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Soil Conservation in Queensland.

J. E. LADEWIG, Senior Soil Conservationist, and A. F. SKINNER, Soil Conservationist.

(*Continued from page 25 of January issue.*)

2. Soil Conservation.

Soil conservation simply means the correct use of land so that maximum permanent production is assured; all practices that assist in achieving this are soil conservation measures, but the primary object is the prevention and control of erosion.

The soil is commonly regarded as something permanent, to be treated in any manner which will suffice to produce a return by the most convenient and economical methods. Such a conception is erroneous and dangerous, because the soil, unless carefully managed, is no more permanent than buildings or machinery, which are obviously depreciating assets for which financial provision for both depreciation and repairs must be made. Soils cannot be expected to produce indefinitely under conditions which do not provide for the maintenance of their original structure and fertility. If even 1 per cent. per annum of the value of the land were spent on measures designed to retain the soil in its original condition, there would be only a minor erosion problem to-day. This same amount or more is expended on maintenance of machinery and is considered a legitimate charge. When the machinery becomes obsolete it can be replaced, but when soils have been exploited to the point of unproductivity, replacement is impossible. Unfortunately, exploitation is generally an extremely profitable business while the soil lasts, and until the individual farmer has suffered from soil exploitation he is usually unable to appreciate the benefits conferred by conservation farming.

Soil conservation, then, means much more than a series of contour banks across the land or ploughing on the contour. It includes all farming techniques the aim of which is the maintenance of fertility, physical structure, and the ability of the soil to absorb and retain rainfall; consequently, it embraces many of the scientific, economic, and social aspects of farming.

A conservation programme in severely eroded areas requires major capital expenditure for reclamation and for the construction of necessary protective earthworks, but a sound conservation plan, in which protective works and land use procedures are correctly integrated, will not only pay off the capital expenditure over a period of years, but will show a handsome profit on the investment and—most important—the productive value of the land will be preserved for future generations.

Where erosion damage is extensive, the cost of reclamation is usually high, but if control measures are adopted in the early stages of erosion (or better still before it commences), the cost is comparatively low, and most of the topsoil can still be retained in its productive state.

In the United States of America, where conservation programmes have been implemented on approximately 100 million acres of farm lands over a period of about 15 years, authoritative figures are quoted, following a survey in 1946. This survey embraced 10,000 farms in

Plate 36.

SOWN PASTURES AT EAST FUNNELL CREEK.—Rhodes grass on the flat and common Guinea grass on the hill.

all parts of the United States—farms on which comprehensive programmes of soil, crop, and water management had been adopted; these farms showed a per acre increase in the yield of major crops amounting to 36 per cent. over the average yields obtained before the programmes were undertaken. Individual cases are quoted. In one instance a farmer invested the equivalent of £12 per acre for the conversion of his farm to a balanced land use programme over a period of 10 years. Over this period, the additional return from the investment was equivalent to £18 per acre. This was enough to liquidate the full cost of the programme and leave the farmer an additional 50 per cent. for his efforts; the major portion of the original investment will remain on the land as a permanent improvement.

Numerous other cases can be quoted from overseas, and similar trends are observed in Australia, but the time period of application of soil conservation measures here is still too short to quote authoritative figures.

Conservation farming *will* prevent deterioration of the farming lands, and it will pay a cash dividend in the process. Even at a stage of serious soil depletion the total expenditure required to adopt complete soil conservation procedures will, in most cases, represent only a small repair charge (1 per cent.) against the land for the period of its productivity in the past.

CONSERVATION FARMING.

Conservation farming is, as a rule, only a little more difficult than current agricultural practice, and, as has been shown, if carried out continuously gives better yields than the older and more wasteful methods.

The first approach to conservation farming, however, entails the efficient use of every acre in accordance with its capabilities. To do this, the farmer needs not only an inventory of his land and its capability, but also the help of an experienced farm planning technician, who can furnish suggestions and help in designing measures that will save and build up the soil. The entire farm must be considered and the various soil conservation practices planned to meet the needs of the particular farm; seldom will a single practice do the whole job, no matter how well it is carried out.

Land Capability.

Land capability is the suitability of land for a permanent specified use; for example, some land is suitable only for forestry purposes, some only for pasture, whilst some may be utilised permanently for cultivation. To a certain extent in the past, land has been classified in terms of its ability to grow particular crops, but seldom in relation to its ability to produce them permanently. *Most farmers, however, have failed to realize fully that sloping land cannot be permanently and safely farmed by level-land methods.* Straight fences were erected, straight furrows ploughed, and straight rows planted, and no attempt made to fit farming methods to land conformation.

Wise land use is influenced by the nature of the soil, the degree to which it has been affected by erosion, the slope and the climate, as well as the physical properties of the soil; of these, erodibility, considered in conjunction with degree and length of slope, is the deciding factor in the determination of the suitability for cultivation.

In the United States of America, eight land capability classes are recognized, varying from Class 1 land which is level and with a negligible erosion hazard to Class 8 land which is too steep or too wet for cultivation, pasture, or forestry purposes, but which may still have value for wild life preservation. For the present, this standard classification has been adopted for use in Queensland, but it is anticipated that, when further data are accumulated, modification may be necessary.

The United States Soil Conservation Service classification is as follows:—

Class 1: Land suitable for cultivation without special practices. It must be workable, level or nearly level, and not subject to more than slight erosion. It usually requires sound crop rotations and correct tillage practices to ensure maintenance of soil structure and fertility.

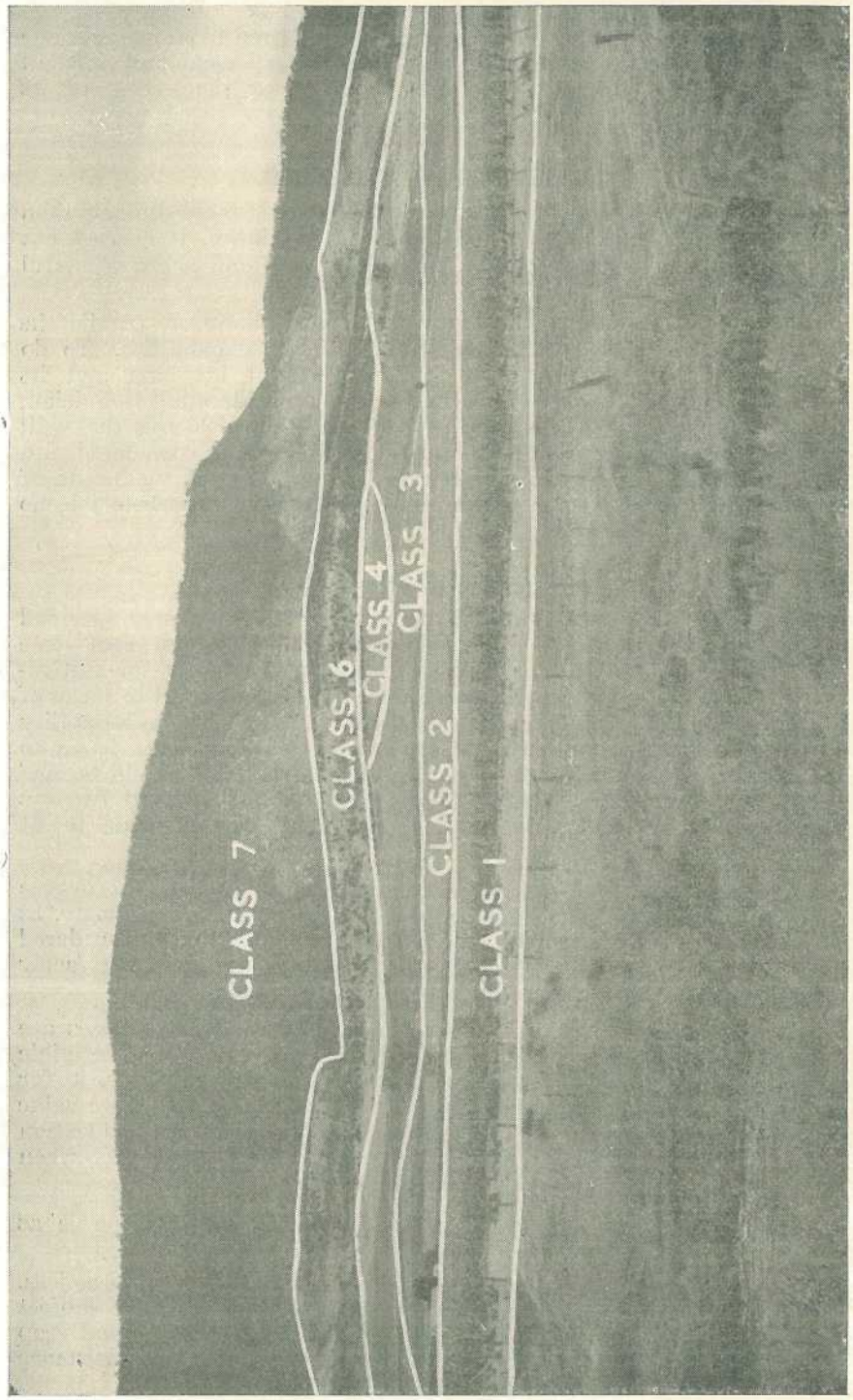


Plate 37.

INDICATING LAND CAPABILITY CLASSES FOR A TYPICAL QUEENSLAND FARMING AREA.

Class 2: Land suitable for cultivation with simple special practices. The types of practices likely to be needed are for erosion control and moisture conservation; they include contour tillage, strip cropping, crop rotation, simple water diversion systems, rough tillage, stubble mulching and basin ploughing. These lands usually possess a fairly absorptive soil on moderate slopes.

Class 3: Land suitable for permanent cultivation, but only by the application of intensive erosion control or soil management practices. These will include those for Class 2, but with much more comprehensive systems of water diversion, including waterways, diversion banks and contour banks. Most of Queensland's eroded arable land falls within this class and requires the application of virtually all known soil conservation practices.

Class 4: Land which is suitable for occasional or limited cultivation only. It may be steeper than Class 3 land, more severely eroded, more susceptible to erosion, less fertile, or otherwise less suitable for cultivation than Class 3 land. It is best suited for permanent pasture, but, if complete soil conservation practices are applied, it may be cultivated intermittently.

Class 5: Land which is not suitable for cultivation, because it is too stony or too wet, but may be used for grazing or forestry purposes. It must be nearly level and not subject to wind or water erosion; no special soil conservation practices are required.

Class 6: Land which is not suitable for cultivation but may be utilised for pasture or forestry purposes with moderate restrictions. It is usually moderately steep, and subject to water or wind erosion. The restrictions required include careful pasture management, reduced stocking, and avoidance of "burning-off" practices.

Class 7: Land not suitable for cultivation, and requiring severe restrictions if it is to be used for pasture. Most of this land is steep, rough and eroded and requires very careful management, including the provision of pasture furrows to reduce erosion risks. Such land should in general be reserved for forestry purposes.

Class 8: Land not suitable for cultivation or for the production of useful permanent vegetation that may be harvested under grazing or woodland use. It is chiefly rough, extremely stony land, or swamps that cannot be drained.

Planning for Conservation.

A farm conservation plan represents a physical inventory of the farm. First, it divides the farm into its land capability classes, and then sets out for each of these parcels of land the type of farming procedures necessary to enable permanent production in accordance with the capability. The land capability classification, once made, is fairly permanent; but changes, either in the land or in the methods which can be employed for using or protecting it, may make re-classification necessary later.

The points involved in the preparation of a conservation plan for a typical farm are illustrated in Plates 38-40.

Plate 38 is an aerial photograph of a once highly productive Darling Downs farm. The evidence of the ravages of erosion, most of which has occurred in the past 20 years, is only too obvious. Crop yields

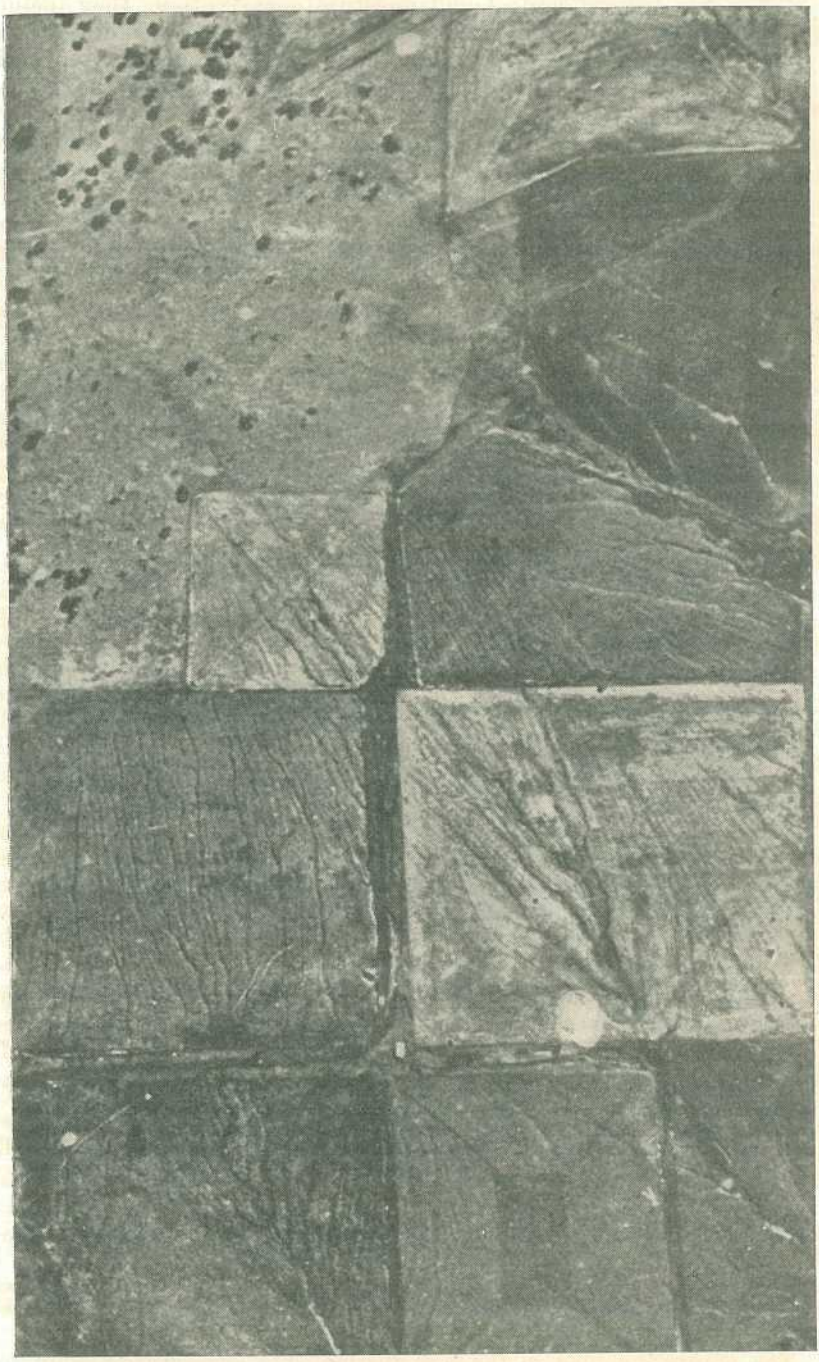


Plate 38.
AN AERIAL PHOTOGRAPH SHOWING RAVAGES OF EROSION.

