wood to select from he can easily see that he has only the right material. If he has not, then he should get it from a neighbour, rather than attempt to use unsuitable material. The grower should see that he has plenty of scions and he will find it advisable to allow for only one scion out of each wood stick. Assuming the wood sticks are about 18 inches long, the grower will usually find that with the bottom 4 inches the buds are poorly developed. The top 6 inches are too thin and the buds immature, leaving but 8 inches of the most suitable wood in the middle of the stick, out of which it is often hard to cut more than one scion. This applies to scion wood other than the peach or nectarine, which is an exception, because in grafting these fruits it is desirable, if the top portion of the scion is of sufficient thickness, to leave the terminal intact.

In grafting, the principle is to graft a dormant scion on to an active stock and then when the sap flows from the active stock into the dormant scion, it brings the dormant buds of the scion into life and growth commences immediately.

Some growers experience difficulty in keeping their scions dormant, but they will have no trouble if they go about it the right way.

The scions kept should not be merely an armful of prunings of the required variety buried in a trench in an orchard, sometimes without even a stick to mark the site, which often means hunting for hidden treasure when the day for grafting arrives. They should first be tied into neat bundles of from forty to fifty scions to a bundle, labelled correctly as to variety and then buried, so that from a third to a quarter of the scion is in the ground and two-thirds to three-quarters above ground.

Choose for the site a place where they have a reasonable amount of moisture, but as little sun as possible, because it is the warmth of the soil that starts them into life. The south or south-westerly side of a building is a good site.

If the grower experiences difficulty in keeping the scions back because of his having a lot of grafting to do, so that the period has to be prolonged, then he should dig them up one evening, leave them out all night and replace them in the soil in the morning. This will act as a check without harming them in any way.

With scions of stone fruit, should the flower buds commence to swell or even come into blossom, the grower should not jump to the conclusion that they are too forward, because, on examination, it will usually be found that the wood bud which is situated in between the flower buds is still dormant. It is when the wood bud commences to shoot that they are too forward. Should the scions show signs of withering through insufficient moisture they should be buried entirely in a moist place for some days. On no account soak them, because this will cause the buds to absorb a large quantity of water which soon dries out again, and there is grave risk of the buds falling out.

When the time for grafting comes and the scions are dug up it will usually be found that callus formation has started at the bottom—this is a normal provision of nature. Should some of the scions have failed to form this callus, however, they should be discarded, because usually there is something wrong with them.

Some growers are inclined to start grafting too soon. This is inadvisable. It is much harder to perform the operation if the sap in the stock is not running freely. In the Stanthorpe district it will be found that the best time to start is in the last week in August or the first week in September for stone fruits, and for apples and pears a month later. The period can be extended to so long as the scions remain dormant.

With grafting there are three essentials:—(1) Healthy trees; (2) good scions; (3) good workmanship. If any one of these three is lacking, then the result must be a failure.

Officers of the Department of Agriculture are in Stanthorpe to assist growers, and should anyone be in any doubt as to whether his trees are suitable for grafting, he should get in touch with the officer in charge who will advise him as to their suitability or otherwise, and the best grafting methods to adopt according to the circumstances.

Further, should a grower be in any doubt as to his own capabilities as a grafter of trees, then the Departmental officers will be pleased to give him the necessary instruction. It is at times hard to understand how some growers, who have but a very hazy idea of grafting, have so little compunction in cutting down perfectly good trees and, through ignorance, spoiling them for all time when an hour or two's tuition would enable them to do the work correctly and without doubts as to its success.

A pamphlet, "Propagation of Fruit Trees," dealing with this and many other points in orchard practice, is available on application to the Under Secretary, Department of Agriculture and Stock, Brisbane.

PRUNING DECIDUOUS TREES.

To make a good job of pruning, good, clean, sharp tools are very necessary. Pruners will find it useful to provide themselves with a light box—fitted with a strap to make carrying easy—for holding secateurs, pruning saw, sharp pruning knife, oil-stone, oil-can, pot of coal tar, a brush and a bottle of disinfectant.

A good pair of secateurs is necessary and it must be kept sharp and smooth. Every pruning cut causes a wound, but wounds of small diameter soon callus over provided the secateurs are sharp and clean. Many pruners try to cut with their secateurs some of the larger limbs, and thus strain both the secateurs and their own wrists, while generally hacking the limb off and leaving rough edges which harbour pests and facilitate the entry of fungous diseases. All large cuts should, therefore, be made with a saw which, like the secateurs, should be both sharp and clean.

A sharp pruning knife is necessary for trimming the rough edges left by the saw, for, if they are not pared, callus formation is slow and the wound may not heal.

The need for an oil-stone and oil is obvious. A rub of the secateur blades on the oil-stone now and again keeps them keen and sharp, and makes the work much easier.

Pruners should always have with them a pot of coal tar, for tar is a disinfectant as well as a wood preservative, and being pliable, makes a good surface covering. After pruning one tree and before going on to the next it is advantageous to paint all large cuts over with coal tar. The operation takes only a couple of minutes, and will help the tree considerably.

Both secateurs and saw often require disinfecting, for many diseases can be transferred from tree to tree by these implements. A strong solution of either formalin or corrosive sublimate rubbed over the blade with a rag will reduce any risk.

The foregoing suggestions are valuable, as fruit trees, on which a man depends for his living and which he expects to keep him for many years, deserve the best treatment possible in regard to pruning as well as to cultivation and manuring.

THE FRUIT MARKET.

JAS. H. GREGORY, Instructor in Fruit Packing.

ALTHOUGH the heat wave of the late summer of 1940 was not repeated, similar conditions in the handling of fruit were experienced. Pineapples and bananas were hard to quit; because of soft rot which occurs occasionally in summer consignments some waste was reported. As mentioned frequently in these notes, Queensland is practically the sole supplier of tropical fruits to Southern markets, and the obligation is on us to give consumers the best value for their money. In this obvious way consumption can be increased. The essentials are quality, careful handling, and attractive presentation. For markets in the South, pineapple-growers should cut their fruit and pack it in good quality woodwool—not bladey grass or coarse woodwool. Banana-growers are advised to continue carefulness in dehanding and breaking fruit from the bunch. All fruit should, of course, be cooled before packing.

Apple and pear growers have a big marketing problem on their hands. "Two apples a day" might supplant the old slogan and, if applied, would go far to solve the pome orchardist's difficulty.

Prices during the last week of February were:—

TROPICAL FRUITS.

Bananas.

Brisbane.—Cavendish: Sixes, 5s. to 9s.; Sevens, 8s. to 11s.; Eights and Nines, 10s. to 13s.

Sydney.—Cavendish: Sixes, 6s. to 8s.; Sevens, 8s. to 10s.; Eights and Nines, 10s. to 12s.

Melbourne.—Cavendish: All grades, 7s. to 11s. Bunch, ½d. to 7d. dozen. Lady Fingers, 1d. to 8½d. dozen.

Pineapples.

Brisbane.—Roughs, 4s. to 6s. case. Smoothleaf, 3s. to 6s. case.

Sydney.—Smoothleaf, 4s. to 9s. (Water blister prevalent.)

Melbourne.—Smoothleaf, 7s. to 9s.

Papaws.

Brisbane.—Locals, 6s. bushel.

Sydney.—8s. to 14s. tropical case.

Mangoes.

Brisbane.—4s. to 6s. bushel.

Passion Fruit.

Brisbane.—First Grade, 10s. to 12s. Seconds, 7s. to 9s. half-bushel case.

CITRUS FRUITS.

Oranges.

Brisbane.—New South Wales Valencias, 12s. to 14s. bushel.

Lemons.

Brisbane.—Gayndah, 14s. to 23s. bushel.

DECIDUOUS FRUITS.

Apples.

Brisbane.—Stanthorpe Jonathan, 6s. to 8s.; Delicious, 6s. to 9s.; Granny Smith, 7s. to 9s.; Dunn, 5s. to 8s.

Pears.

Brisbane.—Packham, 6s. to 9s.; others, 6s. to 8s.

Plums.

Brisbane.—Ponds, 5s. to 8s.; Grand Duke, 5s. to 6s.; President, 5s. to 6s.

Peaches.

Brisbane.—Stanthorpe, 2s. to 4s., demand light.

Grapes.

Brisbane.—Stanthorpe: Coleman, 2s. 6d. to 4s.; Waltham, 5s. to 6s.; Muscat, 2s. to 4s.; Choanch, 2s. to 3s., half-bushel case.

Quinces.

Brisbane.—3s. to 5s. bushel.

Figs.

Brisbane.—2s. to 3s. tray; 6s. to 8s. dozen boxes.

TOMATOES.

Brisbane.—Ripe, 1s. 6d. to 3s.; coloured, 2s. to 5s.; green, 2s. to 4s., half bushel.

Sydney.—2s. to 6s., half bushel.

VEGETABLES.

Cabbage.—Brisbane: Stanthorpe, 4s. to 8s. bag; local, 1s. to 5s. dozen.

Beans.—Brisbane: Stanthorpe, 3s. to 5s. bag; inferior, 2s. to 4s.

Peas.—Brisbane: Stanthorpe, 3s. to 5s. bag; New South Wales, 6s. to 10s. per 2 bushels.

Carrots.—Brisbane: 4d. to 1s. 6d. bundle.

Beetroot.—Brisbane: 3d. to 8d. bundle.

Lettuce.—Brisbane: 1s. 6d. to 4s. dozen.

Choko.—Brisbane: 9d. to 1s. dozen.

Marrow.—Brisbane: 1s. to 5s. dozen.

Rhubarb.—Brisbane: 9d. to 1s. 6d. bundle.

Pumpkin.—Brisbane: 3s. to 5s. bag.

Cucumber.—Brisbane: 3d. to 6d. dozen.

THE WALNUT.

Walnut trees grow well in the cooler parts of Queensland where there is a plentiful water supply and deep and well-drained soil. The trees are ornamental and shady, and there is a good demand for the nuts. The trees should be planted in August or September about 30 feet apart. For a few years after planting, all the training necessary is to cut out crossing limbs and to top the most vigorous shoots in order to form a well-balanced tree; subsequently little pruning is necessary. Seedlings may be raised in a nursery bed and planted out when twelve months' old, but as these may take many years to come into bearing and may not bear large crops of good nuts, it is more satisfactory to buy worked trees of tested varieties (Wilson's Wonder, Freshford Gem, and Franquette are recommended). The nuts fall to the ground when ripe, and to prevent losses by rotting should be gathered frequently and properly dried before bagging. Nuts to be used for seed should be gathered as soon as they have fallen from the tree, and soaked in water for a week just before planting. The best time to plant the seed is about the middle of July.

TALL-GROWING VARIETIES OF BANANAS.

The standard commercial banana is the Cavendish, a relatively low-growing form.

Although some of the tall-growing types—such as the Gros Michel, Williams' Hybrid, Vernon, and Mons Marie—have been in cultivation in small areas for a long period, the demand for suckers of these varieties has only recently become of any consequence. In certain favoured localities, they may yet become as popular as the shorter-growing Cavendish.

The fruit of some tall-growing varieties compares favourably with the Cavendish in both size and quality, while their carrying capacity is frequently superior.

Under ordinary conditions, cultural methods applicable to the Cavendish banana can be used for all varieties. They respond to approved desuckering systems used for the Cavendish and, generally speaking, yield a greater weight of fruit per acre. The returns per acre from tall varieties are thus sometimes better than those received from the more widely grown Cavendish.

Veterinary Medicines.

F. B. COLEMAN, Registrar of Veterinary Medicines.

LIST, No. 4, of veterinary medicines registered for the period January, 1939, to December, 1941 (supplementary to List No. 3 published 1st August, 1940). Compiled to 31st December, 1940, in accordance with section 6 (7) of the Acts.

	Reg. No.
A.C.F. & Shirleys Fertilizers Ltd., Brisbane—	
Andrew Dryden's Famous Condition Powders for Horses and Cattle (replaces Andrew Dryden's Famous Worm and Condition Powders for Horses and Cattle)	452
Cramsie Dwyer & Co., Wallangarra—	
G.T.S. Nycatox	2250
L. W. Finney, Brisbane—	
Telson General Purpose Drench	89
Goldsbrough Mort & Co., Ltd., Brisbane—	
Taipo Sheep Drench	2724
D. Maclean Pty. Ltd., Brisbane—	
Judsol	2634
A. H. McDonald & Co., Brisbane—	
Vetamac Tapeworm Drench (replaces Vetamac Tape and Large Bowel Worm Drench)	2829
Osmond & Sons (Aust.) Pty. Ltd., South Brisbane—	
Osmond's "Vermiline" for Poultry (Worm Expeller and Tonic)	2741
Eclipsal	430
Osmond's Oxygas	209
Osmond's Vaccadyne	331
Osmond's Restoral	2627
Osmond's Pig Powders	347
Osmond's Cattle Oils	348
Bronkos Cough Paste	478
Osmond's Hooseiline	479
Osmond's Ethodyne	1072
Osmond's Cattle Shampoo	1132
Osmond's Vitaline	1917
Osmond's Compound Santonin Worm Powders for Pigs	1477
Osmond & Sons Life Saving Red Draught	329
Parke Davis & Co., Brisbane—	
Aloetic Physic Ball—Veterinary No. 1	2412
Bio 865 Blackleg Bacterin (Formalinized)	2835
Servo Products, Brisbane—	
Antigerm	2746
S. B. Sharkey, Mackay—	
Bot and Worm Expeller	424
Taylors Elliotts & Australian Drug Pty. Ltd., Brisbane—	
Elliotts Worm and Fluke Drench (Double Strength Carbon Tetrachloride)	2761
Elliotts Enca	2759
Elliotts Neige Copper Sulphate	2763

INDEX OF BRANDS

that are not indicated in the foregoing list by the Primary Dealer's name:—

Brand.	Primary Dealer.
Andrew Dryden's	A.C.F. & Shirley's Fertilizers Ltd.
Bio	Parke Davis and Co.
Elliotts	Taylors Elliotts & Australian Drug Pty. Ltd.
G.T.S.	Cramsie Dwyer & Co.
Telson	L. W. Finney
Vetamac	A. H. McDonald

TO WIN THE WAR—AND THE PEACE.

