

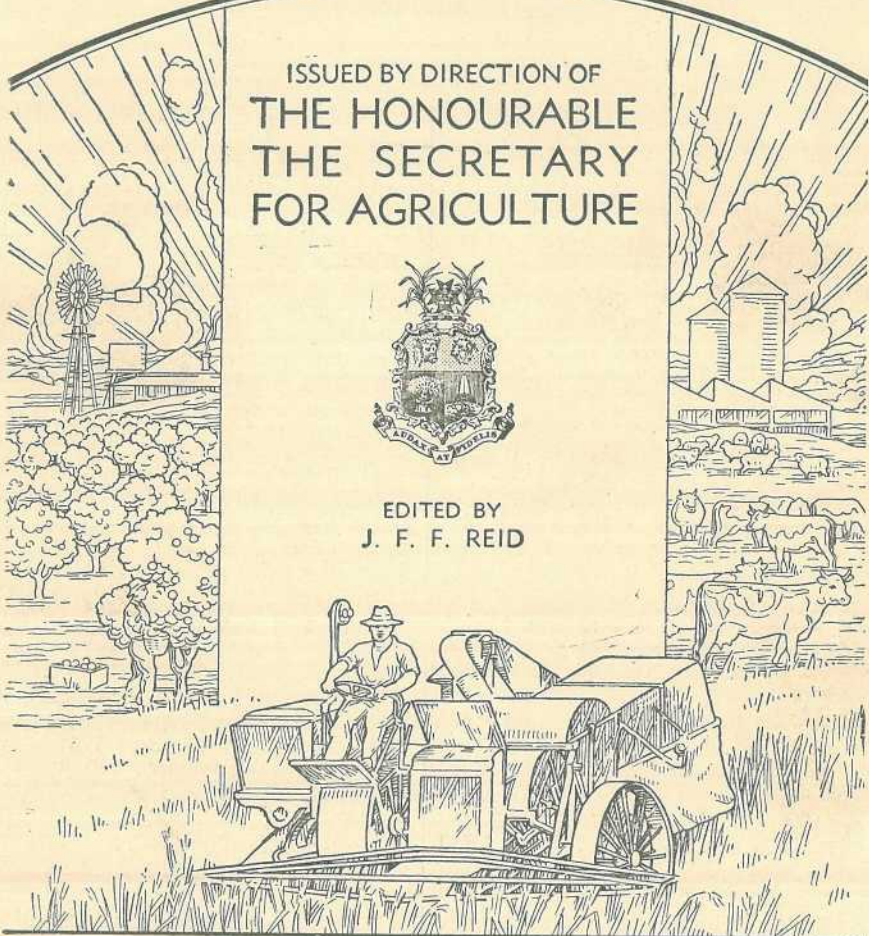
Volume LV

# QUEENSLAND AGRICULTURAL JOURNAL

ISSUED BY DIRECTION OF  
THE HONOURABLE  
THE SECRETARY  
FOR AGRICULTURE



EDITED BY  
J. F. F. REID



JANUARY to JUNE, 1941

# QUEENSLAND AGRICULTURAL JOURNAL

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



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Vol. LV.

1 JANUARY, 1941.

Part 1

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## *Event and Comment*

### The King Speaks to His People.

“REMEMBER this: If war brings separations, it brings new unity also—unity coming from common perils and common sufferings willingly shared,” said the King in a Christmas address broadcast to the Empire.

“We have surmounted a grave crisis,” His Majesty added, “We don’t underrate the dangers and difficulties still confronting us, but we take courage from the successes which our fighting men and their allies have won against heavy odds on land, at sea, and in the air. . . .

“War brings among other sorrows the sadness of separation. There are many men in the forces away from their homes to-day, because they must stand ready and alert to resist the invader should he dare come or because they are guarding the dark seas or pursuing the beaten foe in the Libyan desert.

“Many circles are broken. Children from English homes to-day are in Australia, Canada, New Zealand, and South Africa.

“Not only has the manhood of the whole British Commonwealth again rallied to aid the Mother Country in her hour of need, but the peoples of the Empire have eagerly opened the doors of their homes to our children in order to spare them the strain and danger of modern war.

“In the United States, also, where we find so many generous, loyal friends and organisations to give us unstinted help, warm-hearted people are caring for many of our children till the war is over.

“But how many more children are there here who have been moved from their homes to safer quarters?

“To all of them at home or abroad, who are separated from their fathers and mothers, to their kind friends and hosts, to all who love them, to parents, who are lonely without them, all in our dear island, I wish every happiness Christmas can bring.

“May the New Year carry us towards victory and happier Christmas days when everyone will be at home together in the years to come.

“To the older people here and throughout the world I say that in the last war the flower of our youth was destroyed while the rest of the people saw little of the battle. This time we are all in the front line and in danger together. I know the older ones are proud it should be so.

“To be good comrades, and good neighbours in trouble is one of the finest opportunities of the civilian population and by facing the hardships and discomforts cheerfully and resolutely they not only do their duty but play a part in helping the fighting services win the war.

“Time and again during the last few months I have seen for myself battered towns and cities in England; I have seen the British people facing their ordeal.

“I can say to them all that they may be justly proud of their race and nation. I have seen every side of the new splendid spirit, and good fellowship springing up in adversity, and also a real desire to share the burdens and resources alike.

“From all this suffering there is growing a harmony which we must carry forward into the days to come when we have endured to the end and victory is ours.

“Then, when Christmas days are happy again, and goodwill has come back into the world, we must hold fast to the spirit binding us all together now.

“We shall need this spirit in each of our own lives as men and women. We shall need it even more among the nations of the world.

“We must go on thinking less about ourselves and more for one another, for so—and so only—can we hope to make the world a better place and life a worthier thing.

“Now, I wish you all a happy Christmas and a happier New Year. We may look forward to the new year with sober confidence.

“The future will be hard, but our feet are planted on the path to victory and with the help of God we shall make our way to justice and peace.”

### The Front Line of Freedom.

WE are all naturally interested in how the farmers of Great Britain are faring these days, especially as developments in the Old Country have in one way or another a direct bearing on our own future as a component of the British Commonwealth. One important thing which has developed out of the present situation is a general appreciation of the right of primary producers to a fair deal in the matter of prices. On that basis a solid foundation is being laid for long-term prosperity in agriculture. The farmers of Britain are determined that they will not again allow themselves to be led up the garden path, as happened after the last war. The first thing, however, is to ensure victory, and in this regard the food producers are doing a noble, wholehearted, and very effective best. Food production at this time of crisis is obviously one of the vital factors in the achievement of victory. The people of the Empire know that they can rely on the farmers in any emergency. It is good to know, too, that a plan has been evolved, or rather a price structure has been devised to "reconcile just treatment for the producer with the requirements of the nation"—not, of course, that the farmers need any such stimulus to their stern resolve to pull their weight in winning the war and to-day, to quote Winston Churchill, "the farms of Britain are the front line of freedom."

### New Uses for Farm Products.

FARMERS in Australia, as elsewhere, are faced with all sorts of difficulties, especially in relation to the profitable disposal of crop surpluses. Many changes in rural economy are not unlikely in the near future and, probably, before very long farmers will be producing for something more besides the people's pantry. In addition to food crops, they will be producing, as some already are, raw material for a multiplicity of industrial uses. For instance, one American firm has spent over £3 millions in buying agricultural products for use in the chemical industry, while four years ago the whole crop of soya beans from 50,000 acres was used by one United States organisation alone for the manufacture of motor car accessories.

We have a big job ahead of us and we shall have to get busy on collating all the information we can on our rural resources, and the extent to which it may be practicable to produce for future industrial needs. With the sorting out of all the information obtained and obtainable, it will be possible to plan for the ever-widening demands of modern industry. There is, therefore, a definite obligation on us to survey and tally our present resources, not only in respect of war-time essentials but also in anticipation of the requirements of the reconstructive period when the world regains its reason. Everyone knows that tremendous social, technical, and economic problems have yet to be solved, but we ought to be far-sighted enough to see the possibilities beyond our present difficulties, and game enough to grasp the opportunities when they come knocking at our door.

## Some Queensland Couch Grasses.

L. S. SMITH, B.Sc., Assistant to Research Officer.

A FEW months ago it was found that losses of sheep at St. George were caused by the Common Native Couch. A number of couch grasses occur in Queensland, and some confusion exists concerning their identity. The name "Couch" is usually applied to any creeping grass which does not already possess some other distinguishing name, so that botanically they may not be at all closely related. As some contain a prussic-acid-yielding glucoside and others do not, identification of the species is important. The following account has been designed to assist in distinguishing the common species occurring in this State and to indicate those which are poisonous.

### Key to the Species Dealt With.

In attempting to identify a particular couch grass, the following key should be used as a preliminary. Whether or not the name tentatively worked out from the key is correctly applied to the specimen may be checked by a comparison with the fuller description given further on.

Should at any time the specimen agree with neither group of characters in any pair in the key, then it is not dealt with. The size of the seed can readily be determined by making it stand at right angles to the ray of the seed-head by inserting the finger nail over the tip of the seed and pulling it downwards.

- I. Seeds on slender stalks of varying length; these stalks up to about one-tenth of an inch long. At the junction of the blade and sheath of the leaf is the ligule composed of a white, tissue-paper-like flap up to nearly one-twelfth of an inch long (Plate 2, fig. 5c). The grass has characteristic bluish-green leaves, forms a continuous ground cover, and is commonly used for lawns on the subtropical seaboard.

#### *Blue Couch.\**

Seeds all unstalked. The ligule is always very small and less than one-thirty-second of an inch in length (Plate 2, fig. 1c).

### II.

- II. Grass forming a continuous ground cover. It occurs in both coastal and western Queensland, is of perennial duration, and in the west typically grows along bore drains or near water.

#### *Common Couch.†*

Grasses sending out short runners, but these not intermeshing and forming a continuous ground cover between the tufts. They are solely inland grasses, are of annual duration; and grow in open grassland or open forest country, and not typically along bore drains nor near water.

### III.

- III. Leaf sheaths and blades bearing numerous slender spreading hairs. Seed-head composed of two spikes or only one. Seeds exceeding one-eighth of an inch in length. This is only found in the far central and south-western areas.

#### *Hairy Native Couch.‡*

\* *Digitaria didactyla* Willd.

† *Cynodon dactylon* (L.) Pers.

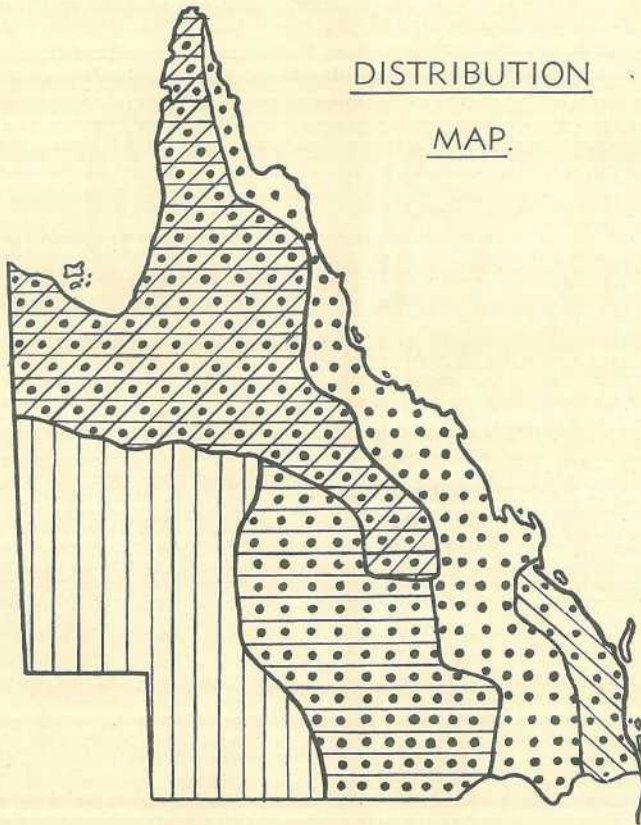
‡ *Brachyachne ciliaris* (Benth.) C.E.H.

Hairless grasses, except, perhaps, for a few at the base of the leaf blades. Seed-head generally consisting of three or more spikes. These two grasses do not extend further west than the railheads, except in the far north-west.

IV.

IV. Seeds larger, one-eighth to one-sixth of an inch long.

*Common Native Couch.\**








COMMON NATIVE COUCH	-	-	-	
SLENDER NATIVE COUCH	-	-	-	
HAIRY NATIVE COUCH	-	-	-	
COMMON COUCH	-	-	-	
BLUE COUCH	-	-	-	

Plate 1.

MAP SHOWING THE DISTRIBUTION OF FIVE SPECIES OF COUCH GRASS.

\* *Brachyachne convergens* (F. Muell.) Stapf.

Seeds smaller, less than one-tenth of an inch long. Generally a more slender and less common grass than the preceding.

*Slender Native Couch.\**

The above key will broadly differentiate the various species, but, as an additional help, a map (Plate 1) showing the approximate distribution of the species has been prepared from available collections. The map must, however, be taken as tentative, and a rough approximation only, for the distribution of the different grasses is not well defined and they overlap to some extent.

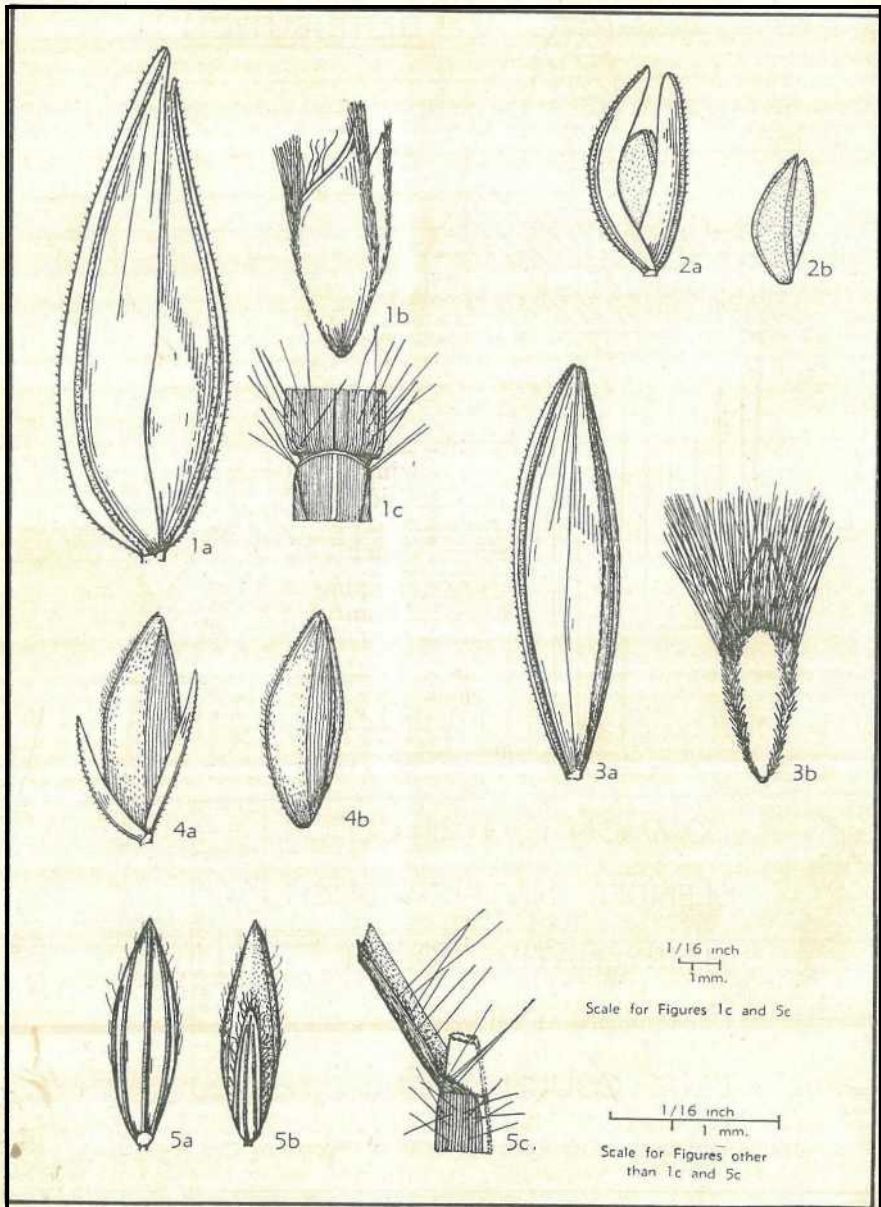


Plate 2.

\* *Brachyachne tenella* (R. Br.) C.E.H.

### Blue Couch.

*Description.*—A rather long creeping slender grass, which, spreading by means of numerous runners, forms a continuous ground cover. The flowering stems reach 1 foot in height, though on grazed land they are often less. The blades of the leaves are a characteristic bluish-green colour, from 1 to 5 inches long, one-sixteenth to one-eighth of an inch wide, and taper into a fine point. The sheath of the leaf surrounding the stem is spreadingly hairy as is also the lower part of the blade. At the junction of the blade and sheath is a small white tissue-paper-like flap, the ligule, up to nearly one-twelfth of an inch long. The seed-head is composed typically of two or three oblique slender rays bearing numerous seeds. The rays of the seed-head are from 1 to 3 inches long. The seeds measure one-twelfth to one-tenth of an inch in length, are a pale greenish colour, and show a few longitudinal ridges on the outer face. They are borne on slender stalks of from one-thirty-second to one-tenth of an inch long.

*Distribution.*—It is an introduced species and was first noticed in the vicinity of Nudgee about 1906, but has since spread over the sub-tropical seaboard. It also occurs in Madagascar, Mauritius, and Indo-China.

*Properties.*—Blue couch is one of the commonest lawn grasses in the southern coastal districts of Queensland, where it does quite well. As a fodder species it is of doubtful value. Although it provides some feed in the summer months on the river flats, it sometimes encroaches upon the hillside pastures where it is usually too low growing to provide much feed and yet tends to smother more useful species. It dries off rapidly during the winter months, showing up as brown patches, though it soon responds to rain. No prussic-acid-yielding glucoside has so far been found in the grass.

### Common Couch.

*Description.*—A rather slender creeping grass which frequently forms a dense sward by means of its many surface and underground runners. The flowering stems are up to 1 foot in height. Throughout Queensland the many forms of this species vary both in general appearance and in the size of the various parts. The blade of the leaf is usually green, but in the west it is sometimes a pale greenish colour. It is up to 4 inches long and one-tenth of an inch wide, though in many instances the leaf is shorter. Typically, both blade and sheath are hairless, but at the junction there is a tuft of whitish hairs. The seed-head consists of from three to six rays, each from  $\frac{1}{2}$  to  $2\frac{1}{2}$  inches long and frequently purplish tinged. The unstalked seeds are densely arranged and appressed to the rays. Each seed measures one-twelfth of an inch or slightly less in length.

*Distribution.*—This grass was first described from specimens collected in southern Europe, and is widely spread over the tropical

#### DESCRIPTION OF PLATE 2.

COMMON NATIVE COUCH.—1a.—whole seed or spikelet; 1b.—floret; 1c.—junction of leaf blade and sheath showing ligule.

SLENDER NATIVE COUCH.—2a.—whole seed or spikelet; 2b.—floret.

HAIRY NATIVE COUCH.—3a.—whole seed or spikelet; 3b.—floret.

COMMON COUCH.—4a.—whole seed or spikelet; 4b.—floret.

BLUE COUCH.—5a.—whole seed or spikelet; 5b.—back of seed; 5c.—junction of leaf blade and sheath showing ligule.

and subtropical regions of the world. It occurs both in the coastal and inland parts of Queensland, and although it occupies a variety of situations on the seaboard, it is usually commonest on the margins of bore drains, tanks, rivers, and similar places in western Queensland.

*Properties.*—Common couch is a useful binder for bore drains and creek banks, and in America, where it is known as Bermuda Grass, it is used extensively to prevent erosion. It is also quite a good fodder. So far, although chemically examined on a number of occasions, the common form of the common couch has not been found cyanogenetic. Besides the common form, however, there are two other forms of this grass which are worthy of mention since both are cyanogenetic. One is a large form and the other is a hairy form.

The large form\* is, as its name indicates, a larger type of grass than the common form and is taller and more luxuriant with broader leaves. It differs from the common form in having the leaf blades up to 6½ inches long and one-quarter of an inch wide, and in having four to seven rays in the seed-head; moreover, the larger seeds are more than one-twelfth of an inch long. Like the common form it is hairless except at the junction of the leaf and sheath. So far as is at present known this large form only occurs at Nerang and Brisbane in the Moreton district. It is probably an introduced form and may have come from South Africa. Small amounts of a prussic-acid-yielding glucoside have been found in it.

The hairy form† closely resembles the common form in general appearance, but differs from it in having either the leaf blade alone or the leaf blade and the sheath, sparsely covered with short hairs about one-sixteenth of an inch in length. The leaves have a slightly bluish-green colour and are generally more rigid than in the common form. The rays of the seed-head are commonly one to four in number, while the seeds are larger than in the other two forms and exceed one-tenth of an inch in length. So far, this form has only been found in the Dalby, St. George, and Dirranbandi districts. Specimens from near Dirranbandi, and St. George, areas where there had been previous deaths of sheep, were found to be cyanogenetic.

### Hairy Native Couch.

*Description.*—A low, tufted annual grass from 3 to 9 inches high, with the stems much branched at the lower notches, the outer ones spreading and sometimes lying along the ground at the base and rooting from a few of the lower notches. The stems and seed-head are purple coloured at times. The leaf blades are short, ½ to 1½ inches long and up to one-tenth of an inch wide. Both the leaf blade and the sheath are densely hairy with fine hairs over one-tenth of an inch in length. These hairs may quite easily be seen with the naked eye by viewing the grass against a suitable background. At the junction of the leaf and sheath on the inner side the ligule consists of a very short white rim. The seed-head is typically composed of two rays, less commonly of only one, and rarely of three rays. Each ray is from 1 to 2½ inches long.

\* According to Mr. C. E. Hubbard, a grass specialist at the Royal Botanic Gardens, Kew, this form agrees more closely than the common Queensland form with specimens from southern Europe, from which locality the species was originally described.

† This agrees fairly well with *Cynodon dactylon* (L.) Pers. var. *pulchellus* F. Muell.



The unstalked seeds, which overlap, are densely arranged along and are appressed to the rays. They measure from one-eighth to almost one-sixth of an inch in length.

*Distribution.*—The grass is native to the central portions of Australia, occurring in Central Australia, northern South Australia, north-western New South Wales, and the far south-western and central-western areas of Queensland. Roughly, its eastern boundary in Queensland lies along a line drawn through the main western railheads.

*Properties.*—Practically nothing is known about its reputation as a fodder, and it has not yet been subjected to chemical analysis. Since both of the other Queensland species of native couch are poisonous, it would not be surprising to find that hairy native couch also contains a prussic-acid-yielding glucoside.

### Common Native Couch.

*Description.*—A tufted annual grass up to 1 foot high, with the outer stems spreading at the base and much branched at the lower notches. It usually throws out a few relatively short runners, but these are not numerous enough to form a continuous ground cover. The leaf blades are commonly  $1\frac{1}{2}$  to 3 inches long and one-tenth to one-fifth of an inch wide, of a greenish or pale-greenish colour, and more or less loosely hairy in the lower part. The leaf sheath is hairless. At the junction of the leaf and sheath there are a few fine hairs on each side and a very small white rim. The seed-head is composed of three or four relatively stout, pale or slightly purplish rays at the top of the stem; less commonly there are two, five, or six rays, and these vary in length from 1 to 3 inches. The unstalked seeds are tightly appressed to the rays and overlap one another, and measure between one-eighth and one-sixth of an inch in length.

*Distribution.*—This is a native of Northern Australia and is found in a broad band running through North-Western Australia, the Northern Territory, and Queensland into New South Wales. In Queensland the common native couch, or Gulf Star Grass as it is sometimes called, occurs in the north from Mareeba across through the Gulf country to Camooweal. To the south, the western boundary seems to run roughly from Camooweal through Cloncurry to near Longreach, thence south to Cunnamulla and the New South Wales border. The Main Divide limits the distribution to the east except that the grass occurs in the Charters Towers and Clermont-Springsure areas, but not on the Darling Downs.

*Properties.*—Conflicting reports have been received from various places regarding its fodder value. Around the Gulf it is looked upon as a useful fattening grass, while in more southern areas it is usually left alone while other grasses are available, although when drying off at maturity it is sometimes eaten.

Chemical analysis of material from St. George indicated that about three times what is generally regarded as a dangerous amount of prussic acid was contained in the sample. As some of the glucoside had no doubt decomposed during transit, the analysis figure may be taken as conservative. Until more is known concerning the dangerous periods of growth, &c., the grass should be treated as a dangerous one.

### Slender Native Couch.

*Description.*—A slender tufted annual grass with the stems erect, oblique, or shortly creeping and branched at the lower notches. The flowering stems are up to 1 foot high and pale yellowish coloured. Both the leaf blade and sheath are hairless. The blades are green or pale-green in colour, those on the shoots  $\frac{3}{4}$  to 1 inch long and one-sixteenth of an inch wide, those on the flowering stems up to  $3\frac{1}{2}$  inches long and one-tenth of an inch wide. At the junction of the leaf and sheath the ligule consists of a very narrow whitish rim, with usually no hairs near it. The pale-greenish rays of the seed-head are slender, 1 to 3 inches long, and commonly two, three, or four in number, though actually the number may range from one to six rays. The numerous small unstalked seeds overlap and vary from one-twelfth to one-tenth of an inch in length.

*Distribution.*—The grass is a native of the Northern Territory and Queensland. So far, it has been recorded in Queensland from the area between Springsure and Blair Athol, from Prairie near Hughenden, and also from Mareeba. It is probable that the area occupied is much larger than that indicated, however, and that it extends across through the Gulf country to the Northern Territory border as in the case of the common native couch. The latter is apparently much more common than the slender native couch which has probably been overlooked and confused with it.

*Properties.*—Little is known concerning the fodder value of this grass. Specimens from the Clermont district have been chemically examined and found to contain sufficient prussic-acid-yielding glucoside to be regarded as potentially dangerous.

### Other Couch Grasses.

Throughout Queensland there are some other grasses known as various kinds of couch. Three well known species are Giant Couch\*, Water Couch†, and Salt Water Couch‡. Giant Couch, or Para Grass, as it is more frequently called, is a valuable fodder grass which is widely spread over the eastern seaboard of Queensland. It is frequently planted as a pasture grass in higher rainfall areas or on swampy land and is useful for reclaiming the latter. The grass is a native of Brazil. Water couch and salt water couch are closely allied grasses and resemble one another in appearance. The former grows near fresh water, while the latter occurs on saline flats and swamps. In their respective habitats they are each useful fattening grasses. None of these three grasses has been suspected of being poisonous in Queensland, and, as mentioned, are useful species.

\* *Brachiaria purpurascens* (Raddi) Henr. (*B. mutica* Auct.).

† *Paspalum distichum* Linn.

‡ *Paspalum vaginatum* Sw.

### NOTICE TO READERS.

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## Poison Plants.

JOHN LEGG, D.V.Se., Animal Health Station, Yeerongpilly.

THE heavy annual loss of stock from poison plants in Queensland makes the study of the subject of plants poisonous to animals a very important one, and for this reason a more intensive investigation has been made of the problem over the last few years. During the course of this enquiry many experiments have been performed to test the alleged lethal qualities of certain plants, much information has been gathered from the field regarding the special circumstances under which poisoning of stock occurs, and the most useful and valuable points which emerge from the pursuit of these enquiries is being placed on record, where they will be available for future use.

A poisonous plant has been defined by Steyn as one which, when consumed by an animal over short or prolonged periods, exerts harmful effects on the system or causes death by reason of the presence of toxic substances in that particular plant.

It is, however, very difficult to define fully the term poisonous plant. Many produce harmful effects because of their fibrous nature which affects the animal in a mechanical way; others are harmful because of the presence of armed fruiting bodies. Again, others are quite good fodders in the ordinary way, but under certain conditions of soil, climate, and possibly other factors they become poisonous; a few because of the presence of certain plant parasites—e.g., ergot.

### Factors which Influence Toxicity.

Plants of the same species can vary widely in their toxicity. This may be due to locality, soil, climate, or some other circumstance, but this does not fully explain all these variations. It is known that plants of the same species growing side by side vary in their specific toxic content, and it has been suggested that certain strains of a species may be more toxic than other strains.

(a) *Soil*.—The composition of the soil and soil content of particular elements influences the make-up of the plant and may convert an otherwise harmless plant into a poisonous one. One of the best known examples of this is the selenium poisoning in certain areas of the United States of America. For many years a peculiar disease of stock prevented the development of certain areas of western United States of America. The cause was unknown until it was determined that the soil content carried a high percentage of selenium salts, and these in turn were taken up by the plant and passed on to the animal, causing unusual symptoms which we now know to be due to the presence of these selenium compounds.

The presence of nitrates in the soil no doubt influences the amount the plant will take up, particularly at certain times of the year and during certain stages of growth. It has recently been shown that the poisonous effects of the ordinary mint weed (*Salvia reflexa*) is due to the large quantity of nitrate present, and this can produce very serious effects upon the host.

*Atalaya* or whitewood is another common Queensland plant which appears to vary in toxicity and according to locality and soil. In the

Gulf country and North Australia generally it is regarded, and probably rightly so, as the cause of walkabout disease in horses. Further south it is considered to be harmless and quite a good fodder by some.

Lantana is another plant which appears to vary in toxicity according to locality and soil. Of the two recognised species which have been introduced into this country and have now become well established along the coast, one, the mauve-flowered variety (*L. camara*) is poisonous in North Queensland, but apparently is not so in the south. The reverse is the case with the red-flowered variety (*L. crocea*), which has been found to be non-poisonous in the North and poisonous in New South Wales. Whether this alteration in toxicity is due to change of soil and/or climate is not known, but it presents an extraordinary paradox.

Another plant, the ordinary linseed (*Linum usitatissimum*) has been found to vary in its hydrocyanic-acid content under different conditions of soil and locality.

The foregoing represent but a few examples.

(b) *Stage of Growth*.—Many plants contain toxic substances in the immature stage, but are quite good fodders when older. The various species of sorghums, Johnson grass and Sudan grass, are well-known examples. The ripe berries of ordinary white cedar (*Melia dubia*) are said to be more toxic than the immature ones, while the berries of some of the Solanaceæ are poisonous when green but quite harmless when ripe. The distribution of poisonous substances, of course, varies greatly according to the part of the plant selected, and naturally this in its turn, to some extent, at any rate, on the stage of growth. One has only to think of the many alkaloids which find a place in pharmacology, such as morphia, which comes from the opium of the poppy head, or cocaine from the leaves of a South American plant. The roots and bark of derris contain rotenone, a substance very largely used to destroy insect and allied pests, while the rest of the plant contains very little; and so on with many other examples.

It must be remembered that some plants contain their active constituents in a form other than that which produces its poisonous effects. Cyanogenetic glucocides as such do no harm, but under the influence of enzyme action hydrocyanic acid (HCN) is liberated.

Drought conditions which seriously affect the growth of the plant may be responsible for the increase in certain active constituents in the plant, this being particularly noticeable in plants of the HCN group. Plants of this group are specially dangerous in this respect—i.e., Johnson grass and the sorghums.