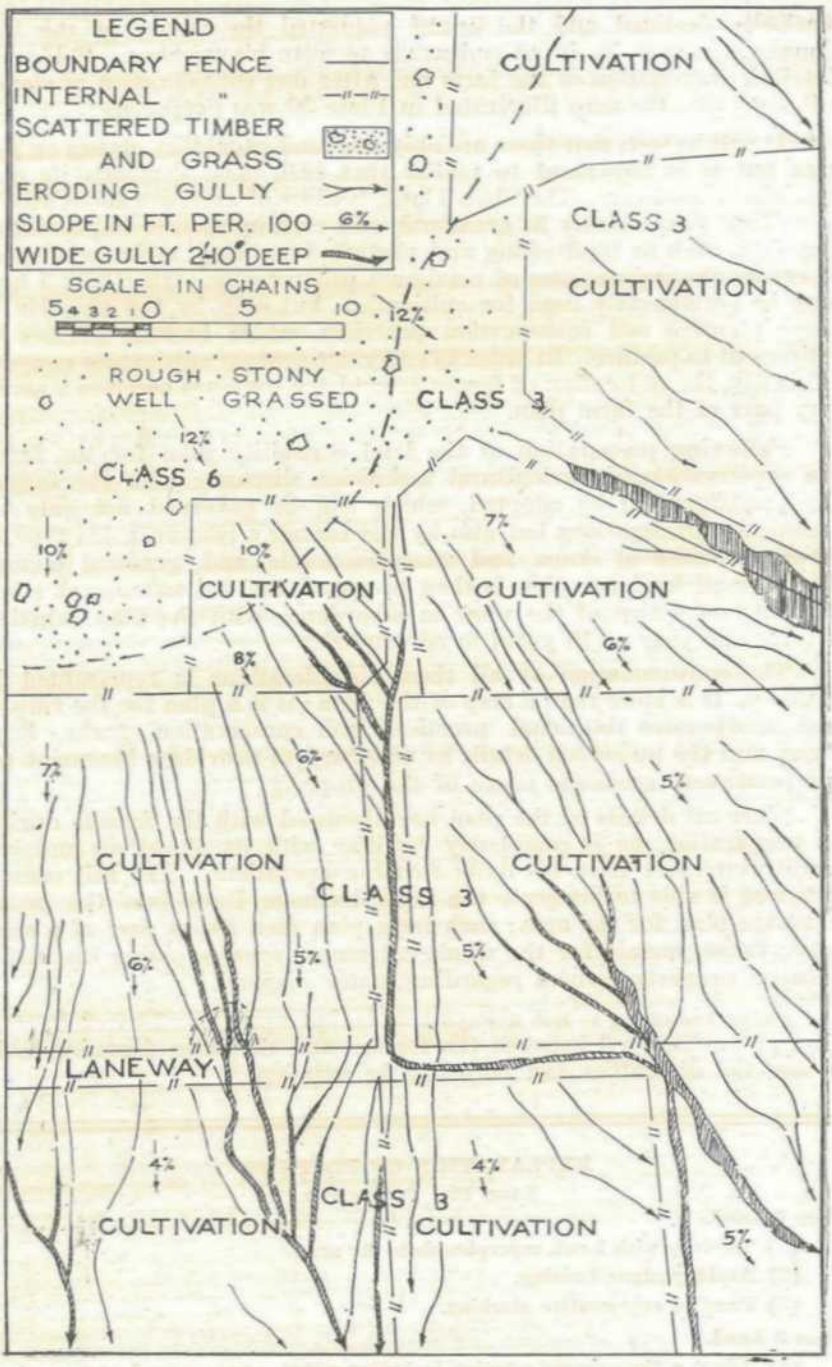


Plate 39.

CLASSIFICATION OF FARM AREAS SHOWN IN PLATE 38.

markedly declined and the owner requested the advice of the Soil Conservation Service in an endeavour to solve his problem. Following detailed examination of the farm and after due consideration of slopes, soil type, &c., the map illustrated in Plate 39 was prepared.

It will be seen that there are only two land capability classes on this area but it is important to realize that each class demands its own specialised treatment. The Class 6 land, because of excessive slope, should be utilised permanently as grassland, and certain pasture improvement practices, such as topdressing and pasture furrowing, must be adopted to ensure the maintenance of maximum productivity. The Class 3 land may be permanently used for cultivation, but only by the adoption of very intensive soil conservation practices, which include periods of retirement to pasture. In order to carry out contour cultivation methods efficiently, the re-location of fences around the contours becomes a necessary part of the farm plan.

Following preparation of the land capability plan for the farm, the conservation or agricultural technician discusses with the farmer the procedures to be adopted, which will be governed not only by technical considerations but also by the farmer's resources, his type of farming, choice of crops, and many economic and personal factors. The over-all land use plan is then prepared, and all subsequent effort aims at completion of the work in accordance with the plan, whether it takes one year or 10 years to accomplish.

The consummation of all these considerations is represented in Plate 40. It is more than a map of the farm; it is a plan for the future, and incorporates rotational practices, soil conservation works, farm dams, and the numerous details so necessary to provide a blueprint for the permanent economic usage of the property.

Since all details of the plan are discussed with the farmer during its preparation, he is completely familiar with its objectives and can readily interpret it in his daily farming operations. The soil conservationist is able to integrate the farm drainage lines into the group drainage plan for the area; each farm plan then forms part of a solid conservation mosaic for the whole catchment area, avoiding dissension between property owners regarding water disposal.

Farm planning is not always simple, but approached carefully and all aspects discussed between the farmer and the farm planning technician, the difficulties can normally be overcome.

EXPLANATION OF PLATE 40.

LAND USE PROGRAMME.

Class 6 Land.

(1) Topdress with 1 cwt. superphosphate per acre.

(2) Avoid pasture burning.

(3) Practise conservative stocking.

Class 3 Land.

(1) Adopt a three-course rotation including wheat, cowpeas, and pasture—land to be retired to pasture for three years in ten.

(2) All crop residues to be retained, preferably as a surface mulch.

(3) Contour cultivation to be practised.

(4) 1 cwt. of superphosphate per acre to be applied at time of wheat planting.

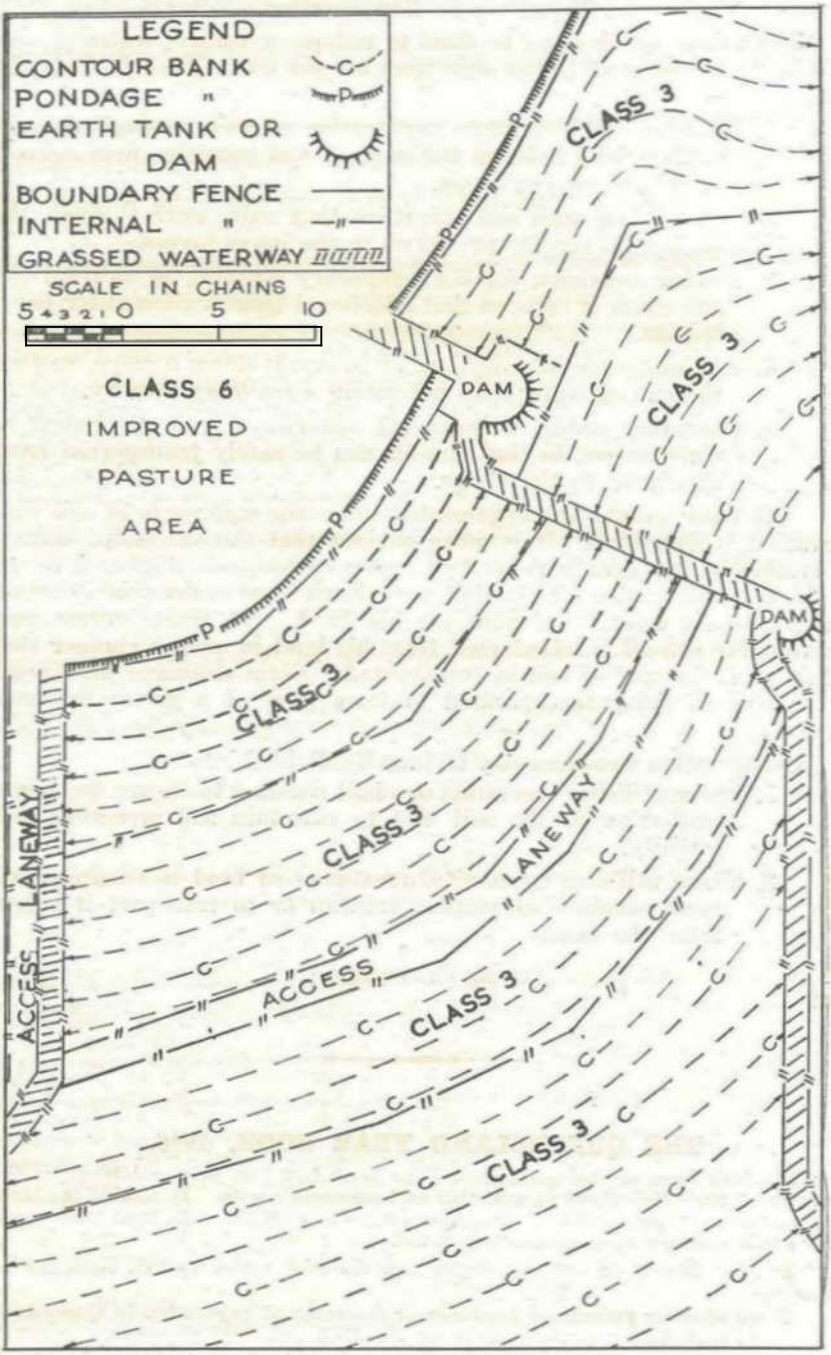


Plate 40.

PLAN FOR SOIL CONSERVATION ON FARM SHOWN IN PLATE 39.

Objectives in Conservation.

The things which must be done to reduce or control water erosion will be more apparent if the objectives are set out. These include the following:—

1. Ensuring the maximum penetration of rain through the soil surface, and holding the surface soil particles firm against movement by raindrops.
2. Maintaining such soil structure that rain, once through the surface, is readily passed on to the lower layers.
3. Making provision for the temporary ponding of rain on the site where it falls, so that additional time is allowed for penetration.
4. Providing for interception, at intervals down a slope, so that the run-off water does not attain a scouring velocity.
5. Providing stable, well-grassed waterways from catchment to watercourse, so that run-off can be safely transported from the farms to the rivers.

If these points are appreciated, then the approach to soil conservation is simplified. It is quite obvious that the successful control of erosion in any area is dependent on an enthusiastic approach to the problem by all landowners in that area. Each must endeavour to retain the maximum amount of rain on his land, and must ensure that unavoidable run-off is transferred from his land in such a manner that a minimum amount of soil is transported. Farm drainage lines must be capable of being incorporated to form part of a group drainage pattern.

Conservation measures may be broadly divided into:—

1. Those utilising vegetation or plant residues to ensure maximum protection of the soil and to maintain soil structure and fertility.
2. Those utilising mechanical treatment of land to ensure maximum pondage of surplus rainfall or to transport it safely from the land.

[TO BE CONTINUED.]

THE QUEENSLAND YEAR BOOK, 1948.

The ninth issue of the Queensland Year Book has just been published by the Government Statistician and is available at bookstores for 2s. It retains the same form as previous issues, with later figures inserted in all the statistical tables, and several new features have been incorporated.

The more important sections of the new material added to this issue are as follows:—

Maps showing percentage increases or decreases of population in Queensland Local Authority Areas between the 1933 and 1947 Censuses.

A detailed description of the new Wheat Stabilisation Plan.

Diagram showing percentage increases in retail prices since 1938-39.

Table giving the industries of the Queensland working population at the time of the 1947 Census.

Diagram showing basic wage increases since 1938-39.

Agriculture, other than Sugar Culture, in the Mackay Area.

N. E. GOODCHILD, Senior Adviser in Agriculture.

(*Continued from page 31 of the January Issue.*)

PASTURES.

Native Pastures.

Native pastures consist generally of coarse, rank grasses such as giant spear (*Heteropogon triticeus*), blady grass (*Imperata arundinacea*), kangaroo grass (*Themeda australis*), pitted blue grass (*Bothriochloa decipiens*) and extensive tracts of spear grass (*Heteropogon contortus*). These grasses are palatable for a short time after being burnt off, but rapidly decline in nutritive value. Over a number of years, little variation occurs in the very light carrying capacity of the poorer class pastures. Spear grass, however, is much superior to most other coastal grasses and in the coastal areas has a carrying capacity of a beast to 7 or 10 acres.

Sown Pastures.

Para grass has proved highly successful and has been established where conditions are suitable on the open plains at St. Lawrence, Inneston and Proserpine and on smaller holdings in the Mackay area. Ample moisture is essential to its successful growth.

In the O'Connell River and East Funnell Creek (Plates 41 and 42) areas, Rhodes grass and paspalum have been the most prominent pasture species used, whilst limited areas of molasses, common Guinea and Para grasses have been planted with success. However, Rhodes grass and paspalum have not proved entirely satisfactory. The former does not thrive as well under tropical conditions as in the sub-tropical areas; there is a lack of vigour and stooling, and general growth is spindly. Paspalum is somewhat sour throughout the wet season but improves and becomes palatable in late autumn and winter. Unfortunately, no better substitute grass has so far been introduced in this area.

Grasses which have given great promise in the O'Connell River and East Funnell Creek areas are Kenya No. 1 Rhodes grass and green panic (*Panicum maximum* var. *trichoglume*). The former is more vigorous than the common Rhodes grass and is much slower in maturing, thus providing succulent feed for a longer period. Green panic is a rapid grower and produces a heavy body of soft succulent feed. The rapid expansion of these two grasses is being carried out in both areas.

The pasture problem on Eungella Range (Plate 43) is completely different from that presented on the coast. The range varies in altitude from 2,000 to 3,000 feet and this elevation produces sub-tropical conditions. The rainfall is much heavier than on the coast, the average being approximately 80 inches per annum. The soils are mostly of granitic origin, with some red volcanic loam on the plateau. The main pasture grasses are Rhodes grass, paspalum and kikuyu grass. Cocksfoot (*Dactylis glomerata*), Toowoomba canary grass (*Phalaris tuberosa*) and rye grasses (*Lolium* spp.) have been tried but are not persistent and are not favoured.

The usual practice is to plant scrub burns with a mixture of 3 to 4 lb. of Rhodes grass and 6 lb. of paspalum. During the first year, Rhodes grass predominates while paspalum is becoming established. In the second and subsequent years, the latter extends in the pasture at the expense of the Rhodes grass, which tends to die out after several years.