"The angel of death has been abroad throughout the land; you may almost hear the beating of his wings." That is a familiar quotation. To-day in the homeland the words can be used with greater truth and graphic power than when they were uttered by John Bright in the House of Commons 85 years ago. To-day, over Britain, the Flying Death is a visible and an audible terror, not merely a figure of speech. By day and night he beats his wings with the drone of doom and rains death from the skies. Not a reaper, but a sower of death, more grim and terrible than Father Time, the sound of his coming is the sound of the kill, and human beings are his prey. With agony and blood he is the huntsman of humankind, sowing death in a flick of time. Beneath him, above him, and about him men work and fight to repel him and lay him low. Beneath him, men, women, and children strive to live and endure, asking no more than the right to live in the pursuit of happiness and the right to fashion in their own way the shape of things to come. All of them, gallant people of a gallant nation, hear and face him and strive against him, resolute, unsubdued, chins up and out, doing their best to maintain the integrity and safety of the nation. But, alas, many of them, by day and night, are dying that shattering death which adds horror to the kill. So, to-day, the defenders of Britain are back on the ramparts of their own resolve, seeking to do their best for the nation as a whole, and the altars of their sacrifice burn not with offerings to creed, class, or coterie, but to a cause—the first and whole cause of humanity, the cause of freedom, peace, and Christian principles.

Here in this free dominion of Australia we kinsmen of those who fight and endure at the heart of the Empire need only a realisation of the grimness of the struggle and the vital issues of that conflict to impel us to lend our aid. To us that desperate drama in the Old Land is not a mere wireless entertainment, feeding our emotions from day to day, and from grave to gay, and cultivating an appetite for the next "listen-in." To us, it is a drama of death, of a life and death struggle, of menace and strain, involving our own people, our own blood, our race, our hopes, and our fate as one of the free nations of the world. Borne on the air is the call of kinship, the kinship of race and common cause, the call for the aid and the hand of comradeship, the call for aid from fellow free men and women who are doing and daring, fighting and dying, so that the Commonwealth of Nations, its people, and its principles, shall not perish from the earth. I say that that call will be met. There is no doubt about that. Britain, the lone and valorous, fighting and defending the cause she represents, will not call in vain.

We Australians are not now just children of the Motherland; we are grown to man's estate, taking our responsible part in the scheme of things and our share in national and world affairs. Here, in Australia, the spirit of the Anzacs still lives, and will endure. It will not flag nor falter, because the Anzac spirit is the free spirit of democracy, the spirit of free men and women working for the free institutions they fought to erect and maintain. We are not content with words and phrases. We are not content to leave actions and deeds to the gallant men who take up arms—the successors of the gallant Anzacs of the last Great War. We are out not to win an argument, but to win the war, and to win the peace. . .

—*Mr Thomas Dunstan, M.L.A.* (Gympie)—Report from HANSARD.

Plate 50.

Pack Team at Granite Creek, Bloomfield River District, North Queensland.

PRODUCTION RECORDING.

List of cows and heifers officially tested by officers of the Department of Agriculture and Stock which have qualified for entry into the Advanced Register of the Herd Books of the Australian Illawarra Shorthorn Society, the Jersey Cattle Society, the Ayrshire Cattle Society, and the Friesian Cattle Society, production charts for which were compiled during the month of January, 1941 (273 days unless otherwise stated).

Name of Cow.	Owner.	Milk Production.	Butter Fat.	Sire.
		Lb.	Lb.	
AUSTRALIAN ILLAWARRA SHORTHORN.				
MATURE COW (STANDARD 350 LB.).				
Sunnyside Honey 8th (365 days)	P. Moore, Sunnyside, Wooroolin	16,009·7	577·384	Bruce of Avonel
Rhodesview Biddy 14th (256 days)	W. Gierke and Sons, Rhodesview, Spa Water, Helidon	9,182·9	425·57	Blacklands Prospector
Faversham Diamond	R. J. Couchman, Warra	11,055·18	412·758	General of Croydon
Merravale Melba	W. Soley, Malanda	11,976·5	400·289	Beatty of Greyleigh
Rhodesview Phyllis 2nd	W. Gierke and Sons, Rhodesview, Spa Water, Helidon	10,210·95	399·609	Blacklands Prospector
Sunnyside Flower 12th	P. Moore, Sunnyside, Wooroolin	11,337·55	398·068	Cosey Camp Rupert
Faversham Flossie	R. J. Couchman, Warra	9,636·78	385·677	General of Croydon
Eacham Vale Pretty	W. Soley, Malanda	10,380·4	381·148	Pyree Boy of Pyree
Brundah Holly	C. O'Sullivan, Navillus, Greenmount	9,094·25	355·1	Osiris of Greyleigh
SENIOR, 4 YEARS (STANDARD 330 LB.).				
Brundah Fancy	C. O'Sullivan, Navillus, Greenmount	10,681·2	416·975	Eros of Greyleigh
Sunnyside Melba 17th	P. Moore, Sunnyside, Wooroolin	9,610·4	333·516	Patrol of Cosey Camp
JUNIOR, 4 YEARS (STANDARD 310 LB.).				
Sunnyside Empress 58th	P. Moore, Sunnyside, Wooroolin	10,526·4	458·583	Patrol of Cosey Camp
Happy Valley Ailsa	R. R. Radel, Happy Valley, Coalstoun Lakes	6,728·05	312·931	Sunny View Artist
SENIOR, 3 YEARS (STANDARD 290 LB.).				
Alfa Vale Star 5th (365 days)	W. H. Thompson, Alfa Vale, Nanango	15,493·4	664·475	Reward of Fairfield
Fairvale Ethel 2nd	J. H. Anderson, Southbrook	8,248·08	372·145	Blacklands Red Major
Valera Lila 2nd	R. Ashford, Pittsworth	8,186·98	317·914	Kilbirnie Royalist
JUNIOR, 3 YEARS (STANDARD 270 LB.).				
Navillus Vision 4th	J. C. Meier, Mount Mort	13,352·7	534·187	Alfa Vale Renell
Patsy 3rd of Brookstead (203 days)	R. Ashford, Pittsworth	7,563·74	320·537	Railway View Loch
SENIOR, 2 YEARS (STANDARD 250 LB.).				
Valera Lila 3rd	Sullivan Bros., Valera, Pittsworth	7,458·95	310·579	Kilbirnie Royalist
White Park Stella 19th	W. T. Savage, Barnesmore, *via* Toowoomba	6,893·8	272·676	White Park Ronald
White Park Pendant 25th	W. T. Savage, Barnesmore, *via* Toowoomba	6,740·6	271·273	Corunna Viscount

JUNIOR, 2 YEARS (STANDARD 230 LB.).				
Trevor Hill Jeanette	Geo. Gwynne, Umbiram	9,288·26	368·024	Corunna Supreme
Rhodesview Carnation 12th	W. Gierke and Sons, Rhodesview, Spa Water, Helidon	7,696·25	337·909	Blacklands Prospector
Navillus Plum 4th	C. O'Sullivan, Navillus, Greenmount	7,872·25	299·886	Alfa Vale Renell
Valera Roseleaf 3rd	Sullivan Bros., Valera, Pittsworth	6,535·58	275·058	Kilbirnie Royalist
Blacklands Pretty Jean	T. Ryan, Kital, Allora	6,726·15	253·461	Parkview Limelight
Faversham Poppet 2nd	R. J. Couchman, Warra	6,505·28	252·363	Faversham Rex
JERSEY.				
MATURE COW (STANDARD 350 LB.).				
Kathleigh Brown May	F. W. Kath, Moffatt, *via* Dalby	12,276·41	638·62	Retford Royal Atavist
Kathleigh Fantail	F. W. Kath, Moffatt, *via* Dalby	10,915·58	627·983	Retford Royal Atavist
Hope of Peeramon	A. H. O. Koppen, Peeramon	7,626·55	360·788	Trinity Segunda's Prince
JUNIOR, 4 YEARS (STANDARD 310 LB.).				
Westbrook Sylvia 3rd	Farm Home for Boys, Westbrook	7,096·75	357·786	Westbrook Prince 36th
SENIOR, 3 YEARS (STANDARD 290 LB.).				
Glenview Twinkle	F. P. Fowler and Son, Glenview, Coalstoun Lakes	7,763·5	348·448	Trinity Governor's Hope
Princess Rose	E. G. Rothery, Archer	6,712·25	322·536	Booser of Cooceall
JUNIOR, 3 YEARS (STANDARD 270 LB.).				
Wyalla Crescent	Mrs. M. Allom, Mackenzie street, Toowoomba	7,344·	387·73	Carnation Fairlad
SENIOR, 2 YEARS (STANDARD 250 LB.).				
Cliefden Beauty's Gem	E. G. Rothery, Archer	6,194·65	286·546	Booser of Cooceall
JUNIOR, 2 YEARS (STANDARD 230 LB.).				
Westbrook Sweet Lucy 7th	Farm Home for Boys, Westbrook	5,437·2	328·888	Oxford Aster's Lad
Westbrook Sylvia 5th	Farm Home for Boys, Westbrook	6,074·85	322·377	Oxford Aster's Lad
Westbrook Buttercup	Farm Home for Boys, Westbrook	5,436·5	286·201	Westbrook Ambassador 20th
Strathdean Princess	S. H. Caldwell, Walker's Creek, Bell	5,411·26	259·919	Langside Noble Dreamer
Lermont Rosalie	J. Schull, Lermont, Oakey	5,469·1	258·094	Belgonia Lady's Duke 2nd
AYRSHIRE.				
SENIOR, 3 YEARS (STANDARD 290 LB.).				
Benbecula Ladylike	Mr. M. J. Brownlie, Fairhill, Oakey	6,824·6	326·5	Benbecula Tory
FRIESIAN.				
JUNIOR, 2 YEARS (STANDARD 230 LB.).				
Tent Hill Stella 11th	W. H. Grams, Upper Tent Hill, Gatton	8,428·7	268·887	Tent Hill Starling's Actuary
Tent Hill Handsome 6th	W. H. Grams, Upper Tent Hill, Gatton	7,649·05	254·613	Tent Hill Starling's Actuary

General Notes

Staff Changes and Appointments.

Mr. G. C. Haim, Ruthven street, Toowoomba, has been appointed an honorary ranger under *"The Native Plants Protection Act of* 1930" and an honorary protector under *"The Fauna Protection Act of* 1937."

Mr. J. W. Wilson, Tregony, Warwick, has been appointed an acting inspector of stock at Maryvale.

Mr. F. G. Retschlag, Spring Creek, Toowoomba, has been appointed an honorary protector of fauna.

Mr. D. Lennon (Enderly road, Ascot) has been appointed an honorary ranger under *The Native Plants Protection Act* and an honorary protector under *The Fauna Protection Act.*

Messrs. E. W. B. Da Costa (Brisbane) and H. M. Groszmann (Nambour), Assistants to Research Officers, Division of Plant Industry (Research), have been appointed Assistant Research Officers, Division of Plant Industry (Research), Department of Agriculture and Stock.

Constable J. Hamilton (Urandangie) has been appointed also an inspector under the Slaughtering Act.

Messrs. W. C. Barlow and C. H. Smith, Clerks of Petty Sessions, who have been transferred to Nanango and Boonah, respectively, have been appointed also acting inspectors of stock.

Cane Prices Board Appointments.

Fairymead Local Board.—Millowners' representatives: Messrs. W. Grimes and J. E. W. Wright (Fairymead Sugar Co. Ltd., Bundaberg); canegrowers' representatives: Messrs. N. E. W. Strathdee (Fairymead) and F. J. Wheeler (Bundaberg); chairman: Mr. R. C. Grenier (Court House, Bundaberg).

Tully Local Board.—Millowners' representatives: Messrs. G. F. Dafforn and E. P. Flegler (care of Tully Co-operative Sugar Milling Association, Ltd., Tully); canegrowers' representatives: Messrs. P. Byrne (Tully) and J. A. Winter (Euramo); chairman: Mr. N. J. Waddell (Court House, Tully).

Erosion Control—The Burdekin River Benefited Area.

Following the enactment of legislation last year to provide for the control of erosion in the Burdekin River area, an Order in Council has been issued under *"The Burdekin River Trust Act of* 1940" creating "The Burdekin River Benefited Area," which comprises Divisions 1, 2, and 3 of the Shire of Ayr as the area to which the provisions of this legislation will apply.

Arrangements are in hand for the constitution of the Burdekin River Trust to discharge the functions and duties imposed under the Act.

Wild Life Preservation.

The property of Mr. V. M. Retschlag, at Spring Creek, Toowoomba, has been declared a sanctuary under *"The Fauna Protection Act of* 1937."

The Waterworks Reserve, Gladstone, has been declared a fauna sanctuary by Order in Council issued under *"The Fauna Protection Act of* 1937."