(c) *Light*.—The poisonous effects of some plants only develop when the animal is exposed to light, and then, as a rule, only on the white portions of the skin. This is due to the absorption by the white portion of the skin of certain of the elements of the spectrum, and these in their turn influence the sensitising agents which derive their origin from the plant. The condition produced is known as photosensitisation, and has been the subject of much investigation during the last few years. It appears that these agents are closely allied in their composition to the chlorophyll of the plant on one side and certain constituents of the protoplasm of the plant cells on the other. It was believed at one time that the production of sensitising agents was confined to a relatively

small number of plants and then under, as a rule, special conditions of climate, season, &c., the exact significance of which was not known. However, the recent outbreaks of facial dermatitis in New Zealand, which appears to be a form of photosensitisation, indicates that many plants are capable of producing sensitising agents and particularly in flush seasons.

(d) *Exercise* is necessary to produce the symptoms associated with poisoning by some plants. A number of well-known plants fall into this group, such as *Stachys arvensis*, the stagger weed, and the *Malva* or marshmallow group of plants. In the ordinary way these plants produce no effect on the grazing animal, but if driven they show trembling and staggering, and if driving is continued the animal eventually falls and is unable to rise.

(e) *Climatic Conditions*.—Mention has been made of the effects of drought and other conditions on the poisonous principle content of some plants, but there is one condition, i.e., tetany, which appears to be associated with the consumption, during certain seasons, of what are usually considered to be otherwise good fodders. Tetany is believed to be usually due to a hypomagnesaemia or a hypocalcaemia—i.e., a decrease in the calcium and magnesium contents of the blood—or a combination of both. A good deal of work has been done on these conditions, particularly in Holland, during the last few years, and the relationship between the decreased amounts of magnesium and/or calcium in the blood and the particular foodstuffs consumed have not yet been determined. In Australia a condition of tetany is frequently seen in sheep and cattle which have grazed on oats or wheat which have been exposed to frosts. The condition, at least in Queensland, appears to be associated more often with a dry winter than with a wet one, though the wet winters frequently represent the years in which there is less frost, which may be an important factor.

(f) *Habituation or Tolerance* to plant poisons is probably not of very great importance from the practical standpoint, but it has a good deal of theoretical interest. I am not referring here to natural tolerance, which varies widely with the species of animal—and even within the species there are marked differences between the susceptibility of individual animals to plant poisons—but to acquired tolerance. In South Africa it has been shown that by repeatedly administering small quantities of sublethal doses of certain plants or the toxic products of such plants that it was possible to induce a tolerance whereby the animals were able to consume without ill-effects up to 800 times the minimum toxic dose.

The tolerance that is seen in human beings to certain plant alkaloids is well known, and there is no reason to doubt that under certain conditions animals acquire a similar degree of toleration, and a good deal of experimental work has been done along these lines, particularly with laboratory animals.

The opposite condition to tolerance is increased susceptibility. Whether this condition can be acquired is not yet known, but there appears to be some evidence that under certain conditions animals become particularly susceptible to the ingestion of certain poisons. It is known, of course, that with certain alkaloids, such as strychnine, there is evidence of an increased susceptibility following repeated small doses, but this, however, may be due rather to a cumulative effect than to a true increased susceptibility.

### Poisonous Principles Found in Plants.

The poisonous principles of a great number of plants are as yet unknown. Apart from the plants which produce HCN in the animal body by virtue of the presence of what are known chemically as cyanogenetic glucosides which are broken down by enzymes or ferments in the animal body whereby the HCN is split off, there are a number of poisonous principles which have been isolated from plants and which fall into more or less well-defined groups.

(a) Alkaloids are among the most important. These are nitrogenous compounds with the reactions of bases, and so are able to combine with acids and form salts, such as sulphates, tartrates, acetates, and chlorides. They vary widely in their effects on the host, and many of them find extensive use in pharmacology.

(b) Glucosides are neutral in reaction and nearly always crystalline in structure and soluble in ether and alcohol. The most important from the point of view of plant poisoning are the nitrogenous glucosides, and among these the cyanogenetic which produce HCN. The amount of these glucosides varies widely in the plant and is governed by a number of factors, some of which are as yet unknown.

(c) Lactoresins or latex form emulsions with emulsifying liquids and appear to consist of a hydrocarbon and a resin which may also be combined with alkaloids, proteins, glucosides, phenols, &c. Their effect is mostly on the alimentary tract. Curare, the South American arrow poison, is a well-known example.

(d) Saponins are allied to the glucosides, and their composition is to a large extent unknown. It is worth noting that when taken via the alimentary tract they are relatively harmless, but via the peritoneum or directly into the blood stream they are extremely poisonous. It is said that when lesions, such as ulcerations, occur in the bowel wall saponins present in the food stuff have a much better chance of reaching the blood stream.

(e) Toxalbumins are analagous to the enzymes in many respects and also have some of the properties of albumins. Beyond this little is known of their composition, but they can, when introduced into the body in small doses, set up the production of antibodies. One of the best known examples is ricine found in *Ricinus communis*, the castor oil plant.

(f) Photosensitisation has already been mentioned, and the substances responsible appear to be related on the one side to the chlorophyll, the green colouring matter of the plant, and on the other to the haemoglobin, the red colouring matter of the blood, and certain other cell constituents.

### Plants which Produce Deficiency Diseases.

These are really not poison plants in the strict sense of the word. Deficiencies in soil lead to the absence of certain essentials in the plant, and these in their turn to deficiency disease in the animal. The absence of sufficient phosphorus in many soils is well known and occurs all over the world. The accompanying disease of phosphorus deficiency has been studied in many species of animals. Within recent years attention has been drawn, particularly in Australia, to the absence of certain other elements in the soils and pasture and the accompanying diseases

they produce. The work on cobalt and copper deficiency in South and West Australia has attracted world-wide attention. As mentioned above, these plants are not strictly poison plants, but they are good illustrations of the manner in which a soil deficiency can be transferred via the plant to the animal economy with disastrous results to the latter, and wherein a group of diseased conditions is produced which is a direct contrast with another group of diseased conditions produced by excess of certain poisonous elements in the soil which find their way by the same route—i.e., via the plant to the animal economy.

### Symptoms and Lesions.

Symptoms and changes produced in the animal body (lesions) vary widely and according to the plant and the animal. Certain classes of poisons act upon the digestive tract and the organs associated with it, some exert their influence on the respiratory and circulatory apparatus, others on the genito-urinary system, many on the nervous system, some on the sensory organs and skin, and so on.

Many of the known plant poisons affect the digestive apparatus. Those acting acutely produce diarrhoea, vomiting, and acute inflammation of the various parts of the tract. The more slowly acting ones, particularly those of a cumulative nature, act upon such organs as the liver producing, according to the degree of irritation, a subacute or chronic inflammation. Icterus—i.e., jaundice—is common with many.

General systematic or body poisons like HCN naturally produce very few symptoms and the lesions are almost negligible.

Many of the alkaloids have a special action on the circulatory and respiratory systems as well as the sensory organs. They do not, as a rule, produce marked changes in the body.

A large number of plant poisons affect the nervous system, the symptoms varying according to the particular plant and poison. On the brain they may produce excitement or the opposite effect—depression. The spinal cord and nerve endings may also be affected with contraction of muscles, either singly or in groups or over a wide area, trembling, convulsions, tonic and clonic spasms, tetany, &c.

Some of those affecting the respiratory apparatus produce profound changes in the lungs. One or two of these are of importance in Queensland.

### Circumstances in which Poisoning Occurs in the Field.

This is the important phase of the subject from the point of view of the stockowners, and in discussing it we propose to select a few of the best-known plants known to be poisonous in this State and deal with each one in turn.

#### 1. *Lantana*.

The first plant to consider is the common *Lantana*, an introduced plant which has established itself along the whole of the coastal area of Queensland, particularly on the rich soils of the sugar districts of the North, but it is also to be found in many of the lighter soils. Once established, it tends to take charge and choke out many other plants.

The first evidence we have regarding the poisonous nature of the *Lantanas* is found in a report by the late Mr. G. Tucker, Deputy Chief

Inspector of Stock of Queensland, and is dated 1911. Mr. Tucker was investigating a condition known as "pink nose" in cattle at Cairns. This disease is associated with loss of condition, marked constipation, and jaundice, which may be intense. The muzzle is swollen and often cracked and is of a dark-blue or pink appearance, hence the name. The condition was noted mostly in cattle brought from inland areas to the coast for slaughter purposes, hence was frequently seen in bullocks running in butchers' paddocks. Many of these paddocks about Cairns were overrun with lantana and had very little grass. By feeding tests, Tucker showed that lantana was responsible for the condition, but his report is not very clear regarding the species.

In this State there are apparently two varieties, one with a lighter green leaf, rougher stems, and yellow and red flowers, the second with a darker leaf and mauve and cream flowers.

In North Queensland, as mentioned earlier in this article, it was considered that the yellow-red variety was the more poisonous of the two, and this received support from some experiments carried out in New South Wales. However, feeding tests which have been carried out in North Queensland on more than one occasion have shown that the mauve-flowered species is very poisonous, the feeding of even a few ounces of the plant producing symptoms in calves, while the yellow-red-flowered variety, even in considerable quantities, produced no ill-effects.

Lantana poisoning is of considerable economic importance at times, for although it does not produce, as a rule, high mortality, the loss of condition and the unsightly appearance of the flesh due to the jaundice causes many bullocks to be rejected in the meatworks. On one occasion some years ago over 100 otherwise first-grade carcasses of beef at Alligator Creek meatworks, Townsville, had to be graded as third grade because of the yellow discolouration.

## 2. *Hoya australis*.

This is a fleshy climber with white flowers, which are sweetly scented. It occurs along the coast but is also found inland, particularly in the brigalow scrubs. It is known as "Hoya" or "Wax" flower.

It has long been regarded as poisonous, but was only recently tested at Yeerongpilly, the plants being obtained from Taroom. Force\* feeding of the plant to two wethers produced symptoms. One was sick within twenty-four hours of consuming a pound of the plant, the second wether showing symptoms after eating 3 lb. over a period of three days. A third wether showed symptoms after being drenched with watery extracts from 2 lb. of the plant.

A peculiar symptom noticed with one of these sheep was the assumption of a kneeling position. This is said to be noted also in both sheep and cattle poisoned under natural conditions.

As stock losses occur in animals which are being driven through brigalow scrubs, especially along roads where little feed is available, it is obvious that such stock routes should be avoided as much as possible,

\* Force feeding means forcing the ground-up plant into the animal's mouth in small balls. By such means considerable quantities can be taken.



and where this is impracticable the animals should be kept away from the plant as much as possible. This is possible at times, for the plant appears to grow in patches.

### 3. *Passiflora alba*.

Known as the "Wild passion vine," this is a native plant occurring on the coast or thereabouts. The flowers are white.

The plant is quite common about the Rathdowney and Beaudesert districts, where it came under suspicion many years ago as being the possible cause of mortality among dairy cows and also among working bullocks.

In dairy cows it was noticed that the affected animals stood about under the trees and did not graze out with the others, nor did they ruminate. There was marked reduction in the milk yield in lactating animals, also loss of condition. Convulsions and fits were not infrequently seen in the last stages of the disease. It was noticed that animals very frequently recovered if the pasture was changed.

Feeding experiments, carried out by the late Dr. Sydney Dodd in 1910 and fully reported at the time, with the succulent tops of the vines at Yeerongpilly produced all the symptoms of the disease as seen in the field. It was also noticed that symptoms were not produced until at least fourteen days after feeding commenced, thus suggesting that the poisonous principle is of a cumulative nature. (See "Q.A.J.," 1910, page 88.)

### 4. *Trema aspera*.

This is a shrub common as a secondary growth found both along the coast and inland but more frequently on the coast. It is known as "Poison Peach."

For many years this plant has been regarded as poisonous to stock, and it was generally believed that this was due to a prussic acid (HCN) glucoside. Tests carried out at various times have failed to produce evidence regarding the presence of HCN.

Extensive feeding tests have been carried out in both North and South Queensland with the green leaves of this shrub, and with positive results in all cases. Thus a two-year-old steer at Townsville died after consuming 18 lb. and a second after consuming 6 lb. One sheep consumed 4 lb., a goat 2½ lb., while another sheep was drenched daily for four days with the watery extract obtained from 1 lb. of the minced plant; death followed in each case.

The symptoms noticed were dullness, loss of condition, and evidence of pain. With one steer it was noticed that the animal kept its head lowered and its muzzle in contact with the ground.

Post-mortem does not show anything characteristic. There is no doubt, however, that the poisonous principle is not HCN.

### 5. *Verbesina encelioides*.

This is an introduced plant which has adapted itself to Queensland conditions, and is now widely spread throughout various parts of the State. It is particularly prevalent in the Lockyer district, parts of the Downs, and the Maranoa. It is known as the "Wild Sunflower," is an annual, often weedy in nature, and about 2 to 4 feet high. In cultivated areas it is a bad pest.

It has been suspected on various occasions of causing death in both sheep and cattle. It is, however, a plant that is not likely to be eaten in the ordinary way by stock because of its woody and fibrous nature, and it has usually come under suspicion where stock have been turned on to pasture containing much of the plant in dry times when other feed is not very abundant.

Drenching experiments with watery extracts of the plant have shown that it contains a toxic principle, and sheep have been killed in twenty-four hours after administration of a single dose obtained from a pound of the minced plant. Experiments with bovines have been limited and have not given conclusive results, but there is no doubt that the plant is consumed not infrequently by cattle in sufficient quantities to cause death.

The toxic principle causes an acute gastro-enteritis and, in addition, an acute congestion of the lungs and a marked oedema of the lung tissue. This peculiar lesion makes the diagnosis of poisoning in the field relatively easy.

The poisonous properties of this plant have been investigated in New South Wales, and the details of their results can be found in the Veterinary Research reports from Glenfield (No. 7, page 89).

#### 6. *Salvia reflexa*.

This is an introduced plant and is now well established in parts of Queensland and tends to spread. It has covered some of the best parts of the Darling Downs. It is known as "Wild Mint."

Like many other plants, it is usually not touched by stock unless they happen to be hungry, when it may be consumed in considerable quantities. Its poisonous properties appear to depend upon the high nitrate content, a quality which appears to vary according to the seasonal conditions prevailing at the time. The nitrate is reduced in the animal's body to nitrite by enzymic action, and this nitrite acting upon the haemoglobin or red colouring matter of the blood produces a substance known as methaemoglobin. By this the oxygen carrying capacity is reduced. The post-mortem is characteristic in the fresh carcass, the blood being a distinct chocolate colour, which pervades all the body organs.

Disastrous losses have been at times associated with this plant. Some years ago a mob of some 1,000 bullocks, which had passed over part of the Darling Downs that had been eaten out, then travelled along a lane for several miles where this plant was growing profusely. No less than 300 of them died.

#### 7. *Salvia coccinea*.

This is another member of the salvia group which is a garden "escape" and has established itself in various parts of the State. It was definitely poisonous when tested on sheep and cattle, but the plant has also been accused of causing abortion in cows. The field evidence in this direction is particularly strong, and for this reason farms where the plant has established itself in the last few years have greatly depreciated in value. Experiments have not yet proved whether it is correct to regard the plant as one capable of producing abortion, but these are about to be conducted shortly, using pregnant cows as experimental animals. By this means it is hoped to settle the question. The fact remains, however, that the plant is definitely poisonous to sheep.

This plant has also been reported as poisonous in New South Wales (Glenfield reports No. 7, page 118).

#### 8. *Threlkeldia proceriflora*.

Known as "soda bush," this is a native plant a few inches to one foot in height. It is very common in the western sheep country and is also found in New South Wales and South Australia. It is particularly abundant in the black-soil areas, where in some cases it constitutes 90 per cent. of the cover.

Notwithstanding the fact that the plant is widespread and has undoubtedly been the cause of heavy mortality in the past, it did not cause undue suspicion until quite recently. It is a plant not readily eaten in the ordinary way by sheep, and all observers agree that when the animals are allowed to graze quietly they ignore the plant. When, however, sheep have been trucked and not fed for periods of forty-eight hours or more, or when they have passed over several miles of a bare stock route, they readily eat the plant if it is available.

A peculiar characteristic of sheep dying after consuming this plant is the fact that many of them are found dead lying on their briskets with the head stretched along the ground. In most other conditions dying sheep lie over on their sides before death and are found in this position, but this is not always so in soda-bush poisoning. It is a point which assists greatly in diagnosing the condition.

It is worth noting that places like the Longreach common are covered with this plant, and it is well known that for years many graziers untrucking valuable sheep have taken the greatest precautions in driving sheep across this common, yet until quite recently this plant was not even suspected. It was only a little more than a year ago that the Longreach stock inspector suspected this plant as the probable cause of trouble in his district, and on further investigation his suspicion was confirmed. (See Aust. Vet. J. of 1939, page 168.)

#### 9. *Wedelia asperrima*.

This is a native plant known as the "yellow daisy" and grows on the black-soil sheep country at Hughenden, Richmond, and Cloncurry.

Like many other plants we have mentioned, it is not readily eaten by sheep in the ordinary way, for sheep bred on a property where the plant is common suffer no ill effects. Introduced sheep, however, frequently consume the plant with fatal results.

When enough plant has been consumed—and a few ounces is often sufficient—the condition runs an acute course. The animal is obviously ill and takes no notice of its surroundings. There is marked uneasiness to be soon followed by a comatose condition. Spasms of the muscles may be noticed just before death.

Post-mortem shows an acute inflammation of the stomachs and first part of the bowel, and also a marked congestion of the lungs, a condition we have already noted in another species, *Verbesina encelioides*, which is closely allied to *Wedelia*.

The testing of this plant was conducted at the Animal Health Station, Oonoonba, Townsville, North Queensland (see "Q.A. Journal," October, 1939).

10. *Brachyachne convergens*.

This is one of the couch grasses. It is a native plant and is fairly widely spread in the eastern parts of Queensland. It had not come under suspicion until quite recently, when it was found to be very common along a certain stock route near St. George. Heavy losses of travelling sheep had occurred at various times along this stock route since the previous wet season and an investigation by Mr. Francis, one of the Government Botanists, showed that this plant was growing profusely in patches and had been consumed by the sheep. Examination also revealed the fact that the HCN content of the plant was very high, and since the animals were showing unmistakable evidence of HCN poisoning, there seems to be little doubt that this plant was the causal agent.

It represents one of the most recent additions to poison plants of this State.

11. *Swainsona luteola* and *galegifolia*.

I have placed these two plants together; the first has been strongly suspected and the second is the well-known Darling Pea. It appears that animals acquire a taste for these plants, and when once this is fixed they prefer to eat them, leaving other good pasture alone. It has not yet been definitely proved in this State that *S. luteola* is poisonous, but the field evidence in this direction is very strong. When affected the animal is said to be "pea-struck."

Unlike many other plants we have mentioned and which kill the animal in a relatively short space of time, the two plants mentioned above do not produce symptoms until the animals have been feeding on them for some weeks—i.e., the poison, whatever it is, appears to be of a cumulative nature. The first symptoms noted are those of a nervous nature; there is trembling of the body, stupidity, and loss of alertness. The animal becomes clumsy and unsteady in its gait. It may fall but soon regains its feet in the early stage of the disease, but has greater difficulty in rising as the condition progresses. If the animal is driven, the symptoms may be greatly aggravated, but if left alone may take some weeks before death ensues. (See Agric. Gazette of N.S.W., 1917, page 735.)

12. *Atalaya hemiglauca* (Whitewood).

A small native tree very widely spread throughout North Australia.

By many it is regarded as quite good fodder for cattle and sheep, but its association with the well-known "walkabout" disease of horses of the Gulf country and the Northern Territory was proved some years ago by investigators working in the latter territory.

The poison is cumulative and animals do not exhibit symptoms until they have consumed considerable quantities. So far as is known, once symptoms have developed, no animal has been known to recover. The symptoms are quite characteristic, the animal seems to have lost to a very large extent its sense of direction and is unable to recognise obstacles. It staggers forward blindly and cannot be restrained unless by force. The consequence is that, as the beast becomes weaker, it frequently finishes by becoming entangled in a wire fence or else staggering into a lagoon and there being drowned. Another peculiar symptom is that if the animal has been used to pasturing near a habitation it moves in that direction and attempts to enter by forcing its way through doors or openings.

The lesions are characteristic. There is frequently a greatly distended stomach due probably to early paralysis and the liver shows marked degeneration changes.

The condition is very prevalent in the Gulf country and appears to be worse in some years, when it is responsible for very heavy losses.

The fact that the poison is cumulative and does not produce symptoms until lesions must be well advanced means that the animal may be removed some weeks from whitewood country before symptoms are observed.

Extensive experiments with this plant were carried out by officers of the Council for Scientific and Industrial Research and the results published in their Bulletin No. 36.

### 13. *Terminalia oblongata* (Yellowwood).

This is a small tree found throughout central Queensland. It was generally regarded as the cause of fits or shivers in sheep for many years before the work of McIntosh and Stewart confirmed these opinions. During the late winter particularly the plants shed their leaves and in dry times these are readily eaten by the sheep. Small branches, too, are frequently broken from the trees and from these the leaves are plucked by sheep.

On experiment it was found that the symptoms which consisted of fits were produced in three to four days after feeding on 1 lb. of the leaves mixed with chaff per day. These fits come on particularly if the sheep are approached by strangers and attempt to run away. McIntosh says: "The sheep drops in its track as though stunned and lies trembling with the extension muscles of the neck and limbs strongly contracted. The animal sometimes lies prone or may raise its head and sway it from side to side. Recovery is usually quick and in less than a minute. The sheep is able to rise, then sway a little, and finally runs off to join the mob. Strangers, loud noises, dogs, and driving all help to bring on the fits. Some animals, after recovery from fits, do not seem to be affected by driving" ("Q.A. Journal," 1934, page 727, where the tree is referred to as *Terminalia bursarina*).

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## SCIENCE SOLVING THE GRAZIER'S PROBLEMS.

Only towards the close of the last war was the value of scientific research in times of emergency fully appreciated, but during the present war its essential service has been recognised in Australia as well as in Great Britain. To-day, work undertaken in many fields of investigation is being continued. Included in that work are projects for improvement in the pastoral industry and the wool clip. Some recent discoveries include a method of treating jaundice in sheep, a treatment for internal parasites in sheep, a system for the elimination of foot-rot in sheep—which has been found to be solely due to germ infection—and a process for making wool unshrinkable.

Other inquiries, nearing successful results, are being made into blowfly strike and other problems, and it is certain that the general adoption of the methods already proved of use will result in improved health of sheep and a better wool clip—a matter of importance to the country as well as to the individual grazier.

Continuance of scientific research such as this must contribute largely to Australia's successful sharing of the burdens of the war.

## A Dairy Building Plan.

P. ROUND, E. B. RICE, and L. E. NICHOLS, Dairy Branch, Department of Agriculture and Stock.

**N**OW that steam sterilization is compulsory under *The Dairy Produce Act* on any dairy operating a mechanical milking plant, it is desirable, especially on the larger farms, to so plan the farm buildings that most of the dairy work can be done under the one roof, if at all practicable or convenient.

To conform with progressive changes in the dairying industry, an experimental shed of a design calculated to provide simplicity of working, while at the same time complying with essential sanitary requirements, was built on the farm of Mr. R. L. Kemp, of Ascot, near Greenmount, Darling Downs. (Plates 3, 4, 5, 6.) The chief features of the layout of a milking shed and yards, covering the requirements of regulation dairy buildings, are:—

- (1) The dairy section of the building—comprising (a) engine room, (b) separator room, (c) milk or cream storage stand, and (d) wash-up area—is attached to and under the same roof as the milking bails; and
- (2) Concreted areas at the entrance to and exit from the bails up to a distance of 30 feet from the dairy section of the shed to provide a clean approach for stock.

After eighteen months' experience, Mr. Kemp has expressed complete satisfaction with the shed and yard layout as to the practicability and advantages of the plan. Forty other dairy farmers on the Downs, who were impressed with the practical benefits of the plan, have since built or converted their milking sheds along similar lines.



Plate 3.

A GENERAL VIEW OF THE SHED AND IMMEDIATE ENVIRONMENT.

### Advantages of the Combined Building.

The advantages of what is described as a combined dairy building in comparison with the detached dairy buildings formerly stipulated are:—

- (1) Building costs are lower.
- (2) Contamination from certain sources (particularly manurially-laden dust from the cowyard) is minimised.
- (3) The milking and subsequent operations are more conveniently performed.
- (4) Steam sterilization can be more efficiently applied.
- (5) The extension of the use of refrigeration on dairy farms will be facilitated.

These points will now be discussed in order:—

(1) *Cost.*—The cost of dairy buildings can be reduced by adopting the type of shed described, particularly by cream suppliers, for the expense incurred in erecting the dairy house (A), which is necessary if detached dairy buildings are preferred, represents an outlay which could otherwise be spent more usefully in improving the design of the milking shed.

(2) *The Minimising of Dust Contamination.*—This also is an objective with the ordinary layout of dairy buildings, but in practice it is not always achieved because of the tendency to deviate from prescribed standards. These may be considered by the farmer to be minor deviations—such as storage of utensils and equipment in a room adjacent to the bails without any regard for layout of yards to offset dust (often dessicated manure)—but these deviations may have a marked effect on the quality of dairy produce. In the layout described, the cowyard is at the side of the shed, and cattle will be on concrete as soon as they come within 30 feet of the dairy, consequently the dust nuisance will be considerably mitigated.



Plate 4.

THE SHED FROM ANOTHER ANGLE, SHOWING GRASSSED AREA FENCED OFF FROM STOCK.

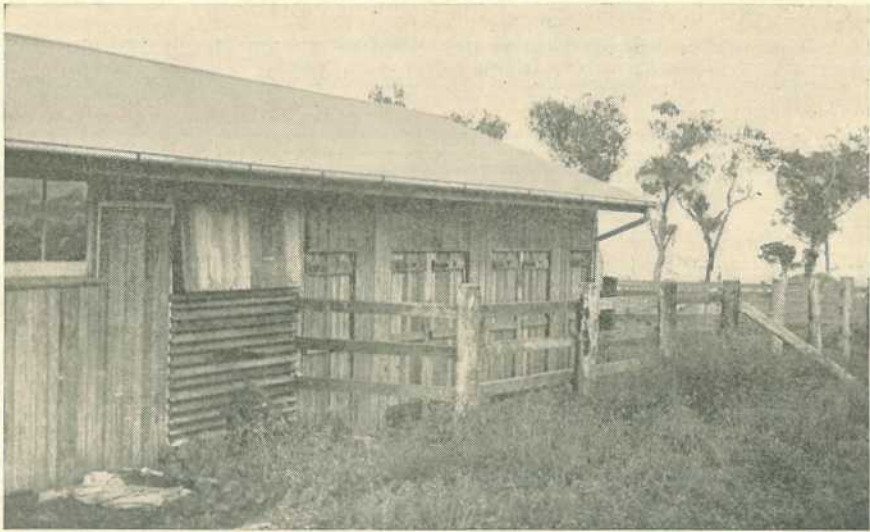


Plate 5.

A CLOSE VIEW OF THE SHED, SHOWING EXIT RACE AND LOUVRES IN ENGINE ROOM.

(3) *Convenience*.—The convenience and the saving in labour and expense through being able to carry out all operations in close and orderly sequence should be appreciated by all dairy farmers and should tend to more careful methods in production.

(4) *Steam Sterilization*.—The buildings previously specified require a division of cleansing operations—the milking machine at the milking bails and the remaining utensils at a wash-up room 30 feet away. The primary purpose in instituting compulsory steam sterilization was to ensure the maintenance of hygienic standards for milk and cream produced by mechanical milking, but the division of the cleansing



Plate 6.

THE SHED AND DAIRY HOUSE FROM THE STOCK-FREE ENCLOSURE.



operations between two places 30 feet apart is inconvenient where a sterilizer is installed, and thus may react against the most efficient application of steam sterilization. A major aim in the design of the new building is to simplify cleansing.

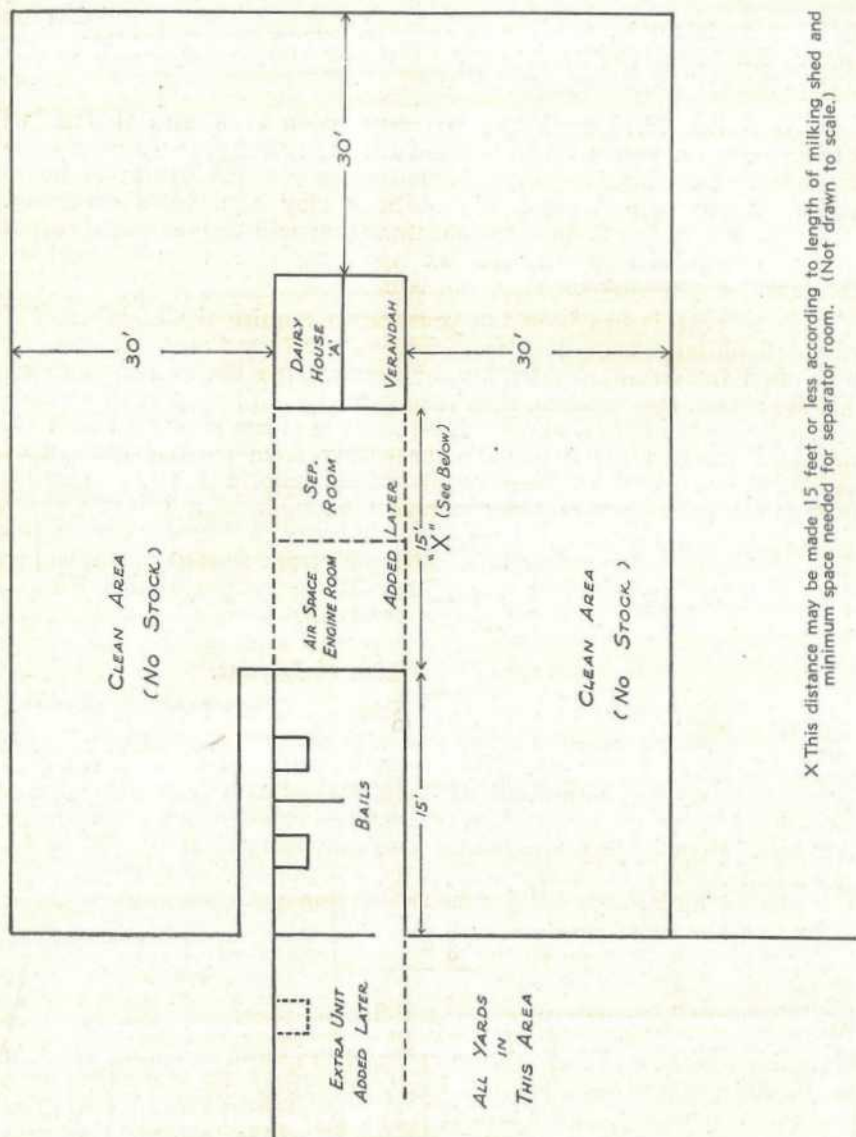
(5) *Farm Refrigeration.*—The new design facilitates the use of refrigeration for cream storage, which is already being applied by some producers and which, if a permanent quality improvement is to be attained irrespective of seasonal conditions, may be adopted generally. Cream storage adjacent to the separator room will enable refrigeration plants to be driven by the same motive power as is used for milking machines.