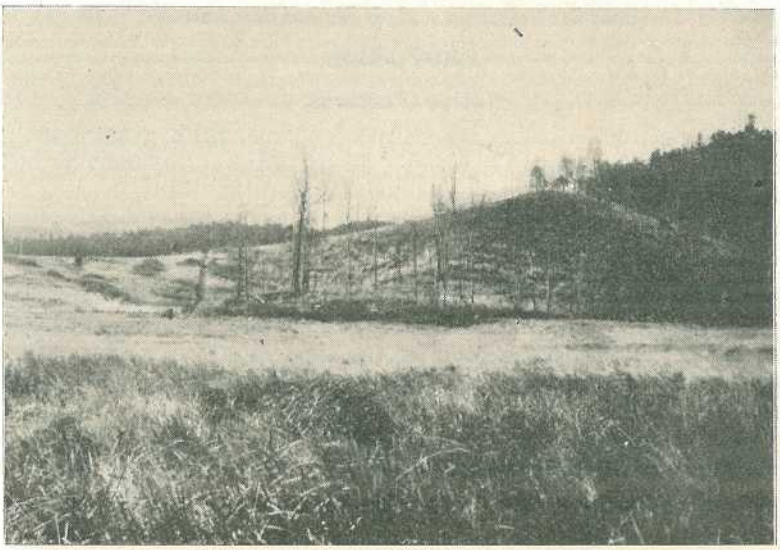


Plate 41.

SOWN PASTURES AT EAST FUNNELL CREEK.—Rhodes grass on the flat and common Guinea grass on the hill.

The country is somewhat broken and is steep in some areas. Such conditions do not lend themselves readily to pasture renovation. Kikuyu grass is rapidly extending and its matlike growth ensures the holding of the surface soil, preventing sheet erosion. It is established by planting cuttings approximately 4 to 6 feet apart which cover the interspaces in the course of a year or two. Kikuyu grass has proved valuable also in preventing the ingress of carpet grass (*Axonopus compressus*). Kikuyu grass, planted along some farm boundaries, has been found effective in preventing carpet grass intruding on pasture land. By careful pasture management and its early eradication in paddocks when observed, carpet grass can be controlled in pastures on the Eungella Range. By these methods, the deterioration of good pastures and the

Plate 42.
A Plant of Common Guinea Grass on an East Funnell Creek Farm.

lowering of the carrying capacity by carpet grass intrusion can be avoided. In the early period of development of scrub land, heavy stocking is often necessary until sufficient areas are cleared to provide a living. Such treatment of new pastures causes deterioration and permits carpet grass to become established, thus lowering the carrying capacity of the country. The amount of fallen timber, satin ash or Eungella gum (*Eugenia smithii*) particularly, also reduces the carrying capacity in this area, since in some paddocks up to 25 per cent. of the land is covered with logs which do not burn readily. This, together with the broken contour of the country, provides a difficult problem in pasture renovation.

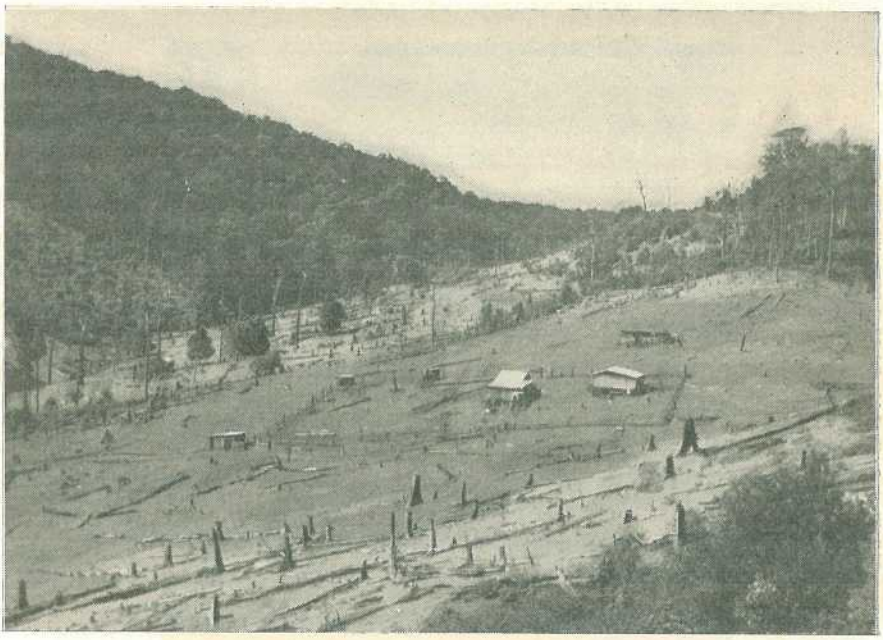


Plate 43.
A TYPICAL DAIRY FARM ON THE EUNGELLA RANGE.

Plate 44.
WHITE CLOVER IN AN EUNGELLA RANGE PASTURE.

Pastures Legumes.

Native pasture legumes are of little importance but two introductions—namely, Townsville lucerne (*Stylosanthes sundaica*) and white clover—are achieving prominence. The so-called Townsville lucerne, an annual legume, has spread rapidly during recent years and is now to be found over a very wide area between St. Lawrence and Bowen. In some areas at Bloomsbury, Proserpine and Salisbury, extensive areas are now covered with this valuable legume. It thrives particularly on poor, hard, stony ridges and poor sandy soils. Although it will grow on heavier soils, it regenerates more prolifically on the poor hard types of soil. The seed germinates with the first heavy summer rains and the plants continue to grow into early winter, when they reach maturity and seeding takes place. Stock eat the early growth but prefer the plant in a more mature stage in May, June and July. In the dried-off state it is relished by stock and in the drier areas it is largely responsible for the good condition of stock when pastures are bare. A very useful purpose is being served by this valuable annual and its continued dispersal will prove an asset to pastures in the Mackay area.

The elevation of Eungella Range, with its sub-tropical climate, has proved eminently suitable to the growth of white clover (Plate 44). The plant is now established throughout the district and is rapidly extending on individual farms in competition with paspalum, Rhodes grass and kikuyu grass. Actually, the encroachment of clover on established pastures is causing concern to farmers in cases where grasses were crowded out by white clover during the winter of 1948. However, it is hoped that the introduction of the clover will arrest the loss of soil fertility and eventually effect an improvement in the fertility of the land, at the same time providing good pasture during the winter and early spring months.

Another legume worthy of mention which abounds in wetter portions of the Mackay area is the introduced sensitive plant (*Mimosa pudica*). Though considered a pest of cultivation, it appears to be a useful legume in pastures. The leaf growth and tender stem terminals are relished by stock. Usually it persists for several years in pastures before dying out.

WEED PROBLEMS.

Lantana (*Lantana camara*) provides probably the major weed problem in the Mackay area. This pest has made steady advances on both open forest and rain-forest country. On the poorer class of country the present cost of clearing is excessive. On the more valuable rain-forest areas, efforts have been made to eradicate lantana by the use of bulldozers followed immediately by the planting of introduced grasses such as kikuyu, Rhodes and Guinea (*Panicum maximum*) grasses.

Control of lantana by spraying with weedicides has been given some attention. This method necessitates the brushing of old growth and the spraying of the regrowth which takes place. When large areas are to be cleared, this work is slow, laborious and costly.

Devil's fig (*Solanum torvum*) is a major weed pest, particularly on scrub areas of the district. It is, however, easily controlled in its early stages by arsenical and hormone-type weed killers.

Noogoora burr (*Xanthium pungens*) may be observed in isolated areas along creek banks but cannot be regarded as a serious problem at present.

Sensitive weed (*Mimosa pudica*) is widespread throughout the district. It is generally regarded as a pest in a cultivated area because of the sharp prickles along the stems which at times cause blood-poisoning in people.

AGRICULTURAL CROPS.

Fodder Crops.

Coastal pastures are generally of inferior types and their palatability is of short duration. In the past, too much reliance has been placed on natural feed, but more and more farmers are now realising that to maintain continuous production of cream and milk it is essential to provide succulent nutritive feed.

As a summer grazing crop, Sudan grass has proved its worth. Seed is broadcast at the rate of 10 to 12 lb. per acre with the first storm rains. Planting may be continued up to March and April. Plantings carried out before December often consist of a mixture of Sudan grass and Poona pea, but of late years Poona pea crops have not thrived and the practice is losing popularity.

Plate 45.
ALGERIAN OATS AT SARINA.

White panicum, one of the millets, has also proved suitable as a summer feed for grazing. Planted at the rate of 15 lb. per acre in early spring or summer, it later provides excellent succulent feed, but as its regrowth is inferior to that of Sudan grass it is not used so extensively as the latter.

Oats as a winter grazing crop is rapidly gaining in favour. Varieties such as Algerian (Plate 45) and Sunrise have been successfully grown, but at times are liable to failure due to rust incidence, especially under wet conditions and when late planted. In recent years, rust resistant varieties of oats (for example, Victoria x Richland) have been planted with success. A series of plantings is usually made in May and June, and late plantings may extend into July with satisfactory results. Sowing is at the rate of one bushel per acre. Under

favourable conditions of sufficient winter rainfall the crop may be fed down three or four times, providing succulent feed during the winter and early spring months when pastures are normally of little value for milk production.

Maize is not grown extensively as a grain crop as yields have not been satisfactory because the soils in general are not sufficiently fertile or well-drained for this purpose. Isolated crops have produced yields varying from 20 to 60 bushels per acre, but generally the crop is grown for green fodder for farm horses and dairy stock.

Many small areas of sweet sorghum are grown in the Mackay and Bowen districts, mainly as green crops for stock, and this crop could be more extensively grown.

Lucerne is selective in its soil requirements and is sensitive to soil acidity. Many of the Mackay soils are very acid and are not suitable for the satisfactory growth of lucerne. However, small areas have been grown on particularly well-drained creek flats. The general high-water table during a wet season rots the root system, and this, together with competition from excessive weed growth during early summer, so weakens the lucerne that crops rarely survive the first wet season. Treated as an annual crop, lucerne has proved a good standby during the dry springs and could be more extensively grown for grazing or cut for hay purposes to augment fodder reserves on the farm.

Fodder conservation is recommended in the Mackay area and both sorghum and maize could be grown more extensively for silage purposes.

Potatoes.

Prior to the war years potato production was mainly limited to small areas for home consumption. When increased production of essential foodstuffs was required during the war for the greatly increased population in North Queensland, the area under potatoes was expanded rapidly to 700 acres. With the end of the war the demand eased, and in recent years production has not exceeded 250 acres, the yield from which is absorbed locally.

Average yields of 2½ tons per acre have been harvested over several years, whilst that for the 1948 season was in the vicinity of 3 tons per acre.

There are no well defined potato-growing areas, the crop being produced mainly on the well-drained river and creek alluvial flats and scrub areas throughout the Mackay and Proserpine areas.

The heavy rains which normally occur in January, February and March preclude planting until after the wet season. Planting is therefore delayed until mid-March at the earliest and continues to the end of May or early June. It is desirable to plant uncut seed to avoid the rotting of seed potatoes that occurs if wet season rains extend longer than usual. Frosts occur along the coastal belt in isolated areas and in these areas it is essential to plant early to avoid the risk of loss of crop by frosting. June rains are fairly reliable and occur at an opportune time to set the early planted crops. Invariably, crop yields are heavier from early planted than from late planted crops. A further advantage is the fact that the risk of damage from potato moth infestation is minimised. Moreover, late planted crops usually do not store well. The general aim is to complete the harvesting by late September or early October. The late crop, however, can with safety be grown on the Eungella Range with its cooler spring conditions.

Tobacco.

Some tobacco crops have been grown successfully in the Mackay and Sarina districts in past years. Climatic conditions are, however, precarious for tobacco production, especially summer-grown crops. Heavy summer rains often produce waterlogged conditions which favour the development of blue mould disease in the field even where clean plants are planted out after treatment with benzol. Crops planted in late summer and early autumn meet with a sudden drop in temperatures, again often resulting in blue mould development in the field. Following unsatisfactory crop results over a period of years, tobacco growing has been discontinued in the Mackay and Sarina districts. To establish tobacco growing it would appear that the crop should be grown in the spring with the aid of irrigation.

The drier conditions of the Bowen district are more suitable for tobacco, especially where irrigation facilities are available. Good crops have been grown there in the past, and in recent years more interest has been shown in the crop.

Cotton.

Small areas of cotton have been grown for some years in different parts of the Mackay area, with varying degrees of success. Isolated crops in the Carmila and Ilbilbie districts have produced up to 1,500 lb. of seed cotton to the acre. The latter district appears to offer the greatest possibilities for cotton growing in the Mackay area.

Suitable soils in this district are grey clay loams overlying a pervious clay subsoil at a depth of 18 to 24 inches. This soil type appears to offer adequate drainage and at the same time is sufficiently retentive of soil moisture to ensure that growth of the cotton plants is not seriously checked.

Conditions in the Mackay area during the heavy wet season compel planting to be so arranged that there is a good chance of dry weather at harvesting. It has been found by a series of plantings over a number of years that late December planting is the most appropriate time. This generally allows the crop to become established and develop a root system before the wet season sets in. The Ilbilbie soils have sufficient drainage to avoid waterlogging and the crop is grown through January to May and harvested in June and July. Winter rains are often experienced but are generally of short duration and are not detrimental to the production of good grade cotton. Overall climatic conditions and soils in the Mackay area are not considered suitable for successful cotton-growing.

Onions.

This crop is grown to a small extent, but though fair yields have been obtained in many parts of the district the monetary returns obtainable from other small truck crops in recent years have been a greater attraction to farmers. Crops grown at Eungella Range have been most successful, yielding up to 15 tons per acre with both Hunter River (white) and Brown Spanish varieties.

HORTICULTURAL CROPS.

Horticultural activities were considerably accelerated during the war years when the growing of small truck crops reached a peak. Production since then has declined. Tomatoes are grown extensively in the Bowen area during the winter months and to a lesser extent in

Mackay. Pumpkins are regarded as a winter crop but are not extensively grown outside the Bowen area, which is the principal centre of production of this crop.

Banana growing has expanded considerably in recent years, the fruit being marketed mainly on the southern markets. The largest plantings are on the easterly scrub slopes at Carmila, whilst the acreages at Netherdale, Seaforth, East Funnell Creek and Proserpine are increasing.

Pineapples are produced chiefly in the coastal areas at St. Lawrence, Bucasia, Seaforth and Bowen. These crops benefit by early maturity under northern conditions.

Papaws are grown on well drained scrub areas at Seaforth and in numerous other centres in the Mackay district and find a ready sale on southern markets. Passion fruit have been given more attention in recent years in the Seaforth, Carmila and West Plane Creek areas. Interest in mango growing has increased and new groves have been planted at Rosella and Bucasia.

Climatic conditions prevailing in the Mackay area are favourable for the production of tropical fruits and present indications are that there will be an extension in the areas devoted to these fruits.