" Scabby Mouth."

An order in Council issued under *The Diseases in Stock Acts* declares "Scabby Mouth" (infectious labial dermatitis), a disease of sheep, to be a disease under and for the purposes of the abovementioned Acts.

Second-hand Fruit Cases.

A regulation has been issued under *"The Second-hand Fruit Cases Act of* 1940" which provides that every dealer shall furnish to the Second-hand Fruit Cases Committee a supply docket with respect to all second-hand fruit cases sold or otherwise supplied to any grower of fruit and/or vegetables or other permitted person.

Plywood and Veneer Boards.

Orders in Council (2) have been issued under *The Primary Producers' Organisation and Marketing Acts* giving notice of intention to further extend the operations of the Plywood and Veneer Board and the Northern Plywood and Veneer Board, respectively, from the 3rd May, 1942, to the 2nd May, 1947. Producers of plywood and veneer may petition for a poll on the question of further extension, and such petition must be signed by at least 10 per cent. of their number.

Pig Grading for Export.

Pursuant to regulations promulgated by the Department of Commerce, Brisbane, there has recently been an amendment of grading specifications for export pork and bacon pigs, and it is important that pig raisers should remember this when finally preparing their pigs for sale.

Actually, the regulations now limit to 25 per cent. the quantity of porker weight carcases that may be exported in any one consignment, which, in turn, necessitates limitation of the number of porkers that would be received by exporters and bacon curers in Queensland, especially as stocks of porker carcases already in cold store far exceed present requirements and are creating a problem in storage of baconers which are urgently required by the British Ministry of Food.

Actually, it will pay farmers to concentrate on marketing their pigs at baconer weights in prime fleshy condition and conforming to trade requirements as regards type, because under amended price schedules operating from Monday, 13th January, 1941, porker prices have been reduced from 6¼d. per lb. dressed weight to 5½d. per lb. for carcases 90 to 100 lb. dressed, and 5¾d. per lb. for those dressing out from 100 to 110 lb., the latter being the maximum weight now allowed for export porkers; these carcases thus vary in value from a minimum of £2 1s. 3d. to a maximum of £2 12s. 8d., whereas baconers weighing 120 lb. dressed are valued at £3 per head and those of 160 lb. dressed weight £4 per head. It should be borne in mind that Commerce Department inspectors have been instructed to strictly reject excessively fat carcases and reduce to second grade those carcases which are considered to be not first grade due to excess of fat.

In calling attention to these amendments, the Minister for Agriculture and Stock (Mr. F. W. Bulcock), stated that the position has been described as serious by a prominent official in the Commerce Department, and it is hoped the issue of this information will lead to an immediate improvement in the position. The British Ministry of Food regards fresh pork as a luxury, but classifies bacon as a necessity.

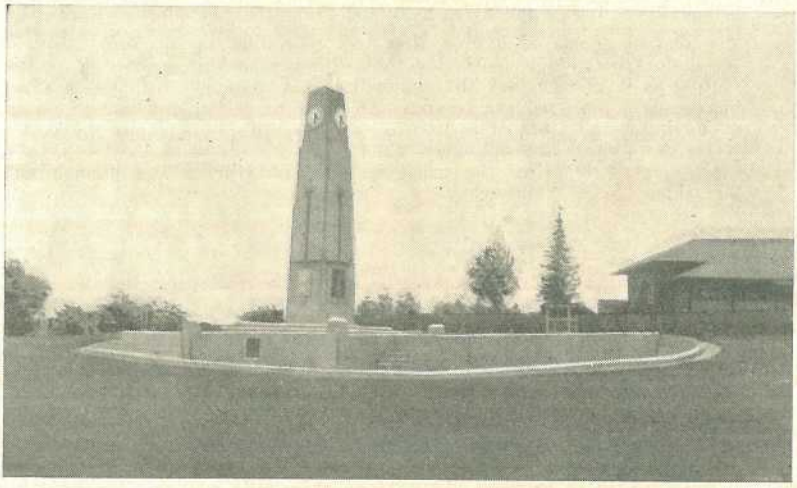


Plate 51.

WAR MEMORIAL, GOOMERI, SOUTH BURNETT, QUEENSLAND.

Answers to Correspondents

VETERINARY ADVICE.

(Selections from the outgoing mail from the office of the Director of Veterinary Services.)

Deaths of Cattle—Possible Causes.

S.T.S. (Mackay)—

The cause of mortality in your cattle appears to be one of two things:—

1. The blueish-black colour of the udder in the cow suggests gangrenous mastitis, a form of mastitis in which certain germs which live in the soil get into the udder and cause it to become gangrenous. In such a condition, a considerable quantity of poisons are formed within the udder and these toxins circulating in the cow's blood stream would be enough to cause her death.

The death of the calf could result from sucking the material from the infected udder, although, if the calf was very young, it is possible that starvation may have even been a contributing factor.

The usual symptoms observed with this disease are—

(i.) General dullness and loss of appetite;

(ii.) Usually some lameness, coupled with soreness of the udder and thick, curdled milk;

(iii.) In the later stages, the udder turns bluish-black and becomes cold.

The treatment for this condition consists of regular and frequent strippings of the milk and hot fomentations of the udder.

2. The frothy blood from the nostrils suggests that the mortalities may have been due to hydrocyanic acid (prussic acid) poisoning. This poisoning is caused by the animals eating certain plants which form this poison in their leaves and/or seeds. There are numerous plants which form the poison, notably Johnstone grass, crosses of the "Poison Peach," which is a well known tree in North Queensland. Should hydrocyanic acid poisoning have been the cause of death, it is possible that the calf got some of the poisonous plant at the same time as the cow.

Very few symptoms are seen with this form of poisoning. Usually the cattle show some brief symptoms of bloat, and death is rapid. There is usually a discharge of frothy blood from the nostrils.

The diagnosis of hydrocyanic acid poisoning in the field is made on the history of sudden death, together with the known presence of poisonous plants, as it is necessary that immediate action must be taken to save the beasts. The most modern treatment consists of giving any animal suspected of having been poisoned a drench consisting of photographic hypo, 2 oz.; water, 1 pint. Repeat every thirty minutes if necessary. Treat the symptoms of bloat in the usual way by puncturing the paunch on the left side.

Scour in Calves.

F.D. (Maleny)—

Treatment for this condition should be along the following lines:—

1. Isolate affected calves from healthy ones and use different utensils for feeding.
2. Dose with two to four oz. of castor oil, depending on the age and size of the calf.
3. For a period of twenty-four hours affected calves should be allowed water only.
4. If calves have been on whole milk the first meal of milk following starvation should consist of equal parts whole milk and water, gradually building up to original diet. If on skim milk add one breakfastcupful of lime water to each drink of milk.
5. If scouring persists give one teaspoonful chlorodyne in each drink of milk.
6. If the disease has been present for a considerable time it would be advisable to establish a new calf pen.

Pig Ailments.

G. Mc.I. (Maleny)—

The trouble among your pigs may be due to one of several causes. A heavy ingestion of the large Round Worm of the pig, *Ascaris lumbricoides*, may cause the symptoms, including the later check to growth. The panting condition would be due to the passage of minute, immature worms through the lungs, and so it might occur in a pig even though no adult worms are found in the bowel. More likely, however, the condition is one of contagious pneumonia.

Bad cases may as well be killed straight away, as their subsequent slow rate of growth renders them unprofitable. The remainder of the affected pigs should be isolated from the main herd and given clean, warm, dry sleeping quarters and good, nourishing food. They should be kept isolated until they are disposed of for slaughter, since apparently recovered cases can act as "carriers" and infect fresh animals.

Control of such diseases lies mainly in improved piggery hygiene. Young pigs should not be run with older stock. Farrowing sows should be treated for worms and shifted to a concrete-floored farrowing pen. This should have a creep-opening into a run which has not been used by other pigs, so providing a run for the piglets but not for the sow. These pigs should then be reared in fresh paddocks if possible. Dung should be removed from all pens daily and the pens and yards kept free of litter, rubbish, and damp, muddy spots. Good feeding and good housing are needed to maintain the animals in the best condition to resist diseases in general. The provision of green feed especially is important in the prevention of diseases such as pneumonia.

Care is needed in buying fresh stock—for example, weaners and slips—and these should be isolated for some weeks before joining the main herd. Where it is suspected that a sow is infecting her suckers, she should be fattened and disposed of for slaughter.

Lameness in a Ram.

W.F.B. (Injune)—

The condition cannot be diagnosed accurately without personal examination of the animal, but it is possible that it may be affected with footrot. As some forms of footrot are contagious it would be advisable to keep the animal isolated pending treatment and recovery.

From your description it would appear likely that pus is present in the foot. Under this condition recovery will not take place until the pus is evacuated. This may be done by paring across the toe at an angle of approximately 45 degrees. It may be necessary to remove several thin layers of horn, but do not pare as deeply as the sensitive structure. All irregularities such as cavities, cracks in the horn, and any overgrown horn should be removed. This treatment should be combined with the use of a 10 per cent. solution copper sulphate bath and affected feet allowed to remain in this solution for about one minute—say, three times weekly.

In some cases pus is not present and this condition yields to copper sulphate treatment alone.

Lime Water for Scouring Calves.

R. McB. S. (Baffle Creek)—

The lime you require is ordinary burnt lime, the common form in which lime is sold, and it can usually be purchased at a local store.

Put about 5 lb. to 7 lb. of lime in a cask and fill with water. It does not matter if an excess of lime is added; only a limited amount will go into solution. Stir the lime up for a start to assist the dissolving process, but let it settle—for instance, overnight—and use only the clear liquid. More water can be added from time to time, as long as a thin scum of chalk forms on the surface. If a cask is not available, the lime water can be made up in a bucket, but lime rusts these through rapidly—hence the value of a wooden vessel.

When a calf starts to scour, cut its milk ration down by half and replace by lime water—that is, feed 3 pints each of lime water and milk at each of two feeds. This should stop the scouring inside a day. Then gradually restore the full milk ration, but continue to feed about a cupful of lime water with each feed.

Sterility in Dairy Cows.

W.M.L. (Tannymorel)—

It would appear likely that as the cows calved during dry months they suffered a severe upset of the normal mineral balance, which, to a large extent, controls the sexual cycles. Usually this temporary upset, which prevents the animals coming in season, will disappear with the onset of better seasonal conditions and ample green feed.

Your herd certainly seems to be responding rather slower than normally, but, nevertheless, it is probable that they will gradually return to normal.

This return to normal may be assisted by giving a mineral mixture, consisting of sterilised bone meal two (2) parts, coarse salt one (1) part. Sometimes when ample green feed is available it is rather difficult to persuade cattle to take a lick, and, therefore, it is suggested that a small amount of molasses may be added to the mixture to make it more attractive.

It may also be necessary to vary the preparation of bone meal and salt slightly until you arrive at a mixture which the cattle will take. It may even be advisable to put the bone meal and coarse salt in separate troughs and allow the animals to feed from one to the other. Whatever mixture is used, it should be placed in troughs protected from the weather and the cattle allowed free access.

Footrot in Cattle.

D.S.G. (Edungalba) and H.W. (Dulacca)—

The following treatment of footrot is a convenient one where large numbers of cattle are affected:—

1. Remove any parts of the horn of the hoof which are obviously diseased or which are causing pus to be imprisoned in the claw.

2. Apply the following dressing to the affected parts twice a day:—Creosote, 1 part; linseed oil, 2 parts; turpentine, 2 parts.

The dressing is applied most easily with a brush.

BOTANY.

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

"Sensitive Plant."

B.McK. (Kalapa, via Rockhampton)—

The common Sensitive Plant which grows in coastal Queensland is generally regarded as a good fodder, but we think that stockowners are really only making the best of a bad job with it. The plant is there, it is a decided weed, is eaten by stock, but becomes harsh, woody, and prickly, and cannot be classed as a first-class fodder. On the other hand, it is a legume and valuable for soil renovation, especially if dug into the ground. On cane lands it certainly has a place.

Sand Burr—A Possible Pest.

L.M. (Warwick)—

Your specimen represents *Cenchrus pauciflorus*, the Sand Burr, a native of North America. It has become naturalised in New South Wales and Queensland, and during the past season, judging from the number of specimens received, very much on the increase. It has the possibilities of becoming a very bad burr pest.

Acalypha—Kurrajong—Cryptomeria.

E.F.Y. (Coolangatta)—

The specimens of leaves from a shrub represent *Acalypha compacta*, the small, copper-leaved Acalypha, a shrub grown for the ornamental, copper-coloured leaves. It makes an excellent hedge and strikes readily from cuttings.

The tree, in leaf only, we should say, represents the Kurrajong (*Brachychiton populneum*). This tree would grow all right at Coolangatta, but, on the whole, is more suited to inland parts. In coastal areas it is sometimes of rather straggly growth.

Cryptomeria will sometimes grow in coastal Queensland. It does fairly well around Toowoomba.

Plant Specimens Named.