In the past it has been the practice to require the erection of a suitable building, situated at least 30 feet away from the assembly yard, to be used for straining, aerating, or separating milk, and for storage of milk, cream, and utensils, thus removing the milk as soon as possible after it leaves the udder, and storing it, or the cream separated from it, and the utensils a reasonable distance away from possible sources of contamination. A concession allowed in the case of a dairy operating a milking machine permits the separation of milk in a suitable room adjoining the bails, provided a 6-foot air space is placed between the separator room and the first bail. Milk or cream storage and washing and storage of utensils, however, has still to be provided for in a detached building 30 feet away from the bails.

#### Factors Governing Choice of Layout.

Although the combined dairy building is mainly adaptable to farms with large machine-milked herds, it may also be used on farms on which hand milking is the practice. However, for small dairy farms on which up to, say, twenty cows are milked, the detached dairy house (A), with veranda used as a combined separator and wash-up room, may be preferred. In order to comply fully with *The Dairy Produce Act* on an established small farm where the yards and milking bails are already in existence, but where a dairy house has not yet been provided, the erection of the dairy house (A) would perhaps involve the farmer in less expenditure than to convert the existing yards and building in accordance with the new layout. Even for large farms operating a milking machine the new combined building is not intended to entirely replace the previous regulation buildings, but the plan is offered as an alternative design, and farmers are at liberty to build or convert to this layout, or to erect detached buildings, according to their individual preference. The ease with which it is possible with the new building to change over from hand milking to the use of milking machines should, however, be borne in mind by anyone contemplating the erection of new buildings and who is likely at some future date to instal a milking plant.

*For example.*—If hand-milking sheds are erected, or converted, to the new layout with the cowyard at the end of the bails, the shed is projected towards the dairy house. Assuming that the shed is 15 feet long, the dairy can be built in line, 15 feet away. Should a milking machine be installed later, the buildings can be connected by constructing the engine and separator rooms between them. In the meantime, a considerable saving of distance has been effected, with no diminution of efficiency, as the dairy is still 30 feet away from the yard. (See Plate 7.)



X This distance may be made 15 feet or less according to length of milking shed and minimum space needed for separator room. (Not drawn to scale.)

Plate 7.

With the "walk-in and walk-out" bails, should it be necessary at any time to extend the shed for machine milking, the additional bail units may simply be projected in the direction of the holding yard.

#### Notes on the Layout.

The impression may be gained that the building of a single shed in which all work can be done and cream storage provided for would entail the laying down of an area of concrete (or other material impervious to water) approximately 30 square feet in front of and behind the bails as shown in Plate 8.

The concreted area, however, can be reduced to any scale suitable to individual premises. For instance, the 30 feet by 30 feet area at the exit of the bails is best reduced to a crush not more than 4 feet wide. With such a crush it is, of course, necessary for all the doors to open in one direction and to be of such a width as to prevent cows from turning back. The action of the doors is to turn the cows as they leave the bails in the desired direction towards the race outlet; on closure the gentle push on the rump hastens exit. The 30 feet by 30 feet area in the assembling yard can be reduced to any width desired, or it can be entirely eliminated by having the yard at the end of the bails and permitting the cows to enter the bails from the end. Experience has shown that if a small holding yard is provided, as shown in sketch No. 3, the cows will walk in and out of the bails undeterred.

It may be claimed that delay will occur in milking a large herd through having to admit each individual cow to the bails, but, if desired, in order to allow a number of cows to be enclosed at a time in a small yard preparatory to milking, a strip of concrete, say, 6 feet wide in front

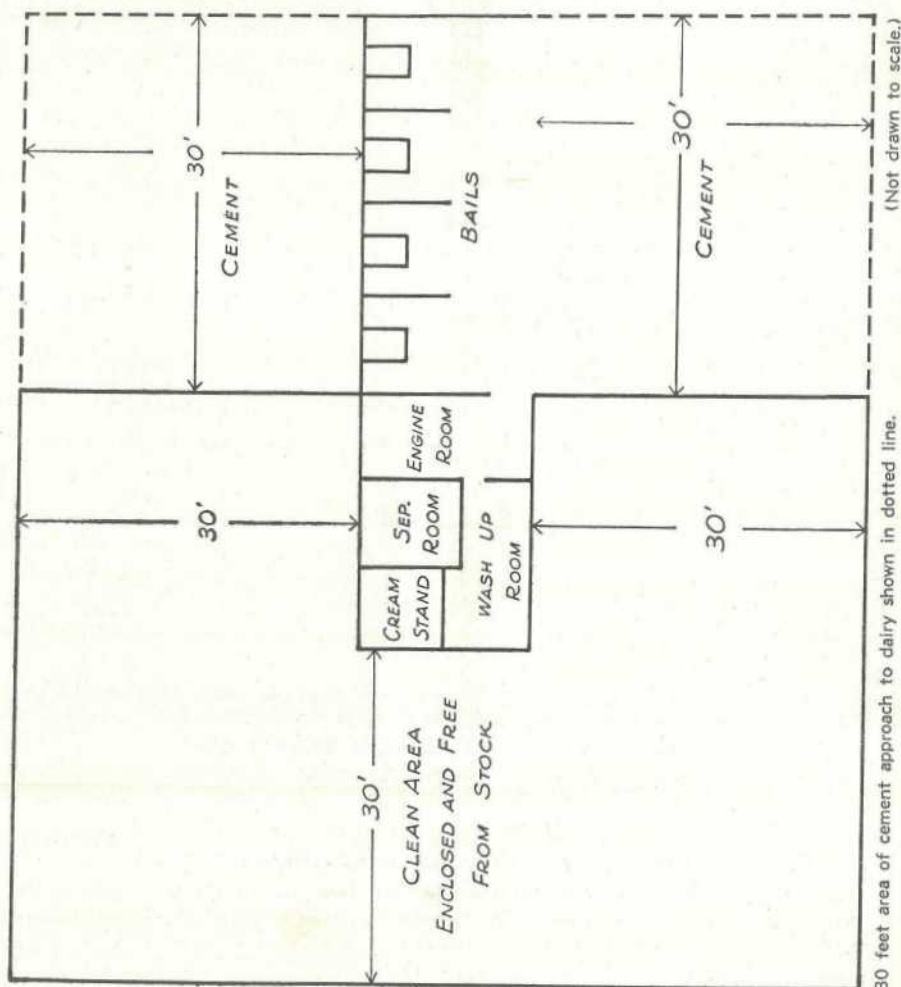


Plate 8.

of the bails, as indicated in Plate 9, could be provided. With such a small waiting area, running the full length of the bail portion of the shed, ten or a dozen cows could be driven in at a time and it will be found that, in most cases, cows waiting in this small area facing the bails are ready to walk in to the bail of their own accord as soon as they see the door opened to let a milked cow through.

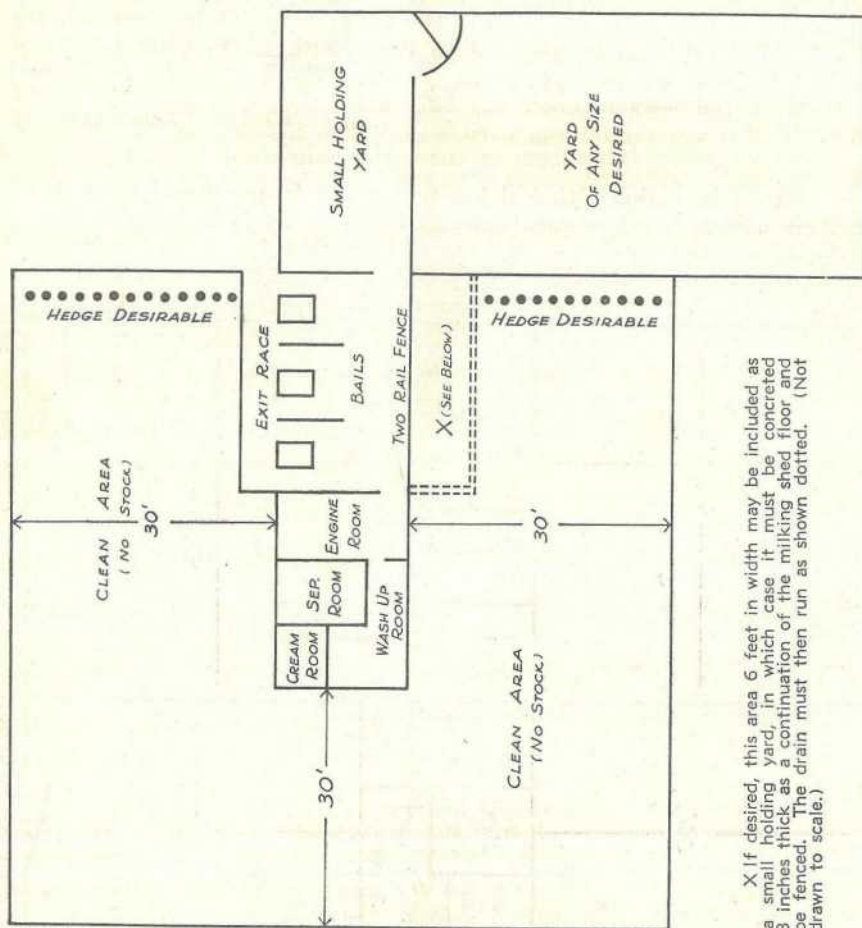
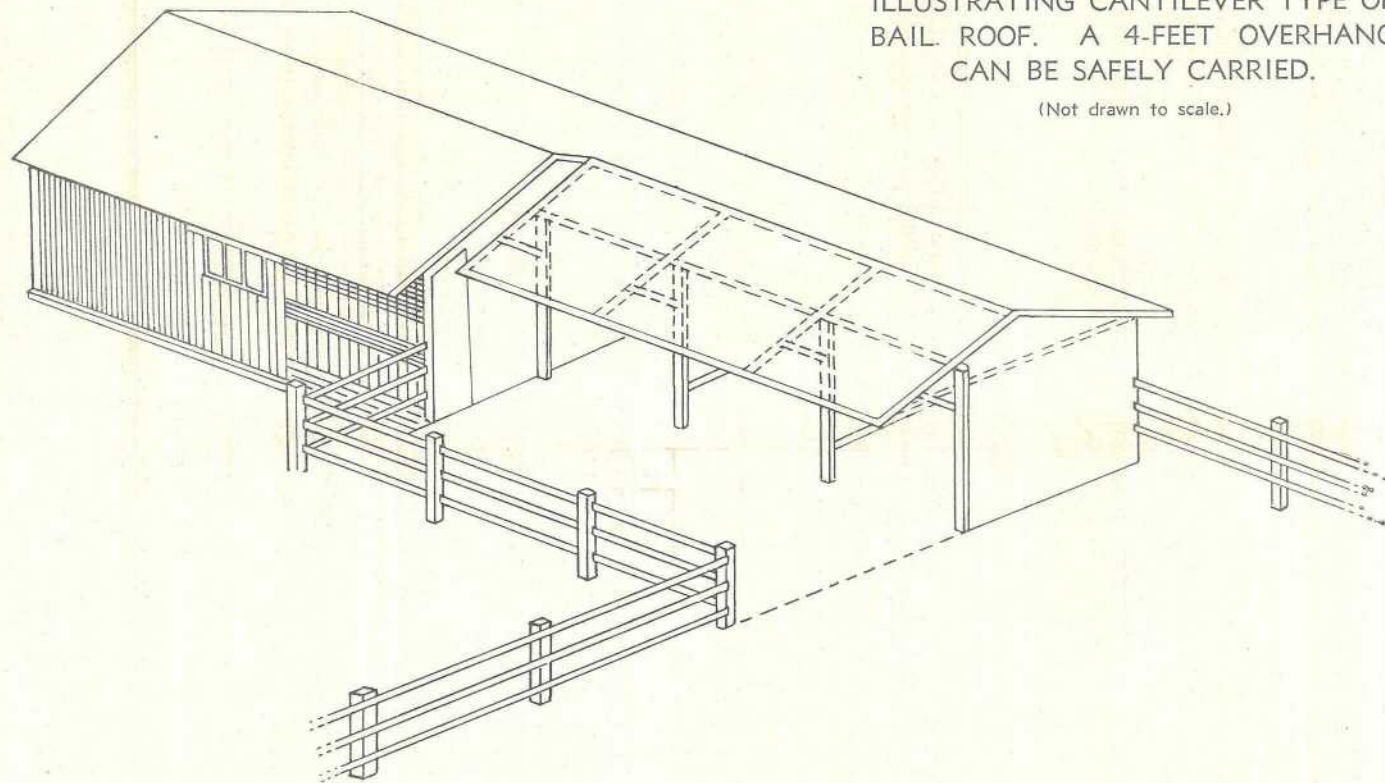


Plate 9.

Increased efficiency, convenience, and ease of operation will be achieved if, where the 6-foot concrete strip in front of the bails is provided, shed posts are dispensed with—supporting posts to be arranged and included in the leg-rope posts of bails. This gives a clear floor space. The bail roof could be shortened, and lowered to give protection from driving rain, as shown in Plate 10.

Having the holding yard at the end of the milking shed is emphasised as a feature of major importance in the new layout. This is much preferred even to a large concreted yard in front of the bails, for, unless this yard is properly cleaned daily, it can also carry very large quantities of manure-laden dust. The layout, by keeping the drainage and cow

X If desired, this area 6 feet in width may be included as a small holding yard in which case it must be concreted 3 inches thick as a continuation of the milking shed floor and be fenced. The drain must then run as shown dotted. (Not drawn to scale.)



ILLUSTRATING CANTILEVER TYPE OF  
BAIL ROOF. A 4-FEET OVERHANG  
CAN BE SAFELY CARRIED.

(Not drawn to scale.)

Plate 10.

yard (which inevitably becomes heavily contaminated with droppings, thus impregnating the soil with harmful organisms which, if they gain access as dust to either milk or cream, are most deleterious to its quality) at one end of the shed and the separating, cream storage, and utensils portions at the opposite end, is conducive to high-quality production. Numerous tests of milk supplies and visits to farms have revealed frequently the effects of contamination with manure-laden dust. The new design provides for the keeping of utensils and stored cream at a distance from the dust-polluted atmosphere of the yard. In comparatively wet coastal districts a draining shed could be provided at the end of the bails, with a sunny northerly aspect. A windbreak or hedge along the yard end of the bails will further minimise yard-dust contamination of the dairy equipment and the milk and cream storage area. The establishment of grass or lucerne plots in the "no stock" areas around the dairy is recommended.

It is the experience of farmers, who have built new or converted existing sheds in accordance with this combined dairy plan, that cattle quickly become accustomed to the system and no difficulty has arisen, even with heifers in their first lactation, in working the cattle in and out of the bails. On the contrary, many have claimed the heifers are less troublesome than in the old style of bails.

In the plan the following features, which are optional, have been incorporated and are suggested as a means of increasing efficiency:—

In the bails, sliding seats may be fitted in each dummy bail for convenience and sanitation.

The use of sheets of galvanised iron, which can be washed down easily, used for lining the side walls of the bails, and on which manure may be splashed, would be an advantage in ensuring greater cleanliness; or, alternatively, concreting up to about 3 feet for the side walls is recommended.

It will be observed that the dummy bails, instead of being fitted into the floor, are suspended from the rafters, thus facilitating the cleaning of the concrete floor of the bails. Although the depth of the dummy bails is shown as 4 feet 6 inches, it is permissible to reduce this depth. For instance, 3 feet 6 inches is deep enough for most cows, for it is only necessary for the head and forequarters to be in the bail and the cows can be securely held in position by adjusting the breeching rope.

By installing the engine and vacuum pump in the air space—which may be adequately ventilated by louvres fitted to a height of 3 feet 6 inches in each end wall—space is economised. This room also provides a "buffer area" between the place of milking and the place where milk is handled.

### Summary.

(1) A dairy building which, without disturbance of Regulations requirements will enable all operations to be conducted under a single roof, has been designed.

(2) The conduct of all operations—cleansing of utensils, steam sterilization, and the storage of equipment and dairy produce—in close proximity is advantageous where machine milking is an everyday practice.

(3) Building expenses are curtailed.

(4) The separation by a reasonable distance of the dairy section of the shed from the areas from which contamination by cowyard dust and manure is possible is achieved—hence protection of quality in the product.

(5) Dairy cows soon become used to the new layout.

(6) The layout is effective in the diminution of the contamination of milk and cream during and after milking.

(7) In addition to its use in operating the milking machine, the motive power is available for farm refrigeration which is practicable in the shed.

**Conclusion.**

That the quality of dairy produce is governed chiefly by the personal equation, or the appreciation by the producer of what constitutes dairy hygiene, rather than by the standard of dairy buildings and equipment or the design of sheds and yards, does not require stressing. However, the layout described in this article, and which is conducive to efficiency because of its convenience and its simplification of dairy and cleansing procedures, should be acceptable to the producer and will also enable the objective of the *Dairy Produce Act* to be reached.

Plans of the combined dairy building have been made available to dairy inspectors, from whom any dairy farmer who is interested should make further inquiry.

**SELF-CLOSING YARD GATE.**

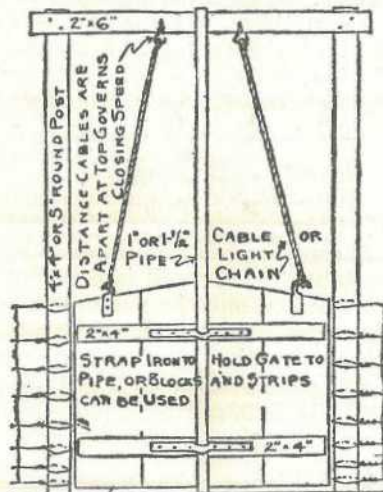


Plate 11.

Here is a diagram of a convenient yard gate where one has to pass back and forth often. It can be opened with the foot or body from either direction and is self-closing, and yet will not blow open. A latch will not be needed for poultry, but should be used if farm animals come against the gate. Boards are used to give a little more weight and better closing, but slats or woven wire may be used if preferred. Putting the chains farther apart at the top increases the speed at which the gate closes.

## Gherkin Growing.

W. J. ROSS, Senior Instructor in Fruit Culture.

AMONG the many small crops that can be grown in the central and southern coastal districts of Queensland are gherkins. Before the outbreak of the present war large quantities were imported by Australia from European countries in barrels containing brine, but since this trade has been cut off opportunities have arisen for local growers to develop a new industry. New South Wales has produced a small tonnage annually for some years and growers there are being urged to increase their output, as the present production provides only a small percentage of the Australian demand. One Sydney firm alone can handle 100 tons a year, while there are smaller firms in Queensland and other States seeking supplies. It is advisable, however, for farmers who are interested to enter into arrangements with a pickling firm to take the crop under contract before deciding to plant an area.

For best results, the vines require to be picked over every day. The companies pickling gherkins pay according to the grade of the product and small sizes are worth more than the larger fruits. Sizes and prices vary with different buyers. For instance, some firms pay 4d. per lb. for top grade and others 6d. per lb. While 1½ inches is considered by some the best size, others affirm that 1¾ inches to 2 inches will return the best price. Hence the advice to intending growers to enter into a contract to grow for a particular firm.

It is essential that gherkins when picked should be placed immediately into a barrel and completely covered with brine made from 2 lb. of salt per gallon of water. Most firms supply casks (about 45 gallons capacity) on loan and sometimes salt for the brine also is supplied. Usually grading is done at the factory, so the grower is saved this expense. The average yield per acre is stated to be about 1½ tons, and the average gross return between £40 and £50. Two acres are probably as much as one man could comfortably handle in a picking season.

Gherkins are susceptible to damage by frost, and if the site intended for planting is one liable to cold, planting should be delayed until all risk of frost has passed. Otherwise, the sowing of seed may be commenced in the late winter and continued until March. Fertile, well drained loamy soils are most suitable. If the soil is not very fertile, well-rotted animal manure (if available) should be worked in where the seed is to be sown two or three weeks beforehand, while at time of sowing an application of commercial fertilizer, such as one used for cucumbers, should be placed under the seed. Five to 8 cwt. per acre would ensure good results, particularly if followed by a side dressing at the rate of 2 cwt. to 3 cwt. per acre when the plants commence to run.

Water for irrigation is more or less an essential requirement, as the plants must be kept growing continuously.

Seed may be sown either in drills or in "hills." If the former method is adopted, the drills should be 6 feet apart and the plants thinned to 12 to 18 inches apart in the rows. If sown in hills, the hills may be made 4 feet apart each way and six seeds sown in each. The resultant plants should be thinned later to two or three to each hill. Thinning should not be done too early, and sufficient time



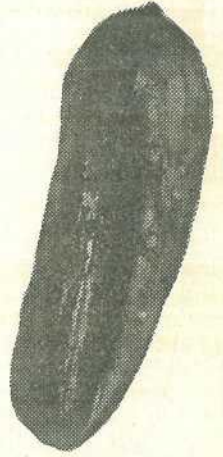
PICKLE SIZES.



3,000 to 45-gallon Cask.



4,500 to 45-gallon Cask.



3,600 to 45-gallon Cask.



10,000 to 45-gallon Cask



22,500 to 45-gallon Cask



15,000 to 45-gallon Cask.



6,300 to 45-gallon Cask.

Plate 12.

should be allowed the young plants to grow so as to be able to distinguish the weak from the strong. At the five or six-leaf stage is a good time to thin.

It is advisable to treat seed before sowing by immersing it in a solution of one part of corrosive sublimate to 1,000 parts of water for five minutes, then wash it in clean water, and dry before planting. Seed treated in this way should be sown soon after drying, and therefore treating of more seed than can be sown quickly should be avoided.

During the warmer months, close planting in rows has advantages because the thick green foliage prevents the soil becoming too hot, and lessens the evaporation of moisture from around the roots. If the soil is warm and contains reasonable moisture, good germination should follow. On the other hand, if cold, wet weather is experienced at time of sowing, there will be a certain amount of seed-rot and slow germination.

Cultivation consists of the suppression of all weed growth and the loosening of the surface soil by shallow cultivation while this is possible. Since the roots do not penetrate deeply into the soil, deep cultivation close to the plants would cause injury to the roots, and would destroy many root hairs on which the plants depend for sustenance. Shallow and frequent cultivation is the best means for conserving soil moisture. It is not advisable to work among the plants when they are wet as this may tend to spread disease.

Should the plants send out "runners" to a length of 3 feet, and there are no signs of fruit setting, it is advisable to snip off the terminals of the runners with a sharp knife, so as to induce further branching and fruiting. When the young fruits have set and are visible, stopping excess terminal growth will aid development and also help to regulate and equalise growth.

As already stated, picking should be continuous throughout the life of the plant. It is important that the fruit be not allowed to remain on the vines to mature seed as the product will not then be first grade and, furthermore, the vines will more rapidly deteriorate and the yield will be lessened.

Gherkins should be as uniform in girth from end to end as possible. Bottle-shaped fruit or club-shaped fruit usually called "nubbins" are not worth as much as uniformly shaped fruit.

Varieties suitable for pickling are "Heinz Early Pickling," "Boston Pickling," and "Naylor's Smooth." Seed is not obtainable everywhere, but is stocked by the large seed merchants. The varieties known as "West Indian" or the wild gherkin are not required by manufacturers and should not be grown.

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### PRINCIPLES OF BOTANY FOR QUEENSLAND FARMERS.

A new book containing a fund of useful information about Queensland trees and shrubs, and of practical utility to the man on the land.

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**Mr. J. D. STORY, I.S.O.****An Appreciation.**

**I**N his annual report, the Public Service Commissioner, Mr. J. McCracken, pays an impressive tribute to his predecessor, Mr. J. D. Story, I.S.O. The office of Public Service Commissioner, he said, was established in March, 1920. Mr. Story, the first Commissioner, continued in office until his recent retirement. Continuing, Mr. McCracken said:



Plate 13.  
Mr. J. D. STORY, I.S.O.

“As one who has been closely associated with him for twenty years, I feel that special mention should be made of Mr. Story’s influence upon Public Service organisation and morale during his fifty-four years of distinguished and meritorious service.

“Mr. Story’s organising and administrative capacity was quickly demonstrated. At the age of thirty-four years he was appointed Under Secretary of the Department of Public Instruction. During his term of office as permanent head of that Department there were marked developments in all phases of educational activity—kindergarten, primary, rural, vocational, technical, secondary, and University. It was during this period that a very high tribute was paid to Mr. Story by the late Sir William MacGregor, then Governor of Queensland and Chancellor of the University of Queensland. Sir William said that during his long experience as Governor and in allied positions he had met only three first-class administrators—one of these three was Mr. Story.

“In the Public Service with its wide ramifications and extensive community interests Mr. Story, as Public Service Commissioner, found ample scope for exercising his zeal and inculcating his ideals of service.

“Throughout his official career he has displayed outstanding ability, breadth of vision, resourcefulness, great courage, and boundless energy—yet unflinching courtesy and helpful encouragement. He has had wide and varied experience; he knows Queensland and Queensland’s requirements.

“Mr. Story’s work as Commissioner remains an inspiration; it leaves an indelible impress on the Service. His Majesty has honoured him in the award of the Imperial Service Order; the Government has honoured him in naming after him the ‘Story Bridge’ which represents strength, organisation, workmanship, and usefulness; the Service will honour him by striving to attain and maintain his high standard of public duty.”

### Mr. STORY’S CAREER.

Born in Jedburgh in that Scottish Borderland where every contour breathes British history, Mr. Story came with his parents to Brisbane in 1877 and while still young enough to get all his education in that city. He attended successively the Brisbane Normal School, the Brisbane Grammar School, and the Brisbane Technical College, and received further courses of training under private tuition. He thus acquired the basis of a wide culture for which he became distinguished in after years.

Mr. Story entered the Department of Public Instruction in 1885 and within 19 years attained to the position of Chief Clerk and Acting Under Secretary at the age of 34 years. He advanced to the full status of Under Secretary two years later, in 1906. In 1920 he was appointed Public Service Commissioner and remained in that office until his retirement.

Throughout the past 36 years, Mr. Story has been a dynamic influence in the development of Queensland and State instrumentalities, first in the field of education and later in the broader sphere of general administration. In educational progress in Queensland his name will always be associated with the establishment of the University of Queensland, State High Schools, Teachers’ Training College, Technical, Vocational, and Rural Schools, and the Home Project Clubs for Primary Schools. The development of the scholarship system, the itinerant teaching service and afterwards the Primary Correspondence School, and the inauguration and extension of medical and dental services, including ophthalmic treatment for children in the Western Division of the State, are all the outcome of his remarkable vision.

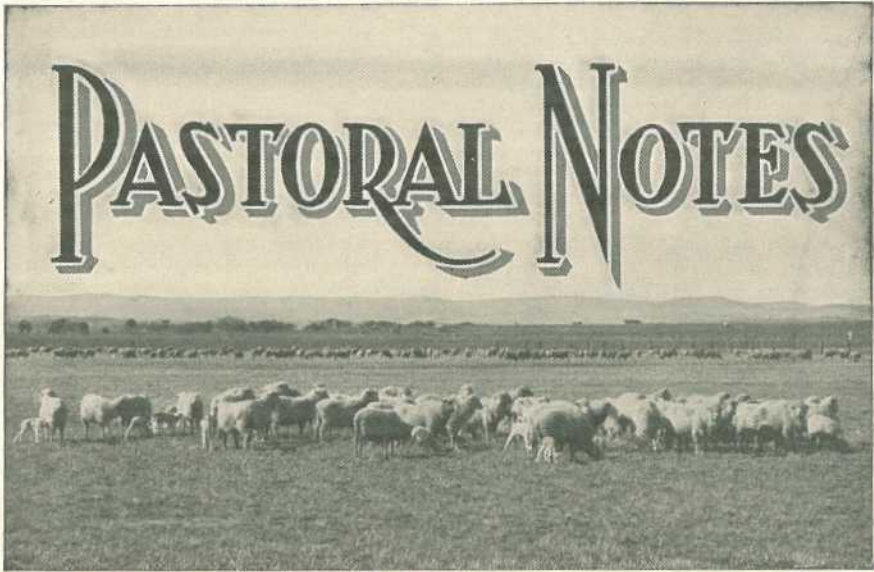
The primary industries of Queensland especially are indebted to Mr. Story for the constructive statesmanship he has brought to bear on the solution of many of their marketing problems. Always interested in the welfare of the people on the land, an interest first exemplified by the extension of educational facilities throughout the State, his was a leading influence in the establishment in 1922 of the Queensland Producers' Association. At the request of the Queensland Government he visited California for the purpose of obtaining first-hand information on agricultural education and methods of rural organisation in that progressive country. The results of his on-the-spot studies were published in a series of illuminating articles in this *Journal*, and formed the basis of the scheme of rural organisation afterwards inaugurated by the State Government and which has given to primary producers so large a measure of control over the marketing of their own commodities. He became the first chairman of the Queensland Council of Agriculture and remained a member of that body until it was firmly established under statutory authority. On his retirement under pressure of other public duties, the Council of Agriculture, on behalf of the organised primary producers of Queensland, specially thanked the Premier for having made Mr. Story's services available. He has since kept in close touch with the rural industries and has been the moving spirit in the formulation of comprehensive schemes for their technical progress and economic benefit. Notable examples of this practical interest were the appointment of commissions of inquiry into the sheep and wool industry, the beef cattle industry, and the establishment of the Brisbane Abattoir. Articles too numerous to mention on various aspects of education, primary production, and cognate subjects have flowed from his able and vigorous pen. Among his notable contributions to current thought—and which no doubt inspired subsequent action—on these matters were papers entitled: "Population Lag in Rural Areas"; "Town Lads for Land Jobs"; "Development of North Queensland"; "An Efficiency Campaign in Primary Production"; "Instructional Staff of the Department of Agriculture and Stock"; "Specialised Training for Special Positions"; "Co-ordination of Agricultural Activities"; "The Researcher and the Producer"; and "Training of Field Officers."

Of Mr. Story it may be said that he is "a man of cheerful yesterdays and confident to-morrows," with a desire to "spread the butter of enjoyment more evenly over the bread of necessity." He obviously believes that an investment in knowledge pays the most interest, and he has given, and continues to give, the best that is in him of undoubted genius and the highest constructive effort for the benefit of Queensland, with yet no film to his vision. A just man, he won and retained the confidence of successive Governments.

Mr. Story early recognised the need of a University as the coping stone of the Queensland educational system, and to which moneyless youth might enter on merit alone. As Vice Chancellor of the Queensland University, he is a front ranker in education and administration—a combination in which few men win a double-first. As an administrator, he abhors the dead-end and the "sapless dreariness of an awful *cui bono*," and believes in giving young people in the Public Service a chance of developing their natural capacity, instead of allowing them to wear deep the ruts of changeless routine. His concern for the future of the youth of Queensland is expressed in *The Apprenticeship Act*, in which he had a shaping hand. In a crowded and fruitful life, Mr. Story has had the happiness of seeing many of his projects become part of the cultural and industrial life of the State.