DAIRYING AND PIG RAISING.

The Port Curtis Co-operative Dairy Association established a butter factory in Mackay in 1930 and the dairying industry has steadily expanded since that date. The factory manufactures butter for local consumption and pasteurises milk for distribution. The local consumption of milk increased rapidly during the war years and has since risen steadily to a figure of 398,000 gallons per annum. The present number of suppliers is approximately 200. Dairying was originally conducted in conjunction with cane growing, but this is not generally practised now. Although dairying is carried on in isolated areas throughout the Mackay area, several districts depend almost entirely on dairying as the main source of income.

Eungella Range, with an average rainfall of 80 inches per year, is the largest concentrated dairying district. In the O'Connell River area, dairying and mixed farming are carried on in a rainfall belt of 60 to 65 inches. Here the pastures consist of Rhodes grass, paspalum, *Urochloa trichopus* and green panic. The last named is one of the most promising grasses established in the Mackay area.

The Sarina Range, East Funnell Creek and Blue Mountain districts are devoted almost entirely to dairying. The rainfall varies from 56 to 65 inches per year and the dairying industry is well established in these districts. Dairy farmers are showing greater interest in fodder conservation and it is anticipated that additional silos will be constructed in the near future.

The dairy breeds finding most favour are Jerseys and Illawarras, while Guernseys, Friesians and Ayrshires are also represented.

Pig raising declined considerably during the war years. The industry, however, is capable of being built up again. A factor militating against its more rapid recovery is the greatly increased local demand for whole milk and the limited and uncertain supply of skim

milk available for feeding to pigs. The demand for whole milk continues to expand and the prospects of raising pig production to previous levels are not encouraging at present.

THE GRAZING INDUSTRY.

The grazing holdings are extensive and consist chiefly of grazing farms and pastoral holdings. They vary in area from 40 square miles to 130 square miles. The carrying capacity of Nebo country varies considerably. On the open forest country, the carrying capacity is 1 beast to 12-15 acres, whilst on the brigalow country this diminishes to 1 beast to 30-40 acres.

Grazing is extensively carried on along the coastal belt from St. Lawrence to Bowen within a rainfall belt of from 30 to 70 inches. There is a preponderance of spear grass associated with pitted blue, blady and other coarse grasses. On the plain country of St. Lawrence, Inneston and Proserpine, Para grass has been successfully established and areas planted to this grass are being steadily increased. Of considerable importance is the wide distribution of Townsville lucerne along the coastal belt, which adds appreciably to the value of the grazing potentialities of the area. The principal grazing areas are, however, located in the Nebo district, west of the main coastal range. The rainfall in this area is generally regarded as fairly reliable. Pastures consist chiefly of spear grass, but other grass species are also found. A total of approximately 120,000 head of cattle are grazed on this area, of which 10,000 head are slaughtered yearly for local consumption.

FORESTRY DEVELOPMENT.

Some 20 years ago, silvicultural work, mainly planting of kauri and hoop pines, was undertaken at Bee Creek on the Eungella Range. The project was later abandoned and the planted area was made a National Park. Large quantities of heavy and light scrub-wood and hardwood have in the past been obtained from the Eungella Range and the area is still being worked. Most of the sawn timber is marketed in the south and logs are also supplied for plywood purposes. During 1948, the amount of timber harvested from Eungella exceeded 5,000,000 super feet.

DAIRY FARM COMPETITION.

Officers of the Dairying Division of the Department in January commenced the preliminary inspection of the 135 farms entered for the Dairy Farm Competition and the task is expected to be completed early in February.

The competition is being conducted in 16 zones in Queensland from funds allotted from the Commonwealth grant for improving efficiency in the dairying industry. The prizes to be awarded in each zone are £70 and trophy, £20 and pennant, and £10 and certificate, respectively, for first, second and third farms.

The final inspection of farms likely to be prize winners will be made by officers of the Divisions of Plant Industry, Animal Industry and Dairying during July.

Specifications for the Construction of a Tobacco Baling Press.

E. W. BAIRD, Adviser in Agriculture.

FROM time to time requests are received from tobacco growers regarding the construction of a tobacco baling press. Details of a suitable type of press are given in this article and the accompanying illustrations (Plates 46 and 47).

Plate 46 shows the press without the sides and lid. The top bar is dressed 5 x 5 hardwood 45 in. long; the end upright posts are dressed 5 x 3 hardwood with an overall length of 65 in. The ends, flooring and sides are made from dressed T. and G. pine, 1 in. thick.

The ends are 22 in. by 36 in. and the floor 24 in. by 38 in., outside measurements. The base boards under the floor consist of one central 5 x 5 dressed hardwood piece, with 5 x 2 dressed hardwood boards on the sides.

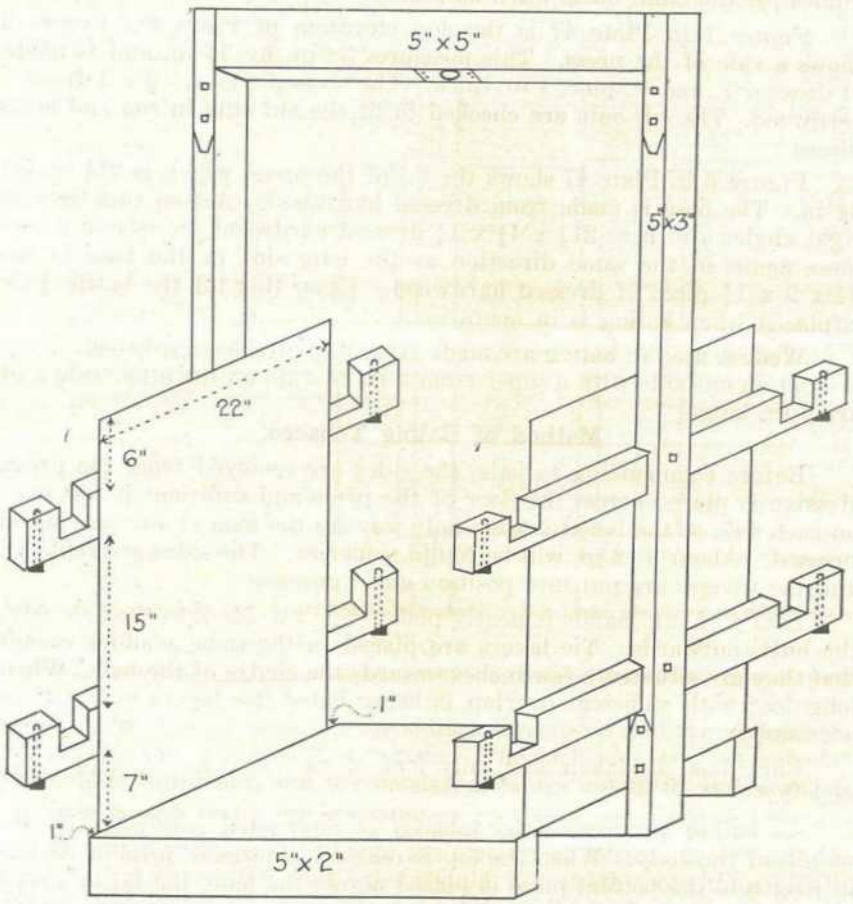


Plate 46.
DRAWING OF PRESS WITHOUT SIDES OR LID. (Not to scale.)

The centre guide for the top of the bottle jack, situated under the top bar, is a piece of iron 5 x 4 x ¼, with the central portion pressed outward to fit the top of the jack.

The cross pieces on each end of the press are made from 4 x 2 dressed hardwood. The cut-outs are bevelled to hold the corresponding pieces on the sides of the press. The straight cut is nearest the press and 1 in. from the side edge with the bevel cut 3¼ in. on the outside to 3½ in. on the inside of the timber. On the outside of the bevel cuts, sufficient timber is left to receive a 4½ x ⅜ bolt. This is to prevent splitting of the timber when the pressure is applied with the wedges. These cross pieces are checked into the uprights and bolted to them with 4½ x ⅜ bolts.

The top bar and the bottom centre bar under the floor are strapped on to the end uprights by iron U straps 12 x 5 x ¼ and bolted securely with 6½ x ½ bolts. In all, eight 6½ x ½ and twelve 4½ x ⅜ bolts are required.

To make a neat bale, ten 1 in. square pieces 36 in. in length may be attached to 3-ply wood and placed at each end of the press to act as guides for the hand butts when baling.

Figure 1 in Plate 47 is the end elevation of Plate 46. Figure 2 shows a side of the press. This measures 38 in. by 36 in. and is made of dressed T. and G. pine, 1 in. thick. The cross pieces are 3 x 2 dressed hardwood. The cut-outs are checked to fit the cut-outs in the end cross pieces.

Figure 3 in Plate 47 shows the lid of the press, which is 21½ in. by 34 in. The base is made from dressed hardwood. Across this base at right angles are three 21½ x 4½ x 1¼ dressed hardwood pieces and across these again in the same direction as the long side of the base is one 34 x 9 x 1¼ piece of dressed hardwood. Upon this lid the bottle jack is placed when baling is in operation.

Wedges used in baling are made from 2 in. dressed hardwood. They are flat on one side with a taper from 2 in. to 1 in. on the other side and are 8 in. long.

Method of Baling Tobacco.

Before commencing to bale, the sides are removed from the press. Hessian is placed across the floor of the press and sufficient is left over on each side of the bale to reach half way up the side of the bale when pressed. About 9-12 in. will be found sufficient. The sides are replaced and the wedges are put into position and tightened.

Leaf tied into hands is neatly placed side by side into the bale with the butts outwards. Tie layers are placed in the same manner except that they are situated a few inches towards the centre of the bale. When long leaf with sufficient overlap is being baled, tie layers may not be necessary.

Care must be taken that only leaf of the same grade is put into each bale.

As baling progresses the tobacco is compacted somewhat by the weight of the body. When the top is reached, a piece of hessian similar in length to the bottom piece is placed across the bale, the lid is placed into position and the bottle jack brought into operation. Only sufficient pressure is applied to reduce the size of the bale by about one-third, as overpressing is detrimental, particularly to light textured leaf.

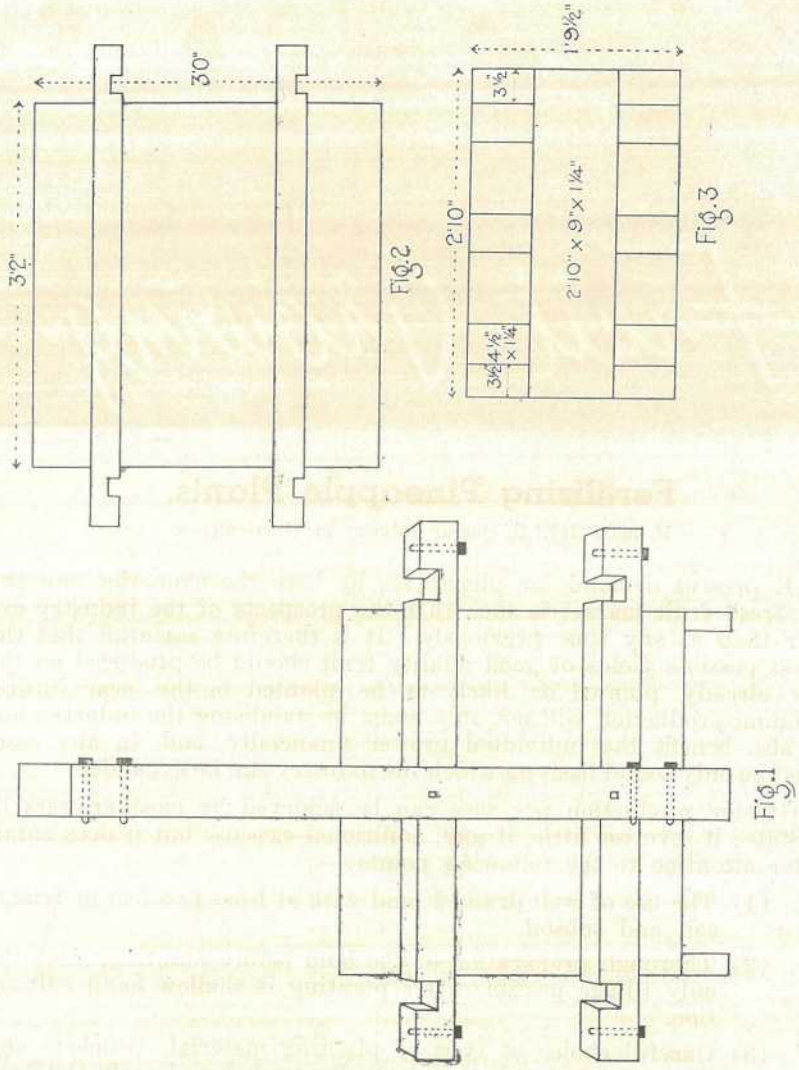


Plate 47.

Fig. 1.—End Elevation; Fig 2.—Side of Press.
Fig. 3.—Lid of Press. (Not to scale.)

Keeping the pressure on, the sides are removed and the ends of the hessian on each side are sewn together. The jack may now be removed. The bale is rolled out, and the hessian ends are cut to fit and sewn on. The bale is then ready for branding.

Experience alone will dictate the amount of tobacco to put into the press, but it is stressed that bales should not weigh more than 150 lb. Overpressing is an easy way to spoil light, bright leaf.

If leaf is being forwarded to an Association or Company for grading it is removed from the bulks, shaken loose and baled as above.

Fertilizing Pineapple Plants.

P. MITCHELL, Senior Adviser in Horticulture.

THE present demand for pineapples by both the canneries and the fresh fruit market is such that the prospects of the industry are better than at any time previously. It is therefore essential that the highest possible yields of good quality fruit should be produced on the areas already planted or likely to be planted in the near future. Maximum production will not only assist in stabilising the industry but will also benefit the individual grower financially, and, in any case, this is the only sound basis on which the industry can be expanded.

Greater production per acre can be achieved by most growers in the State; it involves little, if any, additional expense but it does entail greater attention to the following points:—

(1) The use of well drained land with at least two feet of friable soil and subsoil.

(2) Thorough preparation of the land before planting, since the only tillage possible after planting is shallow hand cultivation.

(3) Careful choice of type of planting material. Suckers and slips are planted between mid-September and early October; tops and butts are planted from mid-February to mid-March. In either case, use only the most vigorous plants available.

(4) A fertilizing and cultural programme designed to promote vigorous growth in the plant crop; without a good plant crop, satisfactory ratoons cannot be expected.

(5) Careful handling of the fruit during harvesting in order to eliminate wastage between the farm and the cannery or market.

Of these five points, the correct use of fertilizer is particularly important, and a summary of current recommendations should therefore be of interest to growers.

Fertilizer Requirements.

The main plant foods required by the pineapple plant are nitrogen, phosphoric acid and potash. The standard pineapple fertilizer is a mixture known to the industry as 10-6-10. This mixture is water-soluble and therefore readily available to the plant.