G.A.P. (Drillham)—

1. *Chrysopogon pallidus,* Blue Leaf. A very common grass in Western Queensland and generally regarded as quite a good cattle fodder.
2. *Leptochloa peacockii,* a native grass very common in cleared brigalow country; quite palatable to stock. It contains a prussic acid yielding glucoside but only, so far as our tests show, in small quantities, and we have not heard of trouble from it.
3. *Sporobolus caroli,* Fairy Grass. This grass comes up very quickly following summer rains. While it lasts it provides quite good fodder for sheep.
4. *Eriochloa pseud-acrotricha,* Early Spring Grass. This seems to be the name given generally to this grass, though we do not know that it responds to early spring rains more than some other summer sorts. It is very palatable and nutritious and one of the best of our grasses, but not particularly drought-resistant.
5. *Cyperus retzii,* Downs Nut Grass.
6. *Panicum decompositum,* Barley Grass.
7. *Astrebla lappacea,* Curly Mitchell Grass. This is probably the best of the Mitchell grasses.
8. *Astrebla elymoides,* Hoop Mitchell.
9. *Dactyloctenium radulans,* Button Grass. This is quite a good fodder, either green or in the dried state. When dried down it leaves a lot of leafy material and seed heads both of which are readily eaten by sheep.

Needle Burr.

Inquirer (Gladstone)—

The specimen is Needle Burr (*Amarantus spinosus*), a native of tropical America, but now widely spread as a weed in most tropical and sub-tropical countries. It is very common in North Queensland, and in recent years has spread as far South as the New South Wales border. It becomes something of a pest in places, but is not difficult to eradicate. It is not known to possess any poisonous properties, and seems to be readily eaten by stock. It has been declared noxious throughout the State.

Yellow Pea.

F.A.B. (Hannaford)—

The specimen is the Yellow Pea (*Cassia Sophera* var. *pubescens*). It is sometimes called Arsenic Bush, though this name is not justified. It belongs to the same family of plants as those producing the senna leaves of commerce, and the leaves of your plant, if eaten by stock, have a purgative effect. Sometimes the plants become a pest, and if you have only a few bushes it would be advisable to hoe them out.

Wild Zinnia.

L.H.C. (Chinchilla)—

The specimen is *Zinnia pauciflora,* commonly known as Wild Zinnia, a native of tropical America, but now widely spread as a weed in Queensland. It has become abundant on the Downs and some other places during the last couple of years. It is not known to be poisonous or harmful in any way.

Feather Top.

E.C.D. (Wandoan)—

The specimen is the Feather Top or Feathertop Chloris, *Chloris virgata.* This grass is very widely spread over the tropical and sub-tropical regions of the world. It is an annual grass and a rapid grower. Although a luscious-looking grass it is not usually favoured by stock and they reject it in the presence of other food. They seem to eat it, however, readily enough in the form of hay. It is a very bad weed in some of the lucerne areas of South-eastern Queensland and has seriously decreased the earning capacity of many lucerne fields. The general opinion seems to be that though it will sometimes be eaten by stock its presence is undesirable, since where it grows better grasses, such as ordinary Rhodes grass, will thrive.

Rural Topics

The Hardy Corriedale.

The Corriedale breed of sheep, the sturdy dual-purpose breed evolved in New Zealand and adopted so largely in Australia, has achieved a remarkable distribution among the sheep-raising countries of the world.

In South Africa and South America the breed is increasing in popularity. In the United States great interest is being taken in it, and over there the American Corriedale Association has been formed with a foundation of seventy registered stud Corriedale flocks. One Australian breeder sold recently a foundation flock to a breeder in Cornwall, England. There also are Corriedales in the Falkland Islands, and Japan has bought many thousands of them. A 200-guinea ram has been sold to a breeder in Scotland, and a draft of Corriedale ewes has recently been shipped to the order of the Canadian Government. India has bought a lot of them, and repeat orders are coming from South Africa where the Australian Corriedale does remarkably well.

In Australia, there are now 502 registered Corriedale flocks.

The Problems of Animal Husbandry.

It is now a generally accepted fact that the supply of animal products is one of the most important contributions, from a material point of view, we are making to the Empire war effort. The efficiency of our methods is likely to be tested even more severely by competition in post-war markets.

Detailed plans to investigate the problems of animal production in Australia are now under careful consideration.

Animal husbandry in Australia, it is believed, is already on the verge of big things. In the change which is taking place in our rural industry from soil and pasture exploitation to a more permanent system of maintaining fertility, longer rotations both of crops and pastures will become established in practice. Technical investigations are already being made into the economics of pig raising, fat lamb raising, dairy production, and beef production.

The main idea underlying these investigations is that we should be fully prepared to tackle the problems which must inevitably arise when the calamitous war has ended.

A "Litter" of Lambs.

A Dorset Horn ewe on a Southern sheep breeding station has certainly made a fine contribution to the united war effort by giving birth to quintuplets. All her five lambs are still living and thriving, as also is the mother.

Dorset Horns, it is well known, are noted for their fecundity, twins being more usual than single lambings, and triplets are not uncommon. The rapidity of growth of lambs of this breed of sheep is remarkable; a pound increase in weight a day in stud lambs is not unusual. Crossbred lambs sired by Dorset Horn rams do not develop at this rapid rate, but they do retain to a marked degree this important characteristic of the sire.

Wealth in Land and Livestock.

There was a growing conviction that land and livestock had virtues and values not so severely affected as were many commodities in the present world crisis, said the president (Mr. J. A. Heading) at the last annual meeting of the Australian Illawarra Shorthorn Society, Southern Queensland branch. The fact was bringing new men and wealth and new valuations to farms and livestock. "We must continue," Mr. Heading added, "with a hope and faith and confidence that will outride and outlast all these man-made depressions of spirit that come through war and hate. Breeders will continue adding to the wealth of the world even while there are those who seek to destroy."

Rotational Spelling of Paddocks.

In the opinion of practical men, the chief necessity in natural pasture to-day is for periods of rotational spelling of paddocks, with the object of giving the better grasses, and particularly the better herbage plants which are always sought after by grazing stock, a chance to seed and re-establish themselves. The preservation of our nutritious native grasses is a matter of first importance. On our grasses depend two of our most important industries—woolgrowing and meat production.

Music in the Milking Shed.

A New Zealand farmer tells in *The New Zealand Farmer Weekly* of his experience of music in the milking shed which, he claims, has a soothing and quietening effect on his cows. He has had a radio in his milking shed for the last four years, so is able to speak with some authority. When asked what sort of music the cows liked, he said it was difficult to say as most of the cows take no notice of the music, or no apparent intelligent interest. One cow stood in front of the radio for awhile with her ears back, chewing the cud, but when the "Blue Danube" waltz was being played she stopped chewing, her ears came up, and she seemed to be really interested. The waltz music seemed to be the most effective.

When the radio was first installed in the shed one cow used to walk in and stand in front of the set and wait while the music lasted. Her early enthusiasm has, however, turned to indifference—like listeners the world over!

The workers in the shed enjoy the broadcasts. Summing up, the farmer regards the few pounds spent on the second-hand radio set a definite investment both from the points of view of production and entertainment. The music, however, must be good, otherwise it would send the cows off their milk! So, if his experience is to be accepted as a guide, it would seem that the "Blue Danube" or "The Merry Widow" are the tunes that fill the bucket.

The Value of Sheltering Tree Belts.

Observations over a long period show that crop yields are relatively higher in dry years in areas close to tree belts. In the orchard districts of New South Wales, the destruction of windbreaks by bush fires last year made an appreciable difference to fruit crops.

The withering effects of both summer and winter gales can be minimised largely by the growing of windbreaks and shelter belts in many farming and fruitgrowing areas. Where protective stands of timber no longer exist, the effect of drought on both crops and pastures is usually more severe. Apart from the loss from lower yields, there is the loss of soil by erosion which may be even worse.

One effect of shelter belts, as observed in Southern States, is to diminish considerably the high wind velocity in the drier regions. Another effect is the wider daily variation in temperature.

The effect of shelter belts on the moisture content of the soil in adjacent areas has been investigated, and, while there appears to be little appreciable beneficial effect in the upper layers of soil, there is a marked increase in the deeper layers. Wheat crops in parts of New South Wales which were protected by shelter belts showed a substantially increased yield as compared with open field crops in good years. In seasons of moderate drought the increase was as high as 50 to 60 per cent., and in severe drought years 100 to 150 per cent. Oats showed similar increases. With lucerne, the enhanced yield in favourable years was 20 to 30 per cent., in dry years 100 to 150 per cent., and in seasons of drought 200 to 300 per cent. These are very striking figures, given on the authority of the Director of Soil Conservation in New South Wales. They should help to impress farmers and graziers with the importance and valuable effect of windbreaks, apart altogether from their value in conserving soil.

The practice of timber conservation and the planting of trees in a programme of wise and efficient land use is one deserving of widespread attention.

Luxury in the Dairy.

Queensland dairy farmers will be interested in this: There is a farm in Wisconsin (U.S.A.) on which no human hand touches the cows during milking and the milk is drawn into glass buckets. It is a regular show place with a glass enclosure built especially for visitors, where they may see the seventy-five cows in the yard, watch them, two by two, walk up the gangway to the milking shed, walk through the washing stalls, stop for a clean-up, and go from there into the bails.

An electric milker draws the milk into glass buckets before the eyes of the visitors. They see it weighed and drawn into coolers, untouched by human hands and out of the reach of ordinary bacteria. The milking equipment is sterilised between each cow's milking.

The Turk of To-day—A National Leader's Philosophy.

"I have seen hundreds of factories and industrial exhibitions, from Stalingrad to Stuttgart, and from Detroit to Tatanagar, but I have never been so impressed as I was by what I saw in Ankara. In the place of the Anatolian peasant whom I remember, with his baggy breeches and slow wits, a new kind of Turk has arisen—educated, alert, clever with his hands.

"In 1930 there were 3,000 industrial apprentices. Now (1939) there are 15,000. Turkey is not making the mistake we have made in India, of training up an army of young intellectuals who know about nothing in the world except a smattering of law and literature, and who soon join the ranks of the unemployed. On the contrary, education in Turkey is very carefully adjusted to the technical needs of the country; and vocational experts tour the land, fitting square pegs into square holes.

"The Turks have all the makings of a great people, and they have a sense of humour which an Englishman understands. . . .

"Underneath a picture of Ataturk (the Turkish commander on Gallipoli and post-war reformer), at his model farm at Ankara, driving a tractor in a peaked cap, there is the following quotation from one of his speeches:—

> "'For 700 years we have neglected the peasant, and left his bones in foreign lands, but this country of ours is worth making a paradise for our descendants; and it can be done only by agriculture and economic activity. The arm which wields the sword may grow tired, but the hands which work the thresher and reaper will grow stronger and stronger.'

"That was Ataturk's philosopy; and it applies to other countries also. He set his people to constructive tasks. Ismet Inonu (his successor) will keep them there."

—F. Yeates-Brown in his book European Jungle.

The Language of the Man of Science.

It has been estimated that there is something like a thirty-year lag between the discovery of a new scientific process or practice and its general application on farms and stations, but that time lag now is rapidly shrinking. In these days, as soon as a new discovery is made, or the effectiveness and value of a new treatment or preventive measure has been established, the information is passed on to the farmer and the grazier as quickly as possible. But this new information usually comes to them in the language of the laboratory, and not in the simple terms of ordinary conversation. It is not always advisable to avoid the use of scientific terms, and if we are not mentally lazy we soon get their precise meaning and so the scientific term soon passes into our everyday talk. After all, it is only because the language of the man of science is unfamiliar that it sometimes alarms us. Once we learn its meaning we soon use the scientific word freely. For instance, take paspalum grass, how many of us know that its vernacular name is "Dhoab grass"? But call it by its Latin name, paspalum, and everybody knows what you are talking about. The same with Phalaris tuberosa, or Toowoomba canary grass. Its ponderous Latin name does not frighten us. There is really no need for us to dodge the charge of wishing to air our knowledge or learning if the real intention is to say in as few and accurate words as we can use what we want to say. Take the word vitamin or vItamin—its use saves a lot of roundabout talk. After all, it does not hurt us to learn the language of science; at any rate enough of it so that we can understand immediately what the scientist is telling us for our own benefit, and it is not so very complicated. As a matter of fact, the language of the laboratory is often simpler than our own and often much more precise, brief, and accurate. When he says "subcutaneous" the man of science means just under the skin; not into the skin. When he tells you to inject something into the skin he says "intradermal." He knows what he wants to say, and says just that and nothing else. Here is another example: A description of strangles in a horse—"strangles," says the scientist, "is an acute specific, contagious disease of horses caused by a streptococcus, its chief characteristics being catarrh of the mucus membrane of the pharynx and

suppuration of the surrounding lymph glands.'' There you have in a single sentence a mass of exact, precise information that could not be conveyed in ordinary language in less than five minutes. So it is worthwhile learning the language of the scientist who is doing so much in helping us to get over our farming difficulties.

Commenting on the foregoing, Mr. H. E. Annett, D.Sc. (Lond.), F.I.C., Grasslands, Matangi, writes in *The New Zealand Farmer Weekly* (30/1/41) under the caption ''Too Much Scientific Jargon'':—

''A famous classical writer once made the remark, 'The man of science is the only man in the world with something to say to-day and says it very badly.' This brought the retort from a scientist, 'The man of letters has nothing to say and says it at great length.'

''It is interesting to hear the opinion expressed in the article above referred to that the farmer and other laymen should learn the language of the scientist. I have seen this expression of opinion elsewhere.

''However, I am of the opinion that it will be many years before we should be able to interest the average farmer concerning scientific developments if we are to use technical terms. I may be wrong, but I hold the opinion that far too much scientific jargon is used in writing for and talking to farmers. I maintain that if one can find simple words which give a sufficiently clear idea of the position one should use them even if they might not be absolutely accurate. Even in lectures to advanced scientific students I have always used ordinary words in place of scientific terms, which are so frequently not really understood even by the lecturer himself. So long as the lecturer or writer understands his subject, I maintain he should be able to make it intelligible in simple language. Numbers of people take it for granted that expressions they know well are understandable by the laymen. Within the last two years I have seen the following among many other examples of words used in official publications for farmers: 'Manipulation of the gland' was used when 'massage of the udder' would have been understood. 'Potable water' was referred to when 'drinking water' should have been used. Try the expression 'Potable water' on a number of laymen and you will be surprised to find how few understand what is meant.