In his public utterances, Mr. Story has always claimed close attention, not only for soundness of matter but for vitality of thought, clarity and originality of expression, and extensiveness of vocabulary. Every speech, whether prepared or extempore, could be printed as spoken—the sort of speech that delights a sub-editor with glints of brilliant phrase, polished epigram, flashes of humour, and evidence of a broad, kindly and comprehending human tolerance.

Through the Bureau of Industry as collaborator with the Co-ordinator General (Mr. Kemp) in the duties devolving on him under "*The State Development and Public Works Organisation Act of 1938*," Mr. Story is continuing his association with the primary producers of Queensland, who appreciate the fact that his keen judgment and ripe experience are still available to the community.



## Scrub Feeding of Sheep.

**E**DIBLE shrubs and trees which are useful as a supplementary ration for sheep cover a large area of Queensland. Methods of feeding vary according to the class of edible bushes available. Stockowners accustomed to scrub feeding make full use of the varieties available, and proportion the day's supply to vary the feeding to best advantage. Although some of the shrubs and trees are not relished under normal conditions, the intensity of a drought gradually reduces the sheep to starvation point, and it is then that whatever top feed is on the property should be made full use of. The system of making this available to the sheep varies according to the habit of growth, but there are few now who destroy the tree to feed the sheep. Lopping is the usual practice.

The digestibility of many of the edible varieties of vegetation leaves much to be desired, consequently they are very poor substitutes for grasses and herbage. When the stage is reached at which the sheep begin to lose condition, and before they fall away to any appreciable degree, scrub feeding should commence. At first the sheep are not inclined to eat much, and then only the most palatable portions. Very little need be provided at the start, and this should consist of a large proportion of the best available. As the sheep take to it, increase the supply, and gradually lessen the percentage of the most palatable until a well-based scrub ration is provided in keeping with the varieties available on the property. If sheep have to be scrubbed for a lengthy period, they are likely to develop digestive disorders, but this is influenced by the nature of the shrubs or trees they feed on. Some varieties will carry them on for many months without showing any ill effects on their condition, but a good lick should be of considerable help in retaining their normal health and condition, no matter what class of vegetation they are fed on. The water to which they have access should be the first point for consideration before preparing a lick, for during very dry weather sheep will drink much more water than they do when juicy food is available.

If the water is slightly salty, say 30 grains to the gallon, it can be considered normal, but if over that amount the salt in a lick may be reduced until the total reaches 250 grains to the gallon, when no salt is needed. Salt alone is not the only ingredient required in a lick, as many other minerals, the chief of which are lime and phosphoric acid, are equally essential.

Analyses of most of our trees and shrubs show rather a low and an uneven mineral content, the lime being fairly well supplied, but they lack in phosphoric acid. Analyses also show rather high carbohydrate and usually a low available protein content. It may, therefore, be assumed that a lick should be based on the salt content

of the water available, and carry protein, phosphoric acid, and lime. A sterilised bone meal carries these three ingredients; it is recommended as the base of the lick, say 60 parts. Other ingredients are salt, 30 parts; Epsom or Glauber salts, 5 parts; and molasses, 5 parts. As the protein content of bonemeal is low, this ingredient can be added by using meals—such as cotton seed, peanut, wheat, linseed, or other such meal—all of which supply a most important want. Blood and meat meal, however, carry a greater protein content and may be used to advantage in supplying this element in a lick. Neither is attractive to sheep, however; therefore any mixture supplied should carry an ingredient to induce the sheep to take it. If salt is lacking in the water, it may be used to advantage in inducing sheep to take the desired amount of mixed lick. In the absence of salt, cotton seed or similar meals are attractive, and the intake of lick regulated to about  $\frac{1}{2}$ -oz. per head per day through their use. The action of a good lick is to stimulate the digestive organs and so whet the appetite as to cause the sheep to eat more and, at the same time, make better use of the food consumed—a decided advantage when scrub feeding.

Practically all our Western timbered country carries a proportion of useful edible shrubs and trees, which include a wide range of varieties (too numerous to mention here) growing over large belts of country. Too much value cannot be placed on the useful fodder trees of the West and when scrub feeding becomes necessary every effort should be made to preserve them.

## DODDER IN LUCERNE SEED.

Lucerne is grown from seed and is usually sown with the object of providing a stand for several years. With this in mind, only the best seed should be bought with an assurance that it is free from dodder.

Dodder is an annual parasitical plant found in the warmer parts of the world. Its seed germinates in the soil, sends up a stem which attaches itself to the host plant which, in Queensland, is mostly lucerne. It is leafless, with twining thread-like stems, which attach themselves to the host plant by means of tubercles; from then onwards the parasite draws its nourishment from this source and severs its connection with the soil. The immediate effect is that the host plant is called on to support not only itself but also the dodder until ultimately the exhausted plant dies, in most cases smothered in a tangled mass of light-brown threads. Dodder produces seed quickly, so that it can run the full life cycle (seed to seed) before the host plant dies from starvation. Dodder seeds are borne in a globular capsule with four seeds in each. These seeds are pressed together, giving them their characteristic flattened surface.

Unfortunately, this parasitical growth is common in lucerne fields. Experience shows that the dodder seeds cannot be removed satisfactorily from lucerne seed with cleaning machinery or by sieving; this statement is based on many unsuccessful attempts to make saleable dodder-infested lucerne seeds.

Growers of lucerne seed, in fairness to themselves as well as to those who may buy their seed, *should never harvest seed from a dodder-infested field.*

It should be borne in mind that any seed for sowing, or any material found to be dodder-infested, is subject to immediate seizure, and the person offering infested seed for sale is liable to prosecution. A £50 fine is provided for the sale of lucerne seed containing dodder. No excuse can be accepted for the presence in seed or feed of such a destructive parasite which can well be considered as lucerne's worst enemy.

Buyers should always insist on an assurance that the seed they are purchasing is dodder-free.

Samples of lucerne seed representing seeds purchased by farmers for their own sowing are examined free of charge, at the Seed Testing Station, Department of Agriculture and Stock, Brisbane. Samples should be of not less weight than 4 oz., and marked as follows:—

Sample of	seed drawn from	bags
representing a total of	bags marked	
Purchased from	of	on
Name and address of sender, and date.		

It is better to send a sample for examination as soon as it is purchased, rather than wait until the crop has grown, and then find it contains injurious weeds.

## STRANGLES.

Strangles in horses is so called because one of the chief symptoms is a swelling of the glands of the throat, thereby causing strangling or interference with swallowing and breathing. It is an exceedingly contagious disease.

In addition to the swellings of the throat, there is usually a dirty discharge from the nose and sometimes the mouth, with occasionally a severe cough.

There is nearly always fever and loss of appetite, the latter due mostly to difficulty in swallowing.

The swellings develop into abscesses which contain pus, and these may or may not burst naturally and discharge their contents, in which case the patient usually improves.

The cause of the disease are small bacteria which are very easily spread from one animal to another by means of water and feeding troughs, bedding, harness, hands of attendants, &c., as well as by direct contact.

In attempting to treat the disease, particular attention must be paid to the isolation of all affected animals, and great care must be taken that none of the sources of infection mentioned is allowed to contribute to the contagion.

Inoculation of all the in-contact horses with a vaccine has definitely proved of value in preventing the disease.

Treatment of affected horses consists in painting the swellings with strong tincture of iodine once daily for three days in order to bring them to a head, and then opening them by surgical methods and keeping them well syringed out. Inhalations of medicated steam are used for relieving the congestion of the air passages.

Drugs such as potassium nitrate (saltpetre) and potassium chlorate may be added to the drinking water, and an electuary of green extract of belladonna is frequently given. In bad cases the use of the new sulphanilamide preparations has proved of great value.

It must not be lost sight of, also, that although strangles most commonly occurs in young horses (yearlings and two-year-olds) it may occur in any age from foals to aged horses, and typical cases are by no means rare where abscesses occur in all parts of the body, notably the chest and limbs, with or without an affection of the throat.



## DRUG TREATMENT FOR REDWATER.

There are two kinds of redwater in Queensland. Both are caused by minute blood parasites and are carried by the tick. The differences between these two organisms are so small that they can only be recognised under the microscope. It is impossible to determine which type of redwater is present by an examination of an animal in the field. Fortunately, this is not necessary.

During the last few years intensive efforts have been made to find a suitable drug which would be effective in treatment and yet easy to apply. For many years piroblue held favour. This is effective in the treatment of one kind of redwater, but is ineffective against the other. Unfortunately, the common form in Queensland is unaffected by piroblue. Moreover, piroblue has a great disadvantage in that it requires to be used intravenously—i.e., it must be inoculated into the jugular vein.

Acaprin is now used largely in the treatment of redwater outbreaks, and is known to be effective against both forms of the disease. It is easily applied because the dose is small and it can be injected subcutaneously—under the skin. Supplies of the drug are kept on hand at the Department of Agriculture and Stock and by leading chemists. It is put up in the form of a solution and in single doses.

In areas where redwater is common, owners should keep a few doses of the drug on hand, together with a small hypodermic syringe.

Cases should, of course, be treated as early as possible, but even those which look hopeless at the start will, within an hour or two, show improvement, and so go on to recovery. A second injection can also be given without harming the animal in any way.



## " PINK EYE " IN SHEEP.

"Pink-eye," or infectious ophthalmia, has been known for many years in Australia, and although the mortality is usually very slight, deaths may and do occur in drought or semi-drought areas where, because of blindness, sheep are unable to get to water.

A lot of trouble follows outbreaks in travelling mobs of sheep or during mustering for shearing and other purposes, for the disease is then very difficult to check.

Material from the infected eye of a sheep transferred to the healthy eye of another sheep reproduces the disease, and healthy sheep grazing on tall pasture (for instance, most seeding grasses, &c.) and running with infected sheep may also suffer. If, however, the grass is kept well cropped down, the liability to infection is considerably reduced. It is presumed, therefore, that in the field, "pink-eye" is not transmitted from sheep to sheep by direct contact, but by the material from the infected eyes being brushed off by grass or herbage, and thus conveyed to the eyes of healthy sheep. Flies also may spread the disease.

An attack of the disease appears to convey an immunity, but if only one eye of the sheep is affected, this is the only eye which possesses the immunity.

It is also known that exudate from the eye becomes non-infective after drying for a short period. Thus, in fine weather, healthy sheep can be turned into previously infected paddocks or driven over stock routes without risk twenty-four or forty-eight hours after infected sheep have been moved out of these places. There is also some evidence to show that any injury to the eyes through dust, grass seeds, or anything else increases the liability to infection.

The symptoms can be divided into three stages which ordinarily follow one another, although it is quite common for the trouble to clear up at the second stage and not proceed to the final stage of ulceration.

The first stage is characterised by a discharge from one or both eyes, and on examination the membrane surrounding the eye is found to be inflamed and the eyelids swollen. These symptoms are followed by the second stage, in which the front of the eyeball become smoky or opaque. A scum is gradually formed through which small branching blood vessels may be seen and a varying amount of pus is present in the corner of the eye.

By this time the sheep is quite blind in the affected eye, and shows signs of acute pain, while the least sound will disturb the animal, causing it to rush blindly in any direction with its head held high, progress being stopped only by violent contact with a fence or some such object.

The third stage, which is not seen in all affected sheep, is one of ulcer formation in the front of the eye. Sometimes the ulcers appear to burst, and the eye becomes practically covered in pus.

Many cases, however, do not go as far as this, and even if left untreated the animal may recover with little or no loss of sight, although complete recovery probably takes a month or even longer.

As in many other diseases of sheep, treatment depends on the facilities for handling the sick animals. All affected sheep should be at once isolated and cut up into small hospital mobs held in small shady paddocks, handy to water, where they can be supervised easily.

A few drops of a 2½ per cent. solution of zinc sulphate in water, made by dissolving 1 oz. zinc sulphate in 1 quart of water, should be dropped into the affected eyes by means of a shearer's oilcan. All pus and other matter is wiped from the eyes with cotton wool soaked in this same solution.

This treatment should be carried out as frequently as possible, and usually the disease will clear up after about a week.

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## THE MERINO.

The Merino constitutes over 98 per cent. of the sheep population of Queensland. Under average seasonal conditions in the Central and Western Divisions of the State they adapt themselves to the varying circumstances and are not likely to be replaced by any other breed.

Merinos vary in type and also in the class of wool they produce, the small fine-boned type usually producing a fine short wool, and the large-framed robust type

producing a longer and stronger wool with a greater weight of fleece. Although the value per lb. of the different types of wool are influenced by the fluctuations of popular demand, the good length, bulky wools showing character have always maintained the highest average per fleece. Fluctuations in the Merino wools generally, however, have not been so marked as with other breeds and crosses. As the large-framed, plain-bodied type adapt themselves more successfully to most of Queensland conditions and uses, the breeder's aim to produce this type should be more pronounced.

Among Merino breeding flocks in Queensland, the wool generally has a tendency to fine down, therefore the necessity for strong wool showing character is apparent.

The large-framed Merino ewe also is most suitable for crossing with the British breeds, both as mothers for fat lambs and for producing half-bred ewes for which there is a growing demand in the fat lamb raising districts.

---

## TRUCKING YARDS.

Some bruising of stock occurs in the trucking yards, and it is quite commonly held that this is unavoidable. Suitable design of yards and races and quieter working of stock are the answers to this fallacy.

In moving cattle from yard to yard or pen to pen, there is some congestion just before, during, and just after passing gate or race. It is obvious that at such places rails should be flush with the posts and padding used where the fences make sharp angles. It is equally obvious that working must be very steady to avoid jamming and, consequently, bruising—more particularly with the outside beasts. To prevent undue crushing at the approach, it is best to have the fences funnel—or V-shaped. If the wings are long and the gate wide the working is not slowed up and the number that can pass through is regulated well back, so that a jam does not occur at the actual place of passage. After passing through, there should be no obstructions to prevent fanning out. For this reason, a straight fence forming a side of two yards is not desirable when a corner gate is used.

When working cattle through one yard to another, gates should be opposite each other—i.e., in a direct line with the direction in which the beasts are streaming. The wings to a crush should both converge. It is bad practice to have one wing in a direct line with one side of the crush. This is often the case when an existing fence is used for one wing. As cattle work better uphill, the loading-out race or crush should be slightly inclined upwards to the truck.

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## CROSSBRED EWES FOR FAT LAMB RAISING.

In every State, especially in Queensland where flocks are 98 per cent. merino, the question of the right type of ewes for the industry is raised. It is presumed, then, that the fat lamb raiser has, in most cases, to breed his ewes for the purpose from the stock available.

Merino ewes are the necessary choice, and these should be the strongest, largest, most robust type procurable. The type of ewes generally culled for strength on a merino station is the most suitable ewe to start with. With these should be joined one of the longwools—such as Romney Marsh, Border Leicester, or Lincoln. The pure-bred Corriedale ewe also is very suitable. The ewe progeny resulting from the breeding indicated should form the breeding flock for the raising of fat lambs. On these longwool crossbreds should be used one of the Downs type of ram; either Southdown or Dorset Horn give best results in Queensland. The resultant drop, both ewe and wether lambs, should be sold as fats.

Many ewe lambs bred the right way for a breeding flock along the lines mentioned are slaughtered annually. The price for true suckers is too tempting, but, in the long run, breeders would be well advised to retain at least a proportion of their ewe lambs as the future breeders in their fat lamb business.

The right type of ewe lamb is worth more as a potential breeder than would be realised at fat lamb rates.

## MEAT AND BLOOD MEALS.

Meat meals and blood meals sold under a variety of names are rich in digestible protein. A high-class meat meal with a crude protein content of 65 per cent. has about twice the digestible protein of commercial cottonseed or linseed meal. In farming terms, this means that 1 lb. of high-grade meat meal has about the same feeding value as 2 lb. of linseed or cottonseed meal.

The cost of meat or blood meal is not greatly different from that of the vegetable meals, and if they can be conveniently included in the ration of dairy cattle feeding costs will be reduced.

Only dairy cattle which have been consistently underfed take kindly to meat or blood meals. Cattle which have been accustomed to small quantities of these meals from birth also present no difficulty. As a general rule, however, dairy cattle only slowly acquire a liking for concentrates containing meat and blood meals and at first only a few ounces should be included in the regular ration. The amount can be gradually built up to the required level, which will, of course, depend upon the quality and quantity of other foods used. Advice on suitable rations may be obtained from the Department of Agriculture and Stock, but the dairy farmer can usually adjust the concentrates in the ration to conform with the milk yield of the individual cow.

Grain and molasses, grain and salt, milling by-products—such as bran and pollard or such attractive meals as linseed, cottonseed, or cocconut—may be mixed with the meat and blood meals to attract unwilling cows.

Animals which still refuse to eat these meals may be kept for a short time without any food, other than that offered, if allowed plenty of water. It is important that the feed should be changed night and morning, so that a fresh mixture is always before the cow. If this system appears too drastic the nose-bag method may be used. Freshly-chaffed green maize and the meal are mixed before using, and the contents of the bag should be changed night and morning. Most cattle can be induced to eat meat or blood meals by one or other of these methods.

Both meat and blood meals should be fresh, free from objectionable odour, finely milled, and sterile. An undue greasiness is not detrimental, but, in general, the higher the fat content the less palatable the meal.

Meat meals should show a good analysis. Any preparation with a crude protein content of less than 50 per cent. is not a true meat meal, but a meat and bone meal. Blood meal should show a minimum of 75 per cent. crude protein. It should be almost without smell.

As both meals decompose when allowed to remain in a moist condition they should be stored in a dry place and any excess in the feed boxes should be removed each day. Material which has been "fouled" by moisture soon becomes a source of danger and is then only fit for fertilizing.

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## SHEEP LICKS.

The necessity for the use of a lick for sheep is generally indicated by a loss in condition more pronounced than what may be expected because of depleted pastures only.

The right use of a lick should be based on the proved deficiencies in minerals in water and proteins and minerals in the grasses to which sheep have access, and which are arrived at by analyses of the grasses and waters, respectively.

The most important deficiency in a wide extent of Queensland's grazing country is phosphoric acid. An ingredient making this loss may, therefore, be safely used as the base of most licks prescribed for sheep. Sterilized bone finely ground is recommended. This substance is rich in phosphoric acid, and, in addition, contains some small quantities of fats and protein, also lime. A tonic may be a help, and sulphate of iron is useful for this purpose. A laxative is a necessity under conditions of hard feeding, and Epsom salts is as effective and as cheap as anything else offering. Salt in some cases also is a necessity, and the quantity prescribed should be strictly governed by the salinity or otherwise of the water accessible to the flock.

Under drought conditions a substantial benefit has followed the addition of a protein to the lick. This usually consists of one of the better meals, and the choice of a particular one should be influenced by the price at the moment. Advice on the use of stock licks may be had on application to the Department of Agriculture and Stock.



## Calf Feeding.

**A**BOUT 87 per cent. of cows' milk is water. Of the remainder, nearly one-third is fat, and a good separator, if properly operated, will remove about 95 per cent. of this fat. Very little protein is removed. It follows that, if the separated milk is to be made equal in feeding value to the original milk, either the fat or its equivalent must be replaced. There is no need to replace protein, and for this reason it is not good practice to feed such protein-rich materials as linseed meal in conjunction with skim milk to very young calves.

Dripping obtained from a reputable meatworks, or cod liver oil, may be incorporated in the milk, but they are rather expensive and difficult to mix properly. A better system is to use finely ground maize. Maize meal from good-quality grain contains as much as 5 per cent. high-grade oil and 70 per cent. of easily digested carbohydrate, which, to some extent, serves the same purpose as fat.

The new-born calf should get whole milk for a fortnight if it is to be given a good start in life. For the first few days it may be fed three times daily; after that, twice daily is enough. A safe level to feed is 1 gallon to each 100 lb. live-weight. At the end of the second week a little maize meal is stirred into the milk and the change to separated milk begun. By the end of the third week the maize meal may be built up to a handful, and the change to separated milk completed. By the end of a month the calf begins to nibble grass, and can consume about  $\frac{1}{2}$  lb. of meal.

From then on to the eighth week the milk can be replaced progressively by water and a meal mixture. By the eighth week the calf will be able to eat up to 2 lb. daily of a suitable meal mixture.

Such a mixture may contain 35 lb. of linseed meal and 65 lb. of a cereal meal Pollard and bran should not constitute more than one-half of the cereal meal. The remainder may be crushed oats, barley, or maize. About  $\frac{1}{2}$  lb. of salt and 2 lb. of sterilized bone meal should be included in the mixture.

As the animals take more grass or hay, the supply of the meal mixture is restricted. At six months, unless an adverse period is encountered, the calf should be able to fend for itself.

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## GROOMING THE MILKING COW.

Grooming of dairy cattle is a refinement in farm management which calls for comment. High-producing animals are usually kept on high-priced farms, where natural scratching or rubbing-posts—trees or stumps—have been removed. Frequent milking and stall feeding prevent during much of the day the natural function of self-licking. Both these small inhibitions have a marked effect on milk production and it has been observed that, under these conditions, some grooming is decidedly beneficial.

## FLUSHING THE SEPARATOR.

The test or percentage of fat required in cream should be not less than 38 per cent. during the hot summer months and not less than 34 per cent. during the cooler months of the year. Whatever make of separator is used, during the process of separating satisfactory results can only be obtained when the cream screw is adjusted so that the driven speed of the separator conforms with the corresponding number of revolutions per minute recommended by the maker of the machine.

At the completion of separating, flushing with cold or warm water so as to remove the last of the cream from the patties is an undesirable practice. If the cream bucket is not removed during the process some of the impurities and slime adhering to the bowl may be removed and deposited in the cream. This applies particularly if warm water is used. When separated milk is used for flushing, excessive milk solids are introduced into the cream, and these will have a detrimental effect on quality, as well as lowering the fat test. Thus the proceeds of flushing should be fed to the pigs or calves on the farm. The maintenance of cream quality is too important to be impaired by laxity in this respect.

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## BRUSHES FOR CREAM CANS.

Although the necessity for using only brushes for the cleaning of dairy utensils is generally well understood by dairy farmers, instances of persistence in the use of cloths for this purpose still come under the notice of field officers. Cans washed with cloths which are not kept scrupulously clean, or renewed for each occasion of use, are a potent cause of taints, such as "dish cloth" or "cheesy" flavours, in milk and cream, the flavour becoming noticeable after the cream has been kept for some time, and particularly if it is not delivered to the factory daily.

The use of cloths to wipe cans or utensils dry after washing and scalding or steam-sterilizing is also unnecessary; in fact, it only helps to reintroduce bacteria to the cans. If properly scalded or steam-sterilized the heat of the can will cause the immediate evaporation of any remaining moisture.

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## PASTURES AND BUTTER-FAT.

Efficient production is the only form of economic production, and this, perhaps, applies more to dairying than to any other primary industry.

Efficiency is achieved by ensuring that cows receive the right food in the right quantities. The cheapest means of filling the first requirement is by herd testing and culling, since by this method only high-producing cows are maintained on the farm.

Nowadays, the value of dairy land is judged, not by the number of cows it will carry, but by the butter-fat production per acre. Once this idea is fixed in mind, it becomes obvious that the higher the cow yields the more economic a producing unit she becomes. Low producers mean reduced output and reduced efficiency in the working of the farm.

As the dairy cow is required to produce large quantities of milk which is rich in protein, it follows that it must be given foods which are likewise rich in protein. There is little difference between the food values of the various popular cultivated grasses, which in the early stages of growth are equal in protein content to many valued concentrates. The young shoots are very rich in this respect, and this accounts for rapid recovery of cattle grazing on pastures after rain following spells of dry weather, or after a burn.

Here, then, is a natural food for the dairy cow readily available. It is economic, too, because with a little care it can be produced in large quantities, and it requires no labour in feeding. The dairy pastures then deserve special attention to maintain them at an efficient standard. There are several ways of maintaining and improving pastures, namely:—

- (1) The growing of grasses which have a high feeding value.
- (2) Top dressing pasture land.
- (3) Rotational grazing, or, in other words, feeding the grass while in its young stage of growth.
- (4) Renovation of pastures.

## CARELESS BRANDING.

Slovenly methods in the branding of stock, particularly cattle, are observed far too frequently, the results being most undesirable in many respects. Quite often the carelessness with which the branding irons are applied involves cruelty, although it may be unintentional.

It is cruel to hold the hot iron on an animal until the skin is burnt through, and it cannot be justified on the score of necessity. This practice may be due to underheated irons, but, on the other hand, it may be due to over-hot irons held on the skin a fraction of a second too long, or with too much pressure. Such branding causes blotches, and very often the actual letters or figures are undecipherable. The skin in the area involved is ruined for tanning purposes, and festering sores may result. Identification of the animal by means of such a brand is rendered very difficult, if not impossible.

It is a well-known fact that, on large stations, where thousands of calves are branded yearly, and where speed is a factor in the handling of large mobs, the standard of branding is much higher than on some small holdings—such as farms, where only two or three calves may be branded at irregular periods.

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## SORGHUM POISONING ANTIDOTE.

Molasses diluted sufficiently to allow of drenching is regarded as an antidote for sorghum poisoning, a quart being advisable for a cow.

The best antidote, however, is a mixture of solutions of carbonate of soda (washing soda) and sulphate of iron. The procedure is to dissolve 1 oz. of washing soda in 1 pint of water, and, in a separate pint of water, half an ounce of sulphate of iron. These ingredients should not be mixed until immediately before application as a drench. Two pints of the mixture are sufficient for a cow, and half a pint for a sheep. If drenching cannot be done, the mixture may be poured into the stomach through a canula inserted as for a bloat, a hand's breadth forward of the point of the hip bone on the left or near side.

The solutions of each ingredient may be concentrated, but they must be kept separate in glass, coloured preferably, wood or earthenware containers—not iron—and made up with the addition of water to contain 1 oz. of washing soda and  $\frac{1}{2}$  oz. of sulphate of iron to the 2 pints of the mixture.

Larger doses of carbonate of soda and sulphate of iron could be given, but it is questionable whether an increased dose would be of any advantage.

Sulphate of iron may be bought for about 3d. per lb., and washing soda for slightly less. A few pounds of each kept on hand for emergencies might obviate a serious loss.

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## SKIN DISEASE.

A condition—dermatitis—manifested by intense irritation, and development of dropsical swellings, and later death of unpigmented surfaces of an animal's body, sometimes occurs during summer in country where trefoil and St. John's wort grow. It is only on white unpigmented patches of the animal's skin that the condition appears. Pigmented or coloured portions of the skin remain unaffected. Feeding experiments have proved that the ingestion of these plants, together with exposure to strong sunlight, bring about the condition. Cattle so affected show signs of much irritation, biting, and licking themselves. Within a few days excretion of the skin of unpigmented areas occurs. Animals become feverish and lose condition rapidly.

Sheep are affected similarly; the ears and face become thickened and dropsical, and the lips become hard and leathery. If shade is provided, animals seek it readily to obtain relief.

Staining of white patches on cattle with ordinary washing blue is protective. An application of a solution of permanganate of potash made with rainwater to a deep pink colour gives relief.



## Feeding Fowls.

**P**OULTRY-RAISERS as a whole have a very fair idea of the principles and practice of feeding, and take into consideration factors which make for efficient and economic production.

The present-day values of cereals may induce some to depart from old and accepted practices in order to reduce costs. There are three points, however, that must not be lost sight of if the best results are to be obtained and the general health of the stock maintained—viz., the vitamin content of the ration, the protein content, and the quantity supplied.

*Vitamins.*—Vitamin A is of outstanding importance at the present juncture, for the shortage in the ration may cause outbreaks of nutritional roup as well as lowered egg production. The feeding of yellow maize and green feed ensures a sufficient supply of this vitamin.

On most poultry farms during the winter months green feed is not plentiful; consequently, under normal circumstances the loss due to a shortage of maize cannot be overcome. It is therefore of paramount importance that the poultry-raiser should make a special effort to supply the birds with good succulent green feed. Green feed is the cheapest form in which the birds' requirement of this vitamin can be supplied. In cases where home-grown feed cannot be obtained, poultry-raisers should use at least 10 per cent. of good green lucerne chaff or meal in the mash fed to their birds.

*Protein.*—To obtain the maximum economic production, laying birds should have in their ration (i.e., grain and mash) a total of approximately 15 per cent. of crude protein. Maize has about 10 per cent. and wheat about 13 per cent. of protein. Where maize has been used extensively and is replaced with wheat it may be desirable to reduce slightly the protein content of the ration. This is most easily brought about by a slight reduction in the meat meal fed.

Generally speaking, however, the protein-rich meat meal is not overfed, and its greater use is advisable in certain circumstances. This is particularly so in the case of the poultry-raiser who feeds extensive quantities of skim milk to his birds. With the approach of winter the milk supply will probably diminish. In such cases the loss of protein of animal origin in the form of milk should be supplemented with meat meal.

*Quantity.*—Providing the right kind of food is being used, economic production is only possible by feeding the birds all they will consume. Do not be afraid of making your birds unduly fat. The good producer will convert the food supplied in excess of body requirements into eggs. Birds which cannot do this should be culled and sold for table purposes.

## WORMS IN FOWLS.

Many young birds will soon be commencing their first season of production. During the rearing of these birds diseases such as coccidiosis, pullorum disease, and roup will have taken their toll. These diseases are spectacular in their onset and the symptoms manifested and the mortalities experienced have compelled the poultry farmer to undertake control measures in order to minimise his losses as much as possible.

In many instances, however, worm infestation has been overlooked. The effects of worm infestation are usually insidious in nature, and being accumulative do not attract attention until the birds are seriously affected. Such effects include failure to make normal growth and even loss of weight, loss of appetite and activity, dull, ruffled plumage, and a paleness of the comb and shanks. The mortality, especially among young birds, may be serious. More important still, young pullets, while maintaining a ravenous appetite and being apparently in fair health, may not be producing their normal quota of eggs.

Of the various worms which infest poultry one of the most important is the large roundworm, which grows up to 4 or 5 in. in length, and is found in the intestine. Where the farmer pays careful attention to sanitation and cleanliness, this and other worms rarely become dangerous. By the regular removal of droppings and the adoption of other measures which promote cleanliness, the source of infestation is removed. Prevention of infestation is most important in the control of parasitic worms. There are, however, certain drugs which may be employed to remove the worms from the birds, and if treatment is employed regularly the infestation should be of no great importance. Treatment of poultry for worms may be undertaken either by mixing certain drugs with the mash (flock treatment), or else by giving the drug to each individual bird (individual treatment).

*Flock Treatment.*—Flock treatment can be applied with success only when the birds are kept under intensive or semi-intensive conditions. The procedure is to mix nicotine sulphate with the mash at the rate of .5 cubic centimetre of nicotine sulphate for every 1 lb. of dry mash. The amount of nicotine sulphate required is incorporated with just sufficient water so that when mixed the mash is flaky. About 1 part of nicotine sulphate to 400 parts of water is usually adequate. The mixing should be thorough so that no lumps remain. This treated mash is mixed fresh daily and fed continuously for four days.

*Individual Treatment.*—The best drug to use for individual treatment is carbon tetrachloride. This may be given in capsules or by means of a syringe and rubber tubing. The birds are starved overnight and treated next morning. They may be fed immediately after treatment. The doses range from .5 cubic centimetre to 2 cubic centimetres, depending on the size of the bird. If the syringe is used great care must be taken to avoid delivering the drug into the windpipe, which would cause instant death. Before undertaking this treatment, farmers should apply to the Animal Health Station, Yeerongpilly, for further details.