The placement of fertilizer is important, for most of the plant's feeding roots are in the top three or four inches of soil and relatively close to the base of the plant. The fertilizer must, therefore, be applied on the surface of the soil and as close as possible to the base of the plant, preferably in the lower base leaves. As the narrow, trough-like leaves of the plant collect moisture, even from light showers and heavy dew, any fertilizer lodging in the base leaves is dissolved and the nutrient solution thus formed percolates through the soil, where it can be absorbed by the pineapple roots.

Times of Fertilizing.

When suckers and slips are planted towards the end of September, a dressing of 10-6-10 should be applied a fortnight later; the young roots will then be about half an inch long. An application of sulphate of ammonia should be made in midsummer, just before the period of maximum growth, when the demand for nitrogen is greatest. A second dressing of 10-6-10 is required in late summer and a further dressing of sulphate of ammonia late in autumn. The latter enables the plant to maintain its vigour throughout the winter.

Tops planted in March should receive the late summer and late autumn fertilizer applications and then fall into line with standard recommendations in the following spring. For butts planted in March, the late autumn application of sulphate of ammonia is required shortly after planting and standard recommendations apply thereafter.

Although fertilizer practices vary with the soil type and the vigour of the crop, a typical programme would be as follows:—

September-October: 50 lb. 10-6-10 per 1,000 plants;

December-January: 30 lb. sulphate of ammonia per 1,000 plants;

March-April: 50 lb. 10-6-10 per 1,000 plants;

Early May: 30 lb. sulphate of ammonia per 1,000 plants.

(50 lb. per 1,000 plants equals one good handful to 4 plants; 30 lb. per 1,000 plants equals one good handful to 6 plants.)

Method of Applying Fertilizer.

The pineapple crop is fertilized by hand on practically all plantations and galvanised buckets are useful for carrying it along the rows. The fertilizer should be applied from a height of about 6 inches above the ground with a flick of the wrist, which will throw most of the mixture into the base leaves and a smaller amount on the ground close to the base of the plant. When fertilizing tops and small slips, the lower leaves should be lifted by a light pressure from the back of the hand and the fertilizer placed at the base of the small plants on the higher side of the plant.

Care must be taken in fertilizing, as faulty application may bring it in contact with the growing point of the plant and cause serious burning to the young leaves. Fertilizing on a windy day should be

avoided, for excessive amounts of the mixture may settle on the leaves and injure them.

Trace Element Deficiencies.

On many of the sandy soils in Near North Coast districts, a peculiar disorder known as "crookneck" has been noted in young pineapple plants since 1934. The leaves become very narrow, thickly waxed and light green to yellow in colour. During autumn, the centre leaves bunch and bend over almost parallel to the ground. The disorder is now known to be caused by deficiencies of the trace elements copper and zinc.

"Crookneck" can be controlled effectively by applying a 10-6-10 fertilizer to which copper sulphate and zinc sulphate have been added. Fertilizers of this type are now marketed and contain 56 lb. of copper sulphate and 56 lb. of zinc sulphate in each ton of the 10-6-10 mixture. This special mixture is applied in the usual way and has been a standard recommendation for several years as the correct dressing for young pineapple crops, particularly in the Beerwah-Caboolture-Wamuran district.

One application of the 10-6-10 plus copper and zinc mixture to the young plants should normally prevent the development of "crookneck" throughout the whole cropping cycle. However, should the disorder appear after the first year, a spot application to the affected plants will remedy the trouble. If it is necessary to apply the 10-6-10 plus copper and zinc mixture to ratoon crops, the fertilizer should be placed close to the base of the parent plant rather than in the basal leaves. High applications may cause severe injury.

There is some field evidence that the pineapple fertilizers now available burn the plants more than in pre-war days. Therefore, great care should be exercised in using the 10-6-10 plus copper and zinc mixture, which is not as safe as the normal 10-6-10 fertilizer.

Hormones and Flowering in Pineapples.

H. M. GROSZMANN, Horticulturist.

FOLLOWING reports from Hawaii and elsewhere on the use of hormones in pineapple culture, it was decided to test some of them under Queensland conditions and trials were begun late in 1947.

The first point to be determined was the possible value of these substances for the promotion of flowering in the pineapple crop. Several were tested under field conditions and compared with the acetylene treatment which is normally used in commercial practice to induce flowering. One of the hormones, alpha naphthalene acetic acid, was found to be quite effective. When used in spring and early summer, it induced flowering as well as did the acetylene treatment and also gave an increase in fruit weight of 7-14 per cent. When used in autumn, however, alpha naphthalene acetic acid was less reliable than the acetylene, which itself gives variable results in southern Queensland at that time of the year. It is proposed to examine this point further. Meanwhile, alpha naphthalene acetic acid might well be used in place of acetylene during the spring and early summer months.

Alpha Naphthalene Acetic Acid.

Alpha naphthalene acetic acid is now marketed by several firms, under various trade names, in tablet, powder and liquid form. This chemical is first mixed with water to give a solution of the desired

strength, which is then poured into the heart of the plant, allowing rather less than two fluid ounces to each plant. One gallon of the solution will thus treat nearly 100 plants.

For spring and early summer application, a concentration of five parts of alpha naphthalene acetic acid in one million parts of water should be used. In autumn, when the heart of the plant is often filled with water, double this strength is advisable. It will usually be possible to work out the necessary strength from the directions supplied on the labelled container. As a rough guide, however, it has been found in practice that one tablet or one eight-ounce bottle in 100 gallons of water generally gives a concentration of 10 parts in a million.

This very dilute solution is prepared by first thoroughly mixing the hormone with a small quantity of water and then adding the concentrate to the balance of the water required to give the desired strength.

Advantages of Flower Induction.

The use of hormones or acetylene to induce flowering helps the pineapple grower to control the crop on his plantation. In combination with judicious planting, it enables him to avoid glut periods, to spread the crop to suit his convenience in harvesting, and also to ensure that as little fruit as possible matures during the winter period when black heart is prevalent.

When properly applied, flower induction treatment is also useful in preventing "holding over." In an area of well-grown plants, only a small percentage may flower in September, although all are large enough to bear commercial fruit; the rest "hold over" until the next peak period of flowering in March. Sometimes, a few plants do not flower until the following September. Not only is the development of the ratoons delayed by irregular flowering, but the patch becomes uneven and the "hold over" plants become very tall, sucker high, and often collapse when fruiting. This can be prevented by applying either the hormone or acetylene treatment during October and early November to any sizeable plants which have failed to flower in September. The flowers appear about seven weeks after treatment, and the fruit should mature during late April and May.

Treatment in March is used in southern Queensland to bring in fruit in November and December, but the results are uncertain; and unless the situation is warm and otherwise favourable for growth, the fruit is often inferior in quality. In North Queensland, April treatment is practised widely to bring in a November-December crop.

Other Uses of Hormones in Pineapples.

Promotion of flowering is only one of the possible uses of hormones in pineapple culture. The variety of these growth substances, their different effects on the plant, and the distinctive reaction of the plant to one hormone according to the time of application and concentration at which it is used give promise of still greater control of plant and fruit development. One such possibility is indicated by two trials in which concentrated sprays of alpha naphthalene acetic acid were applied to the plant and fruit several weeks before the normal time of fruit maturity. In these trials, fruit maturity was delayed and the size of the fruit increased.

HAVE YOUR SEEDS TESTED FREE

The Department of Agriculture and Stock examines FREE OF CHARGE samples representing seed purchased by farmers for their own sowing.

The sample submitted should be representative of the bulk and a covering letter should be sent advising despatch of the sample.

MARK YOUR SAMPLE

Sample of ..... seed
Drawn from ..... bags
Representing a total of .....
Purchased from .....
Name and Address of Sender
Date.....

SIZE OF SAMPLE

Barley -	8 oz.	Oats -	8 oz.
Beans -	8 oz.	Peas -	8 oz.
Grasses	2 oz.	Sorghum	4 oz.
Lucerne	4 oz.	Sudan -	4 oz.
Millets	4 oz.	Wheat -	8 oz.

Vegetable Seeds - ½ oz.

SEND YOUR SAMPLE TO—

STANDARDS OFFICER,
DEPARTMENT OF AGRICULTURE AND STOCK,
BRISBANE.

1950 SHOW DATES.

February.

Stanthorpe	1, 2 and 3
Killarney	6 and 7
Warwick	8, 9, 10 and 11
Allora	17 and 18
Clifton	24 and 25
Millmerran	28 and 1st March

March.

Oakey	3 and 4
Pittsworth	7 and 8
Inglewood	10 and 11
Cooyar	11
Goombungee	15
Toowoomba	18 to 23
Jandowae	27 and 28
Dalby	30, 31 and 1st April

April.

Tara	4 and 5
Blackbutt	13, 14 and 15
Chinchilla	13, 14 and 15
Miles	17 and 18
Monto	26 and 27
Taroom	26, 27 and 28

May.

Eidsvold	1 and 2
Roma	2, 3 and 4
Kingaroy	4, 5 and 6
Beaudesert	5 and 6
Marburg	12 and 13
Ipswich	16, 17 and 18
Blackall	16 and 17
Charleville	17 and 18
Biggenden	18 and 19
Thangool	19 and 20
Warrill View	20
Biloela	25 and 26
Gympie	25, 26 and 27
Crow's Nest	26 and 27
Kalbar	27

June.

Maryborough	1, 2 and 3
Wowan	1, 2 and 3
Boonah	2 and 3
Childers	5 and 6
Bundaberg	8, 9 and 10
Mt. Morgan	8, 9 and 10
Lowood	9, 10 and 12

PLANT PROTECTION

Approved Strawberry Planting Material.

A SCHEME for providing approved strawberry runners was initiated in 1947 with a view to reducing the incidence of strawberry virus diseases and improving the general quality of strawberry planting material. In 1949 a number of growers in various districts submitted their crops for examination and a series of inspections were made during the season to ascertain that the crops were kept free of virus infected plants, and were maintained in good cultural condition.

The crops of the following growers have satisfied the requirements of the strawberry-runner scheme and these growers may now sell their runners as "Approved by the Department of Agriculture and Stock." In future years it will be necessary for growers desiring to have their strawberry crops approved to plant runners from approved runner beds.

Grower.	Address.	Variety.
L. H. Keating ..	Pinklands, *via* Cleveland	Phenomenal
C. A. Kempnich ..	Pinklands, *via* Cleveland ..	Phenomenal
G. E. Lax	Redland Bay road, Pinklands, *via* Cleveland	Phenomenal
A. H. Pateman ..	Pinklands, *via* Cleveland ..	Phenomenal
J. R. Richardson ..	Pinklands, *via* Cleveland ..	Phenomenal
D. J. Brown ..	Wellington street, Cleveland ..	Phenomenal
E. H. Lambley ..	Birkdale	Phenomenal
G. L. Langford ..	"Springlands," Slacks Creek ..	Phenomenal and Usher
J. De Meio ..	"Kingston Park," Woodridge ..	Phenomenal
W. J. J. Akers ..	School road, Eight Mile Plains ..	Phenomenal
J. B. McLaughlin ..	Logan road, Upper Mount Gravatt	Phenomenal
J. D. Johnston ..	Glasshouse Mountains	Aurie
G. A. Armstrong ..	Montville road, Palmwoods ..	Phenomenal
J. F. Yesberg ..	Palmwoods	Phenomenal
C. L. Tompkins ..	Old Bowling Green road, Palmwoods	Rex
W. Smith ..	Western road, Montville	Aurie and Phenomenal
W. A. Wood ..	Image Flat road, Nambour ..	Phenomenal

A Useful Machine for Spraying Potatoes.

W. G. STEELE, Senior Adviser in Agriculture.

WITH the advent of DDT and its successful use in controlling potato tuber moth in the field, potato growers have become interested in the practical application of DDT sprays to potato crops. A primary need was a cheaply constructed spraying machine of horse-drawn type to supplement the manually operated knapsack spray pump commonly used for such purpose.

An outline of the type of machine required was given to a local machinery manufacturer at Boonah and, after some experimenting, a machine of simple construction was produced. This was reasonably priced and gave a satisfactory performance. Spraying four rows at a

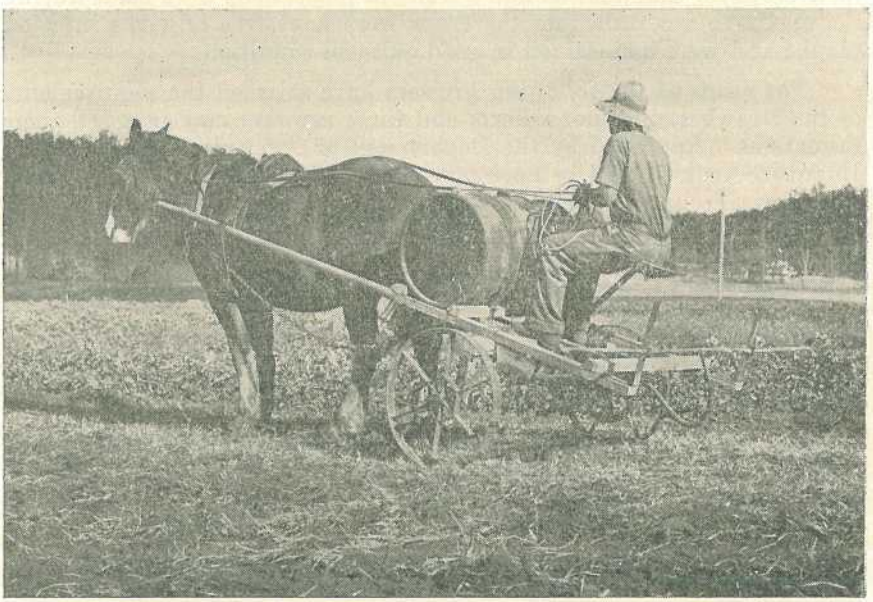


Plate 48.
VIEW OF POTATO SPRAYING MACHINE READY FOR OPERATION.

time, a maximum rate of 50 gallons per acre can be applied to give a good cover to the plants. The machine can also be used to spray other crops, such as pumpkins and lucerne.

The machine (Plates 48 and 49), which is drawn by a single horse, consists of a 44-gallon drum fitted to a frame mounted on two wheels each 27 inches in diameter. From the rear of the drum a ¾-inch galvanised iron pipe leads to a brass rotary pump which forces the spraying liquid through to a spray boom fitted with cyclone type nozzles. A shut-off tap is fitted in the line before entering the pump and a gauze strainer is also included. By connecting the pump and boom by means

of a length of rubber hosing, allowance is made for the boom to be raised or lowered on the supporting standards to suit any height of crop.