''This all leads to my main point which attracted my attention in the article. If we are to use scientific language for the farmer, let us make sure it is accurate. The writer makes the following statement: 'Few practical farmers to-day would recognise a certain familiar grass if referred to by its vernacular name of ''Dhoab grass.'' But call it by its Latin name, Paspalum, and everybody without exception will instantly recognise an old identity well known to them.' Personally, I have never heard Paspalum called 'Dhoab.' 'Dhoab,' sometimes written 'Doob,' but more correctly spelt 'Dhub,' is the common Indian name for the grass whose Latin name is Cynodon dactylon. This grass is common in the northern half of the North Island, though of poor feeding value here, but in Northern India, it is looked upon as a very valuable fodder. I know how easy it is to make a slip over names when writing an article, and this is probably the explanation of the mistake.''

—From *The New Zealand Farmer Weekly.*

Shock Farming.

One of the latest experiments undertaken by farmers in California is with a machine to produce electric sparks underground as it moves. The object is to increase the fertility of the soil. The contrivance is a tractor-drawn trailer supporting a sort of drag carrying a row of cutting blades. These open the earth 3 or 4 inches down to moist soil. Following each blade closely is an electrode, the end of which is less than an inch above the surface of the uncovered moist soil. A generator on the tractor supplies the current that passes through a transformer, stepped up to 12,000 volts. A distributor arrangement causes a series of sparks to jump from the electrodes to the soil. The inventor believes that it is possible that the electric sparks may do something to the nitrates in the soil, to make them become more readily assimilated by the feeder roots of the plant. His experiments indicate that plants growing on electrically-treated soil show more luxuriant growth than those in untreated adjacent plots.

Expansion of the Pig Industry.

The pig industry is rapidly developing into one of our major industries. In the past the pig industry has been closely associated with the dairy industry, pigs being kept mainly as a convenient means of disposing of milk by-products. Pigs kept under such conditions do not always receive the serious consideration they deserve and are usually badly housed, and also under-nourished because of the unbalanced ration they receive. Opportunities for further expansion of the industry were never brighter than at the present time, and farmers are giving closer attention to the production of more and better pork and bacon.

In the last six months of 1939 exports from Australia aggregated 19,785,516 lb. —90 per cent. more than the quantity shipped in the corresponding period of 1938, with Queensland the largest exporter of pork from Australia, representing about 60 per cent. of shipments.

In a recent article relating to the export bacon industry in Australia, Dr. John Hammond, Director of the Physiological Section of the Animal Nutrition Institute, Cambridge University, contends that if the bacon factories of Great Britain receive from Australia during wartime long, light-shouldered, and not too fat but thick-fleshed carcasses of the right weight (140 to 160 lb.), they will continue to demand them in the post-war period.—P. McCallum, Dairy Branch.

The Value of Improved Pastures.

Last year some interesting sheep feeding trials on a property in the Glen Innes district of New South Wales produced some interesting results. Sheep grazed on improved pastures maintained better weight than sheep on natural grasses without supplementary feed. The trials were spread over a period of twenty-one weeks. Of the sheep run on improved pasture, the greatest loss of weight was 8 per cent., while on unimproved pasture the loss was as much as 22 per cent. of their original weight. The local experience is that sheep run solely on natural pasture lose from 20 to 30 per cent. of their body weight in winter, which shows that there is not enough nourishment in the ordinary grasses at that season of the year. A group which had been fed a ration of oil meal cubes kept their weight fairly well, although sheep fed on chaff did not do badly—their final loss being about 10 per cent.

An important point brought out in the trials was that not one of the supplementary feeds compared with improved pasture even if it was not of the best.

Sheep rotationally grazed on natural pastures did better than those run in one paddock of natural grasses, but not much. The season was extremely dry, and under reasonably good seasonal conditions rotational grazing should give better results.

As to the actual financial results: Taking the estimated returns on an acreage basis, it was found that the natural pasture gave an average return of 8s. 3d. an acre, while the improved pasture group gave a gross return of 19s. 2d. an acre. The cost of establishing the improved pasture worked out at just under 25s. an acre, which, of course, would be spread over a number of years. The chaff-fed group gave a return of 6s. 3d.

Eucalyptus Oil as Motor Fuel.

One thing a war does is to compel attention to our natural and often neglected assets. Take our gum trees, for instance.

There is at present a brisk demand for Australian eucalytus oil as a source of products used in trades and manufactures. A big percentage of the oil goes overseas. Had Australia established chemical industries back in the nineteenth century a big chain of local chemical works based on gum-tree products might be in operation now.

One result of our slackness is that European nations have planted Australian gum trees, and with the oil from these trees compete against Australian oil in the world's markets. To-day, the oils of our peppermint gums are sought by foreign buyers, because of their content of certain chemicals used largely in trades, confectionery, and medicine. Britain and America and Europe were big buyers before the war and, except Europe, still are.

Eucalyptus oil is now suggested as a blend in motor-car fuel. It acts like alcohol—makes for smooth running, and is a decarboniser.

Motorists in the Mallee country of Victoria have found that a compound of leaves of eucalyptus trees is one of the best anti-knock compounds in existence for motor vehicles.

A sidelight on the increasing importance of eucalypt products—many farmers are now replanting cleared land with peppermint gums. Peppermint gum plantations may yet become a profitable feature of the Australian rural scene.

GUM TREES

BY

Mrs. E. M. FORGAN SMITH

Although described by the Authoress, Mrs. E. M. Forgan Smith, wife of the Hon. W. Forgan Smith, Premier of Queensland, as "A tree lover's tribute to the beauty and utility to be found in our forests," "Gum Trees" is filled with valuable information concerning the various species of Eucalypts that flourish in Australia.

The book contains a brief description of each species, its distribution, common name, botanical name, and timber. It is beautifully illustrated and contains four superb colour plates. The cover is a splendid piece of descriptive art.

A reproduction (reduced size) of one of the many illustrations is shown on the back hereof.

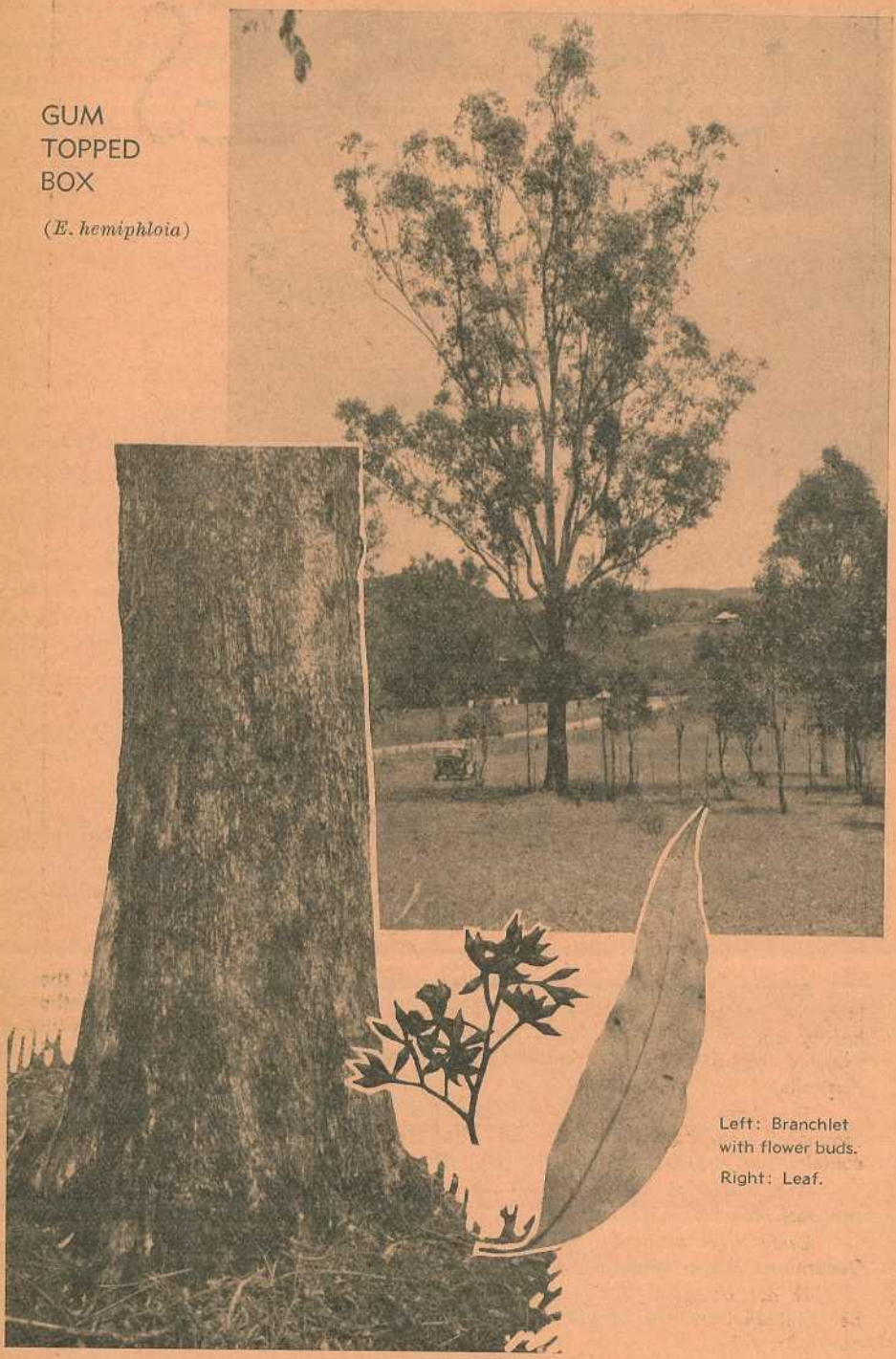
Every lover of nature will delight in browsing through its pages and every Queensland Home should possess a copy.

If not obtainable from your local bookseller, copies of "Gum Trees" can be obtained from the Government Printer, Brisbane. Price—Stiff cover 5s., limp cover 3s. 6d.

All profits from the sale of this book go to Queensland Patriotic Funds.

GUM TOPPED BOX

(E. hemiphloia)



Left: Branchlet with flower buds.

Right: Leaf.

The Value of "Live Wire" Fences.

In the Old Country, with so much new land ploughed up, the demand for fencing has greatly increased, and is being met by the use of "live wire" electric fences. Over there, they are finding that the electrified fence needs only a single strand of wire on light fencing posts 12 to 15 yards apart. On some farms, light angle iron posts are in use, and they have the additional advantage of being easily removed. A six-volt motor car type of battery and electric current controller send an intermittent current through the wire at 30 to 60 tunes a minute, and this gives an animal touching it a shock that causes neither pain nor harm, but enough of a "kick" to make it keep away from the wire in future.

There is little doubt as to the efficacy of this fencing system, and recent official inquiry in Britain has confirmed its advantages, particularly for penning pigs. The important thing is to see that the height of the wire above the ground makes contact with the animal certain.

The electric fence is ordinarily quite harmless to stock or to human beings, but there have been some sad experiences in America when attempts have been made to link it up with a main electric supply. Hardly less disastrous have been the efforts of some thrify-minded people to "knock together" their own control equipment. It is all a matter of commonsense, for to fool about with highly-charged live wires is like asking for a one-day pass to the cemetery.

It certainly looks as if the electric fence has come to stay as an essential in farm equipment, and a way out of many fencing troubles.

Fodder Conservation Pays.

Last year's drought in the country below the Border which, fortunately, was partly broken by recent rains, had its compensations to some extent in that it led to an intenser study of fodder storage possibilities. For one thing, it showed that those landholders who stored surplus pasturage before the dry spell set in had a lot to be thankful for. Baled hay seemed to be the general preference, because of the ease with which small bales can be handled both in stacking and feeding. In the Moree district, some graziers had baled up surplus herbage growth which turned out to be excellent hay; in fact, the clover burr, or burr trefoil, hay was regarded as superior even to lucerne hay, mainly because of the large amount of seed it contained. On one property, 700 tons of silage was made last year from crowfoot, trefoil, and barley grass. So satisfactory were the results that it is planned to clear areas all over the holding for the purpose of harvesting in future good seasons similar material for silage, and Mitchell grass for hay. With silage, the cost was estimated at 8s. a ton for cutting the growth and filling it into the pits. Horses were used to do the work.

The Apiary

HINTS ON MAKING HIVES.

IN South-eastern Queensland some beekeepers, both commercial and non-commercial, already make their own hives and frames, and it is possible that others will think of making their own equipment in future.

When constructing a hive, the first essential is for the beekeeper to decide upon the size and type; the Standard Langstroth ten-frame hive is recommended. By having uniform equipment the parts are interchangeable from hive to hive and manipulation of the colony is therefore comparatively easy. An apiary comprising standard equipment will always sell at a better price than an apiary made up of an assortment of material or of material of unusual sizes.