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## PURPLE STAINED CHICKENS ARE ALWAYS COCKERELS—A WARNING TO BUYERS OF DAY-OLD CHICKS.

Now that determination of the sex of day-old chickens has become an accepted practice, it has brought with it the usual malpractices that seem to follow an innovation of this kind. The Department of Agriculture and Stock aims to prevent imposition by making it incumbent on any person licensed to determine the sex of day-old chickens to spray the cockerels with an indelible purple stain. The stain is clearly visible on the down of white chickens, and may be detected on coloured chickens by a little closer inspection of the beak and legs and the lighter parts of the body.

It has come to the notice of the Department that, as it is possible to buy up day-old cockerel chickens in large numbers, some unscrupulous dealers have apparently discovered that they might make a lot of money by selling cheaply bought cockerels as pullets, and by informing prospective buyers that the staining indicates some special pedigreed strain. The public is, therefore, warned that the staining is merely an indication that the chickens have been determined as cockerels by a licensed sexer.



## EFFECT OF CLIMATIC CONDITIONS ON DIFFERENT CLASSES OF POULTRY.

Two classes of birds are generally used by commercial farmers—light breeds, such as Leghorns, Anconas, and Minorcas; and heavy or dual-purpose breeds, such as Australorps, Wyandottes, and Rhode Island Reds.

Light breeds, as a rule, are of a "highly strung" nature, and very susceptible to climatic changes, particularly during the early periods of production. Rains and cold snaps will invariably check production with this type of bird. This is particularly noticeable if the birds are not housed under the intensive system. If false moults are to be avoided, the highly strung nature of the birds also makes it inadvisable to alter their location until they have settled well into production and until spring approaches.

If, for any reason, light breeds have to be handled before the middle of, say, July, go about the work quietly and, if at all possible, work only in the afternoon, for most of the birds to lay on that day will have done so by then.

The dual-purpose breeds, on the other hand, are more docile and quiet. They are not so easily disturbed by climatic changes during the early laying stages, but are more susceptible to heat, as many dual-purpose birds lay on fat. In selecting breeders, select against this characteristic and choose the most active, alert birds. Greater liberties can be taken with dual-purpose breeds in relation to change of quarters, but do not worry them or shift them during early winter, as they are not immune from false moults.

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### TO SAVE FOWL FEED.

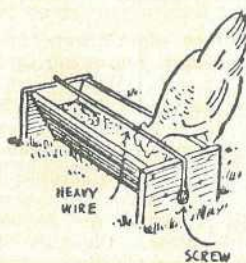


Plate 14.

One of the simplest and most reliable feed troughs for keeping hens from soiling the feed is this one. It is an ordinary feed trough, except that there is a strong wire fastened across the top, running from end to end. This simple device prevents the hens from getting their feet into the trough and wasting or contaminating the feed.

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### A WHITEWASH HINT.

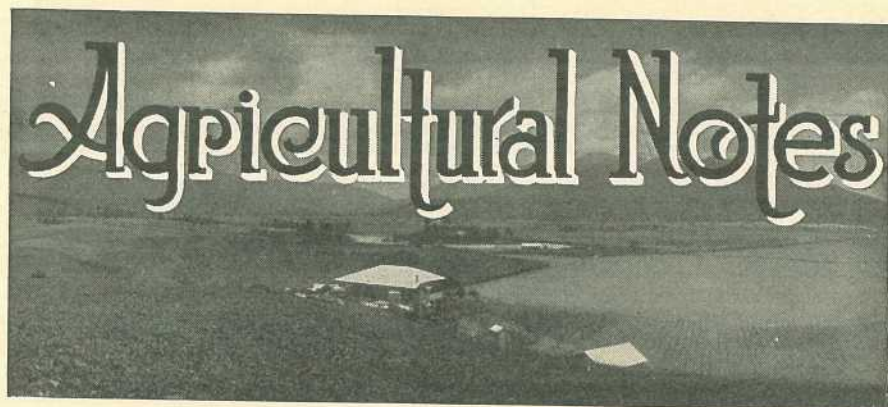
A pound of cheap soap dissolved in a gallon of boiling water and added to 5 gallons of thick whitewash gives it a gloss-like paint and makes it stick better.

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### A WORD FOR THE BLACKBIRD.

Californian farmers say that the blackbird is most useful on a sheep farm. The birds perch on the sheep and pick ticks and other parasites out of the wool. Both the sheep and the sheepman appreciate the service, and so do the blackbirds, so everybody's happy.

There's the inevitable moral—farmers, protect your feathered friends!



## Cutworms in Seedling Cotton.

**D**URING the spring and early summer months one of the most serious pests of seedling cotton with which the farmer has to contend is the common cutworm.

In years of cutworm outbreaks the loss of stand may necessitate replanting. Replanting is successful only when the soil contains adequate soil moisture, and some time may elapse between a cutworm outbreak and the re-sowing. Late replant crops are rarely so successful as those sown early, and for that reason precautions should be taken against cutworms to ensure a commercial stand of cotton with the first seeding. Farmers, therefore, should be familiar with the pests and ready to deal with it if necessary.

The cutworm—the larva of a dark-brown moth—is a stout soft-bodied greyish-brown to greyish-green caterpillar growing up to  $1\frac{1}{2}$  inches in length which feeds principally on low-growing weeds. When these food supplies are disturbed in any way, the caterpillars may migrate to nearby cotton fields or, if already in the paddock, they may damage the germinated cotton. The pest feeds at night and normally attacks the stem just above the ground level.

Cutworm losses in cotton may be considerably reduced by a good cultural system. Thorough ploughing, in which weeds are destroyed completely, is necessary. Patches of weeds missed during ploughing are frequently the centre from which extensive cutworm damage may radiate. Ploughed land should be kept free of weeds for at least a month before the planting, which, if the rains are suitable, will be carried out between mid-September and mid-October. Early ploughing is, therefore, required. After planting, weeds should be kept in check.

If weeds are ploughed under immediately prior to planting the risk of cutworm injury is increased greatly, for many of the eggs and larvae on the weeds will survive and attack the cotton seedlings.

Virgin land, or Rhodes grass paddocks which are being prepared for cotton, usually contain little weed growth, and this, to a great extent, minimises the risk of cutworm injury.

Where direct control of cutworms is required, insecticides must be used. The poisoned bran bait method has been tested thoroughly and is recommended as a reliable control measure.

To prevent the entry of invading swarms, the use of one or more baited furrows is necessary. When the pest is within the field, the bait may be broadcast or applied in lines along the rows of cotton seedlings. If broadcast, about 50 lb. dry weight of bran will be required per acre; if distributed along the rows, 25-30 lb. dry weight of bran per acre should be sufficient for baiting purposes. The formula of the poison bran bait is as follows:—25 lb. bran, 2 lb. lead arsenate, 4 lb. molasses, and enough water (approximately 2 gallons) to make a friable crumbly mash which can be broadcast without difficulty. The bran and the lead arsenate are thoroughly mixed dry. The molasses is then dissolved in 1 pint of boiling water, and made up to 2 gallons with cold water. The solution is poured on to the already mixed bran and lead arsenate and stirred thoroughly into a uniformly moist but loose mash.

As the cutworms are night feeders, the bait should be applied in the late afternoon and evening.

## STORING SEED GRAIN.

Maize, wheat, and other grains are best stored in insect-proof bins or tanks, which can be made gastight without any difficulty. Any weevils or other insects in the grain can then be destroyed by fumigation with carbon-bisulphide while the construction of the bin or tank will effectively prevent further attacks. Properly carried out, fumigation with carbon-bisulphide does not affect the grain, and it can be used for either stock feeding or seed purposes.

Frequently, however, the farmer has a few bags of seed wheat or maize and no bin or tank in which to store it. Under these circumstances, he cannot do better than use a mixture of paradichlorobenzene and naphthalene to keep the seed free from pests. Both these substances are white crystalline solids, each with its own characteristic odour. Both vaporise on exposure—paradichlorobenzene the more quickly of the two. The mixture is both toxic and repellent to insects; it kills insects already present in the seed and ensures a very considerable measure of protection against further infestation for a period of some months.

To use these fumigants for the special purpose of seed grain storage, equal parts by weight of paradichlorobenzene and naphthalene are first thoroughly mixed. The mixture can then be incorporated with the grain at the rate of 1½ lb. to every bushel of seed. Alternatively the mixture may be enclosed in cloth bags, each containing ½ lb., provided the same concentration of the fumigant is retained. The bags containing the fumigant would, of course, be evenly distributed through the bags of grain.

Of these two methods of using a paradichlorobenzene-naphthalene mixture the second is preferable, for any crystals remaining when the seed is sown can be retained for future use provided they are stored in an air-tight tin. These residual crystals will be almost entirely pure naphthalene and should be treated as such when making up fresh lots of the mixture.

Grain treated with paradichlorobenzene and naphthalene, though quite suitable for seed purposes, carries a characteristic taint and should not be fed to stock.

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## WINDBREAKS.

For the comfort of stock, windbreaks are a necessity, especially on open plain or high tableland country. In timbered country, provision should be made for windbreaks when the land is being cleared by leaving suitable stands of the original forest or scrub covering, otherwise the expense of establishing shelter belts will have to be incurred later on.

In country which has already been cleared, the planting of suitable trees on the prevailing windward boundaries of farms on tablelands, plains, and undulating country is worth serious consideration. If edible trees are planted, they might be useful in times of drought. A farmer would naturally hesitate before destroying shelter trees for feeding purposes, but, if the necessity arises, edible trees may be lopped without destroying them.

The undermentioned trees are mainly suitable for planting on the Darling Downs. Edible types are the kurrajong, bottle tree, Portuguese elm, honey locust, and carob bean. Less palatable trees are the cypress (*Cupressus torulosa*), *Pinus radiata*—commonly known as *Pinus insignis*—white cedar, and *Bauhinia hookeri*. The well-known and valuable western tree, the wilga, should be added to this list if available. Although there is a considerable variation in the palatability of individual trees, the wilga is both a useful and ornamental species.

In most cases the trees mentioned can be bought from nurserymen. In the event of expense proving an obstacle to adequate planting, the trees can be raised from seed in an improvised nursery on the farm. The seeds could be germinated in shallow boxes or tins about twelve months before the young trees are required for planting. In frost-free areas June, July, and August are suitable months for planting out the young trees in their permanent locations. Some protection should, however, be given to the plants in frost-susceptible districts if midwinter planting-out is attempted.

Protecting the young trees from stock is most important. If the trees are planted near a boundary fence, it might be found most convenient to erect a second inner fence to keep stock away from the trees until they are high enough to be out of reach. Smaller farm stock, such as sheep, can be let into the enclosure once the trees have attained sufficient height for their foliage to be above reach.

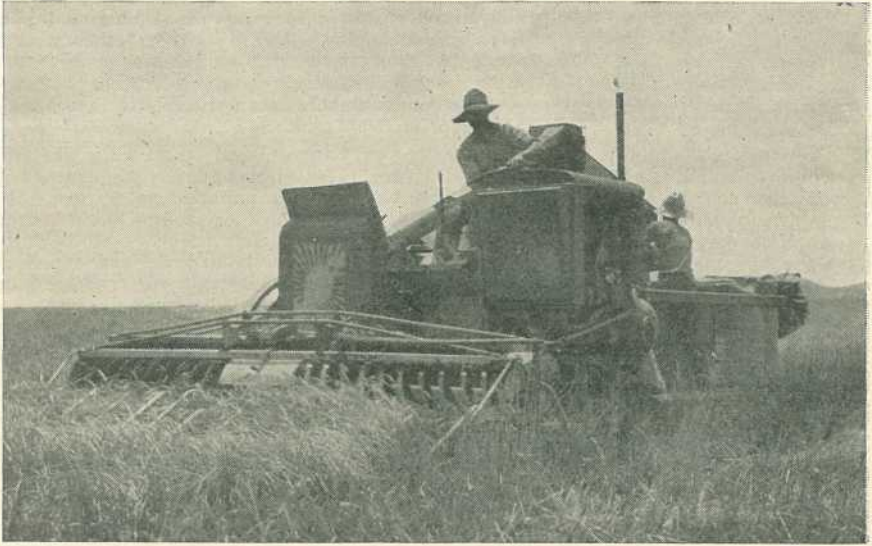


Plate 15.

AN AUTO-HEADER HEAD-ON IN A DARLING DOWNS WHEAT CROP.

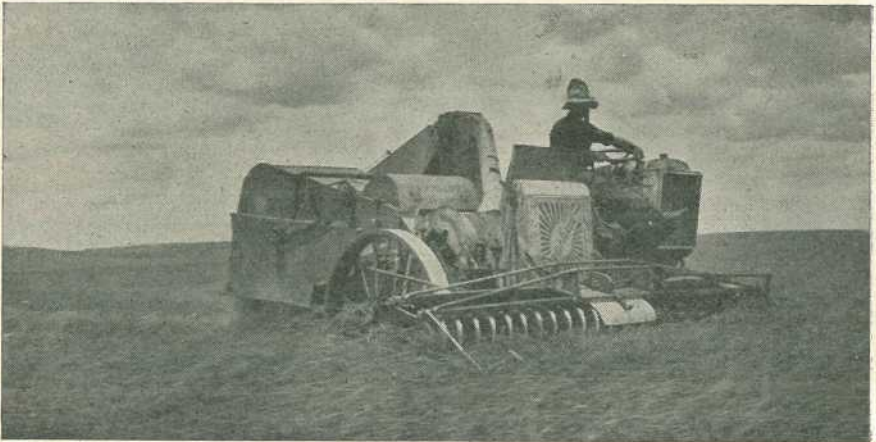


Plate 16.

AUTO-HEADER AT WORK ON A BADLY-LODGED GRAIN CROP.

## LUCERNE ON THE DOWNS AND MARANOA.

Although comparatively few settlers in the Western Darling Downs and Maranoa districts have established lucerne stands, it is significant that most of those who have done so plan a considerable increase in acreage. The qualities of lucerne as a grazing proposition, both for sheep and cattle, are gaining wider appreciation outside the recognised agricultural regions. The results obtained on scrub and forest lands during dry spells at Guluguba, Columboola, Wallumbilla, and other localities are very encouraging. An adaptation of lucerne to a wide range of soils and a capacity for giving good results under adverse climatic conditions were clearly demonstrated.

In sowing lucerne, high seeding rates are unnecessary and have been the cause of many failures in the past; 3 to 4 lb. per acre is quite heavy enough for the districts named.

With the wide variation in farming conditions and soil types that obtain in these districts, hard-and-fast rules regarding sowing are not practicable. The following points are, however, important:—Deeper sowing than  $\frac{3}{4}$  inch is inadvisable in all soils, except those of a self-mulching nature where, if necessary, the depth may be a little greater, provided that there is sufficient moisture to give the plant a good start in addition to germinating the seed.

Where old wheat land is to be converted into pasture, it is usual to sow the lucerne with the last crop of wheat. This method reduces costs to some extent; but, in soil that has a tendency to pack or cake after rain, it is advisable to drill the wheat in first and then follow with the lucerne—having the drill hoes out of the ground, and covering with light harrows. This avoids planting the lucerne at the same depth as the wheat—i.e., 2-2 $\frac{1}{2}$  inches.

When broadcasting, it is difficult to get an even sowing with the small seed; but, if two sowings are made, one across the paddock and the other in the opposite direction, a more even crop can be obtained. Only light harrows should be used to cover the seed.

On small holdings where more intensive culture is practised, a method of sowing which might commend itself to dairymen, particularly in the Maranoa district, is to plant lucerne in rows 18 inches to 2 feet apart. Inter-row cultivation may then be practised when necessary after rain. Established in this way, the plant has exceptional drought resistance and an area of green feed for emergency use is assured.

All settlers in the reclaimed prickly-pear country might well turn their attention to lucerne as a grazing crop. With light seedlings it is not expensive to establish and is well worth a trial.

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## SWAMP LANDS.

Throughout a considerable stretch of the coastal country swampy areas of lesser or greater extent are encountered, particularly in the wetter regions where dairying is now expanding. These lands, to a large extent lying idle, could at no great cost be brought into use by planting them with para grass. This grass is easy to establish, because of its habit of rooting freely at the nodes. It is a rather coarse, vigorous grower, but has succulent stems and leaves and gives a large quantity of green material per acre. Under favourable conditions, yields of over 30 tons per acre have been obtained in one year. It is easily cut back by frost, and is, therefore, most suitable for the warmer localities.

This grass grows well in swampy places, the runners going out even into deep water. Once established, it holds its own with any other grass. It has a further advantage in that it is credited with completely drying out marsh lands.

Para grass is usually propagated by runners, which root readily. These runners can be easily planted in furrows about 3 feet apart and about the same distance between the rows.

## SEED MAIZE SELECTION.

As like tends to beget like, the necessity of selecting seed from ears of desired type and known parentage is obvious. Some farmers, however, do not realise the importance of this, and are satisfied to sow seed of any breeding, provided the grain is sound and germinates readily. Uniform tasselling and maturity cannot be expected from such seed. When times of tasselling do not coincide, there is poor fertilization of late-maturing plants and reduced yields follow.

The general improvement of a crop and the rapid elimination of undesirable characters can only be brought about by a regular process of seed selection. Isolation of the growing crop is necessary to ensure that cross-fertilization with maize in neighbouring fields does not occur. That is all the more important because wind and insects frequently carry pollen over long distances. Where isolation is not possible, sowings may be arranged so that tasselling times do not coincide.

It has been proved beyond doubt that locally grown seed is more suitable for planting than comparable supplies of the same variety secured from outside sources. Farmers should, therefore, endeavour to improve their own seed by rigorous selection from year to year—provided, of course, the variety grown is continuing to give satisfaction—rather than buy seed annually, which cannot always be guaranteed as to its type and purity.

Seed selection may be carried out by the grower both on the field and in the barn.

Field selection is the better way, and it can be done conveniently when the corn is being pulled. More essential characters can be taken into consideration during field selection than are possible in the barn, where characters in the cob are alone considered. In the most rigid field selection the characteristics of only one parent can be determined, but, even so, seed selected from plants showing the following characteristics should give the best possible crop in the coming season:—

- (1) The crop should have matured naturally, be thoroughly dry, and free from disease.
- (2) Ears, when compared with the stalk, should be comparatively large and selected from those plants remaining upright.
- (3) One good single ear to a plant is better than two mediocre ones, but where possible select from a plant with two good ears.
- (4) Position of the ear on the stalk is important, for if too high from the ground harvesting is difficult and the risk of lodging is greater. If too low there is a danger of loss through weed overgrowth and also slow drying-out in showery weather.
- (5) Most varieties sucker to a greater or lesser extent, but the smaller the sucker development the better the plant.
- (6) The ears should be firmly attached to the stalk and droop when ripe. The point of the cob should be well covered by the husk as a protection against insects and the weather.
- (7) The cob itself should be of moderate size, both in length and thickness, cylindrical (not tapered) in shape, having a well-filled butt and tip, yielding when threshed a high percentage of grain. Such cobs are much heavier than the average.
- (8) The grain itself should be typical of the variety, uniform in depth and shape, and tight on the cob in regular straight rows.

Of all the characteristics in the grain, the farmer can least afford to overlook mixed colour, for maize showing this defect sells at a disadvantage if the crop is sold in the open market.

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## WHAT WE OWE TO POSTERITY.

There is debt to posterity which is owed by every owner of agricultural land. On him rests the responsibility of leaving to his successors his land in as good condition as it was when he turned his first furrow—even in a better condition, if possible. Anyone who does not do everything in his power to prevent his soil from washing away or from loss of fertility can hardly expect to be held in happy remembrance by those who have the misfortune to follow on in the cultivation of a misused and worn-out farm.

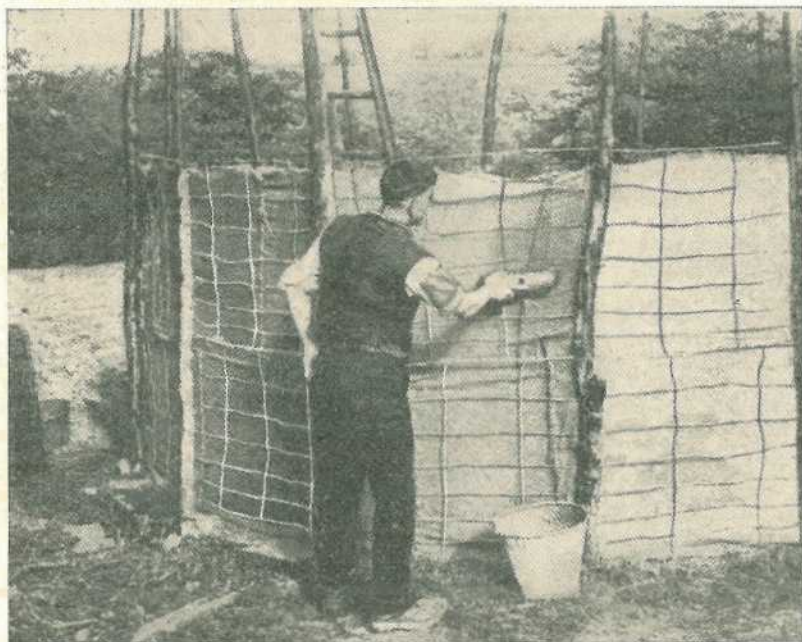
## PROTECTION OF FARM FENCES.

Each year timber requirements on the farm cause a big drain on local timber resources. In some districts the position is now such that repairs and replacements are very expensive, and wastage on the farm should, therefore, be kept to a minimum. This can be achieved by preservative treatments which lessen the risk of damage by termites (white ants) and other destructive agents which shorten the life of fence posts and other types of timber which are normally in contact with the ground.

Fence posts must necessarily be durable and should preferably be free from sapwood. Several materials can be used in preservation treatments, but K55 creosote is the most suitable for the farm. K55 creosote is manufactured to specifications of the Standards Association of Australia and contains less tar than the heavy-grade creosote common on the market a few years ago. It penetrates well into the wood—a feature that is very important in the treatment of fence posts.

Fence posts are most effectively treated with creosote by impregnation under pressure. This is seldom practicable on the farm, but a satisfactory alternative method is to immerse the lower portion of the posts in a tank containing hot creosote. An empty 44-gallon oil drum, from which the top has been removed, is placed on fire-bars raised from the ground, and the posts are placed in the drum, which is then almost filled with creosote. A fire is lit under the drum the contents of which are heated to a temperature just exceeding 200 deg. F. and maintained at this temperature for about four hours. The drum is then either allowed to cool down or the posts can be quickly transferred to a second drum containing cold creosote and left for a few hours. In both cases the creosote is drawn into the timber as it cools.

If the heat treatment is not practicable two coats of creosote should be brushed onto the posts, a day being allowed to elapse between treatments.



[Photo.: "The Farmer and Stock-Breeder," England. Plate 17.]

A SILO MADE WITH SACKS AND PIG NETTING.—One of numerous types of emergency silos now in use in Great Britain as war time improvisations. The sacks are hung on the inside and treated with: Cement, 12 lb.; lime, 2 lb.; salt, 1 lb.; and alum,  $\frac{1}{2}$  lb.; all in  $1\frac{1}{2}$  gallons of water. The cost of this silo was 25s. and it holds about 30 tons.



## Apple and Pear Varieties.

**O**RCHARDISTS in the Stanthorpe District who may be planning a planting programme are advised to place their orders with reliable nurserymen. Early ordering ensures early delivery of the young trees.

As regards varieties to plant, the Granny Smith is likely to be the best commercial apple for many years to come. If reasonably well treated, it will give a good crop every year.

Some growers are inclined to think that the market will be overloaded with Granny Smith apples when young trees already planted come into bearing. This is not likely to happen.

The Stanthorpe Granny Smith is equal to if not superior to any grown in the Commonwealth. The keeping qualities are good, and far more should be cold stored than at present. Stanthorpe applegrowers should try to supply the requirements of their own State with Queensland-grown apples as long as possible by using the available cold-storage facilities.

If the Granny Smith crop in the Stanthorpe district were doubled, or even trebled, there should be no difficulty in marketing the fruit at existing or even enhanced prices.

In addition to the Granny Smith, which should be the main variety, Delicious, Lalla (Red Delicious), Winesap, and Red Statesman are good types.

Red Statesman and, in addition, Dougherty are eminently suitable for the late "private order" trade. Growers who specialise in this trade should cater for their customers over as long a period as is possible. Stocks are frequently exhausted long before they should or need be, and then supplies have to be drawn from elsewhere.

The Gravenstein is a good early dessert apple well worth growing. On account of its susceptibility to gnarl or twist, it is advisable to grow a scaffold tree of another strong-growing variety, such as Delicious, and then rework with Gravenstein scions from selected trees free from the trouble.

Growers should be wary of planting new varieties of apples. Generally it is a good plan to plant only standard varieties and let someone else do the experimenting. Though new varieties may have good characteristics, they are seldom better than those already grown, and being unknown to the trade or the householder the fruit is viewed with suspicion and is difficult to market.

As regards pears, the best commercial varieties are Williams, Bon Cretien, Packhams, Triumph, and Beurre de Box—all are good growers and croppers.

The Winter Cole is a late-maturing variety which is popular in the other States. Stanthorpe growers should, however, limit their plantings of this variety on account of possible fruit fly attacks at the end of the season.



## GLADIOLUS THRIPS.

The gladiolus thrips is again active in southern districts, and in some gardens and nurseries the present crop of blooms will be of little value while subsequent crops will require protection from the pest.

The insect is a typical fringe-winged thrips about one-fifteenth of an inch in length, and dark-brown, sometimes almost black, in colour. Normally both the adults and the small yellowish larvae are confined to the more sheltered parts of the flower spike or the growing point, and the bulk of the injury is produced before the leaf or flower spike is unfurled. Colonies of larvae may often be found in the small spaces between the closely folded leaves of the plant, and in the as yet unopened flower buds. The distinctive injury consequently often follows feeding on these younger parts of the plant prior to their emergence. Typically, symptoms are an uneven silvering on the surface of the leaves, malformations in and discolourations of the flower spike, and a general bedraggled appearance of the plant. Though the damage to the plant is obvious, a secondary effect is lack of vigour in the corms which is frequently not appreciated. Any setback to the plant has an adverse effect on corms taken from it, and thrips injury is no exception to the rule. Control measures are therefore necessary, not only for the current season's crop, but also for that of the following year.

As with most species of thrips, reproduction is very rapid and populations may build up quickly to injurious levels. Continuous attention is therefore necessary, for it is much easier to retain control if treatment is applied before the plants are more or less "alive" with the insects. Similarly, corm protection is desirable to ensure freedom from infestation when planted out in the field. The essentials in control are therefore three:—

(a) Corms should be fumigated in paper bags at the rate of 1 oz. naphthalene per 100 corms for a period of one week before being stored during the off season. A second treatment should be given just prior to planting out in the following season. If corrosive sublimate (1-1,000 for one hour) treatment is given before planting out, the second fumigation may be omitted.

(b) When planted out suitable sprays should be applied as soon as the thrips appear, and at weekly intervals thereafter. If an outbreak was experienced in the previous season, it is better not to wait for the appearance of the thrips but to apply an initial treatment when the plants are about 6 in. high. The most efficient spray contains Paris green 1 oz., brown sugar 2 lb., and water 3 gallons. A mist spray is desirable and it is important to agitate the contents of the pump frequently to ensure an even discharge of the toxic ingredient, Paris green. The cost of this spray is not excessive, but it has the disadvantage of occasionally burning the leaves. A more expensive spray, suitable perhaps for garden purposes, is said to be equally effective, and at the same time less harmful to the plants. It contains tartar emetic 2 oz., brown sugar  $\frac{1}{2}$  lb., and water 3 gallons.

The derris wet sprays provide a further alternative method of dealing with the thrips, and, although they do not offer maximum efficiency they are relatively inexpensive and convenient. Derris sprays should be mixed to the normal strength as recommended by the manufacturers and applied to the plants weekly.

(c) Where possible plantings should be arranged to allow a break of some months between seasonal operations, volunteer growth being suppressed throughout. In the absence of field hosts, the pest population will thus be at a minimum when corms are planted.

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## RIPENING BANANAS.

To ripen bananas on a large commercial scale a properly constructed room, or rooms, with insulated walls are necessary. Probably the most convenient size for such a room would be 12 ft. long by 8 ft. wide by 7 ft. 6 in. high, such measurements allowing for 100 cases capacity. Factors that must be taken into consideration when building ripening rooms are insulation, air circulation, ventilation, cooling, heating, and humidity control. Details are set out in the C.S. and I.R. Bulletin, No. 64, which is available to anyone interested.

To ripen bananas for home consumption, or a small local trade, is an entirely different proposition. Directions are as under:—

Allow the fruit to become fully matured prior to cutting. After harvesting, cut the hands off and allow them to drain for one hour. Obtain a 50-lb. tea chest

or similar box. Stand it upon two pieces of 3-ft. by 2-in. timber to permit a current of air to pass between it and the floor. Pack the hands of bananas carefully round the inside of the chest, being sure to leave the centre open. Next, place a small handful of carbide in the centre of the chest and cover over in a manner that makes the inside of the chest or box as near to airtight as possible. Two or three thicknesses of canvas, or four thicknesses of corn sacks are usually satisfactory.

Take the covering off after sixteen hours and recharge by placing another small handful of carbide on the floor of the chest. Re-cover it and allow it to stand for a further twelve to sixteen hours, after which uncover it and the fruit then will be almost ready for sale. If not quite ready, cover it but without carbide.

In very warm weather, only one application of carbide may be necessary. Ventilating the chest after sixteen hours is very necessary. Keep the chest in the shade away from the direct rays of the sun.

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## MARKETING CAULIFLOWERS.

*Cutting.*—There should be no difficulty in marketing cauliflowers to the best advantage. The main stalk is cut a short distance below the base of the leaf stalks. This short length of stalk gives protection and prevents the leaves from breaking away. All first quality cauliflowers should be marketed with the leaves intact, as this prevents the heart from being damaged in transit.

*Containers.*—A clean chaff sack is the best container, being light and airy. Corn sacks, unless new, are usually unsuitable.

*Packing.*—The cauliflowers should be packed with the leaves brought together to protect the heart. This assists in preventing bruising and discolouration, keeping the heart white and attractive and in a fit condition to sell at high values.

*Grading.*—First and second quality cauliflowers should be packed separately. Each bag should contain as near as possible cauliflowers of the same size and quality. Mixed sizes do not sell as well as graded. Any cauliflowers showing leaf damage should be packed as second grade.

*Branding.*—Where possible, markings should be placed on the bags before filling. Stencils suitable for doing this are easily procured, and save time. The grower's name, or mark, and the number of cauliflowers in the bag should be conspicuously placed on the side of the bag. This makes identification easy, and often saves unnecessary handling.

Packed bags should not be used as a seat when carting cauliflowers.

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## RESOILING RAIN-WASHED ORCHARD LAND.

Repairing the damage caused by heavy rains scouring gutters through the orchard is an operation requiring considerable thought, if the work is to be permanent. A repetition of the occurrence is inevitable where the work has been done haphazardly.

Land denuded of the surfact soil presents a hard surface with which the replaced soil will not readily combine. Realisation of this important fact is one of the essentials of a successful job.