The pump is rotated by means of a gear wheel, fitted to one of the land wheels, which drives a smaller cog on a counter shaft. From this shaft the drive is taken by means of a rubber V belt and pulleys on to the pump shaft. At ordinary cultivating speed the pump is estimated to make 300 to 350 r.p.m. This gives a fine mist which covers the plants

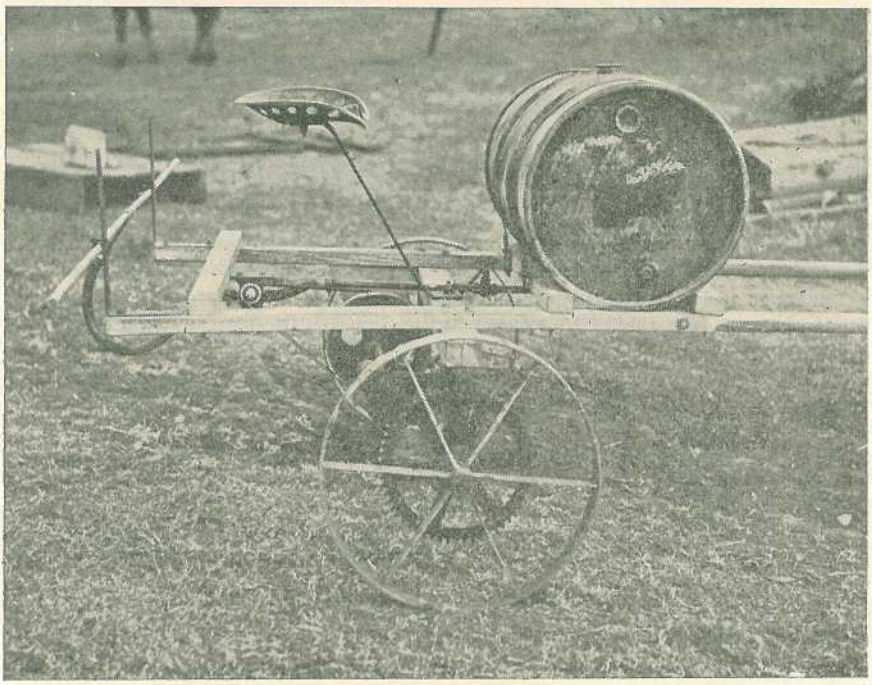


Plate 49.
Close View of Pumping Mechanism.

well. Three spray nozzles, spaced 8 inches apart, are fitted above each row; these may be screwed out if desired and replaced by small bolts so that one or two nozzles only are operating per row. This permits a saving of material if small plants are being sprayed. The span of the land wheels can be altered so as to allow for row widths of 27 to 33 inches.

Up to the present about 10 of these machines have been placed on farms throughout the Fassifern, Charlwood and Aratula areas, and more have been ordered. In some localities growers have purchased a machine on a group basis so that several farms are served by the one machine.

Wool and its Structure.

G. R. MOULE, Director of Sheep Husbandry.

IT is universally acknowledged that wool is one of the most versatile of all fibres, and this is largely due to its unique physical and chemical structure. A close study has been made of the physical structure of wool during the last 100 years, and some of its unique properties as a textile fibre can now be explained. Various authorities have been consulted in compiling this and subsequent articles on the structure of wool; these will be acknowledged at the conclusion of the series.

THE PHYSICAL STRUCTURE OF WOOL.

When a staple of wool is examined by a classer he notes its length, its colour, and its crimping. In addition, he feels it for "handle" and tests it for tensile strength. These physical characters of length, colour, crimp, handle, and tensile strength have an important bearing on the uses to which wool is put, though other factors, such as the presence or absence of grass seed and occurrence of dust, also have a bearing on the "line" in which any fleece is offered for sale. However, the obvious physical characters such as crimp and tensile strength bear an important relationship to the internal structure of the fibre, and up to a point they may be regarded as being indicative of the arrangement of cells and molecules which are too small to be seen.

Most people who handle wool imagine each fibre is made up of an outer scale sheath and an inner cortex. That a wool fibre is covered by "scales" is a common belief, but recent investigations have cast doubt as to whether scales, as such, do exist. The outer sheath of a wool fibre is about $\frac{1}{25000}$ of an inch thick, but it seems to be impossible to remove the scales singly from a fibre in the same way that scales can be removed from a fish. This has led to the suggestion that the scale sheath may not carry scales at all, but that it embodies a number of folds in its outer surface, thereby producing the illusion of scales. However, this folded outer sheath is specific to animal fibres, such as wool, though it is absent from hair, vegetable fibres, and synthetics.

A wool fibre has been likened to a pile of flower pots, all of the same size, which are standing one inside the other (Plate 50). It is important to remember that the folds all lie in the same direction, which is from base to tip. This gives a unidirectional frictional effect,

which is familiar to most people who have drawn their fingers from the base to the tip of a staple and have then done the same thing in the reverse direction. This unidirectional frictional effect probably explains why wool fibres "migrate" after they have been woven into a fabric.

Plate 50.

Plate 51.

Plate 52.

EXPLANATION OF PLATES.

Plate 50.

Wool Fibre (Magnified). (From "The Book of Wool.")

Plate 51.

Photo-micrograph of the Merino Wool Fibre. (After A. F. Barker, in "The Textile Manufacturer.")

Plate 52.

Photo-micrograph of Southdown Wool Fibre. (After A. F. Barker, in "The Textile Manufacturer.")

The exposed edge of the folds seems to be set at a definite angle, which is fairly constant for each type of fibre (Plates 51 and 52.) For instance, a certain relationship exists between the visible height of the fold (above the line of the edge of the fibre) and the average diameter of a wool fibre. This relationship for wool is entirely different from that which exists for mohair.

If d be taken to represent the average diameter of any wool fibre and S the average distance between folds (*i.e.*, the length of the apparent scales), the formula $\frac{S}{d}$ is useful for comparing different fibres. In the case of Merino wool, the ratio ranges from 0.4 upwards, while Southdown wool has a $\frac{S}{d}$ ratio of 0.16 to 0.39. The following table gives the range of the $\frac{S}{d}$ ratio of four different wool types:—

Fibre.	$\frac{S}{d}$ *Ratio.*
Merino wool—finest	1.00
Merino wool—60's	0.55
Southdown	0.27
Low quality wool	0.11

This table is of vital interest because comparison between low quality "Down" wool and the finest Merino wool suggests that the rate of growth of the scale sheath in comparison with the solid inner core or cortex is much quicker in the case of Downs wool and is only lightly overgrown in the case of the Merino.

The folds are extremely small and in a "64" Merino wool there may be as many as 50,000 to 60,000 per inch. They have an important bearing on the way in which the wool reflects light and so influence to some extent the colour of a fleece and the dyeing capacity of a fabric.

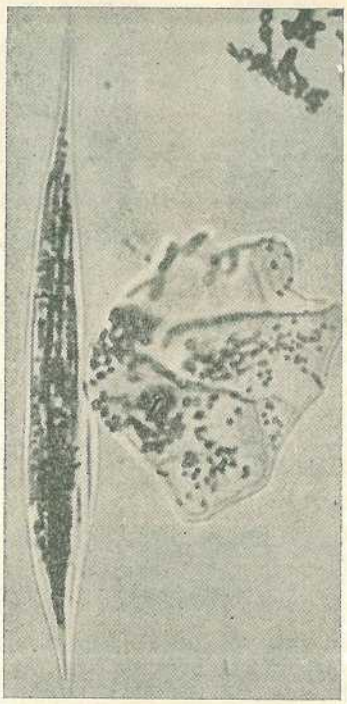


Plate 53 (above).

SPINDLE CELL OF NORMAL LENGTH, GREATLY MAGNIFIED. (After E. H. Mercer.)

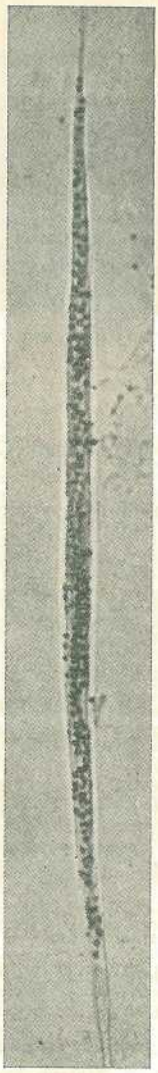


Plate 54 (at right).

STRETCHED SPINDLE CELL, GREATLY MAGNIFIED. (After E. H. Mercer.)

These facts should also be kept in mind when considering the handle of wool, although other factors such as fibre diameter and resilience also influence this important quality. Minute spaces or pores exist between the folds in the outer sheath; in a dry fibre they might be as small as 0.06 micron (a micron is about 1/25,000 inch) but they expand up to 0.4 micron when the fibre is wet. The importance of this to the dyer is obvious. The expanded pores allow the dye to enter much more easily and when the fibre dries the pore contracts and locks the dye in under the cuticle sheath, as the outer folded layer of so-called scales is more correctly known.

The inner layer or cortex of the wool fibre consists of a solid matrix. This is an important point differentiating wool from hair, which has a hollow medulla in the centre of the fibre.

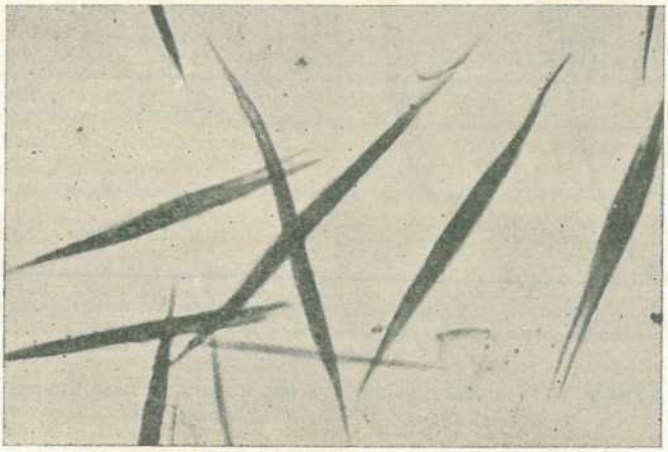


Plate 55.
Spindle Cells from Fine Merino Wool. (After E. H. Mercer.)

There are two distinct parts to the cortex, the more important and spectacular being the spindle cells (Plates 53, 54, and 55). These are elongated, have tapering ends, and are capable of tremendous extension. It is possible to free them from the fibre and stretch them many times their unexpanded length. Besides being extensible within themselves, the spindle cells are arranged on a slight bevel. It is well known that by increasing the bevel and allowing cards to slip along one another the length of the stack can be increased.

When a wool fibre is stretched, the spindle cells first elongate and then they slip along one another until their contact is destroyed. During this time the folded sheath expands until it reaches its limits and it, too, finally breaks. This gives wool a particular extension curve of the type shown in Plate 56.

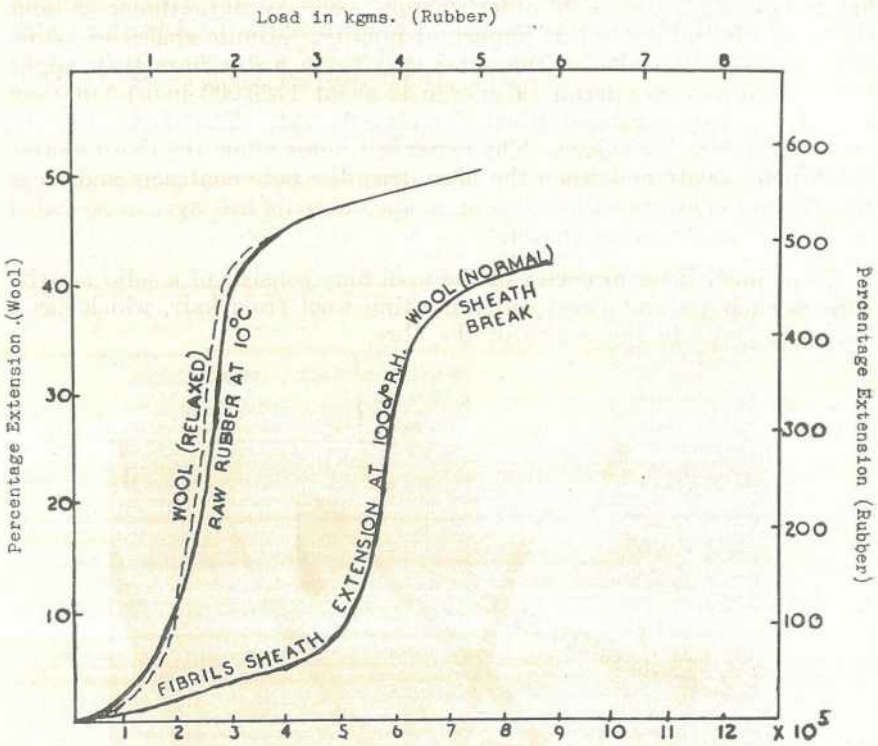


Plate 56.

GRAPH SHOWING EXTENSION OF WOOL FIBRE AND RAW RUBBER.

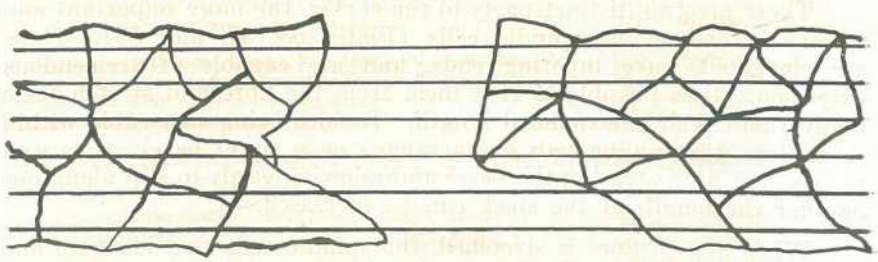


Plate 57.

DIAGRAM OF A BROKEN SHEATH EXPOSING CENTRAL FIBRILS. (After A. F. Barker, in "The Textile Manufacturer.")

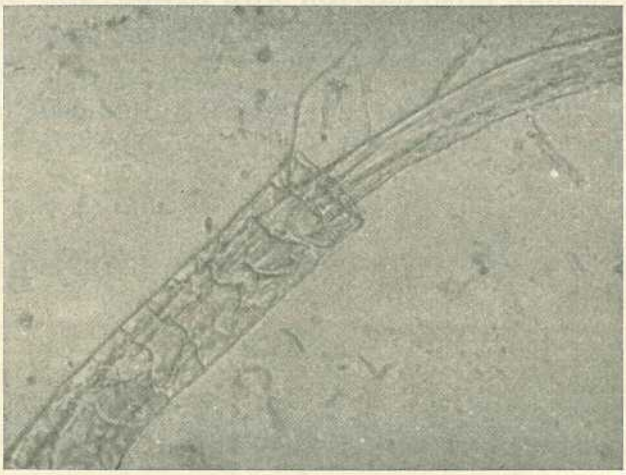


Plate 58.

Sheath and Central Fibrils of the Normal Wool Fibre. (After A. F. Barker, in "The Textile Manufacturer.")

The other part of the cortex consists of fibrils which are tightly packed together (Plates 57 and 58). This means that the wool fibre is a solid structure (Plate 59) and this is one of the important differentiating features between wool and hair. Hair has a hollow medulla which contains air, and this alters its dyeing capacity.