In constructing a hive, the timber used should be seasoned, good-quality soft-wood, so that the completed article may be solidly built and able to withstand rough usage. Cement-coated nails should be used, as they do not slip, with the result that warping and distortion is prevented. The corners of the hive can either be rabbeted or butt-jointed; whichever method is adopted, a plentiful supply of nails should be used, as the corners are the weak parts of the hive. If the corners are butt-jointed, the timber must be well squared, so that the hive body will show no cracks after nailing. Unless these corners meet evenly, the completed hive will usually be out of shape and will not fit the other equipment satisfactorily.

Before nailing, the joining surfaces should first receive a good coat of paint. After the hive body has been completed, it is given two or three coats of paint externally, the sawn edges receiving particular attention. The paint has the effect of weather-proofing the hive, which, if repainted about every three years, will last indefinitely, as there is then little chance of the timber warping. The cover, of course, should be well painted for preservation in the case of a wooden cover and as a means of reducing the hive temperature in the case of a cover sheeted with galvanised iron; white or very light-coloured paint should be used.

When making the frames, the important factor of bee-space should be considered. The spaces between combs and between the outer comb and the walls in a natural hive usually approximate to ¼ inch in width. In the modern hive the sizes of the parts should be so arranged that the frames are likewise separated from each other, from the walls, and from the top and the bottom by "bee-spaces" approximating ¼ inch. Failure to do this will result in the bees plugging any narrower spaces with propolis or building wax comb in any wider spaces. Either of these activities makes the frames difficult to remove and interferes to some extent with hive manipulation. The length of the lugs of the frames in relation to the width of the horizontal rabbet in the top of the end boards of the hive will determine the end spacing of the frames; similarly, the thickness of the lugs in relation to the depth of the rabbet will determine the top spacing.

In badly constructed hives the young larvæ of the wax moth can usually be found where the frames touch the walls or where the cover fits closely to the top bars of the frames. If, however, bee space is allowed in the hive, the bees have access to every part and can prevent wax-moth infestation. Similarly small ants frequently nest on the top bars of the frames where bee-space has not been provided. In addition, correct bee-space enables the bees to ventilate the hive properly.

Farm Notes

APRIL.

SUMMER-FALLOWED wheat lands should now be in good condition, and may be maintained in good tilth by a light surface working after every rainfall of over half an inch.

Seed wheat may be prepared and held in readiness for immediate sowing by grading and treating with an approved bunticidal dust for the prevention of smut. Copper carbonate, or the mercury dusts agrosan and ceresan, will be found effective for this purpose, using from 1 to 2 oz. to a bushel, according to the efficiency of the mixing apparatus employed.

Seed barley and oats should be treated with a mercury dust, or with formalin in preference to copper carbonate.

The main sowings of winter cereals and legumes required for winter and spring feed may be made during this month; and growers are advised to include field peas or tares at the rate of 20 lb. seed per acre, thereby increasing the nutritive value of the fodder obtained. Algerian oats predominate in present sowings, but the barleys—Cape and Skinless—in addition to the slower maturing varieties of wheat are also of value.

April and May are good months for the sowing of lucerne. The area under this valuable crop should be extended whenever and wherever possible. By sowing when weed growth is at a minimum, the young plants have a better chance to become strongly established, and there is less likelihood of the surface soil drying out and affecting germination, than if early summer sowings are made. From 10 to 12 lb. of seed to the acre is ample on the best lucerne lands, but where sown largely for grazing purposes in the drier districts 3 to 4 lb. to the acre should be sufficient.

Root crops sown during March will be making fair growth, and should be thinned out to permit of full development. Further sowings of mangolds, swede turnips, sugar beet, field carrots, kohl rabi, and rape may be made where soil moisture is sufficient.

Information on fumigation of maize may be obtained from the Department of Agriculture and Stock, Brisbane.

Sorghums and other summer fodder crops which are approaching maturity, and are not required for green fodder, should be conserved as silage wherever possible.

Pumpkins required for storage should be allowed to ripen in the field, gathering with the short stalk attached and storing in a dry airy shed, preferably on slatted shelves to permit of rapid inspection for possible decay.

Winter grasses and clovers may be sown during April in districts suitable for their growth, but sowings must be made on thoroughly prepared cultivation.

Orchard Notes

APRIL.

ONLY the best fruit should be selected for market, and it should be graded for size, colour, and quality, and properly packed—only one grade of fruit being packed in a case.

All orchards, vineyards, and plantations not thoroughly clean should receive early attention, for from now until the next rainy season the ground should be kept in a thorough state of tilth and free from harmful weeds in order, firstly, to retain moisture in the soil; and, secondly, to enable birds, ants, and predacious insects to get at and destroy the pupæ of fruit flies and other pests harbouring in the soil.

Banana and pineapple plantations should be put into good order, and kept free from noxious weed growth.

Land to be planted with fruit trees should be prepared now. It is always advisable to allow newly cleared land time to sweeten before planting.

QUEENSLAND SHOW DATES FOR 1941.

March.

Allora Sports Day	8th
Pittsworth	11th and 12th
Millmerran	14th
Goombungee	15th
Toowoomba Royal	24th to 27th

April.

Dalby	1st and 2nd
Tara	4th and 5th
Chinchilla	8th and 9th
Miles	16th
Taroom Campdraft Show	28th, 29th, and 30th
Kingaroy	30th April, and 1st and 2nd May

May.

Monto	1st to 3rd
Goondiwindi	2nd and 3rd
Longreach	5th to 7th
Nanango	8th and 9th
Mundubbera	7th and 8th
Blackall	12th and 13th
Roma	14th and 15th
Gayndah	14th and 15th
Murgon	15th to 17th
Beaudesert Show	14th and 15th
Beaudesert Campdraft	16th and 17th
Warrill View	17th
Mitchell	21st and 22nd
Biggenden	22nd and 23rd
Blackbutt	23rd and 24th
Charleville	27th to 29th
Ipswich	27th to 30th
Gympie	29th to 31st
Kalbar	31st

June.

Maryborough	5th to 7th
Lowood	6th and 7th
Childers Patriotic Carnival	9th and 10th
Boonah	11th and 12th
Bundaberg	12th to 14th
Gin Gin Horse Show and Carnival	16th and 17th
Gladstone	18th and 19th
Rockhampton	24th to 28th
Toogoolawah	27th and 28th

July.

Mackay	1st to 3rd
Proserpine	4th and 5th
Bowen	9th and 10th
Charters Towers	10th to 12th
Ayr	11th and 12th
Nambour	10th to 12th
Townsville	15th to 17th
Laidley	16th and 17th
Rosewood	18th and 19th
Ingham	18th and 19th
Cleveland	18th and 19th
Gatton	23rd and 24th
Cairns	22nd to 24th
Innisfail	25th and 26th
Atherton	29th and 30th
Crow's Nest	30th and 31st

August.

Pine Rivers	1st and 2nd
Home Hill	1st and 2nd
Royal National, Brisbane	11th to 16th

September.

Imbil	5th and 6th
Canungra	6th
Pomona	12th and 13th
Rocklea	13th
Beenleigh	19th and 20th

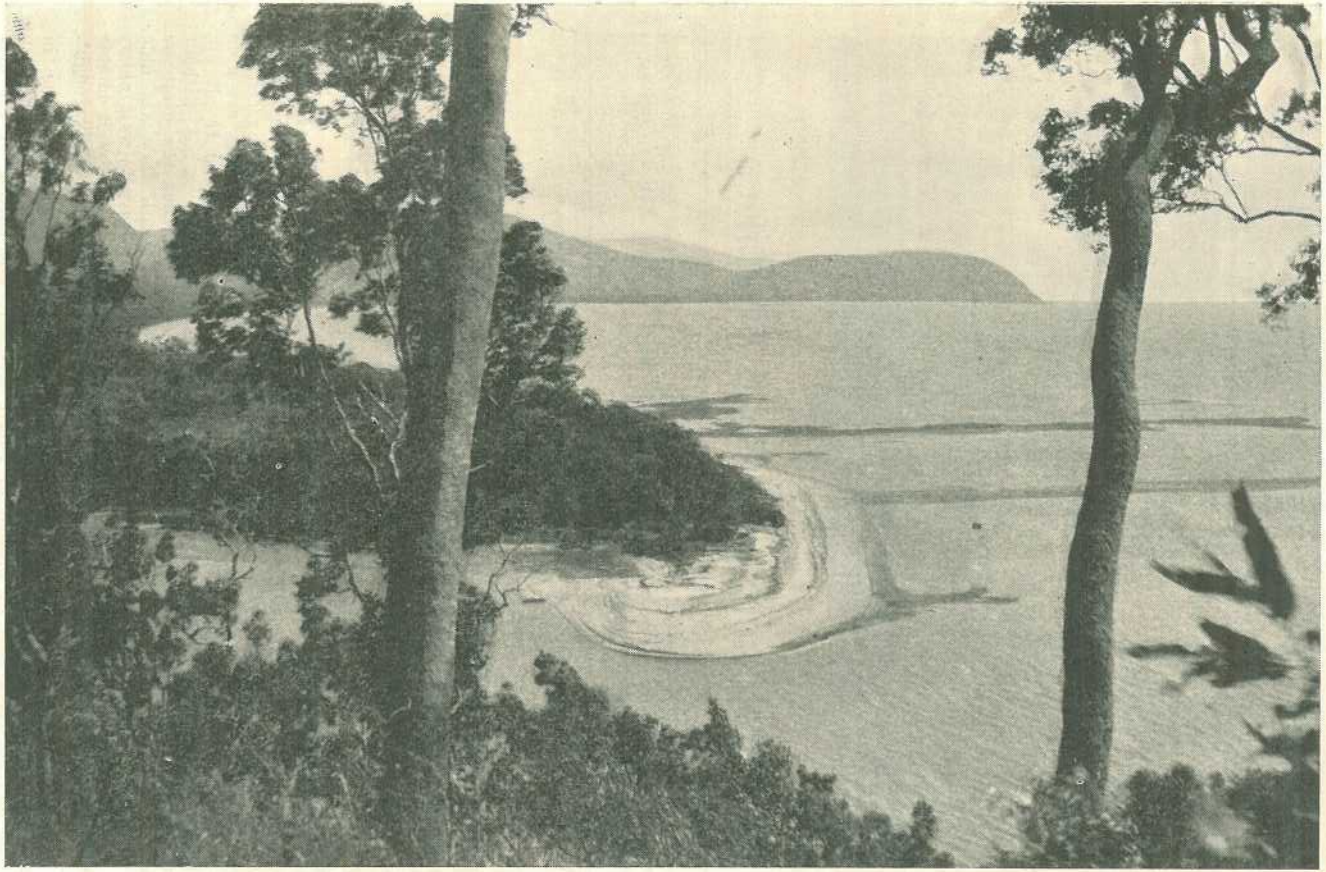


Plate 52.
WEARY BAY, AT MOUTH OF BLOOMFIELD RIVER, NORTH QUEENSLAND.

Maternal and Child Welfare.

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

CARE OF MOTHER AND CHILD.

THE HANDICAPPED INFANT.

OF the many babies who are born into the world there are a few who are handicapped from the first. Although they may appear to have no physical defect they behave differently from other babies. Some of them cry continually without any obvious reason, others take faint turns. Many of these children take a long time in learning to do or to notice things, and such little things that they do are done in an unusual manner. They are often slow in learning to sit up, to walk, and to talk. It is to the mothers of such children that we wish to speak this month.

Baby's Progress.

Lest any mother be needlessly anxious about the progress of her baby, we want her to know that children differ in regard to the ages at which they reach the various stages of development. At the age of three months most babies are able to hold up their heads. At about the sixth month they are learning to sit up, although they may be eight or nine months old before they can sit without some support, particularly if they are big, fat babies. By about the ninth or tenth month most babies can crawl, and by the eleventh month they are able to stand with support. Between twelve and fifteen months they learn to walk alone. If there is excessive delay in reaching any stage—for instance, if baby is unable to sit up by the time he is nine or ten months old—medical advice should be sought.

In regard both to cutting teeth and talking there is considerable variation in the rate of development. The first tooth may be cut at the age of six or seven months and six teeth may be present at twelve months. The cutting of the first tooth may be delayed until the age of nine months and quickly followed by the cutting of others. On the other hand, the first tooth may be cut at six months and then two or three months pass before the next tooth appears, although baby is perfectly healthy.

A baby may utter single syllables at the age of nine months and single words at twelve months. A few are slow in learning to speak, although they hear and understand what is said to them. As they mix with other children they learn to speak.

Delayed Development.

When a baby is not quite like other babies of his age in his behaviour it is important that his mother should recognise it early. She can then set herself to learn how she can best help her baby to grow like other babies.

It is often impossible to find out the reason why these babies are different, but it is certain that only in a few instances is it in any way the fault of their parents or anyone else. We need not concern ourselves at present with puzzling questions as to how and why these things happen. What does interest the mother is what can be done to bring the child on in every way possible. There are two reasons why baby may have difficulty in using his limbs like other babies. In the first place, he may lack the natural curiosity in his surroundings, which promotes spontaneous activity, and, in the second place, his muscles may be soft and weak from want of use.

What the Mother Can Do.

The mother must realise that a great deal more time and patience will need to be spent on her baby's training than in the case of other babies. His progress will necessarily be slow. Some time may require to be spent in teaching him things which other babies seem to learn for themselves. She should not worry more than she can help about baby's future. No one can tell how much he will improve—only time will show. Her work is to persevere with her training. Many mothers with not a great deal of spare time and very little experience have succeeded very well in training children like these. Although the difficulties are great to begin with they will become less with practice. The mother must not expect too much of baby. She should not allow failures to disappoint or discourage her but go on trying each day to do a little, avoiding fatigue. She should find out the things that baby is able to do with least difficulty and train him to do them better. He must be encouraged and helped in doing things that are a little difficult, but not allowed to go on trying to do something which is too difficult at his present stage of development. Frequent failure will discourage and irritate him. Mother must always be ready to praise him for any little success he has.