Whatever method is employed to repair the damage by replacing soil, it is of the greatest importance that the exposed hard areas should be treated first. Where practicable, the subsoil plough is the best implement to use, but any strong-toothed implement which will break up the surface will serve the purpose. Besides assisting in drainage, this will allow the overburden of replaced soil to incorporate with the subsoil.

If, however, repairing the damaged area entails very much labour, it may be advisable to commence resoiling at the higher levels first. If this is not done, and heavy rain interrupts the work, the undiverted water may again flow down the gutters and carry away the replaced soil on the lower portions.

For general purposes, and where soil can be taken from land adjacent to the orchard, a scoop should be used. Unless it is very soft, the ground should be ploughed before scooping, and careful ploughing to an even depth will greatly facilitate scooping.

## THE FRUIT MARKET.

J. H. GREGORY, Instructor in Fruit Packing.

**S**TONE fruits are now in full supply on a firm market. Some excellent consignments are being handled and prices are good. The two holiday breaks did not affect marketing because of their mid-week occurrence. Mangoes are in heavy supply, indicating a bumper crop. Southern market prices for mangoes are lower than in previous seasons, although they have been profitable for good quality fruit. Only special varieties are saleable in Sydney and Melbourne. Pineapple values have remained firm, but bananas have eased somewhat.

Prices at the end of December were:—

### TROPICAL FRUITS.

#### Bananas.

*Brisbane.*—Cavendish: Smalls, 4s. to 6s. 6d.; Sixes, 5s. to 8s.; Sevens, 6s. to 10s.; Eights, 7s. to 11s.; Nines, 6s. to 11s. 3d.

*Sydney.*—Cavendish: Sixes, 5s. to 8s.; Sevens, 6s. 6d. to 9s.; Eights and Nines, 9s. to 12s.

*Melbourne.*—Cavendish: Sixes, 8s. to 11s.; Sevens, 9s. to 12s.; Eights and Nines, 12s. to 14s.

*Brisbane.*—Lady Fingers: 2½d. to 9d. dozen.

#### Pineapples.

*Brisbane.*—Smooths, 5s. to 8s. case; 1s. 6d. to 6s. dozen. Roughs, 5s. to 9s. case; 1s. 6d. to 4s. dozen.

*Sydney.*—Smooths, 5s. to 10s. case.

*Melbourne.*—Smooths, 9s. to 15s. case. Bowen pines, 10s. to 16s. case.

#### Papaws.

*Brisbane.*—Yarwun 5s. to 7s. tropical case. Local, 2s. to 3s. bushel. Gunalda, 3s. to 3s. 6d. bushel.

*Sydney.*—8s. to 13s. for special grades.

*Melbourne.*—10s. to 14s. tropical case.

#### Mangoes.

*Brisbane.*—Fancy, 10s. to 12s. Northern Commons, 6s. to 8s.

*Sydney.*—Fancy, 6s. to 10s. Inferior lower.

*Melbourne.*—8s. to 12s.

#### Passion Fruit.

*Brisbane.*—8s. to 10s. half bushel.

*Sydney.*—5s. to 10s. half bushel.

*Melbourne.*—12s. to 20s. half bushel.

### CITRUS FRUITS.

#### Oranges.

*Brisbane.*—Imported to 13s. case.

#### Lemons.

*Brisbane.*—Gayndah, 20s. to 25s. case.

### STONE FRUITS.

#### Plums.

*Brisbane.*—Burbank, 5s. to 8s. half bushel. Angelina, 6s. to 10s. half bushel. Santa Rosa, 5s. to 8s. half bushel.

#### Nectarines.

*Brisbane.*—3s. to 7s. half bushel.

#### Cherries.

*Brisbane.*—5s. to 8s. half bushel.

#### Peaches.

*Brisbane.*—2s. to 5s. half bushel.

#### Apricots.

*Brisbane.*—6s. to 10s. half bushel.

**DECIDUOUS FRUITS.****Apples.**

*Brisbane.*—Gravensteins, 9s. to 11s. William Favourites, 5s. to 9s. Cookers, 5s. to 8s.

**Pears.**

*Brisbane.*—Clapps, 5s. to 8s. bushel.

**Grapes.**

*Brisbane.*—Roma Muscatels, 5s. to 10s. Local Whites, 2d. to 2½d. lb.

**MISCELLANEOUS, VEGETABLES, ETC.**

*Watermelons.*—*Brisbane:* 4s. to 10s. dozen.

*Rockmelons.*—*Brisbane:* 1s. to 4s. dozen.

*Cabbages.*—*Brisbane:* Stanthorpe, 6s. to 10s. bag.

*Beans.*—*Brisbane,* 1s. to 4s. bag. Specials higher.

*Peas.*—*Brisbane:* Stanthorpe, 5s. to 7s.

*Carrots.*—*Brisbane,* 3d. to 1s. bundle.

*Lettuce.*—*Brisbane,* 1s. 6d. to 2s. dozen.

*Beetroot.*—*Brisbane,* 4d. to 1s. bundle.

*Marrows.*—*Brisbane,* 6d. to 1s. 6d. dozen.

*Cucumbers.*—*Brisbane,* 3d. to 9d. dozen; 2s. to 3s. case.

*Chokos.*—*Brisbane,* 4d. to 9d. dozen.

*Pumpkins.*—*Brisbane,* 4s. 6d. to 6s. bag.

**Tomatoes.**

*Brisbane.*—Ripe, 6s. to 9s. Inferior lower. Coloured, 8s. to 10s. Others, 3s. to 7s.

**LET US SPRAY.**

Would you have your young banana  
Suffer blight and come to grief?  
Must you leave off for "manana"  
Deadly spots upon a leaf?  
When, in easy way, you may .. .. SPRAY!

Would you have this swift infection  
Scourge your fields from "pole to pole?"  
Leave you want and desolation  
When it's easy to control  
In a way, the only way .. .. SPRAY!

Would you rest in idle manner  
While your plants all droop and die?  
When beneath the Control Banner  
You can such disease defy  
And, you may, in easy way .. .. SPRAY!

Would you jeopardise your "holding"  
By indifference to this threat?  
Heedless of our timely scolding,  
Yet, before the ills are met,  
There's a way, a certain way .. .. SPRAY!

Better then be up and doing,  
Crush this menace and be free—  
Spend no time in silly mewing,  
Tend to each affected tree  
With a will, and in a way .. .. LET US SPRAY!

\* To-morrow.

—George B. Wallace, in *The Journal of the Jamaica Agricultural Society.*

## NEW DIRECTOR OF DAIRYING.



Plate 18.  
MR. E. B. RICE.

Mr. E. B. Rice, a technical officer of the Dairy Branch of the Department of Agriculture and Stock, has been appointed Director of Dairying—after a considerable period of acting service in that capacity—in succession to Mr. G. H. E. Heers, who has retired under the age limit provisions of the Public Service.

Mr. Rice spent his boyhood on the Darling Downs. He was educated at the Harlaxton State School and the Brisbane Technical College. Completing a four-year course at the college, he gained the diploma in industrial chemistry with honours, together with certificates in sugar chemistry and assaying.

In 1922, Mr. Rice entered the Department of Agriculture as a cadet. Specialising in dairy technology, he pursued various courses of study, including agriculture, animal husbandry, and dairy bacteriology, and gained certificates for proficiency in milk and cream testing, buttermaking, and cheesemaking.

In 1934-35, under the scheme then operating for the interchange of technical officers, Mr. Rice was attached to the Dairy Branch of the Department of Agriculture of New South Wales. In addition to gaining considerable practical experience of the dairy industry of another State, he completed a course in dairy bacteriology at the Sydney University. In 1936 he was selected for a course of advanced study and research at the National Institute of Research in Dairying, University of Reading, England. While abroad, he travelled extensively in Great Britain, Eire, Germany, Denmark, and Holland, observing dairy practice, research activities, and marketing methods in those countries.

As a member of the Cheese Investigation Committee, Mr. Rice was associated actively with the recent reorganisation of the cheese industry on its technical side, and which has led to a remarkable improvement in cheese quality.

### MR. HEERS' CAREER.

The new Director's predecessor, Mr. G. H. E. Heers, has had a meritorious career of many years' duration in the service of the Department of Agriculture and Stock, to which he was appointed as a dairy inspector in 1907. From the position of Senior Grading Inspector he was appointed Director of Dairying on the retirement of Mr. Chas. McGrath in 1935.

Mr. Heers has been associated with every progressive development in the Dairy Branch and assisted in the drafting of "*The Dairy Produce Act of 1920*," the most advanced legislation of its kind at that time. In this and many other ways he contributed materially to the establishment and maintenance of high standards in the Queensland dairy industry, which now approximates £10,000,000 in annual value and which is ever adding to the volume of our export trade. No limit has yet been set to its expansion in this State.

Among other offices held by Mr. Heers in the course of his official career were Chairman of the Dairy Cattle Improvement Board, Chairman of the Dairy Factories Investigation Committee, and membership of the Milk Tribunal, the Cheese Advisory Board, and of the Rail and Road Transport Committee. As a judge of butter and cheese quality he has few, if any, equals in the Commonwealth.



Plate 19.  
MR. G. H. E. HEERS.

A keen horticulturist, Mr. Heers is regarded as one of the highest authorities on rose growing in Queensland. His present land interests are bound up with the well-known Pacific Nurseries at Manly, near Brisbane. As a young man he was a noted all-round athlete, excelling in field sports, particularly cricket and football, and at one time enjoying the distinction of being among the foremost of distance footrunners of his day. He also excelled in aquatic sports and was one of the founders of the Manly Yacht Club.

Mr. Heers, in his retirement from official life, continues to enjoy the good will of every section of the dairy industry—including producers, manufacturers, and shippers—in the development of which he played for so long a leading part.

## PRODUCTION RECORDING.

List of cows and heifers officially tested by officers of the Department of Agriculture and Stock which have qualified for entry into the Advanced Register of the Herd Books of the Australian Illawarra Shorthorn Society and the Jersey Cattle Society, production charts for which were compiled during the month of November, 1940 (273 days unless otherwise stated).

Name of Cow.	Owner.	Milk Production.	Butter Fat.	Sire.
		Lb.	Lb.	
<b>AUSTRALIAN ILLAWARRA SHORTHORNS.</b>				
MATURE COW (STANDARD, 350 LB.).				
Sunnyside Empress 33rd .. .. .	P. Moore, Sunnyside, Wooroolin .. .. .	12,307-1	434-579	Bruce of Avoncl
Evansvale Carey .. .. .	J. F. Evans, Malanda .. .. .	9,689-35	397-297	Malanda of Glenore
Merravale Tulip 9th .. .. .	W. Soley, Malanda .. .. .	10,606-7	358-819	Greyleigh Honorarium
JUNIOR, 2 YEARS (STANDARD 230 LB.).				
Sunnyside Empress 65th (365 days) .. .. .	P. Moore, Sunnyside, Wooroolin .. .. .	9,928-25	369-319	Cosey Camp Rupert
Bingleigh Melody's Darling 2nd .. .. .	J. C. Meier, Mount Mort .. .. .	7,473-5	303-364	Blacklands Patrol
Corunna Ideal .. .. .	J. H. Anderson, Fairvale, Southbrook .. .. .	6,954-95	286-517	Fairvale Emperor
Faversham Prim 2nd .. .. .	Messrs. Couchman Bros., Warra .. .. .	6,771-54	277-328	Faversham Rex
*Sunnyside Marvelette 2nd .. .. .	P. Moore, Sunnyside, Wooroolin .. .. .	7,699-9	274-892	Cosey Camp Rupert
Kyabram Jewel 2nd .. .. .	A. H. E. Black, Kyabram, Kumbia .. .. .	6,228-06	264-087	Berry Joker
Balcarres Queen .. .. .	E. E. Reeve, Balgowan, Muldu .. .. .	5,447-85	242-82	Morden Signal
Cedar Grove Model 10th .. .. .	T. Ryan, Allora .. .. .	6,894-35	236-349	Cedar Grove Trump
Faversham Bluebell .. .. .	Couchman Bros., Warra .. .. .	5,515-78	235-79	Faversham Rex
<b>JERSEY.</b>				
MATURE COW (STANDARD 350 LB.).				
Keystone Dot (251 days) .. .. .	E. J. Keys, Proston .. .. .	8,724-3	376-063	Keystone Canon
JUNIOR, 3 YEARS (STANDARD, 270 LB.).				
Windyway Maiden .. .. .	Wakefield Bros., Upper Barron, Atherton .. .	5,628-4	320-105	Royal Emblem 2nd of Rosedale
JUNIOR, 2 YEARS (STANDARD, 230 LB.).				
Lermont Bella .. .. .	J. Schull, Lermont, Oakley .. .. .	5,196-45	259-945	Woodside Golden Volunteer
Peeramon Fairy Dove .. .. .	A. H. O. Koppen, Peeramon .. .. .	5,563-5	317-304	Trinity Popcorn 2nd's Pioneer
Windyway Greta Garbo .. .. .	Wakefield Bros., Upper Barron, Atherton .. .	4,172-4	239-921	Hero of Windyway

\* Sunnyside Marvelette 2nd is a Senior 2 Years (Standard 250 lb.), and not a Junior 2 Years.

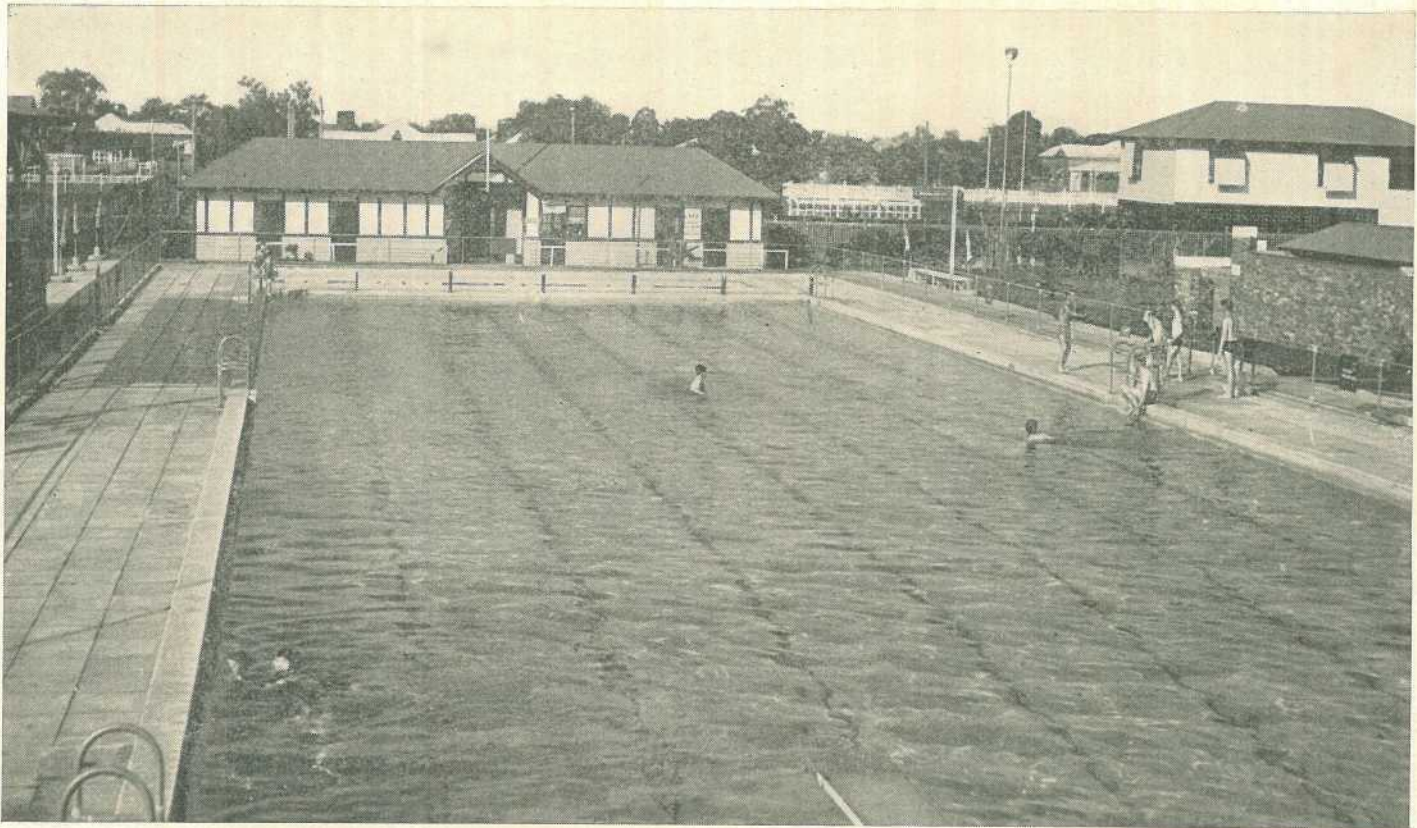


Plate 20.

THE SWIMMING POOL AT DALBY.—Dalby, “The City of the Plains,” is now one of the most important stock markets in the Commonwealth. Wool, grain, and dairy production are the main industries of the Northern Darling Downs, of which Dalby is the thriving capital. Water for the public baths is obtained from a deep bore in the centre of the town. Within a short motor drive are the Bunya Mountains, one of the finest scenic regions of the State. The Dalby district is renowned for its superb winter climate.

[Photo.: Department of Agriculture and Stock.





## General Notes



### Staff Changes and Appointments.

Messrs. J. C. Gilpin (Department of Agriculture and Stock) and H. Bell (View street, Woolloowin) have been appointed inspectors under *The Diseases in Stock Acts*, *The Slaughtering Act*, and *The Dairy Produce Acts*, Department of Agriculture and Stock.

Mr. F. W. Blackford, assistant research officer in the plant pathological section, Division of Plant Industry (Research), will be transferred to Atherton early in the new year.

Mr. K. B. Tomkins, Westgrove, Injune, has been appointed an honorary protector of fauna.

Constables R. C. J. Kennedy (Wandoan) and J. P. W. Frederiksen (Oxley) have been appointed also inspectors under *The Slaughtering Act*.

Mr. D. R. L. Steindl, assistant pathologist, Bureau of Sugar Experiment Stations, has been transferred from Bundaberg to Brisbane.

Miss P. Thorburn, assistant cane tester, has been attached to the Fairymead mill for the remainder of the current sugar season.

Sergeant F. W. Zeller (Craew) has been appointed also an inspector under *The Slaughtering Act*.

### Bingera Mill Levy.

Regulations have been issued under *The Primary Producers' Organisation and Marketing Acts* empowering the Bingera mill suppliers' committee to make a further general levy for administrative purposes on suppliers of sugar-cane to the Bingera mill at the rate of one farthing per ton.

### Plane Creek a Wild Life Sanctuary.

An Order in Council has been issued under *The Fauna Protection Act* declaring Plane Creek and its banks to be a sanctuary.

### Papaw Levy.

The Papaw Levy Regulation, which came into force in December, 1938, for a year and was extended in 1939, has been again extended for a further period of twelve months as from 9th December, 1940.

### The Law Relating to Margarine Manufacture and Sale.

A Proclamation issued under *The Margarine Acts Amendment Act of 1939* provides for its enforcement as from the 1st January, 1941.

### Weight of Hay Bale Battens.

The Minister for Agriculture and Stock (Hon. F. W. Bulcock) has called the attention of growers of hay to the provisions of *The Stock Foods Acts, 1919 to 1935*, which prescribe that the total weight of battens used on bales of hay shall not exceed 10 per cent. of the gross weight of the bale.

A recent inspection of hay offered for sale in Queensland revealed that, in the main, battens were below the weight allowed, but, unfortunately, a number of bales were loaded with one or more battens of excessive weight, some weighing as much as 11 lb. each. In order not to exceed the maximum allowed and to provide for a uniform pack, the total number of battens per bale should not exceed eight. Each batten should not be of greater length than the bale and should not be more than 3 inches by  $\frac{1}{2}$  inch.

The Minister also called attention to the penalty clause in *The Stock Foods Acts* which provides for a fine of £20 for the first offence, £50 for the second offence, and £100 for subsequent offences relating to the use of battens of a weight and size in excess of the prescribed maximum.

It is the intention of the Department, said the Minister, to take necessary steps without further notice to enforce these provisions.

**Peanut Levy.**

An Order in Council has been issued under *The Peanut Industry Protection and Preservation Act of 1939*, which directs the Peanut Board to make a levy for the purposes of section 34 of the Act on growers of peanuts at the rate of one-eighth penny per lb. weight of peanuts in shell delivered to the Board, whether for sale or for grading by the Board, that shall have been harvested during the period commencing on the 18th December, 1939, and ending on the 27th August, 1947.

**Pig-raising.**

New and expanding export markets for pig products have opened, and departmental policy has been shaped in accordance with the determination to take full advantage of trade expansion opportunities as they occur. In comparison with the figures of twenty years ago, pig production has trebled in Queensland. Its present annual value is computed at £1,500,000. The Queenstate Stud Piggery, established by the Department at the Queensland Agricultural College three years ago, has continued to exert a beneficial influence on the pig industry. The progeny of the foundation stock has been distributed widely within the State under reasonable conditions for farmers as to price and transport. The community boar scheme, through which pedigreed animals are made available for farmers, is already fulfilling the purposes of its foundation.

—R. P. M. SHORT, *Under Secretary, in his Annual Report.*

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**QUEENSLAND SHOW DATES FOR 1941.**
**January.**

Pittsworth Bushman's Carnival 27th

**February.**

Stanthorpe ..... 6th to 8th  
Killarney ..... 14th and 15th  
Warwick ..... 18th to 20th  
Clifton ..... Postponed

**March.**

Allora ..... 7th and 8th  
Pittsworth ..... 11th and 12th  
Millmerran ..... 14th  
Goombungee ..... 15th  
Toowoomba ..... 24th to 27th

**April.**

Dalby ..... 1st and 2nd  
Tara ..... 4th and 5th  
Chinchilla ..... 8th and 9th  
Miles ..... 16th  
Nanango ..... 23rd and 24th  
Kingaroy ..... 30th and 1st and 2nd May

**May.**

Monto ..... 1st to 3rd  
Longreach ..... 5th to 7th  
Blackall ..... 12th and 13th  
Gayndah ..... 14th and 15th  
Murgon ..... 15th to 17th  
Beaudesert Show ..... 14th and 15th

Beaudesert Campdraft ..... 16th and 17th  
Mitchell ..... 21st and 22nd  
Ipswich ..... 27th to 30th  
Gympie ..... 29th to 31st  
Kalbar ..... 31st

**June.**

Lowood ..... 6th and 7th  
Maryborough ..... 5th to 7th  
Childers ..... 9th and 10th  
Boonah ..... 11th and 12th  
Bundaberg ..... 12th to 14th  
Gladstone ..... 18th and 19th  
Rockhampton ..... 24th to 28th  
Toogoolawah ..... 27th and 28th

**July.**

Proserpine ..... 4th and 5th  
Nambour ..... 10th to 12th  
Townsville ..... 15th to 17th  
Cleveland ..... 18th and 19th  
Cairns ..... 22nd to 24th  
Innisfail ..... 25th and 26th  
Home Hill ..... 31st July and 1st August

**August.**

Pine Rivers ..... 1st and 2nd  
Royal National ..... 11th to 16th

**September.**

Imbil ..... 5th and 6th  
Rocklea ..... 13th



## Answers to Correspondents



### BOTANY.

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

#### Chaff Burr.

G.S. (Glen Allyn, Malanda)—

Your specimen forwarded is Chaff Burr (*Achyranthes aspera*), a native plant which also has a wide distribution through India, Malaya, and the islands of the Pacific. It is moderately common in some parts of North Queensland, and is carried about by stock from one place to another. We cannot say, however, that we have actually seen it a pest in any locality. It is not known to possess any poisonous or harmful properties, but seems to be left untouched by stock, and it might be just as well to eradicate it if only a few plants are present.

#### Indian Jujube or China Apple.

G.H.R. (Longreach)—

The specimen is the Indian Jujube or China Apple (*Zizyphus Mauritiana*). This plant was originally described from Mauritius, hence the specific name, but is also widely spread in India and South-Western China. It has become naturalised and somewhat of a nuisance about Rockhampton and Townsville, and some other northern coastal places. Its fruit is pleasant to the taste, and when grown properly is quite a good shade tree.

#### Blue Mauritius Bean.

C.C.B. (Townsville)—

The specimen is the Blue Mauritius Bean (*Mucuna aterrimum*). This bean is much cultivated in the sugar lands of North Queensland as a green manure crop. We have not known anybody to eat either the young beans or the seeds. They are, in fact, supposed to be slightly deleterious. The plant is very closely allied to the Florida Velvet Bean, sometimes cultivated as a fodder in Queensland.

#### "Justicia."

W.A.K. (Clermont)—

The specimen represents *Justicia procumbens*, a small native plant with a very wide distribution in Queensland, but for which we have not heard a common name. The generic one, *Justicia*, however, is short enough for general use.

We were very interested in your remarks about this plant, and it is evidently a valuable fodder. It belongs to the family Acanthaceae, and we have had several reports about different members of this family being valuable as fodders.

#### Paspalidium.

W.D.S. (Drillham)—

The specimen is *Paspalidium distans*, a native grass which is fairly common, but for which we have not heard a local name. The generic name, *Paspalidium*, however, is short enough for general usage.

We have several species of *Paspalidium* in Queensland, and previously they were included in the larger genus *Panicum*. One is the Brigalow Grass, another with larger seeds is the Shot or Sago Grass, common on open downs country. The Brigalow Grass and the one you sent seem to grow best in rung brigalow country, as they like a bit of shelter. They come back, however, after a time, when the country has been cleared. It is quite a good grass, and worthy of encouragement, but we think you will find it will spread naturally.

**Plants from Innisfail Named.**

J.T.L. (Innisfail, N.Q.)—

1. *Bowenia spectabilis*, a Cycad. Members of this family are commonly called Zamia in Australia. The one you send is sometimes known as "Zamia Fern." It is reputed to cause rickets in stock.
2. *Digitaria longiflora*, a native grass for which we have not heard a local name.
3. *Digitaria adscendens*, Summer Grass. A very common grass in Queensland, mostly occurring as a weed of cultivation. In the ordinary pasture it favours rather sandy soils. Species of *Digitaria* for the most part are quite good fodders.
4. *Brachiaria* sp. This is a *Brachiaria* we are not too sure of. It is close to *Brachiaria milliformis*, but has differences. Could you send more material? Practically all the *Brachiarias* are useful fodders for stock.
5. *Passiflora alba*, the White Passion Vine. This *Passiflora* is rather different from the others in that it contains no prussic-acid-yielding glucoside. Feeding tests proved it to be poisonous to stock, but the poisonous principle is of a cumulative nature, and animals have to feed on the vine for some weeks before effects are noticeable.
6. *Drymaria cordata*. A tropical plant closely allied to the European Chick Weed.

**Plants Identified.**

R.M. (Gladstone)—

The specimens have been determined as follows:—

The larger leaf (*Aralia Guilfoylei*),

The smaller leaf (*Aralia geraniifolia*).

These plants are quite different from the *Acalypha*. They strike readily from cuttings during the summer months.

**Asystasia.**

D.F. (Dimbulah)—

The specimen is *Asystasia eoromandeliana*, a native of India. We have not heard a common name applied to it, but the generic name, *Asystasia*, is short enough for general usage. We have previously received specimens of this shrub as a useful feed for cattle. It is reported in India to be used as greens in the same way as silver beet or spinach. It belongs to the family *Acanthaceae*, and we have noticed on several occasions that plants of this family, both native and in garden culture, are freely eaten by stock. The plant should propagate quite easily from cuttings, if it does not set seed with you.

**Mexican Poppy.**

G.M. (Brisbane)—

The specimen forwarded is the Mexican Poppy (*Argemone mexicana*), a very common naturalised weed in Queensland. Both in Australia and abroad, the plant has been suspected of poisoning stock. In addition to its prickly nature, however, the plant is very bitter and is very rarely eaten by stock to any extent. The seeds are poisonous, and cases are on record where people in India suffered severe vomiting and purging after using a cooking oil adulterated with argemone oil. In spite of these references, however, actual feeding tests in Australia conducted at the Veterinary Research Station, Glenfield, New South Wales, some years ago yielded negative results.

**Hyptis—A Common Townsville Weed and its Possible Uses.**

T.G.R. (Ayr)—

Thanks for specimens of *Heliotropium indicum*. We have sent you a piece of *Hyptis*. You will probably recognise the plant, as it is a fairly common weed about Townsville, and probably Ayr. Fishermen on the Strand at Townsville frequently strew it about and burn it to drive away mosquitoes. A correspondent is interested in the manufacture of mosquito coils, and is looking for plants other than those commonly used. We have suggested to him the possible usefulness of *Hyptis* for that purpose.

**Bellasombra Tree.**

E.M. (Gayndah)—

The specimen is the *Phytolacca* or Bellasombra Tree (*Phytolacca dioica*). The leaves of this tree are generally regarded as an excellent green feed for all classes of stock. Some farmers make a practice of cutting down the branches in dry times and feeding them to cattle.

**Bindweed. Chicory.**

C.C.D. (Allora)—

The smaller specimen is the Bindweed (*Convolvulus arvensis*), one of the worst weed pests that has appeared on the Darling Downs in recent years, and, unfortunately, it is much on the increase. Every bit of the plant, when broken, is capable of forming a fresh growth. We think your best means of controlling it would be weak arsenical solutions applied repeatedly. Mr. W. Deacon, when Minister for Lands, informed us that he had found pigs very useful in controlling the plant, as they were very fond of the white underground runners when these were turned up by the plough or spade.

The larger weed is Chicory (*Cichorium Intybus*). This plant has become rather a pest on the Darling Downs. Chicory runs out and becomes a weed, losing the enlarged tap root, and is of very little value. Several forms of it, of course, are cultivated in Europe as a source of the adulterant of coffee on the one hand, and the leaves for greens on the other. For this latter purpose, the leaves are always blanched before being eaten raw.

**Brigalow and Belah as Fodder for Stock.**

E.A.G. (Columboola)—

Brigalow is very inferior as a fodder, but is eaten by both sheep and cattle, particularly sheep, in its very young stages. As a matter of fact, sheep have been found quite useful for keeping down Brigalow suckers. They prefer them when just coming through the ground, but if they get a few inches high, the suckers become coarse and unpalatable. We think you would experience trouble if you fed much mature Brigalow.

Belah is quite good fodder. In feeding Belah, it is frequently noticed that stock will clean up one or two trees, and leave others. This preference is possibly due (we cannot be sure) to the fibrous content of the leaf and branchlets. Dr. M. White, Nutritional Adviser of the Department of Agriculture and Stock, informs us that a good test of Belah is that if the leaf can be bent in a hoop without cracking, then it is too fibrous to be fed in a dry time. On the other hand, if the Belah leaf or branchlet can be bent round in a hoop, and cracks, it is suitable for feeding.