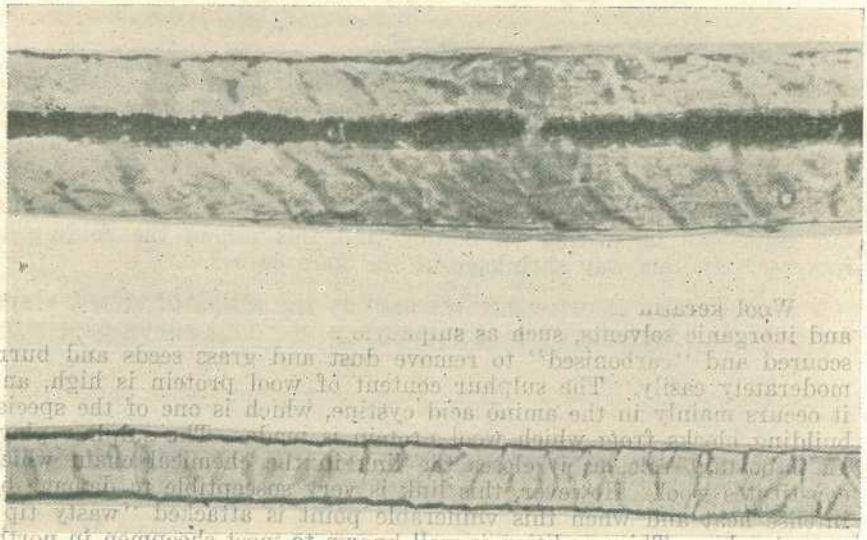


Plate 59.

Coarse and Fine Fibres (Magnified). (From "The Book of Wool.")

THE CHEMICAL COMPOSITION AND STRUCTURE OF WOOL.

Chemically, wool is composed of a particular protein known as keratin. The building blocks from which wool protein is made are known as amino acids and at least 13 are of importance in the formation of wool protein. When combined in the fibre they constitute chains, which are referred to as peptide chains, and they are folded in a fashion suggested in Plate 60.

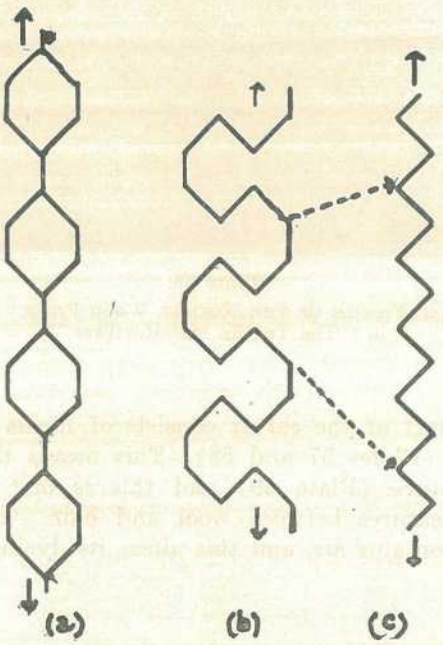


Plate 60.

DIAGRAM OF SMALL PORTIONS OF CHAIN MOLECULES. (*a*) Cellulose; (*b*) Wool before stretching; (*c*) Wool stretched. The long-range elasticity made possible by the structure of the wool molecule distinguishes the natural fibre from many artificial products, especially those based on cellulose. (After McMahon.)

Further folding is opposed by chemical linkages between the chains, but these can be broken on boiling and this allows the folding to increase. In this way shrinkage of the fibre occurs.

Wool keratin is extremely resistant to the action of water, soaps, and inorganic solvents, such as sulphuric acid. This allows wool to be scoured and "carbonised" to remove dust and grass seeds and burrs moderately easily. The sulphur content of wool protein is high, and it occurs mainly in the amino acid cystine, which is one of the special building blocks from which wool protein is made. The sulphur plays an important role, as it closes the link in the chemical chain which constitutes wool. However, this link is very susceptible to damage by intense heat and when this vulnerable point is attacked "wasty tip" may develop. This condition is well known to most sheepmen in north-western and central-western Queensland, who have examined many "backs."

Crop Planting Tables—Southern Districts.

Showing Times of Planting and Rates of Sowing for Field Crops.

By Officers of the Agriculture Branch.

QUEENSLAND is a large State covering a wide range of climatic conditions, and in a crop planting summary it is impossible to define accurately planting and harvesting times for each and every area. The tables which have been compiled for the various agricultural areas are intended to be a general guide with reference to the season generally experienced, and in determining sowing times attention has been paid to the seasonal conditions under which it is expected harvesting would be carried out.

Zones.

For the purposes of the tables, Queensland has been divided into three main zones as follows:—

Southern Districts.—Included in this zone is the area south of latitude 25° (approximately Bundaberg) to the southern border of Queensland.

Central Districts.—This zone lies between latitude 20° (approximately Bowen) and latitude 25°.

Northern Districts.—All districts north of latitude 20° are grouped in this zone.

The Coastal Districts within each zone refer, for the most part, to the land between the main coastal ranges and the seashore—approximately a 30-mile strip. In some areas, where the influence of coastal rainfall extends further inland, this strip may be wider. The Inland Districts are defined as beyond that limit to the outer edge of the 25-inch annual rainfall belt. Tableland Districts refer to elevated areas within about 100 miles of the coast.

Generally speaking the bulk of the annual rainfall in Queensland is received during the summer months. In areas with an annual rainfall lower than 25 inches and with a high rate of evaporation of soil moisture, crop production is hazardous without supplementary irrigation.

Explanation of Terms.

The meaning of most terms used in the tables is obvious, and the only ones in which confusion in interpretation may arise are "green feed" and "food."

The term *green feed* is used where the crop can be cut and fed immediately in the green state to farm animals. The term *food* is used where the crop can be harvested and fed immediately to farm animals, or held in good condition for some time in the field without harvesting if required, or harvested and then stored in farm structures.

It is recognised that individual farmers may use some crops in other ways than indicated in the tables, but the intention here is to name the *main purposes* for which various crops are used.

SOUTHERN DISTRICTS.

Sowing and Planting Table for Field Crops.

(This Table requires to be adapted to suit individual circumstances).

Crop.	Main Purpose for Which Grown.	When to Sow or Plant.			How Sown or Planted.				Approximate Period of Growth of Crop in Months.	Remarks.
		Coastal Districts.	Tableland Districts.	Inland Districts.	Distance Rows Apart.	Distance Between Plants.	Quantity of Seed per acre if Drilled.	Quantity of Seed per acre if Broadcast.		
Arrowroot	Flour and pig food..	Aug. to Oct.	..	..	Ft. In. 5 0	Ft. In. 2 0	10 to 12 cwt. of bulbs	..	8 to 10 ..	Suited best to coastal districts
Artichoke	Pig food	Aug. to Nov.	Sep. to Nov.	..	3 6	1 6	4 to 5 cwt. of tubers	..	4 to 5 ..	Difficult to store; will keep better in the soil
Barley (Cape and Skinless)	Grazing and green feed	Mar. to June	Mar. to July	Mar. to June	Drilled	..	1 bus. ..	1½ bus. ..	2 to 4 ..	..
Barley (Malting) ..	Grain	..	May and June	May and June	Drilled	..	1 bus. ..	1½ bus. ..	4½ to 5 ..	..
Beans, Lima ..	Seed	Sep. to Dec.	Oct. to Dec.	Oct. to Dec.	2 6	0 9	20 to 25 lb.	..	3½ to 4 ..	..
Beans, Navy or Canning	Seed	Sep. to Jan.	Sept. to Jan.	Sep. to Jan.	2 4	0 4	15 to 24 lb.	..	3 to 3½ ..	Wider rows for fertile soils
Beet, Silver	Green feed for poultry	Mar. to June	Mar. to June	Mar. to June	2 6	1 0	4 lb. ..	..	3 to 4 ..	..
Broom Millet ..	Brushware	Sep. to Dec.	Oct. to Dec.	Oct. to Dec.	3 6	0 9	3 to 4 lb. ..	..	4½ to 5 ..	..
Buckwheat	Nectar for bees; grain for poultry	Sep. to Mar.	Sep. to Mar.	Sep. to Feb.	2 0	0 3	25 to 30 lb.	40 to 45 lb.	1½ to 2½	Produces a valuable nectar crop within 6 to 7 weeks of planting
Cabbage	Green feed	All seasons except summer	All seasons except summer	All seasons except summer	2 6	2 0	1 lb. ..	..	4 to 5 ..	..
Canary Seed ..	Hay, green feed and grain	..	Apr. to June	Apr. to June	Drilled	..	10–15 lb. ..	20–25 lb. ..	4½ to 5	..
Carrot, Field ..	Stock food	Mar. to June	Apr. to May	Apr. to May	1 9	..	2 to 3 lb. ..	..	4 to 5 ..	..
Cassava	Pig food	Aug. to Oct.	..	..	5 0	2 0	Cuttings used	..	8 to 10 ..	Boil tubers before using; discard water
Cotton	Fibre..	Sep. to Dec.	Oct. to Dec.	Oct. to Dec.	3 6	1 6	15 to 20 lb. delinted seed	..	5 to 7 ..	..

Cow Cane	Stock food	Sep. to Dec.	Sep. to Dec.	..	5 0	1 6	2 or 3-eyed setts used	..	7 to 9	Suitable for several ratoons
Cowpea*	Seed, grazing and hay	Sep. to Jan.	Oct. to Jan.	Oct. to Jan.	3 0	0 6	6 to 10 lb.	15 to 20 lb.	3½ to 4½	For green manure purposes, *see* under "Leguminous cover crops"
Garlic	Market	Aug. to Sep.	Aug. to Sep.	..	1 6	0 6	..	..	6 ..	..
Grasses (*see* "Pastures")										
Kale	Stock food	Feb. to June	Feb. to June	Feb. to June	3 0	2 0	1 lb. ..	2 lb. ..	4 ..	..
Kohl Rabi	Stock food	Mar. to Apr.	Mar. to Apr.	Mar. to Apr.	2 6	1 6	2 lb. ..	..	4 to 5 ..	..
Leguminous Cover Crops*—										
Blue Lupin ..	Green manure ..	Autumn ..	Autumn ..	Autumn ..	Drilled	..	1 bus. ..	1½ bus. ..	5 ..	Erect growth
Cowpeas	Green manure ..	Summer ..	Summer ..	Summer ..	Drilled	..	20–25 lb. ..	25–30 lb. ..	3½ to 5 ..	Creeping growth
Cusara Pea ..	Green manure ..	Summer ..	Summer ..	Summer ..	Drilled	..	5 lb. ..	10 lb. ..	5 to 6 ..	Erect growth
Field Pea	Green manure ..	Autumn ..	Autumn ..	Autumn ..	Drilled	..	1 to 1½ bus.	1½ to 2 bus.	3 to 4 ..	Creeping growth
Gambia Pea ..	Green manure ..	Summer ..	Summer ..	Summer ..	Drilled	..	5 lb. ..	10 lb. ..	5 to 6 ..	Erect growth
Mauritius (Velvet) Bean	Green manure ..	Summer ..	Summer ..	Summer ..	3 0	2 0	20 lb. ..	40 to 60 lb.	5 ..	Creeping growth
Poona Pea.. ..	Green manure ..	Summer ..	Summer ..	Summer ..	Drilled	..	20 to 25 lb.	20 to 30 lb.	3½ to 4 ..	Erect growth
Rice Bean ..	Green manure ..	Summer ..	Summer ..	Summer ..	Drilled	..	15 to 20 lb.	20 to 25 lb.	4 to 5 ..	Creeping growth
Soybean	Green manure ..	Summer ..	Summer ..	Summer ..	Drilled	..	20–30 lb. ..	25–35 lb. ..	3 to 4 ..	Semi-erect growth
Tangier Pea ..	Green manure ..	Autumn ..	Autumn ..	Autumn..	Drilled	..	10 lb. ..	12 lb. ..	5 ..	Creeping growth
Vetches or Tares ..	Green manure ..	Autumn ..	Autumn ..	Autumn ..	Drilled	..	¾ bus. ..	1 bus. ..	3½ to 4½	Creeping growth
Linseed (Flax) ..	Seed for oil	Apr. to June	Apr. to June	Apr. to June	Drilled	..	20 to 25 lb.	..	4½ to 5 ..	..
Lucerne*	Hay and grazing ..	Apr. to May	Apr. to May	Apr. to May	Drilled	..	10 to 12 lb.	14 to 18 lb.	3 ..	For grazing in drier areas 4 to 6 lb. In grass mixtures 1 to 3 lb.
Maize	Grain and stock food	Aug. to Jan.	Sep. to Jan.	Sep. to Jan.	4 0	1 3	8 to 10 ..	56 lb. for stock food	4 to 5 .. For stock food 3 to 4	For stock food, closer row and plant spacing increased seed rate
Pop Corn	Grain	Sep. to Jan.	Oct. to Jan.	Oct. to Jan.	3 6	1 0	5 to 7 lb. ..	..	4	..
Sweet Corn ..	Market	Sep. to Jan.	Oct. to Jan.	Oct. to Jan.	3 6	1 0	6 to 8 lb. ..	..	3	..
Mangel and Sugar Beet	Stock Food	Feb. to May	Mar. to June	Mar. to June	2 6	1 0	4 to 6 lb. ..	..	6 to 7	..

* The use of bacterial inoculum with most leguminous plants is recommended. Supplies are obtainable from the Department of Agriculture and Stock, Brisbane.

SOUTHERN DISTRICTS.—*continued.*

SOWING AND PLANTING TABLE FOR FIELD CROPS.

(This Table requires to be adapted to suit individual circumstances).