It will be necessary to arouse his interest in his surroundings through his senses. He may be shown bright, moving objects, he may be allowed to handle and grasp objects, and to listen to various sounds. By these means he will be taught how to use his weak limbs and so strengthen them.

The services of a trained nursery school and kindergarten teacher who is temperamentally suitable will be found of great assistance.

Stiffness of Limbs.

In some cases the difficulty in moving the limbs arises from their stiffness. The muscles themselves may be quite strong, but the child is unable to control them. The general stiffness prevents him from moving his head to look about him, from sitting up, and from standing and walking. It often makes swallowing difficult, causes dribbling of the saliva, and interferes with speech. The baby who suffers in this way is severely handicapped, but is capable of making steady progress under suitable training and treatment.

You may obtain information on all matters concerning infant and child welfare by visiting the nearest Maternal and Child Welfare Centre (Baby Clinic), or by writing to the Sister in Charge, or by communicating direct with the Maternal and Child Welfare Centre, Alfred street, Fortitude Valley, N. 1, Brisbane.

MILK IN THE HOME.

The keeping quality or "life" of milk is dependent primarily on the care exercised in its production and handling on the farm. The neglect on the part of the householder to observe certain precautions, however, may seriously impair its keeping quality, consequently the milkman is blamed for what should really be the responsibility of the customer.

Every utensil into which milk is put adds its quota of germ life to the milk. It cannot, therefore, be expected that milk, even if produced under careful conditions and thus having a low bacterial count, will keep well if it is subsequently

treated carelessly in the consumer's home. The consumer must accept his share in ensuring that this most valuable food is kept as pure as possible. In the home, the prevention of the introduction and growth of germs in milk depends chiefly on the cleanliness of the jugs or other vessels in which it is contained and the temperature at which it is held.

The cleaning of any vessel which is intended for milk requires a slight modification of the usual procedure in washing dishes and pots and other household articles. The following instructions should be observed:—

1. Rinse with cold water.
2. Wash in hot water or hot water to which washing soda has been added.
3. Scald with boiling water.
4. Invert to dry. Cloths should never be used for drying as they simply reintroduce numerous germs which, if favourable conditions exist, will multiply extensively in and reduce greatly the period of sweetness of milk placed in the vessel afterwards.

Any milk vessel cleaned in the way described will add very few additional bacteria to those already present in the milk on its delivery, whereas a neglected or carelessly washed container might add countless numbers. The influence of an improperly cleaned vessel in reducing the "life" of milk will be appreciated readily if it is remembered that bacteria double in number every twenty to thirty minutes at ordinary temperatures. Their multiplication is markedly restrained at lower temperatures until below 50 deg. Fahr., when it is practically suspended. The object in keeping milk as cool as possible in the home is, therefore, evident.

To preserve the freshness of milk in the home, the chief things to be done are—

1. Use only vessels free from cracks and chips and cleansed scrupulously in the way already described. Plain vessels are preferable to those of fancy design, because of the greater ease in cleaning them.
2. Keep the milk in a cool clean place.
3. Always cover the milk jug to exclude insects, particularly flies, as they, especially, transport numerous objectionable bacteria.
4. Since milk fat readily absorbs odours from its surroundings, milk should be kept apart from any substance possessing a penetrating odour—onions, certain fruits, such as pineapple, meats, and fish in any form.
5. Remove the jug from the doorstep, or wherever it is placed, as soon as possible. See that the milk is protected from the sun, preferably in a cool, dark place.

IN THE FARM KITCHEN.

ORANGES, LEMONS, AND GRAPEFRUIT.

Because of their vitamin content, citrus fruits deserve a prominent place on the menu several times a week. This is, of course, apart from the daily morning drink of orange or lemon juice.

The recipes below describe several health-giving and appetising desserts made from oranges, lemons, and grapefruit, which are suitable for serving all the year round.

Orange Fruit Souffles.

Take 1½ oz. flour, 1½ oz. sugar (or to taste), 1½ oz. butter, 3 eggs, oranges as required.

Cut a circular slice off the top of each orange, scoop out the pulp, but do not break the skins. Rub sufficient pulp through a sieve to give half a pint. Melt the butter in a stewpan. Add the flour, and when blended stir in the orange pulp and boil it until it is thick. Remove it from the heat and cool it. Add the sugar and the three egg-yolks, one at a time. Whisk the egg-whites very stiffly and fold it lightly into the mixture. Fill the orange cases with the preparation and set them on a baking sheet in a moderate oven for 20 minutes. Serve them quickly. Any left-over mixture may be baked in a buttered souffle dish.

Creme Renversee a l'Orange.

Take 2 oz. castor sugar, 2 large oranges, 4 eggs, ½ pint milk, ½ oz. gelatine, whipped cream, a little water.

Sieve the castor sugar on to a plate and grate the rind of the oranges on to it. Rub these ingredients well together with the fingers, and then put the orange-flavoured sugar into a basin. Add to it the yolks of 4 eggs and the whites of 2, and beat together for a few minutes. Heat the milk and stir it gradually into the basin. Return all to the saucepan and stir gently over the heat until the custard thickens, but do not allow it to boil. Remove quickly from the heat and strain into basin. Dissolve the gelatine in very little water and strain into custard, also the juice of the oranges. Stir occasionally until lukewarm, then pour into a wetted mould, and put in a cool place to set. Turn out on to a glass dish and serve with whipped cream.

Orange Bavarios.

Take 1 cupful orange juice and pulp, ¼ cupful cold water, 1 tablespoonful lemon juice, 1 tablespoonful gelatine, ½ cupful sugar, 1 cupful cream, pinch salt.

Soak the gelatine in cold water for 5 minutes, and dissolve by standing cup containing mixture in hot water. When dissolved, add to orange juice and pulp. Add lemon juice, sugar, and a pinch of salt. Allow to cool, then fold in whipped cream. Turn into a mould rinsed out with cold water.

Orange Charlotte Russe.

Take 6 oz. lady-finger biscuits, ½ packet lemon jelly, 1 orange.

For the filling:

Take 2 oranges, 1 oz. gelatine, 2 eggs, ¾ pint milk, 2 oz. sugar, 1 gill cream.

Peel one orange, divide it into sections, and remove the pith. Dissolve the jelly in half a pint of hot water. Rinse a cake-tin in cold water and pour in enough jelly to cover the bottom. Let it set and lay on it a circle of orange sections with three in the middle. Pour on a few spoonfuls of jelly to keep the orange in place and let it set, then pour on the remainder of the jelly. Cut the sides of the biscuits straight and make them all the same length. When the jelly is firm, arrange the biscuits standing in it all round the tin. To make the filling, grate the rind of 1 orange and put it in a double saucepan with the eggs and sugar. Whisk with an eggwhisk and add the milk. Stir the custard till it is thick enough to coat the back of the spoon. Let the custard stand where it will keep warm. Squeeze the juice from the oranges on to the gelatine and add half a gill of cold water. Dissolve the gelatine slowly over a low gas, stirring all the time, and when cool stir into the custard. Whip the cream and add it to the mixture when quite cold. Stir as it cools, and when it thickens (but not before) pour it into the prepared tin. When set, dip for a moment into hot water to loosen the jelly from the tin. Place a dish on top, turn upside down, and shake very gently.

Lemon Cream.

Take 3 lemons (rind of two, juice of three), 6 oz. castor sugar, 1½ dessert-spoonfuls custard powder, 1 oz. butter, ½ gill cream, crystallised lemon slices and glace cherry for decoration, ½ oz. gelatine, water.

Wipe the lemons and grate the rinds finely. Squeeze out the juice and strain it, then make up to three-quarters of a pint with water. Mix the custard powder to a smooth paste with some of it. Put the remainder into a saucepan with the grated rind, sugar, and butter, and when boiling stir on to a custard mixture, then leave until cold, stirring occasionally. Whisk the cream until it stiffens and stir in. Dissolve the gelatine in a saucepan with half a gill of water (extra to that given in recipe) and strain it, mixing all together lightly. Turn into a wet mould or basin, and when set turn out and decorate with crystallised lemon slices. If these are not available, use slices of fresh lemon.

Lemon Rice.

Take 8 oz. rice, 8 oz. sugar, 2 lemons, water.

Boil the rice and drain it. Pour cold water over it until the water is clear. Boil barely 1 gill of water with the sugar, lemon juice, and grated rind of the lemons until this syrup is quite thick (letting the sugar dissolve before it comes to the boil). Mix this with the rice. Simmer them in a double boiler for an hour. Remove it from the heat and let the rice cool. Then turn it on to a glass dish and garnish it with lemon and plainly boiled rice, and serve with stewed fruit.

Baked Lemon Pudding.

Take 1 lemon, 2 eggs, 1 breakfastcupful sugar, 2 small tablespoonfuls arrowroot, 1 dessertspoonful butter.

Mix the arrowroot smoothly with a little cold water. Add the egg-yolks, not beaten, half the sugar, the strained juice of the lemon, and the grated rind. Add 1 pint of boiling water, and boil for 5 minutes. Mix the butter well with the ingredients, then put the mixture into a buttered dish. Beat the egg-whites to a stiff froth, and add the remainder of the sugar to them. Spread this on top of the pudding and bake in a moderate oven until it is a light-brown.

Grapefruit Mousse.

Take 2 grapefruit, 1 egg, ½ gill milk, ½ oz. gelatine, ½ gill water, 5 dessertspoonfuls castor sugar.

Cut the grapefruit into halves crosswise, then remove the pulp and rub it through a sieve. The best way to loosen the pulp is first to remove the centre pith and pips, then cut round the side of the pulp to loosen it from the rind, and again through each section. Separate the egg. Beat up the yolk and mix with the milk, and cook in a double boiler until it thickens. When cold add to the grapefruit pulp with the sugar. Dissolve the gelatine in a saucepan with the water and strain it in. Mix together, then leave until beginning to set. Then fold in the well-beaten egg-white. Turn into the grapefruit rinds. Allow half a grapefruit for each person.

Grapefruit Sponge.

Take 1½ cupfuls grapefruit pulp, 1 egg-white, ½ cupful boiling water, ½ cupful castor sugar, 1½ tablespoonfuls gelatine, 4 tablespoonfuls cold water, 1 cupful grapefruit juice, 2 tablespoonfuls grenadine syrup, whipped cream.

Dissolve the gelatine in boiling water. Stir in the grapefruit juice, sugar, and syrup. Stand till the mixture begins to thicken, then beat till foamy, then add the pulp and 2 tablespoonfuls well-drained grated pineapple, if liked. Fold in the stiffly-beaten egg-white. Turn into a wet mould and leave till set. Serve turned out, and decorated with whipped cream.

IN THE FARM GARDEN.

GARDEN SEED SELECTION.

In selecting and saving seed for future plantings, the most vigorous, healthiest, and heaviest-bearing plants should always be reserved for the purpose. Type and production are essentials that should always be observed.

Various methods are used in the harvesting and cleaning of garden seeds, but the actual principles remain more or less steadfast. Seeds should not be harvested until fully ripe or mature. It is equally important that the crop should be promptly gathered when the proper time has arrived. If seed be left too long on the plant, sprouting or moulding may occur, and the seed, at least, will discolour. Seeds are generally ripe when the pods or seed capsules turn yellow, or the fruits—such as tomatoes and melons—lose their firmness.

Bright sunny weather should be selected, if possible, for the harvesting of crops which require threshing—such as beans and peas. The plants should be dried thoroughly before threshing, and it is always better to select days of low humidity for this operation. No matter how the seed is threshed, the greatest care should be taken to prevent breaking the seeds or the seed coats. Winnowing is often necessary for the final cleaning of the seed.

In obtaining clean seeds of such fruits as tomatoes and melons, the ripe fruits must stand for some time in their juices to remove the mucilaginous covering. A common method is to throw the cut specimens or the scooped-out pulp into any convenient vessel—such as a bucket, tin, or small barrel—and stir daily until fermentation has loosened the covering about each seed. This requires from three to six days. To prevent the discolouring of seeds, the fermentative process should not be continued longer than necessary.

After fermentation, the seeds are separated from the pulp and the skin by washing as often as may be required to obtain clean seeds. The good seeds settle to the bottom of the vessel, while the pulp, skin, and light seeds rise to the top and may be poured off. Three or four washings are usually sufficient, and the use of sieves in this process of separation is recommended.

After winnowing or washing, as the case may be, all seeds must be cured thoroughly before storing. They should be spread in layers on trays in well-ventilated places until completely cured. It is an advantage to wash early in the mornings of bright days to facilitate drying, which should always be done under shade. Seeds may be stored in either cloth or paper bags. The greatest enemy to the preservation of seeds is moisture, but usually the conditions in an ordinary living-room are satisfactory. Provided the seeds are well cured and the humidity remains low, ordinary fluctuations in temperature do not affect the vitality of the seed. It is a well-known fact that seeds do not keep well in North Queensland, because of the great amount of moisture in the atmosphere. Some seeds—such as cabbage, turnip, and radish—stand a very great chance of becoming mouldy unless kept in well-ventilated containers.

Plate 53.
MENA CREEK, NEAR INNISFAIL, NORTH QUEENSLAND.

ASTRONOMICAL DATA FOR QUEENSLAND
APRIL, 1941.

By A. K. CHAPMAN, F.R.A.S.