**Footrot. Sudan Grass Poisoning.**

C.H.R. (Proston)—

1. Treat for footrot with a mixture made up of creosote 1 part, olive oil 2 parts, and turpentine 2 parts. This will give better results than your cattle gall mixture. The mixture recommended should be applied to affected parts with a brush. Any overgrown horn of the foot should be removed. If any pus can be detected in the foot the overlying horn should be removed in order to allow drainage. Actually, in nearly every case of footrot the presence of pus cannot be detected, and the application of creosote mixture in the cleft of the hoof and on any swollen areas daily gives good results.
2. Sudan grass poisoning is treated by drenching with hyposulphite of soda (ordinary hypo.), which can be obtained from any chemist. Drench with 2 oz. of hypo. in sufficient water to form a drench and repeat at half-hourly intervals as required. Animals in the final stages of the poisoning and too far gone to drench should be treated by puncturing the left side with a trocar and canula as for bloat. Remove the trocar and leave the canula in position, then pour the mixture of 2 oz. of hypo. in sufficient water to dissolve it down the canula so that it passes directly into the paunch. Leave the canula in position and repeat at intervals of about twenty minutes as required.

**VETERINARY ADVICE.***(From the outgoing mail of the Office of the Director of Veterinary Services.)***Warts on Calves.**

E.H.R. (Cootharaba).

Warts are small solid growths arising on the surface of the skin or mucous membrane, the cause of which is not definitely understood. Warts do not apparently affect the health of the animal adversely, and are only important in that they are unsightly, and by their position may cause trouble mechanically. In calves and young cattle they are frequently extremely numerous and may spread over the whole of the head and neck, this type apparently being contagious from one beast to another. Another common site is on the teats of cows.

Treatment will depend on the number, shape, and position of these growths. Small growths occurring singly on the skin of the body may be cut off with a sharp pair of seissors or, if attached by a stalk they may be removed by tying a piece of strong sewing silk tightly round the stalk and allowing the growth to rot off. Where large growths occur extending over big areas of the body such as the head and neck, it is necessary to give tonics and nourishing food as well as local treatment. Various remedies may be used for applying to the growths, crude castor oil being one of the most common, particularly when the warts occur on the teats. Other remedies for use when large areas are affected are coal tar applied daily for three or four days, or glacial acetic acid, applied every third day.

**Impaction. Sorghum Poisoning. Blight.**

E.C.S. (Lawgi, via Rockhampton).

*Impaction.*—In the case of impaction, affected animals show signs of restlessness, lying down and getting up frequently, show little desire to feed and do not chew the cud. The production of milking cows drops suddenly. Many animals may be sick for three or four days and then recover without treatment, but as the majority need attention it is wise to treat animals as they become affected. If the animal is not weak from emaciation, a drench of epsom salts, 1 lb., with ground ginger 2 oz., in one and a-half pints of water is recommended. Enema treatment with soapy water also is beneficial. Where animals are very emaciated it is unwise to give purgative drenches. These animals should be given powders made up of powdered nux vomica  $\frac{3}{4}$  oz., powdered ginger 1 oz. Give one powder night and morning for three days. The powder should be mixed with treacle and placed on the back of the tongue. If impactions are not relieved, the walls of the stomach lose tone, normal movements cease and gases collect, causing the common symptoms of hoven or bloat to develop. Animals that are not weak can be treated with 1 to 2 oz. of oil of turpentine in 1 to 2 pints of raw linseed oil. This should be followed next day with a drench of epsom salts, 1 lb. in  $1\frac{1}{2}$  pints of water. As it is unwise to purge weak animals, they should receive powders made up of powdered nux vomica  $\frac{1}{2}$  oz., powdered ammonium carbonate  $\frac{1}{2}$  oz., powdered ginger 1 oz.—one powder night and morning for three days. Acute cases should be treated by puncture with the trocar and canula, and if the condition recurs at intervals, give a course of the powders of nux vomica, ammonium carbonate, and ginger. Naturally, a course of these powders is intended for special animals rather than for the wholesale treatment of many.

*Sorghum Poisoning.*—Sorghum poisoning is treated by dosing the animal with hyposulphite of soda, the ordinary photographic hypo stocked by any chemist. Animals in the final stages cannot be drenched, but may be treated as follows:—The left side is punctured with a trocar and canula as for ordinary bloat, the trocar withdrawn and the canula left in position. A mixture of hypo 2 oz. in sufficient water to dissolve it is then poured down the canula so that it goes directly into the paunch. Leave the canula in position and repeat dosage at intervals of 15 to 20 minutes according to the progress of the animal. Even very bad cases will usually get on to their feet about an hour after treatment has commenced. Once the animal is up, keep it under observation in case further treatment is necessary. Animals in the early stages can be drenched quite easily, using 2 oz. of hypo in sufficient water to make a drench.

Treatment may be repeated if necessary, according to the progress made.

*Blight.*—Blight can be treated with a mixture of zinc sulphate 2 per cent and boracic acid 2 per cent. in sterile water. This can be made by dissolving two level teaspoons of zinc sulphate and two level teaspoons of boracic acid in half a pint of water that has been boiled and allowed to cool. Treat affected eyes, using a syringe with a short length of rubber tubing attached to the nozzle and use just enough to wet the inside of the lids and the eye proper. Where possible, treat twice daily. A generous application of vaseline to the outside of the lids and adjacent parts of the face is advisable to prevent scalding by discharges and to keep flies away.

### Sickness in Calves. Sudan Grass Poisoning.

T.J.C. (Wallumbilla)—

*Sickness in Calves.*—In the case of colic, the calf suddenly becomes sick, lies about with head stretched round to the flank and shows no desire to feed. Some recover, but many die after two or three days. They seem to suffer pain during the illness. For treatment, castor oil is very effective in doses of 2 to 4 oz., depending on the size and age of the calf. This should relieve the condition and the calf usually shows a return of appetite. It should then be fed on whole milk for a few days. Gradually change on to separated milk. If the ingestion of dry feed cannot be avoided, the feeding of molasses can be used as a preventive. Some animals may be slow to recover and be inclined to suffer frequent mild attacks. These should be given a powder consisting of nux vomica 1 oz., ammonium carbonate 1 oz., ginger 3 oz. Divide this into six powders and give one night and morning. Mix the powder with treacle or molasses and place on the tongue.

For Blight, see answer to E.C.S.

When animals are suffering from sudan grass poisoning treatment consists of drenching with hyposulphite of soda, which is ordinary photographic hypo stocked by any chemist. When animals are too far gone to be drenched, the left side should be punctured with a trocar and canula as for ordinary bloat, the trocar withdrawn and the canula left in position. A mixture of hypo 2 oz. in sufficient water to dissolve it is then poured down the canula so that it goes directly into the paunch. Leave the canula in position and repeat dosage at intervals of 15 to 20 minutes, according to the progress of the animal. Even very bad cases will usually get on to their feet about an hour after treatment has commenced. Once the animal is up, keep it under observation in case further treatment is necessary.

For animals in the early stages of poisoning drenching is all that is necessary. Use 2 oz. of hypo in sufficient water to make a drench. Treatment may be repeated if found necessary according to the progress made.

### Blood Scour in Calves.

J.L.P. (Milmerran)—

For blood scour in calves, the following treatment is suggested:—

- (1) Isolate affected animals from healthy ones.
- (2) Sterilise by boiling any utensils which have been used for feeding affected animals and do not use the same buckets for feeding healthy and sick animals.
- (3) Calves that are scouring should be starved for 24 hours—i.e., receive no milk over that period—dose with 2 to 4 oz. castor oil, depending on the size and age of the calf.
- (4) Following the 24 hours period of no milk, put the calves back on the whole milk for a few days; if scouring persists give 1 teaspoonful of chlorodyne in each drink of milk.
- (5) Gradually get back on to the original diet, taking about a week to change over. When the calves are again receiving skim milk the addition of lime water would be beneficial. Start off with 2 tablespoonfuls in each drink of milk and gradually increase until they receive 1 breakfastcupful in each feed. The lime water should be continued as part of the feeding as it has a definite preventive value.

We are sending you under separate cover a pamphlet, "Care of the Cow after Calving," which contains some useful information.

**How to Sling a Cow.**

T.G.M. (Calliope)—

For slinging a cow, the apparatus consists essentially of a broad, strong sheet which passes under the animal's chest and abdomen, supported by a block and tackle or by some other means to a beam overhead. Connected with this there are two strong straps, one passing round the front of the chest and the other passing round the buttocks. These serve to hold the sling in position and prevent the animal from struggling free. The whole is adjustable so that it may fit animals of different sizes. The sling is often made with a metal or wooden bar along each end of the sheet; these bars serve to distribute the weight of the animal along the whole width of the sheet and afford a rigid means of attachment of the slings to the cross-beam to which the chain or rope of the block and tackle is attached.

When slings are to be used, they should be so fixed as to enable the animal to move a little in each direction as it desires. Animals soon learn to lean on the sling and rest their feet; when the sling is drawn so tightly that whenever the animal tries to move itself it is lifted off its feet it becomes irritable through being unable to move and is likely to struggle violently to free itself.

It should be possible to pass a hand under the sling webbing when the animal is standing immediately beneath the centre of the block and tackle; neither the chest strap nor the breeching should be buckled tightly. It is usually necessary to secure the head of the animal with a halter to restrict its movement, and also to supply a suitable manger or other receptacle from which it may feed at ease.

**The Orphan Foal.**

G.S.M. (Upper Freestone)—

*The Rearing of the Orphan Foal.*—The foal may, with proper care, be reared on cow's milk. As mare's milk contains much less fat but more sugar than cow's milk, the milk should be modified for a very young foal. Choose milk from a cow in the first part of the lactation period and one giving milk low in fat if possible. Put four tablespoonfuls of lime water and two teaspoonfuls of ordinary cane sugar in a pint jar and then fill it with fresh milk. Feed about a quarter of a pint every hour for the first day or so, warming the milk to 100 degrees F. (blood heat), using an ordinary nursing bottle with a large nipple. The bottle should be carefully cleansed and sterilized. If the foal is doing well, the amount of milk may be gradually increased and the period between feedings lengthened until the foal is fed only four times a day. After a few days unmodified whole milk may be substituted and the foal taught to drink from a bucket. In five to six weeks sweet skim milk may gradually replace the whole milk, and after three months the foal may be given all it will drink three times a day. As soon as possible the foal should be fed solid food, such as crushed or ground oats, bran, a little linseed meal, and legume hay, and it should have the run of a paddock where there is good grazing.

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**THE USE OF STERILIZED BONE MEAL.**

*Dr. E. Hirschfeld, M.D., writes under date 3rd December, 1940:—*

Many inquiries have reached me, concerning the use of sterilized bone meal, both from pastoralists and dairy farmers. Will you permit me to reply briefly to the points raised by them?

While an adequate supply of phosphates is indispensable to the raiser of beef-cattle, it is a matter of even greater urgency to the dairy farmer. The beef-cow supplies as much milk as is required by its calf. The dairy cow is bred in such a way as to produce the greatest amount of milk possible—an amount of milk far beyond the needs of one calf. Cow's milk is exceedingly rich in phosphates; it contains five times more phosphorus than human milk. The reason for such a difference is this: The frame of the calf is built up in a much shorter time than the frame of the infant; hence Nature has enriched cow's milk with a greater wealth of frame-building materials than woman's milk. It is obvious that the drain upon the resources in phosphates of the body of the cow must be correspondingly greater. The milk-cow is a vast spender of phosphates, far more so than the beef-cow; the beef-cow far more so than a woman. In addition, the cow has a double expenditure;



she has to build the calf she is carrying, while at the same time being milked twice a day. Pastures rich in phosphates are needed to make good this double demand; the in-take must keep pace with the expenditure, otherwise the health of the cow is sure to suffer; she stands up to her work at the expense of her body.

Winter and dry spells are the natural enemies of the cow that carries a calf and produces milk. The winter is harmful, because the grasses are seeding in the autumn. Most of the phosphorus is gathered in the seed of the plant; as the seed falls to the ground, the stalk still standing is left without its mineral contents.

Dry spells are harmful in a different way; while the rain falls the phosphorus of the soil is brought into solution, feeds the roots of the grasses and plants, is carried upwards into the green shoots, and renews the supply for the animals grazing upon them. On the other hand, if no rain falls, less phosphorus is furnished to the roots and less phosphorus finds its way above the ground. You will understand why winter plus dry spells mean such a hard time for the dairy farmer. It now becomes his business to supply his cows with the phosphates that his pastures have ceased to furnish.

Phosphates in the form of sterilized bone meal are not expensive. A bag of 100 lb. of calphos prepared at the Abattoirs costs in the neighbourhood of 10s.; this has to be mixed with an equal weight of salt (a bag of salt weighs heavier than a bag of bone meal).

When should the farmer begin to feed bone meal to his herd? The cow, not the farmer, should be the judge of that. The lick ought to be exposed in the sheltered trough, as described in the paper. When the cow feels the need of it she will seek it. She will leave it alone while the pastures feed her.

The lick keeps.



Plate 21.

SOME OF THE SOUTHDOWN STUB FLOCK ON GOLDEN DOWNS, NEAR YANDILLA.  
[Photo.: Lands Department.]



## Rural Topics



### The Corriedale's High Wool Yield.

As an example of the wool-producing quality of Corriedales, a recent clip taken off nearly 2,500 grown sheep in the central-west of New South Wales is outstanding.

Although grown under conditions which were not good, except in the spring, and despite the fact that a third of the number carried only ten and a-half months' wool, the average weight per sheep was over 11 lb.

In a favourable season, a good Corriedale flock will produce fleeces averaging nearly 12 lb. of high-yielding, well-sought-after wool of a fifty-sixty-sixes spinning count. Breeders, however, do not strive after a bigger average yield than this, recognising that it would be gained only by sacrificing carcass quality.

### Quality in Pigs.

Talking of animal products and their importance in our export programme, we come to the point that in the building-up of the pig industry to supply the needs of the Motherland, and to confirm our name for quality on the British markets—and any other oversea market on which we may get a toe-hold—one of the most important things to do is to cull—cull consistently, and, if necessary, rigorously.

The voice of informed authority says there is no room for "scrubbers" in the pig industry. True enough; and there is only one place for animals that do not measure up to type and conformation standards, and that is the killing-pen. No matter what the breed of pig, the need for culling is urgent if quality of the product is to be maintained. That means, of course, that continuous and systematic grading of all pigs on the farm is essential if we are to ensure full growth and development, especially of the youngsters which should be kept in grazing paddocks.

As with most stock, there is a tendency when the demand is keen to ease up on culling; but no breeder, who has an eye to the future, can afford to neglect this fundamental, because the future of his own stud depends on the success of the stock he sells.

And here's another important point: It is possible when the war is over that there may be a strong demand for breeding stock as well as for high quality carcasses, and those who are likely to be in a position to supply that demand are the breeders who have stuck rigidly to selection and culling.

### The Value of Bird Life.

In the South the gradual disappearance of useful bird life is causing serious concern to the powers that be. The Premier of New South Wales, for example, has expressed alarm at the lack of bird life in that State, and a good many thousands of people in the country districts feel the same way about it.

When creating wild life Nature achieved a true balance of the species, each with a particular purpose of its own, and kept in check by a natural enemy. Once this balance is destroyed no-one can adequately estimate the harm that is done. It is a well-known fact that the curse of insect pests to-day, especially in the pastoral industry, is causing enormous loss to primary producers. It is a sad fact that much of our native bird life is threatened with extinction, so much so that it is most important for the man on the land to take a personal interest in its welfare by preserving trees and other nesting places for insect-eating birds. Vandalism by indiscriminate shooting of birds cannot, of course, be too strongly condemned.

In Queensland, much has been done to preserve wild bird life by proclaiming sanctuaries all over the State. What are required are green timber belts and other natural cover for nesting places. Native bird protection should be a sound activity in every district throughout the State. If we measure up our recurring annual losses as direct results from our negligence and wanton destruction of insect-eating birds, we would get an idea of what they mean in terms of real money—money amounting to millions of pounds in the aggregate.

### A New Agriculture in a New World.

That the end of the war will mean a new world in which Britain's policy should be based on agricultural expansion is the view expressed by agricultural authorities in Britain.

### Butter from Whey.

The making of butter from whey was demonstrated in England recently. It is claimed that every 100 gallons of whey will yield 2 lb. of butter.

While the wisdom of saving this valuable fat is undeniable, especially in war-time, it suggests something wrong with a separator, or separating methods, which allows so much fat to remain in the skimmings.

### Farming in Germany Under the Nazis.

The present German Government requires three fundamental requirements of the farmer—he must be Aryan in race, of German nationality, and of proved proficiency. There is no getting past any of these three points.

Every farmer is issued with a "hoffkarte" or farm card. It doesn't matter how small his acreage is, the farmer must have a card with room for at least four yearly returns. On this card all particulars are filled in, beginning with the name of the farm, its area, number of fields, description of crops. Everything has to be accounted for, even the vegetable garden and the fruit trees. Stock returns must show particulars of every animal and fowl and what they produce. The farmer is told just how much he is expected to produce. If in any way he falls short, a commission is on his doorstep to know the reason why. If the commission is not satisfied, then all activities are placed under control. He has to start exact bookkeeping, keep accounts daily and send them in monthly. Every three months he has to send in a balanced quarterly report, and every twelve months a report and balance-sheet for the whole year.

If there is no improvement after two or three years, the German farmer can expect to lose his farm without a penny compensation.

It has been said that the difference between national socialism and communism is that the communist takes away your cows, while the Nazis let you keep the cows but take the milk.

All this has meant a tremendous amount of organisation, including a survey of the productive capacity of 300,000 farms, reclamation of derelict land, the distribution of labour, and many other activities.

### Grain Sorghum for Stock Feeding.

On parts of the Downs 1940 has been a great year for grain sorghum. On the Dawson and the Callide, and round about Monto and the South Burnett also, good crops have been bagged. Yields have been up to as high as fifty bushels and more to the acre.

Wherever conditions are too hard or too risky for maize, grain sorghums are recommended. Grain sorghum may be used as a substitute for, or in combination with maize and wheat in stock feeding. Many dairy farmers, pig, and poultry men are already using it with good results. And there is no doubt about its feeding value. Grain sorghum has nine-tenths the feeding value of maize, but, like all cereals, its protein content is deficient. That deficiency, however, can be made up with, say, cotton-seed meal, meat meal, or blood meal, if procurable. A bit of green lucerne or the addition of maize grain would help towards its completion as ration.

For pigs, grain sorghum should be crushed, if practicable, or fed as soaked grain. For fowls, grain sorghum may be used instead of wheat, but the change-over should be made gradually. It should be crushed for all-mash feeding—a mash which should contain 10 per cent. of lucerne meal. For dairy cows also, it should be crushed, but not too finely milled. Without green feed, it may cause paleness in cream, so it would be just as well, if seasonal conditions are not good, to add some maize meal to the crushed grain ration. For horses, grain sorghum should be crushed and the horses brought on to it gradually, otherwise there is risk of colic. For sheep, if plenty of rough feed is available, it would not be necessary to grind the grain sorghum, but in a dry time it should be fed to sheep in a milled form.

### When a Cow is Most Profitable.

After a certain age has been reached by a cow—on the average, seven years—the food required for milk and butter-fat production increases, both in respect of dry matter and the digestible parts of the food. A good milking cow of exceptional strength, kept under favourable conditions, should continue to be a profitable producer until her twelfth year, although the economy of her production is apt to be somewhat reduced before this age is reached.

### Nose Prints Foil the Dog Thief.

To foil dog thieves in America, a novel system of identifying stolen dogs has been devised by taking an impression of their nose prints—a variation of the fingerprint system. The system is claimed to be infallible.

### Give "Denis" His Due!

The pig has always been a despised animal. When we speak of an untidy house we call it a pig sty. "Fat as a pig" is a common expression, so is "dirty as a pig." Then if a fellow wails about anything we allude to him as "squealing like a pig." Call a man by any rude name you like, but never call him a swine, unless you're looking for real trouble. Speedsters we call road hogs; the obstinate fellow is pig-headed, and the glutton also is a hog. Flat beer we call pig swill. A bad-tempered horse is a "pig rooter."

Now, in spite of our contempt for "Denis," he is a very plucky animal—you'll find that out when hunting wild pigs. As animals go, he is docile, strong, and intelligent. Yet, we never hear anyone referred to as "game as a pig," or as quiet or as strong as a pig, or as cunning, although, for cunning, the pig could give a dog fox ten up and beat him.

Now that Danish bacon and pork is no longer on British breakfast tables, what "Denis" can do for the Queensland farmer becomes obvious, in view of the fact that the annual importation of pig meats from Denmark was valued at £20,000,000. We can breed pigs by the million if we like, and modern freezing methods make transport to the British market easy, subject, of course, to the availability of shipping space. We have the foundation stock for a big expansion in the pig industry. If we miss this chance through "pig-headedness," then we will be a pig-headed people, and there will be no sense in our "squealing like a pig."

### A Cheap and Effective Dam.

In South Africa, a cheap and effective dam for stopping soil erosion in small creeks and gullies has been devised. It can be built at small cost with unskilled labour, and is especially useful where the bottoms of creeks are gravelly and where good-quality rock is not available for rough rubble masonry.

This is how the dam is built: A trench about a foot deep is dug in the bed of the creek from bank to bank, and a net made with No. 8 or No. 10 galvanised wire for placing across the trench. Stones are packed on the wire netting. The netting is then drawn around the stones, the ends of the wire being placed to hold the cylindrical mass of stones in position. The ends of the wire should be bound together on the upstream side of the wall and as near the foot of the roll of stones as possible. An earthen embankment will then prevent damage to the lacing during floods. The crest of the dam should be slightly lower in the centre than at the sides adjoining the creek banks, so that the water may flow over the middle of the dam. A "stone-in-wire" apron, at least a foot deep, should be constructed on the down-stream side of the wall to prevent erosion there.

### Best Beef Crosses.

Results of a breeding experiment in Canada which enabled a practical comparison in beef production have attracted much interest among cattle men. Shorthorn, Aberdeen Angus, Herefords, and Galloways were used in the experimental crosses.

When the calves were fattened and slaughtered, the Shorthorn-Angus cross produced the highest average daily gain and the highest percentage of top-grade carcasses. Next in order were the Shorthorn-Hereford crosses. Some of the calves were slaughtered in Canada and some in England. Heifer calves, it was found, finished about thirty days earlier than steer calves. There was no difference in the fertility of the cows.

### A Cure for "Wild Morning Glory."

American agricultural terms are, apparently, as bewildering and characteristic as American journalism itself. Here is an example: One paper tells about a machine which is charged with a chemical (carbon bisulphide) to kill "wild morning glory"—the *Glory* and the *Nothing* of a name, as Byron is alleged to have said.

This term "wild morning glory" leaves a doubt as to whether there is not some confusion between a "hang over" after the night before and a flat contradiction of the spirit of the song of a willy wagtail at break o' day. Actually, this American "wild morning glory" has no association with either, for, on reading a little further down, it is called a "bug pest." And this is a pity, for "morning glory," whether wild or otherwise, is much too good a name for a bug.

### Oil Spoils the Fight in the Pig Pen.

Oil poured on troubled waters will calm the tempest, so will oil poured on troubled backs stop the fight in the pig pen.

Although every farmer may not realise the fact, heavy losses may result from the indiscriminate mixing of pigs in a pen. A strange pig cannot expect to put on weight when bullied and knocked about by the older inhabitants of the sty, and that happens when an outsider is placed among them. The stranger quickly loses condition, while the energy used up by the others in undue exertion also costs good money to replace as weight. Fighting, especially among the heavier pigs, often causes bruised pork unacceptable to the butcher.

An excellent way of preventing fighting when pigs from different litters are penned together for fopping off is to smear sweet oil on their backs. They are soon so busy with the enjoyment of licking off the oil that they have no time to fight. The oil has the further effect of "smothering" the differences in smell that pigs detect at once.

Every fight means loss to the pig farmer, for the quicker a pig reaches marketable weight the more profitable it is. The man who makes most out of his pigs is the man who keeps his stock comfortable and contented. A pig may be spoiling for a fight, but oil will spoil the fight.

### "Drowning" the Bulrush.

If there had been no bulrushes, there probably would have been no Moses. All the same, the bulrush is a pest known to mankind since pre-Biblical times; and it is a particularly serious pest in bore drains and irrigation channels. It stops the flow of water and causes silting, because of its dense habit of growth.

Methods of getting rid of it have proved very costly. The Council for Scientific and Industrial Research took the matter up. After trying sprays, soil poisoning, and cutting, success was eventually attained by a special cutting method. This method involves cutting the plant under water at intervals sufficient to prevent it ever reaching the surface of the water in irrigation channels. In that way the plant is "drowned" by having its air supply cut off. Once the channels are free, it is, of course, necessary to maintain a not very expensive patrol system to prevent plants growing on the edge of channels where they are difficult to "drown."

By continuing the cycle of cutting and patrolling channels from October to March each year since 1937, it has been possible to clear completely the worst infested 900 miles of the 2,000 miles of supply and drainage channels in the Murrumbidgee irrigation areas. As a consequence, the water distribution and drainage system is far more efficient than it was.

### Liquid Manure Storage and Distribution.

Under the war-time cultivation scheme in Great Britain, all sorts of wrinkles and gadgets, many of them the outcome of new ideas, are being put into use. Officially, it has been pointed out that such a natural fertilizer as liquid manure is too valuable to waste, so that manure tanks and distributing carts are now in great demand. Much of the liquid manure produced on farms is allowed to go to waste, yet it is one of the finest of all top-dressings for quick-growing crops; it promotes an early bite of grass and is highly beneficial to arable land. Such a manure also is particularly rich in potash, a fertilizer not now so easily obtainable in artificial form as it was before the war.

Undiluted liquid manure is, of course, too strong for direct application; it should be mixed with about an equal volume of water. It is safer, too, to apply it in showery weather. It could be used far more frequently on a cultivation, particularly on bare land intended for leafy green crops, dilution being less necessary.

Under our conditions, this information would probably be of more use to farmers and market gardeners cultivating only small areas. Anyhow, it is a useful point to ponder over.

### Shocking the Rabbit.

Talking of electric fences, and their value in making breaks for lambs feeding off rape crops, here is a new application of the idea: In the Hawkes Bay district in New Zealand electric fences are used to keep rabbits and hares out of the crops. It is well known that a lot of damage can be done to root crops by these pests. The new idea is to stretch two wires along the boundaries of a paddock at from 5 to 10 inches from the ground. This, it is said, will give all the protection from rabbits required and at a reasonable cost.

### "Cash and Confidence."

One of the brighter sides of war is provided by the official bulletins of the British Ministry of Agriculture. Among the bright efforts, almost lyrical in expression, of farm advisers to get away from the stodginess of stern official "journalese," take this journalistic gem: "In stimulating the milk flow, nothing will take the place of fresh, green grass." Here is a drastic hint: "Shoot the pigeons and save the crops," otherwise entitled "Zero hour on the feathered front." This is almost as good as "The Lion hath wings," and it is wondered if the lion in question comes into the category of "the feathered front."

An "intensive attack is to be launched against the wood pigeon who must not (we are informed officially in anything but official language) be allowed to be one of the leading beneficiaries from the increased acreage we shall have under the plough this year."

Other entertaining contributions catch the eye. One comes under the heading of "cash and confidence." Then there is the reference to "animals that need no ration card"—just a little journalistic by-play on the topic of the day to stress the fact that sheep have no food fads and "of all our farm animals, they alone can face a long war without a ration card."

One does not look for laughs in official bulletins, but you do get real humour at times, even though it may be unconscious.

### For the Farrowing Sow.

An unusually efficient type of farrowing pen that can be built in an afternoon at very little cost has been in continuous use on a New Zealand farm (as reported in *The New Zealand Farmer Weekly*) and has given complete satisfaction.

The pen consists of six posts arranged in the form of a rectangle. One end, facing due east, is left open and wire netting is strung round both the inside and outside of the posts. The space between the wire netting is thus the thickness of the posts. This space is stuffed with hay and when an iron roof is added the pen is complete.

In building such a cosy, draught-proof pen, it would be a wise precaution to dig a trench about a foot deep where the wire netting has to go. This prevents the sow from rooting underneath the straw walls. The mesh of the wire netting should, of course, be small so that the sow cannot pull the hay packing out. The floor of the pen should be about 18 inches higher at the back, so that it slopes sufficiently towards the front of the pen. This, of course, keeps the floor of the pen dry and comfortable.

When seen, the straw packing in three such farrowing shelters had not been touched for four years, except that from time to time a little more straw was thrust in at the top. An opening of a couple of inches was left all round between the hay packing and the roof to give plenty of ventilation.

### The Clydesdale "Comes Back."

Down South the question of horse-power on the farm, whether it should be mechanical or animal, is engaging a lot of attention just now. Fuel costs, of course, is one of the important reasons why the Clydesdale may stage a "come-back," especially on the average-sized Australian farm.

Experiment farms are using horses, because it has been found they provide the cheapest power for field purposes. On large scale cultivations, the value of the tractor in comparison is, naturally, not disputed.

Getting down to tin tacks, when using tractors we have to think of every cost involved—cash instalments, replacement, spare parts, oil, fuel, and so forth—especially as they affect the enterprise of the smaller farmer.

The farmer who works horses usually breeds for replacements, makes practically no cash payments, and so is able to keep his financial commitments within revenue bounds. In war time, too, good money is kept in the country that would otherwise go overseas for both machine and fuel.

As a matter of fact, more than at any other time in the history of farming in Australia, it is now necessary to produce economically and hold in check any tendencies which inevitably move in the direction of higher production costs—hence the movement back to the yoking up of Darby and Dobbin for plough and other work on the average-sized farm.



## Farm Notes



### FEBRUARY.

**A** LATE sowing of sorghum will provide succulent fodder during the early winter months, or, if not required for immediate use, the crop may be conserved as silage or stover. The saccaline variety is favoured for this purpose, as it will withstand mild frosts, and continue to supply good feed well into the winter.

If additional green fodder is desired, there is still ample time to sow early maturing millets, Japanese millet, white panicum, or French millet; while buckwheat also is suitable, as it will ripen in eight to ten weeks.

In the cooler districts, a first sowing of oats, barley, or wheat for grazing may be made towards the end of the month, but elsewhere March sowings will be early enough.

February is regarded as the best month for planting the late or autumn potato crop, the acreage planted exceeding that of the spring or early crop because of the increased soil moisture usually available. Plant whole seed, preferably not less than 2 inches in diameter, and treat it with hot formalin or corrosive sublimate in accordance with recommendations issued by the Department of Agriculture and Stock. Farmers who are dissatisfied with their returns, and who do not regularly apply fertilizers, would be well advised to ascertain the increased yields usually resulting from their judicious use.

First sowings may be made of mangolds, swedes, field turnips, and other roots utilised for pig and cattle feed. Crops should be drilled in spaced rows so as to permit of cultivation between the rows, and the thinning of plants to suitable distances apart. Where only small areas are sown, the "Planet Junior" type of hand seeder will be found very useful. Because of the importance of increasing the area under lucerne, attention should be given to the adequate preparation of land reserved for late March-May sowings. The semi-permanent nature and value of a lucerne stand certainly warrant the best possible seed-bed, for once the crop is established only light surface cultivation can be given.

In the wheat areas, summer fallows will now be in fair condition, and with sheep to keep down weed growth, good tilth can be maintained by using rigid tye cultivators, spring tooth cultivators, and harrows. Wheatgrowers generally are well aware of the importance of maintaining a good surface mulch.

Maize and other row crops will now be well advanced, so that any cultivation given should be as shallow as possible, consistent with the work of weed destruction.