SUN AND MOON.
AT WARWICK.

April.	SUN.		MOON.	
	Rises.	Sets.	Rises.	Sets.
	a.m.	p.m.	a.m.	p.m.
1	6.2	6.50	9.27	8.40
2	6.3	6.49	10.18	9.24
3	6.3	6.48	11.8	10.10
4	6.3	6.46	11.54	11.0
			p.m.	
5	6.4	6.45	12.46	11.54
6	6.4	6.44	1.33	nil
				a.m.
7	6.5	6.43	2.19	12.51
8	6.6	6.42	3.3	1.50
9	6.6	6.42	3.47	2.51
10	6.6	6.41	4.31	3.54
11	6.6	6.40	5.16	4.59
12	6.7	6.39	6.4	6.6
13	6.7	6.38	6.52	7.13
14	6.8	6.37	7.45	8.20
15	6.9	6.36	8.39	9.26
16	6.9	6.35	9.36	10.28
17	6.10	6.34	10.33	11.25
				p.m.
18	6.11	6.33	11.31	12.16
19	6.11	6.32	nil	1.3
			a.m.	
20	6.12	6.31	12.27	1.46
21	6.12	6.30	1.22	2.25
22	6.12	6.29	2.15	3.1
23	6.13	6.28	3.7	3.36
24	6.13	6.27	3.59	4.11
25	6.14	6.26	4.50	4.46
26	6.14	6.25	5.41	5.22
27	6.15	6.24	6.32	5.59
28	6.16	6.23	7.23	6.39
29	6.17	6.23	8.14	7.22
30	6.17	6.22	9.5	8.6

Phases of the Moon.

5th April, First Quarter, 10.12 a.m.
12th ,, Full Moon, 7.15 a.m.
18th ,, Last Quarter, 11.3 p.m.
26th ,, New Moon, 11.22 p.m.

THE OTHER WORLDS.

AT the beginning of April the two great planets, which bore each other company for eight months, will be low in the west at dark. In February, Jupiter passed Saturn for the third time, ending the rare triple conjunction which last occurred in 1683. Now Jupiter is hurrying on to the eastward, leaving the slower moving Saturn behind. We must look at them for the last time, for Saturn sets about 38 minutes after the sun and Jupiter 10 minutes later.

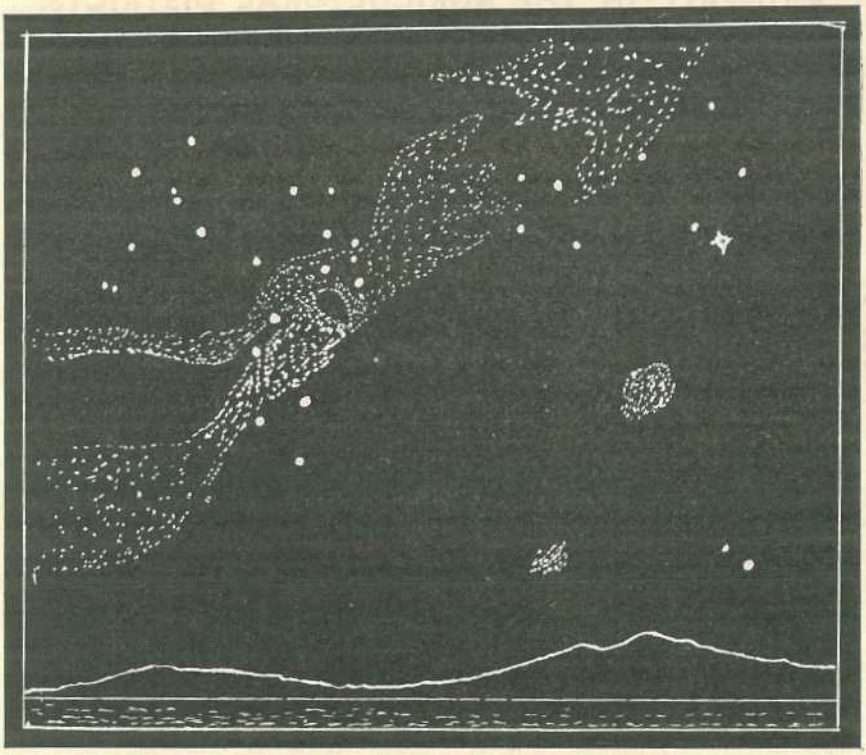
We have lately missed the Morning Star, Venus, which for many months heralded the dawn. She has slipped down into the brightness of the rising sun and disappeared. On 19th April the planet will be beyond the sun; a few weeks later we may look for her low in the twilight where she will become the Evening Star.

This year, in October, we shall have Mars in opposition; we have not seen this for a long time. The reason is that the fiery planet only comes into opposition to the sun once in nearly two years and two months. It rises now about half an hour after mid-night in Capricornus, not far from Alpha and Beta of that constellation, which stars mark the eyes of the Sea-goat. Capricornus follows Sagittarius, which rises after the Scorpion. About 3 a.m. on 20th April Mars will be about as far south of the waning moon as the Pointers of the Southern Cross are from each other. Mars will soon be in the evening sky, growing brighter until the time of opposition, when it will be at its nearest to the earth.

Brief reference was made last month to Cunningham's comet and, as was expected, it came and went before the Journal was published. This page is prepared six weeks before publication, and at the time of writing little was known about this visitor. While it was visible it gave pleasure and interest to millions of people who contemplated it. It was very beautiful, and because naked eye comets are rare it aroused much comment. Astronomers, however, see quite a number of distant comets each year, some of which are predictable. The last naked-eye comet was Peltier's, which passed through Capricornus, a little east of the present position of Mars, in August, 1936. In 1927 we saw comet Pons-Winnecke, which was so distant that it appeared only as a small nebula. The last comet comparable with the one we have just seen was Halley's of 1910, which is due to return in 1985. The last Great Comet was seen by those who remember 1882.

About this time of the year, the Zodiacal Light may often be quite noticeable to those who look for it, especially in West Queensland, where the atmosphere is dry and clear. This light appears after all sunlight has faded from the sky. It consists of a tall cone of faint light which lies in the ecliptic (where the sun, moon and planets are always found). Its broad base rests on the horizon where the sun has set and it tapers to a point 60 or more degrees above, where its light generally peters out. The light is very faint and ethereal, so that a young moon or a slight haze obliterates it. Under ideal conditions it reaches faintly to the meridian and down to the eastern horizon. In the meridian, just opposite the sun, a slightly brighter patch may be noticed, which is known as the Counter Glow. The Zodiacal Light may also be seen before the dawn, rising from the eastern horizon. It is considered that there is a great lens-shaped formation of fine particles of matter extending from the sun far beyond the earth. It is sunlight reflected from these particles which we see.

For places west of Warwick and nearly in the same latitude, 28 degrees 12 minutes S., add 4 minutes for each degree of longitude. For example, at Inglewood, add 4 minutes to the times given above for Warwick; at Goondiwindi, add 8 minutes; at St. George, 14 minutes; at Cunnamulla, 25 minutes; at Thargomindah, 33 minutes; and at Oontoo, 43 minutes.



THE STARRY SKY IN APRIL LOOKING SOUTH.

The illustration shows a few star groups and the Milky Way, when looking south about dark in early April. The Southern Cross is shown just above the pear-shaped black spot, half-way up the Milky Way. This black spot is known as the Coal-sack. It was once thought to be a hole in the Milky Way but it is now known to be a black nebula—an immense cloud of dust which obscures the starry background. According to Black-fellows' star-lore, the Coal-sack forms the head of a huge emu. The two Pointers to the Cross are in the long neck which opens out to form the breast and back. On clear moonless nights this black figure becomes conspicuous, when once recognized. A line through the Southern Cross and continued toward the lower right-hand corner passes a little below Achernar. If the line is drawn from Beta Centauri (the Pointer next to the Cross) to Achernar, a line dropped from the centre of this line gives the south point on the horizon. A half-way between Beta Centauri and Achernar is near the South Celestial Pole, around which all the stars appear to revolve once in every 24 hours.

The two patches, which appear like small portions of the Milky Way, are the Magellanic Clouds. They are huge star systems at tremendous distances. The smaller cloud is no fewer than 95,000 light-years distant. Light, which travels 186,000 miles a second, takes 6,000 years to traverse the cloud. The larger cloud is 112,000 light-years away and is, therefore, correspondingly larger. They are now getting rather low to be well seen.

In early times the Cross was a part of the Centaur. The Pointers formed his front feet. There are many more stars than shown, but these mark something of the figure of a Centaur thrusting a spear forward. The Pointer farthest from the Cross is Alpha Centauri, the nearest bright star to the earth; its light has taken 4¼ years to reach us. Below this star are two stars on the edge of the Milky Way, which, with a third, forms a triangle. This is known as the Southern Triangle. In the top right is the large constellation of Argo, the Ship. The bright star is Canopus, which is second in brightness only to Sirius. Whereas Sirius is comparatively near, Canopus is very distant, 650 light-years has been estimated, but its distance is not accurately known. Above the Cross, in the Milky Way, is another, rather larger, cross lying parallel with the Southern Cross. This is the False Cross in Argo and is often mistaken for the Southern Cross by people coming south for the first time.

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF JANUARY IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALL DURING 1940 AND 1941, FOR COMPARISON.

Divisions and Stations.	Average Rainfall.		Total Rainfall.		Divisions and Stations.	Average Rainfall.		Total Rainfall.	
	Jan.	No. of years' records.	Jan., 1941.	Jan., 1940.		Jan.	No. of years' records.	Jan., 1941.	Jan., 1940.
North Coast.	In.		In.	In.	*South Coast–contd.*	In.		In.	In.
Atherton	11·66	40	15·88	7·15	Gatton College ..	4·28	42	8·60	3·69
Cairns	16·66	59	14·43	13·19	Gayndah	4·59	70	5·22	5·84
Cardwell	16·97	69	26·54	10·45	Gympie	6·53	71	9·45	4·48
Cooktown ..	14·46	65	4·48	22·24	Kilkivan	5·58	60	6·86	3.00
Herberton ..	9·42	55	11·24	7·10	Maryborough ..	6·99	70	8·34	2·19
Ingham	15·82	49	26·40	16·08	Nambour	9·43	45	10·83	4·82
Innisfail	20·39	60	26·07	25·42	Nanango	4·61	59	6·41	4·51
Mossman Mill ..	18·42	28	15·16	26·80	Rockhampton ..	7·43	70	5·63	3·15
Townsville ..	10·94	24	39·97	8·23	Woodford ..	7·70	54	8.59	9·61
Central Coast.					*Central Highlands.*				
Ayr	10·95	54	20·01	4·23	Clermont ..	4·99	70	9·45	0·51
Bowen	9·55	70	20·98	2·89	Gindie	3·70	42	..	2·07
Charters Towers ..	5·34	59	10·35	4·68	Springsure ..	4·16	72	9·26	0·91
Mackay P.O. ..	13·61	70	19·32	10·48	*Darling Downs.*				
Mackay Sugar Experiment Station	13·30	44	..	10·17	Dalby	3·42	71	4·00	5·28
Proserpine ..	15·05	38	24·03	15·56	Emu Vale ..	3·20	45	5·00	3·06
St. Lawrence ..	7·79	70	7·92	2·67	Hermitage ..	2·95	35	..	..
South Coast.					Jimbour	3·50	62	3·39	1·48
					Miles	3·65	56	12·50	1·83
					Stanthorpe ..	3·63	68	6·88	3·07
Biggenden ..	5·17	42	5·92	1·85	Toowoomba ..	5·09	69	11·66	5·72
Bundaberg ..	8·29	58	10·77	2·36	Warwick	3·56	76	6·29	3·28
Brisbane	6·36	89	12·99	7·47	*Maranoa.*				
Caboolture ..	8·02	65	8·00	4·78					
Childers	7·12	46	10·43	1·01	Bungeworgorai ..	2·12	27	..	0·78
Crohamhurst ..	11·93	48	11·70	6·88	Roma	3·08	67	9·30	0·80
Esk	5·63	54	9·38	4·79					

A. S. RICHARDS, Divisional Meteorologist.

CLIMATOLOGICAL TABLE—JANUARY, 1941.

COMPILED FROM TELEGRAPHIC REPORTS.

Divisions and Stations.	Mean Atmospheric Pressure at 9 a.m.	Shade Temperature.						Rainfall.	
		Means.		Extremes.				Total.	Wet Days.
		Max.	Min.	Max.	Date.	Min.	Date.		
Coastal.	In.	Deg.	Deg.	Deg.		Deg.		Points.	
Cooktown	..	90	79	96	24	72	5	448	12
Herberton	..	82	67	88	14	61	2	1,124	21
Rockhampton	29·86	88	73	99	14, 15	69	27	563	18
Brisbane	29·95	82	68	91	26	63	31	1,299	16
Darling Downs.									
Dalby	..	83	64	90	17, 25	58	31	400	11
Stanthorpe	..	76	59	85	17	52	28	688	16
Toowoomba	..	74	60	85	17	55	11	1,166	20
Mid-Interior.									
Georgetown	29·80	94	73	100	24	66	28	1,208	20
Longreach	29·82	89	70	101	17	60	26	1,234	16
Mitchell	29·88	82	66	90	17, 18, 19	56	29	1,103	14
Western.									
Burketown	..	90	76	100	7	68	27, 28	1,134	14
Boulia	29·81	94	73	106	15	62	4	809	6
Thargomindah ..	29·84	85	69	96	21	59	4, 26	527	8