The harvesting of a variety of crops will occupy much time as the season advances. Too much care cannot be given to the grading, bagging, baling, and generally attractive packing of all products placed on the open market, for inferior grades or poorly packed produce are rarely profitable.

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### SHEEP DIPPING.

The only known method to combat lice and ticks (ked) in sheep successfully is to dip. A preparation of proved efficiency should be used. If a powder dip is chosen, great care should be taken in the mixing. The powder in small proportions should be mixed with water and stirred until the consistency of an ordinary mustard mixture is attained. When the whole of the powder necessary to charge the bath is so mixed it may be added to the full quantity of water in the dip. This should be done overnight.

It is necessary to follow carefully the directions as to quantities given by the manufacturers. Sheep get most benefit from dipping when a month to six weeks off shears. Never dip sheep when they are hot or thirsty. For the job, avoid, if possible, extremes of heat and cold. Let the sheep drain thoroughly in the shade, if practicable. Treat the dipped sheep gently and avoid driving them for any considerable distance.



## Orchard Notes



### FEBRUARY.

#### THE COASTAL DISTRICTS.

**F**EBRUARY in coastal Queensland is frequently a wet month, with plant growth rampant. Where green cropping is not practised, it is not always possible to keep weed growth in check by cultivation.

The main crop of smooth-leaf pineapples will be ready for canning, and care should be taken to see that the fruit is sent to market with the least possible delay and in the best possible condition.

Bananas for shipment to the Southern States should on no account be allowed to become over-ripe before the bunches are cut; at the same time, every banana should be well-filled.

Citrus orchards require careful attention, as there is frequently a heavy growth of water shoots, especially in trees which have recently been thinned out, and which must be removed. Citrus trees may be planted now where the land has been properly prepared, and it is also a good time to plant most kinds of tropical fruit trees.

A few late grapes and mangoes will ripen during the month.

Strawberries may be planted towards the end of the month and, if early ripening fruit is desired, care should be taken to select the first runners from the parent plants, as these will fruit quicker than those formed later. The land for strawberries should be well and deeply worked. If available, a good dressing of well-rotted farmyard manure should be given, as well as a complete commercial fertilizer, for strawberries require plenty of food and pay well for extra care and attention.

#### THE GRANITE BELT SOUTHERN AND CENTRAL TABLELAND.

**T**HE marketing of later varieties of peaches and plums and of mid-season varieties of apples and pears, as well as of table grapes, will fully occupy the attention of fruitgrowers in the Stanthorpe district, and the advice in these notes for the last two months on handling, grading, packing, and marketing is repeated with emphasis.

Extra trouble taken with fruit always pays. Good fruit, evenly graded and honestly packed, will sell when ungraded and badly packed fruit is a drug on the market.

Early in the month it will be necessary to keep a careful watch on the crop of late apples for codling moth. If there is a slightest indication of attack, a further spraying will be necessary, as the fruit which has previously escaped injury usually suffers most.

Fruit fly also should be systematically fought whenever and wherever found, and no infested fruit should be allowed to lie on the ground.

Grapes will be ready for market, and the utmost care in handling and packing is necessary. Grapes should never be packed wet, and, if practicable, it is an excellent plan to let the stems wilt for a day at least before packing. This tends to tighten the hold of the individual berries on the stem and prevent their falling off.

In the western districts, winemaking will be in progress. Here, again, care is necessary, as the better the condition in which the fruit can be brought to the press the better the prospect of producing a high-quality wine.

Where necessary and practicable, citrus trees should be given a good irrigation, as this will carry on the fruit until maturity, provided the watering is followed up by systematic cultivation so as to retain sufficient moisture in the soil.





## 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.

#### FOUR COMMON ERRORS IN BABY MANAGEMENT.

Though fewer mistakes in baby management are made now than in the days before Maternal and Child Welfare Centres were established, there are mothers and nurses who still adopt methods which are likely to have a serious effect upon the health of the baby. Often mistakes are made in the earliest days of the infant's life and bad habits are begun which may be difficult to change.

#### Omitting to Put Baby to the Breast in the First Two Days.

Most babies when born know how to take their food from the breasts. Occasionally we find one who does not and he requires careful handling and management. If baby, who very often in these first days of life is very sleepy, is allowed to lie undisturbed he may, at the end of a day or two, be unwilling to work for his living. For that is what sucking is to a baby. There is no more difficult child to manage than one who has not learned to suck properly. Feeding him from a bottle having a teat with a hole so large that the fluid pours into his mouth without effort on his part will result in further disinclination to suck. Recently a mother was admitted into residence at the Welfare Centre with a baby aged three and a-half weeks who had refused the breast since birth. The reason for his admission was that, although he had been having large feeds from a bottle, he weighed less than he did at birth. The mother was disappointed because she had not been able to feed her baby naturally, and she was still anxious to do so. After much patience, perseverance, and work the nurses at the Welfare Centre succeeded in establishing natural feeding, and baby was sent home six weeks later completely breast-fed, having gained 41 oz.

#### Giving Artificial Food During the First Two Days.

An error which still persists is that of giving baby artificial food during the first two days of life. Although the mother's milk supply does not become established

until the third day, there is present in the breasts from birth a creamy-looking fluid which, though small in amount, is highly nutritious and contains substances which help to protect the baby against disease. This is the food which Nature has provided for the newborn child, whose digestive processes are beginning to function for the first time. If any other food were required during these early days, Nature would provide it. The practice of giving artificial milk mixtures, such as condensed milk or sweetened cow's milk, during the first week must be condemned. In the comparatively few cases in which, with proper management, the supply of natural milk is not established by the third day, the baby should continue to be put to the breasts regularly and the shortage supplied by giving what fluid can be expressed from the breasts with a little warm boiled water.

### Thinking Mother's Milk "Does not Agree."

The reason why breast milk is best for baby is because it contains in the right proportions all the food materials necessary for the growth and development of the child and it can be readily digested. Mother's milk is always the right temperature and is free of germs. It is always ready and no troublesome preparation of utensils or of foods is necessary and it costs less. Mother's milk is the only perfect food for the baby. A mother should not believe that her milk "does not agree with her baby." If baby is upset it is usually due to mismanagement. Baby may not be getting enough. On the other hand, the mother may have an over-supply and baby may be getting the milk too quickly, or he may be taking too much, and his motions may become frequent and curdy. A mother should seek the advice of a Welfare nurse, either personally or by letter, and learn how to deal with these conditions.

### Thinking a Binder is Necessary to Support Baby's Abdomen and Back.

The purpose of a binder is to keep the dressing on the navel in place until it heals. After this occurs it should be removed. Muscles, to grow strong, require to be allowed to move freely. Anything that restricts movement should be discarded.

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.

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## IN THE FARM KITCHEN. FOR SUMMER MENUS.

### Baked Savoury Fish.

Take filets of any fish and place either whole or cut in half, according to size, in a fire-proof dish. Cover with a good white sauce and add a thick layer of grated cheese mixed with fine bread crumbs on top. Bake for 5 to 10 minutes (according to thickness of fish) in a hot oven, and finish under grill so that crumbs brown. A variation is to grease the dish and line with peeled and sliced tomatoes, and finish as before.

### Creamy Rice.

Ingredients: 2 tablespoons well washed unpolished rice,  $\frac{1}{2}$  cup boiling water, 1 pint milk, 2 tablespoons sugar, 1 tablespoon of sultanas or chopped dates, 1 dessertspoon of butter or shredded suet free from skin.

Put rice in buttered pie dish. Cover with boiling water, and allow to stand in oven for 10 minutes or until water is absorbed. Pour milk over the rice. Stand 10 minutes longer. Add sultanas and sugar, place butter or suet on top. Put pie dish in slow oven, standing in baking dish containing water. Cook very slowly for about 2 hours till rice is thoroughly cooked, well swelled, and of a creamy consistency. Stir every 20 minutes. If after cooking for 1 hour rice is too thick, add a little more milk. Cook slowly for  $\frac{1}{2}$  hour to 1 hour to form crust. Do not stir in last  $\frac{1}{2}$  hour.

### Caramel Rice and Bananas.

Make a creamy rice pudding using 2 tablespoons of brown sugar instead of white. When cooked and quite cold, slice 2 bananas, lay slices in lemon juice, arrange on top, and cover with a thin layer of whipped cream. Sprinkle with nuts.

**Potato and Egg Savoury.**

Hard-boiled eggs, boiled potatoes, white sauce, grated cheese.

Put a layer of sliced potatoes on the bottom of a buttered pie dish, cover with white sauce and grated cheese, add a layer of sliced hard-boiled eggs, and cover with sauce and cheese. Continue till dish is full. Sprinkle with bread crumbs and heat in oven.

**To Cook Cabbage.**

Wash cabbage well, including the green outer leaves. Tear into small pieces and place in saucepan with only the water left on the leaves after washing.

When almost cooked add a little butter, then pepper and salt to taste, and the boarding-house cabbage becomes a delicious vegetable.

**Baked Potatoes.**

Choose potatoes of uniform size. Wash well and brush till thoroughly clean. Dry and brush over with dripping. Bake in a hot oven. When cooked, make a small slit in each potato and press sideways so that the skin will split. Place a small lump of butter, a little salt, and a sprig of parsley in the opening.

**Tomato Omelette.**

Mince a medium-sized tomato with a little onion, add about 1 or 2 oz. butter, stir on the fire till the onion is cooked, then lightly beat 2 eggs and put into the saucepan, stirring all the time until eggs are nearly set. Serve on fried bread or buttered toast rounds.

**Waldorf Salad.**

Ingredients: 2 cups of diced apple, 1 cup diced celery, lettuce, 1 tablespoon lemon juice,  $\frac{1}{2}$  cup walnut (crushed),  $\frac{1}{4}$  cup mayonnaise.

Add lemon juice to diced apple to prevent it from turning dark. Combine all ingredients, adding mayonnaise and mixing well with a fork. Salad of this sort should always be prepared in a very cold mixing bowl. Arrange lettuce leaves on individual plates and serve immediately. The mixture should have been previously chilled.

Salad Dressing: One-third cup of flour, 3 tablespoons butter, 1 cup hot water or milk, 3 egg yolks, 2 tablespoons lemon juice, 1 teaspoon of dry mustard, 1 teaspoon salt, 2 tablespoons sugar.

Salad Dressing:  $\frac{1}{3}$  cup of flour, 3 tablespoons butter, 1 cup hot water or mixture becomes quite thick, stir continually, put remaining ingredients in mixing bowl, and pour white sauce in and beat until all ingredients are combined thoroughly. Place in closed refrigerator jar and it will keep as long as desired.

**Apples with Raisins.**

Ingredients: 6 cooking apples,  $\frac{1}{2}$  cup seeded raisins,  $\frac{1}{2}$  cup stoned dates,  $\frac{1}{4}$  cup brown sugar, teaspoon butter.

Mix raisins, dates, butter, and sugar well together. Remove core from apples and fill with mixture. Brush apples over with butter quite smoothly, then prick skins with a fork to prevent bursting. Place apples in a well-buttered pie dish. Add about 2 tablespoons of cold water. Put a small piece of butter on each apple, and bake in a moderate oven until tender.

**Devilled Kidneys.**

Required: As many sheep's kidneys as persons to be served, some slices of bacon and some pieces of toast, 1 teaspoon chopped parsley.

Cut each kidney in half lengthways and roll in a slice of fat bacon. Sprinkle freely with cayenne, pack tightly together in small pie dish, scatter the parsley over, and bake for 20 minutes in a fast oven. Place 2 pieces on each piece of toast, and serve hot.

**Milk Jelly.**

Required: One pint of milk, 1 dessertspoon sugar,  $\frac{1}{2}$  oz. powdered gelatine, 6 drops vanilla essence.

Put milk, sugar, and vanilla into a bowl. Dissolve gelatine in  $\frac{1}{4}$  cup of boiling water. Stir until cool, then mix carefully with milk. Pour into cold glass bowl to set.

**Beetroot Mould.**

Ingredients: 2 dessertspoons gelatine, 2 average-sized beets, 1 small lettuce,  $1\frac{1}{2}$  cups ( $\frac{3}{4}$  pint) hot water,  $\frac{1}{2}$  cup vinegar, pepper, salt, and sugar to taste.

Cook the beetroot till tender. Peel and cut into slices. Line a fluted mould with the slices, then fill centre with small dice-shaped pieces of beetroot. Dissolve the gelatine in hot water, add the vinegar, pepper, salt, and sugar. Pour over the beetroot, and allow to set. Garnish with shredded lettuce and sliced tomato. Serve with mayonnaise dressing.

**Savoury Eggs.**

Ingredients: 7 eggs, 1 tablespoon minced ham, 1 teaspoon parsley,  $\frac{1}{2}$  saltspoon salt, pepper, and  $\frac{1}{2}$  oz. butter.

Boil eggs hard and stand in cold water. When cold peel and cut in half lengthwise. Take out yolks and pound in a mortar with other ingredients. Fill whites with mixture, press sides together, rub with flour, egg, and bread crumbs, and fry nice brown. Serve hot.

**Pineapple and Cheese Salad.**

Ingredients: 1 small rough-skin pineapple, 2 or 3 oz. cream cheese, 2 tablespoons boiled dressing, savoury cream or mayonnaise, 3 gherkins, red pepper, lettuce leaves.

Peel, core, and slice pineapple.

Arrange crisp, green lettuce leaves on salad plate and place slices of pineapple in a ring with slices overlapping each other.

In the middle of each pineapple slice arrange a spoonful of cream cheese and sprinkle with red pepper. Heap in the centre of the salad the mayonnaise or cream mixed with chopped gherkin. Garnish with sliced gherkin.

If you have no cream cheese, grate up 2 oz. of matured cheese and moisten with cream.

**Macaroni Cheese.**

Boil  $\frac{1}{2}$  lb. of macaroni till tender. Strain and return to saucepan. Add  $\frac{1}{2}$  pint of milk, 1 teaspoon of butter, 2 tablespoons of grated cheese, pepper, and salt to taste. Add 1 teaspoon of smoothly-mixed flour. Bring to the boil and place one-third in a greased pie dish. Sprinkle with grated cheese, add a thin layer of bread crumbs, and a slight seasoning of salt and pepper. Repeat in layers until dish is full or until all material is used up. Sprinkle the top with grated cheese and light-brown bread crumbs. Place small pieces of butter on top and heat through in a very moderate oven from 20 minutes to half an hour.

**EVERY-DAY DISHES.****Left-Over Short-Cake.**

Sift  $\frac{3}{4}$  cup plain flour, 1 level teaspoon salt, 4 level teaspoons baking powder, and 1 tablespoon sugar together; add  $1\frac{1}{2}$  level cups yellow cornmeal and mix well together. Beat 1 egg and add  $1\frac{1}{4}$  cups milk and 4 level tablespoons melted butter. Form into a soft dough and spread mixture into a well-greased tin about 8 in. square. Bake in a hot oven for about thirty minutes. Split through the middle and fill with the following:—To 2 cups well-made white sauce add 2 cups diced cold meat,  $\frac{1}{4}$  cup diced cooked carrots,  $\frac{1}{4}$  cup cooked peas, the juice of 1 onion or grated onion will do, 1 teaspoon chopped parsley, 1 tablespoon chopped or shredded ham or cooked bacon, 1 dessertspoon lemon juice, and pepper and salt to taste. Simmer for five minutes to get thoroughly hot. Do not cook meat any longer, as it will toughen.

**Salmon Mould.**

In a double saucepan place  $\frac{3}{4}$  cup milk and the yolks of 2 eggs, slightly beaten, 1 level teaspoon made mustard, pepper and salt to taste, and if liked, a dash of cayenne. Cook until mixture thickens, stirring all the time. Remove from the water and add 1 heaped tablespoon melted butter, the juice of 1 lemon or about 4 tablespoons, and 1 level tablespoon gelatine previously soaked in about  $\frac{1}{4}$  cup cold water. Stir until well dissolved and allow mixture to cool a little. Add 1 large tin salmon, having removed bones and skin and broken up, taking care to keep it in flakes. Place in a mould and thoroughly chill. Turn out on to a flat dish and garnish with crisp lettuce and serve with a mayonnaise dressing to which has been added 3 tablespoons finely-chopped cucumber.

**Baked Egg and Bacon.**

Line a muffin tin with a rasher of bacon, drop in 1 or 2 eggs, sprinkle with salt and pepper, a little chopped parsley, and buttered breadcrumbs. Bake in hot oven until eggs are set.

**Chocolate Trifle.**

Make a boiled custard with  $\frac{1}{2}$  pint milk and 2 eggs and 1 tablespoon castor sugar. Flavour with vanilla. Line a glass dish with stale sponge fingers or sponge cake, sprinkle with sherry and a little of the custard. Add another layer of cake in the same way. Melt 4 oz. sweet chocolate and pour half of this over the second layer of custard, and now another layer of cake, &c., and lastly the remaining chocolate. Sprinkle thickly with chopped nuts and chill thoroughly. The custard must be poured on cake while hot, so it will soak well in.

**Nut Croquettes with Crisp Bacon.**

Mix 1 cup cooked and cold rice with  $\frac{1}{2}$  cup thick white sauce and  $\frac{1}{2}$  cup finely chopped peanuts. Add salt and pepper to taste and mix well together. Form into balls, roll in flour, then egg and breadcrumbs, and fry in boiling fat until a golden brown. Drain well and serve with or without crisp bacon.

**Cheese and Pineapple Salad.**

Cream  $\frac{1}{2}$  lb. Continental cheese well, add 1 tablespoon green capsicum and 1 tablespoon red, both finely chopped, 1 small tin crushed pineapple,  $\frac{1}{2}$  teaspoon made mustard, salt and pepper to taste, and if liked a little celery salt. Lastly add  $\frac{1}{2}$  cup mayonnaise and  $\frac{1}{2}$  cup whipped cream. Place in refrigerator tray and freeze or cover with salt and ice for two or three hours. Serve with cheese biscuits or water biscuits.

**Date and Walnut Tart.**

Place 2 cups milk in a double saucepan, add  $\frac{1}{2}$  cup brown sugar, and a good pinch salt. Mix 2 level tablespoons cornflour and 2 level tablespoons plain flour with a little cold milk until smooth, then add to milk, &c. Stir until mixture thickens, then add the beaten yolks of 2 eggs. Cook for 1 minute only to set the eggs. Now add 2 level tablespoons melted butter and stir until well mixed in. Now add 1 cup chopped dates,  $\frac{1}{2}$  cup chopped walnuts, and vanilla to taste. Allow to cool a little, then fold in the egg-whites, beaten to a stiff froth. Turn into a well-baked tartshell and decorate top with half walnuts. Melt  $\frac{1}{2}$  cup sugar in a saucepan, and when it becomes a rich brown add  $\frac{1}{4}$  cup boiling water and stir until dissolved. Cool slightly, then pour over top. Chill well before serving.

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## ORANGE ALCOHOL.

We have known of the many uses of orange juice and of how nourishing it is, but a letter from a Digger in Palestine tells us of still another way of using up the surplus of the citrus crop. This is what our Digger friend says:—

“Production is now in full swing at a new citrus-alcohol factory which recently started operations. One of the main drinks made is ‘Maski’ (I don’t know whether that name is Arabic or Hebrew, but I suppose it’s a he brew, whatever the strength of the ‘kick’ it may have!). ‘Maski,’ which means ‘My Drink,’ is a new invention which is sure to interest citrus growers anyhow.”

The Palestine factory making it is working three eight-hour shifts daily. That suggests the A.I.F. over there is a definite business or, more correctly, a canteen prospect. The factory uses up about 30 tons of citrus fruits daily. The “flesh” remaining after the juice has been extracted is treated separately, and will be used as stock food.

Come to think of it, there are other possibilities. Power alcohol can be made from all sorts of vegetable material. Just imagine army transport run on orange juice! It would have this distinct advantage, both drivers and vehicles could “fill up” at army “boozers” (browsers, rather)—a case of “rejuicing” and rejoicing, so to speak.

## COCKROACH CONTROL.

Cockroaches are nocturnal, hiding during the day in dark corners and crevices, where they congregate in large numbers. In the house they usually hide near the sink and drainboard, behind the kitchen cabinet, and in similar places. If disturbed when foraging at night, they run rapidly for shelter, and a knowledge of where they conceal themselves is usually the key to their control.

In Queensland, houses are constantly being reinfested by adults crawling and flying in from outside, and no control measures can keep a building continuously free from the pest, if reinfestation is possible. Therefore, it is first necessary to clean up all outbuildings and burn accumulated rubbish of any kind. All cockroaches found hiding in packages of food and merchandise being brought into the house should be destroyed. They may be killed mechanically or by spraying with a proprietary fly spray. Crack fillers such as putty or plaster of paris, can be used effectively to close many openings used by cockroaches as avenues of escape to hiding places. This is particularly important if cockroaches are coming in from adjacent apartments through wall spaces or along the plumbing fittings.

Sodium fluoride is the best cockroach remedy for use in homes which have already become infested. If the powder is not readily available in pure form, suitable commercial preparations, generally known as insect powders, containing up to 80 per cent. sodium fluoride, can be obtained from any grocer. Sodium fluoride is poisonous to man if taken internally in sufficient amounts, and it should be kept away from food and away from children and pets. If used with reasonable care in cockroach control, however, no harm will follow. It may be sprinkled by hand along the back of shelving, draining boards, and other places frequented by the pests. When so placed in the runways the powder adheres to the limbs and is subsequently taken in through the mouth as the insect cleans itself. Sodium fluoride therefore acts as a stomach poison. The powder remains effective indefinitely in dry situations, but in very damp places it may cake and become useless.

Sodium fluoride is best applied with a small duster or bellows, and blown into the hiding places. In this way more cockroaches are directly affected, for they die rapidly when the powder is blown directly on them. The application should be made in the evening and the powder left for two or three days. Frequent treatments are usually necessary at intervals of one or two weeks if the pest is to be kept under control.

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### LEVEL WITH A SQUARE.

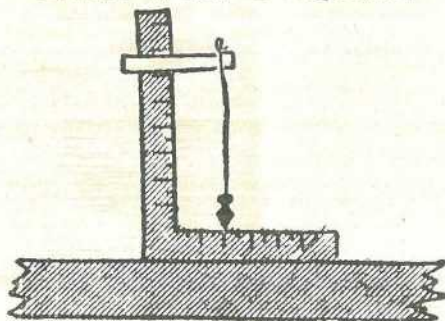


Plate 22.

To level with a square, fasten a clamp to the vertical arm of square and attach a plumb bob to the clamp. When the distance between the string and the vertical arm is equal top and bottom, the surface upon which the lower arm of the square rests is level. This bit of knowledge may help sometime when the level is broken.

## RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF NOVEMBER IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALL DURING 1940 AND 1939, FOR COMPARISON.

Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.		Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.	
	Nov.	No. of years' records.	Nov., 1940.	Nov., 1939.		Nov.	No. of years' records.	Nov., 1940.	Nov., 1939.
<i>North Coast.</i>					<i>South Coast—contd.</i>				
Atherton .. ..	2.67	39	1.68	5.59	Gatton College ..	2.90	41	3.34	3.54
Cairns .. ..	3.87	58	1.85	3.53	Gayndah .. ..	3.01	69	2.42	3.41
Cardwell .. ..	4.17	68	3.62	4.97	Gympie .. ..	3.30	70	8.64	3.27
Cooktown .. ..	2.49	64	0.28	0.56	Kilkivan .. ..	2.65	61	6.16	1.43
Herberton .. ..	2.65	54	4.12	4.35	Maryborough ..	3.23	69	4.20	2.83
Ingham .. ..	3.80	48	2.84	1.93	Nambour .. ..	4.27	44	4.49	4.09
Innisfail .. ..	6.35	59	3.28	5.55	Nanango .. ..	2.82	58	7.62	2.48
Mossman Mill ..	4.77	27	7.19	10.16	Rockhampton ..	2.49	69	3.22	4.66
Townsville .. ..	2.56	23	0.52	1.43	Woodford .. ..	3.28	53	5.01	2.07
<i>Central Coast.</i>					<i>Central Highlands.</i>				
Ayr .. ..	1.73	53	..	0.52	Clermont .. ..	2.07	69	3.83	1.94
Bowen .. ..	1.28	69	0.38	2.61	Gindie .. ..	2.21	41	..	1.39
Charters Towers ..	1.43	58	1.40	0.18	Springsure .. ..	2.32	71	1.84	2.78
Mackay P.O. ..	3.07	69	0.51	1.59	<i>Darling Downs.</i>				
Mackay Sugar Experiment Station	2.81	43	0.91	1.33	Dalby .. ..	2.89	70	2.63	2.05
Proserpine .. ..	2.85	37	2.44	0.69	Emu Vale .. ..	2.79	44	4.17	2.97
St. Lawrence .. ..	2.40	60	2.21	2.34	Hermitage .. ..	2.58	33	..	..
<i>South Coast.</i>					<i>Maranoa.</i>				
Biggenden .. ..	2.86	41	5.86	4.49	Bungeworgoral ..	2.18	26	0.34	0.82
Bundaberg .. ..	2.79	57	2.03	5.41	Roma .. ..	2.16	66	0.69	1.58
Brisbane .. ..	3.77	88	4.66	2.54					
Caboorture .. ..	3.65	53	5.47	4.18					
Childers .. ..	2.86	45	3.04	5.25					
Crohamhurst .. ..	4.61	47	5.59	3.02					
Esk .. ..	3.29	53	4.69	2.41					

A. S. RICHARDS, Divisional Meteorologist.

## CLIMATOLOGICAL TABLE—NOVEMBER, 1940.

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.				
<i>Coastal.</i>		In.	Deg.	Deg.	Deg.	14, 20,	Deg.	24	Points.	..	
Cooktown .. ..	..	..	87	76	90	25	72	24	28	2	
Herberton .. ..	..	..	84	61	91	7	49	17	412	8	
Rockhampton .. ..	..	..	93	70	102	2	62	16, 17	322	6	
Brisbane .. ..	..	..	29.94	84	97	9	59	17	466	8	
<i>Darling Downs.</i>		..	..	..	..	..	..	..	..	..	
Dalby .. ..	..	..	89	60	97	1	46	7	263	9	
Stanthorpe .. ..	..	..	81	52	92	12	35	6, 7	220	10	
Toowoomba .. ..	..	..	82	58	91	1	48	17	384	10	
<i>Mid-Interior.</i>		..	..	..	..	..	..	..	..	..	
Georgetown .. ..	..	..	29.87	97	71	107	2, 3	58	18	273	6
Longreach .. ..	..	..	29.88	98	67	107	8	53	16	35	2
Mitchell .. ..	..	..	29.90	91	61	102	8	45	7	116	..
<i>Western.</i>		..	..	..	..	..	..	..	..	..	
Burketown .. ..	..	..	..	97	75	105	6	64	17	145	4
Boullia .. ..	..	..	29.87	96	69	107	7, 11	60	18	30	3
Thargomindah ..	..	..	29.91	91	64	104	20	56	3, 7, 17	..	..

# ASTRONOMICAL DATA FOR QUEENSLAND

## FEBRUARY, 1941

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

SUN AND MOON, AT WARWICK.				Phases of the Moon.				
Feb.	SUN.		MOON.		IN THE HIGH HEAVENS.			
	Rises.	Sets.	Rises.	Sets.				
			a.m.	p.m.	NEAR the beginning of last month the earth was at her nearest to the sun, a distance of 91,350,000 miles separating us from the great power station, which energises the whole earth. Since then we have moved on our way some 50,000,000 miles and, of course, new sky-scapes have come into view. Most of the starry constellations we saw a month ago are still in our night sky but they rise about two hours earlier and new stars appear below them, which, in turn, will pass across our sky, as the earth moves onward, through the heavens round the sun.			
1	5.24	6.46	9.25	9.37	At the beginning of this month, between 8 and 9 o'clock, the finest group of constellations ever seen from planet earth will be in the northern sky in the meridian; that imaginary line through the sky which stretches from north to south and above the observer's head. The centre of this starry group is the famous constellation of Orion, the giant hunter. In very early times, even before the dawn of history, men associated certain star groups with the figures of men and animals, perhaps national heroes or historic narratives which could be seen and so remembered by people however scattered. Some think that Orion is the starry effigy of Nimrod, the mighty hunter, mentioned in the early part of the book of Genesis. The Giant's belt of three equally spaced stars, and his sword hanging therefrom, is well known. Above the belt to the northward are two bright stars which mark his shoulders, and two others mark his legs. Around Orion is a group of, what seems to be, associated constellations, their purpose known only to those who devised them probably 5,000 years ago. Behind Orion, to the eastward, are his two dogs, Canis Major and, across the Milky Way, Canis Minor, in which are the Dog Stars, Sirius and Procyon. In front of the Giant is the Bull, Taurus, which appears to be charging him. In the head of Taurus is a large, V-shaped cluster of stars, called the Hyades, the chief star of which is Aldebaran, a ruddy star. A little farther to the westward is the well known cluster of the Pleiades or the Seven Sisters. These are in the shoulder of the Bull. Some distance north of Orion, across the Milky Way, is the very bright star, Capella. A line from Sirius to Procyon and continued brings us to two bright stars in the constellation of Gemini, called Castor and Pollux, named after two Roman gods who were patrons of sailors. The ship in which St. Paul sailed from Malta to Rome was called Castor and Pollux. Whatever was the origin of the names and groupings of the forty-eight ancient constellations it has now only an antique value. In spite of attempted alterations the ancient names still persist.			
2	5.25	6.46	10.17	10.12	Jupiter and Saturn, the evolutions of which we have watched for so many months, are now declining toward the west at dark. They have been moving together again since 20th December. On 26th February they will be in conjunction for the third and last time, thus ends the rare triple conjunction of these two planets which will have kept them together for eight months. The last triple conjunction of Jupiter and Saturn occurred in 1683.			
3	5.26	6.45	11.8	10.48				
4	5.27	6.45	11.59	11.25				
5	5.28	6.45	12.50	nil				
6	5.29	6.44	1.42	12.4				
7	5.29	6.43	2.34	12.50				
8	5.30	6.42	3.26	1.38				
9	5.31	6.42	4.18	2.29				
10	5.32	6.42	5.7	3.26				
11	5.33	6.41	5.55	4.25				
12	5.33	6.40	6.40	5.26				
13	5.34	6.39	7.25	6.29				
14	5.35	6.39	8.8	7.32				
15	5.36	6.38	8.52	8.36				
16	5.36	6.37	9.36	9.40				
17	5.37	6.36	10.22	10.43				
18	5.37	6.34	11.10	11.46				
19	5.38	6.33	nil	12.47				
20	5.38	6.32	12.1	1.46				
21	5.39	6.32	12.53	2.41				
22	5.40	6.31	1.49	3.33				
23	5.40	6.30	2.45	4.21				
24	5.41	6.29	3.41	5.6				
25	5.42	6.28	4.37	5.46				
26	5.43	6.27	5.32	6.24				
27	5.43	6.26	6.25	7.0				
28	5.44	6.25	7.18	7.36				

In early February, the sky, before daybreak, is very beautiful with brilliant stars and constellations. Venus lends her charm low in the east among the stars of Sagittarius, the Archer. A little higher the starry curves of the Scorpion will be seen. Almost in the meridian is the large white star, Spica, in the Virgin, from which the reddish star Arcturus is found toward the north-east. Farther along the zodiac and declining to the west Leo is very conspicuous, with the well known Sickle which forms his forepart.

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.