Crop.	Main Purpose for Which Grown.	When to Sow or Plant.			How Sown or Planted.				Approximate Period of Growth of Crop in Months.	Remarks.
		Coastal Districts.	Tableland Districts.	Inland Districts.	Distance Rows Apart.	Distance Between Plants.	Quantity of Seed per acre if Drilled.	Quantity of Seed per acre if Broadcast.		
					Ft. In.	Ft. In.				
Millet (French) ..	Grain	Sep. to Jan.	Oct. to Jan.	Oct. to Jan.	Drilled	..	10 to 14 lb...	20 lb.	2 to 2½	..
Millet (Giant and Dwarf Setaria)	Grain, hay and grazing	Aug. to Feb.	Sep. to Feb.	Sep. to Feb.	Drilled	..	10 to 14 lb. ..	20 lb.	2½ to 3	Can be grazed earlier if required
Millet (Japanese) ..	Hay and grazing ..	Aug. to Feb.	Sep. to Feb.	Sep. to Feb.	Drilled	..	10 to 14 lb. ..	20 lb.	2 to 3	Can be grazed earlier if required
Millet (White Panicum)	Hay and grazing ..	Aug. to Feb.	Sep. to Feb.	Sep. to Feb.	Drilled	..	10 to 14 lb. ..	20 lb.	2½ to 3	Can be grazed earlier if required
Oats	Grazing, hay and grain	Mar. to June	Feb. to June	Feb. to June	Drilled	..	1½ bus. ..	1½ to 2 bus.	3 to 5 ..	..
Onion	Market	Apr. to May	Mar. to Apr.	Mar. to Apr.	1 2	3 to 6 in.	1½ to 3 lb.	..	5 to 6 ..	..
Panicums (*see* "Millets") ..										
Pasture Grasses—										
Blue Panic ..	Pasture	Sep. to Feb.	Sep. to Feb.	Sep. to Feb.	..	..	..	4 lb. ..	Perennial; summer grower	To be grazed heavily and intermittently once established
Buffel	Pasture	Sep. to Feb.	Sep. to Feb.	Sep. to Feb.	..	..	..	4 to 5 lb. ..	Perennial; summer grower	Sandy or deep soils best; lighter sowing rate in the west on sandy country
Cocksfoot	Pasture	..	Autumn ..	..	..	..	..	15 to 20 lb.	Perennial	Intermittent grazing spring and early summer
Couch (Green) ..	Pasture	Sep. to Feb.	Sep. to Feb.	..	..	..	..	5 to 8 lb. ..	Perennial; summer grower	Pest in cultivation
Elephant	Pasture and green feed	Sep. to Jan.	Oct. to Feb.	Oct. to Feb.	5 0	2 0	Root and stem cuttings used	..	Perennial; summer grower	Graze or cut frequently to prevent woody stems developing; ratoons vigorously
Guinea (Common and Green Panic)	Pasture	Sep. to Mar.	Oct. to Feb.	Oct. to Feb.	3 0	3 0	Root cuttings used for Common Guinea	4 to 5 lb. ..	Perennial; summer grower	Graze to maintain young growth, but allow resting period
Italian Rye ..	Pasture	Mar. to Apr.	Mar. to Apr.	..	Drilled	..	15 lb. ..	15 to 20 lb.	Annual ..	Intermittent winter and spring grazing

Kikuyu	Pasture	Sep. to Feb.	Sep. to Feb.	Sep. to Feb.	3 0	3 0	Runner cuttings used, or plough or disc in chopped runners	..	Perennial; summer grower	27" rainfall lowest limit for growth; useful for pig paddocks
Mitchell	Pasture	..	..	Spring-early summer rains	..	..	..	2 to 3 lb. ..	Perennial; summer grower	Trample seed in with sheep
Molasses	Pasture	Sep. to Feb.	Oct. to Feb.	..	..	..	..	2 to 4 lb. ..	Perennial; summer grower	Used on scrub burns; needs careful grazing; suitable only in limited areas; frost susceptible
Para	Pasture	Sep. to Feb.	..	..	6 0	6 0	Runner cuttings used, or plough or disc in chopped runners	3 to 4 lb. ..	Perennial; summer grower	Use in swamps or where water supply ample or land always damp
Paspalum	Pasture	Sep. to Feb.	Oct. to Feb.	..	..	..	..	8 to 12 lb.	Perennial; summer grower	Best growth where rainfall exceeds 40"
Perennial Rye ..	Pasture	Mar. to Apr.	Mar. to Apr.	..	..	..	..	15 to 20 lb.	Perennial; winter grower	Limited use in specially favoured areas
Prairie	Pasture	Mar. to Apr.	Mar. to Apr.	..	..	..	..	20 to 25 lb.	Annual; winter and spring grower	May regenerate if allowed to seed
Rhodes	Pasture and hay ..	Sep. to Feb.	Oct. to Feb.	Oct. to Feb.	..	..	..	8 to 12 lb.	Perennial; summer grower	Sown on summer burns; best results from sowing in prolonged showery weather
Toowoomba Canary	Pasture	..	Mar. to Apr.	..	..	..	4 lb. ..	..	Perennial; winter and spring grower	Very light grazing in first year and then intermittently
Water Couch ..	Pasture	Summer ..	..	..	..	..	Runners used, or plough or disc in chopped runners	..	Perennial; summer grower	Frost susceptible; can be used to stabilise dam banks
Pasture Legumes*—										
Alsike Clover ..	Pasture mixtures ..	Autumn ..	Autumn ..	..	..	..	..	1 lb. in mixtures	Annual in Queensland; winter and spring grower	Moist winter conditions are required
Berseem Clover ..	Alone and in pasture mixtures	Late summer	Late summer	Late summer	..	..	..	4–5 lb. in mixtures; 8–10 lb. alone	Annual; autumn and winter grower	Requires 12" winter rainfall or irrigation

* See footnote on page 103.

SOUTHERN DISTRICTS.—*continued.*

SOWING AND PLANTING TABLE FOR FIELD CROPS.

(This Table requires to be adapted to suit individual circumstances).

Crop.	Main Purpose for Which Grown.	When to Sow or Plant.			How Sown or Planted.				Approximate Period of Growth of Crop in Months.	Remarks.
		Coastal Districts.	Tableland Districts.	Inland Districts.	Distance Rows Apart.	Distance Between Plants.	Quantity of Seed per acre if Drilled.	Quantity of Seed per acre if Broadcast.		
					Ft. In.	Ft. In.				
Black Medic ..	Pasture mixtures ..	Autumn ..	Autumn ..	Autumn ..	..	..	..	2–3 lb. in mixtures	Annual o biennial	Growth extends into summer; may regenerate
Burr Medic ..	Pasture mixtures ..	Autumn ..	Autumn ..	Autumn ..	..	..	..	2 lb. ..	Annual; winter and spring grower	Regenerates; more suitable for Tableland and Inland Districts
Clustered Clover ..	Pasture mixtures ..	Autumn ..	Autumn ..	Autumn ..	..	..	..	2 to 3 lb. ..	Annual; spring grower	Shows drought resistance; regenerates
Phasemy Bean ..	Pasture mixtures ..	Spring-summer	Spring-summer	Spring-summer	..	..	..	5–7 lb. in mixtures	Annual; summer grower	Regenerates; of promise in Rhodes grass country
Red Clover ..	Pasture mixtures ..	Autumn ..	Autumn ..	..	..	..	..	2–3 lb. in mixtures	Short lived perennial; late winter, spring, and early summer grower	..
Strawberry Clover	Pasture mixtures ..	All seasons except winter	All seasons except winter	..	3 0	3 0	Runners used	3 lb. ..	Perennial; spring, early summer grower	Requires ample moisture; very limited experience in Queensland
Subterranean Clover	Pasture mixtures ..	Autumn	Autumn ..	Autumn ..	..	..	..	3 to 5 lb. ..	Annual; winter grower	Requires 12–15" May-October rain with favourable seeding conditions August-September for regeneration
White Clover ..	Pasture mixtures ..	Early autumn	Early autumn	Early autumn	..	..	..	2 lb. in mixtures	Perennial; winter and spring grower	Requires 12" May–October rain for best results
Pea, Field * ..	Stock food and grazing	Mar. to June	Mar. to June	Apr. to June	Drilled	..	1 to 1½ bus.	1½ to 2 bus.	3 to 4 ..	When sown in combination with a cereal, ½ to ¾ bus. per acre. For green manure purposes, *see* leguminous cover crops

Peanut	Kernels	Sep. to Jan.	Sep. to Dec.	Sep. to Dec.	3 0	1 3	12g 08-b. of kernels	..	4 to 5 ..	..
Potato	Market	Aug. to Feb.	Aug. to Feb.	Aug. to Feb.	2 6	1 0	6–8 cwt. of tubers	..	3 to 4 ..	..
Pumpkin	Market and stock food	Aug. to Jan.	Sep. to Jan.	Sep. to Jan.	8 to 12 ft.	3 to 4 ft.	2 to 3 lb. ..	..	5 to 6 ..	..
Rape	Stock food	Mar. to May	Mar. to May	Mar. to May	Drilled	..	5 to 6 lb. ..	6 to 8 lb. ..	2½ to 4 ..	..
Rice, Swamp ..	Grain	Oct. to Jan.	Oct. to Jan.	Oct. to Jan.	Drilled	..	80 to 120 lb.	..	4 to 5 ..	Requires constant flooding during growing period
Rice, Upland ..	Grain	Oct. to Jan.	Oct. to Jan.	..	Drilled	..	60 to 90 lb.	..	4 to 5 ..	..
Rye	Grain and grazing ..	Mar. to June	Apr. to June	Apr. to June	Drilled	..	¾ to 1 bus...	1 to 1¼ bus.	3 to 5 ..	..
Sorghum, Grain ..	Grain, stubble grazing	Sep. to Feb.	Sep. to Jan.	Sep. to Jan.	14 to 42 in.	..	4 to 12 lb.	12 to 20 lb.	3½ to 5	Immature growth of any member of this group may contain poisonous properties, and care should be exercised in grazing
Sorghum, Sweet ..	Stock food	Sep. to Feb.	Sep. to Feb.	Sep. to Jan.	3 6	0 4	5 to 6 lb. ..	12–15 lb. ..	3½ to 5	
Sudan Grass ..	Grazing and hay ..	Sep. to Feb.	Sep. to Jan.	Sep. to Jan.	Drilled	..	8 to 10 lb.	10 to 14 lb.	2 to 4	
Soybean *	Seed, grazing and hay	Sep. to Jan.	Oct. to Jan.	Oct. to Jan.	2 6	4 to 6 in.	15 to 20 lb.	25 to 35 lb. ..	3½ to 4½	For green manure purposes, *see* under "Leguminous cover crops," page 103
Sunflowers	Seed for oil and bird seed	Sep. to Jan.	Sep. to Jan.	Sep. to Jan.	28 or 35 in.	1 0	4 to 6 lb. ..	..	4 to 5 ..	Wider spacing and less seed per acre where hand harvesting adopted
Sweet Potato ..	Market and stock food	Aug. to Jan.	Sep. to Jan.	Sep. to Jan.	3 to 3½ ft.	1 6	Cuttings used	..	4 to 5 ..	Useful for pig grazing
Tobacco	Leaf	Sep. to Dec.	Sep. to Dec.	Sep. to Dec.	4 0	18 to 24 in.	1–5th oz. in seed-beds	..	3 to 4 .. from trans-planting	Plants must be raised in specially prepared seed-beds and transplanted to permanent positions when strong enough
Turnip (including Swede)	Market and stock food	Feb. to May	Feb. to May	Feb. to May	2 0	1 0	1½ to 2 lb.	3 to 4 lb. ..	4 to 5 ..	..
Vetches or Tares * ..	Grazing	Mar. to June	Mar. to June	Mar. to June	Drilled	..	30 to 40 lb.	40 to 60 lb.	3 to 4 ..	For green manure purposes, *see* under "Leguminous cover crops," page 103
Wheat	Grain, grazing and hay	Apr. to June	Apr. to July	Apr. to July	Drilled	..	⅝ to 1 bus.	1 to 1½ bus.	3 to 6 ..	Fodder purposes only on coast, where rust resistant varieties are recommended

* See footnote on page 103.

PRODUCTION RECORDING.

List of cows and heifers officially tested by Officers of the Department of Agriculture and Stock, which qualified for entry into the advanced register of the A.I.S., Jersey, Guernsey, Ayrshire, and Friesian Societies' Herd Books, production records for which have been compiled during the months of April, May, June, July, August, September, and October, 1949 (273 days unless otherwise stated).

Animal.	Owner.	Milk Production.	Butter Fat.	Sire.	Month Compiled.
		Lb.	Lb.		
AUSTRALIAN ILLAWARRA SHORTHORN.					
MATURE COW (STANDARD 350 LB.).					
Rhodesview Kitty 16th	W. Gierke and Sons, Helidon	13,119·55	484·791	Fairvale Major	April
Faversham Dewdrop 5th	H. V. Littleton, Crow's Nest	11,075·36	440·39	Chelmer Redman	April
Hillfield Duchess 45th	A. E. Powell, Chinchilla	11,111·95	434·554	Trevlac Leslie	April
Blacklands Foremost 23rd	G. Sperling, Kooralgin	10,030·8	430·764	Parkview Limelight	April
Fernhome Fawn	R. S. Griffiths, Moregatta	9,603·55	421·216	Glengarry Gem's Royal	April
Roshill Queenie 4th	W. Flesser, Boyland	10,699·6	414·763	Dnalwon Felix	April
Applegarth Silver Lady	F. Derrick, Moonford	10,036·0	375·802	Applegarth Acme	April
Sunnyview Gem 8th	J. Phillips and Sons, Wondai	14,130·15	581·282	Sunnyview Envoy	May
Navillus Charm 17th	C. O'Sullivan, Greenmount	12,126·65	552·712	Greyleigh Eros	May
Sunnyview Nancy 8th	Klein Brothers, Grantham	12,572·0	518·568	Sunnyview Kitchener	May
Sunnyview Blossom 8th	Klein Brothers, Grantham	12,071·45	494·713	Sunnyview Commodore	May
Blacklands Foremost 34th	Klein Brothers, Grantham	12,306·7	490·616	Blacklands Sultan 2nd	May
Sunnyview Thelma 12th	J. Phillips and Sons, Wondai	10,333·2	439·933	Sunnyview Commodore	May
Wonga Sunspray 3rd	T. W. Fowler, Kenstan	10,130·55	411·254	Raleigh Amesbury	May
Glenore Posey	P. J. Donaghy and Son, Malanda	8,965·0	407·222	Glengariffe Great Heart	May
Glenore May 2nd	P. J. Donaghy and Son, Malanda	8,386·8	399·485	Sunnyview Melba's Hero	May
Valera Lila 9th	D. Sullivan, Rossvale	9,369·4	369·645	Rosenthal Surplus 2nd	May
Cresslea Pride	A. Lohse, Biggenden	11,926·8	508·707	Blacklands Excellent	June
Rozana Jason's Laurel	T. McLennan, Willowvale	12,999·95	508·3	Chelmer Jason	June
Greyleigh Gem 196th	W. H. Thompson, Nanango	14,074·4	505·364	Greyleigh Wootan	June
Valera Sheila 12th	Sullivan Brothers, Pittsworth	10,848·55	478·669	Alfa Vale Pride 2nd	June
Mountain Home Gentle 27th	W. J. Horrocks, Maclagan	9,819·15	395·221	Fairvale Ensign	June
Applegarth Merle's Hope	F. Derrick, Moonford	9,819·25	372·624	Thornleigh Lancer	June
Fairvale Opal 3rd	H. L. and C. I. Bruggemann, Kulpi	9,403·84	363·138	Fairvale Sir Echo	June
Rhodesview Lincoln 4th	W. Gierke and Son, Helidon	8,957·35	358·086	Fairvale Major	June
Dorravista Floss	H. A. Turner, Tarzali	15,313·1	751·833	Evansvale Eclipse	July
Dorravista Model	H. A. Turner, Tarzali	11,270·8	457·643	Glengariffe Peter	July
College Rapture 3rd	Q.A.H.S. and College, Lawes	10,140·8	389·375	Sunny View Alert	July
Blacklands Lily 13th	Klein Brothers, Grantham	9,919·75	330·857	Sultan 2nd of Blacklands	August
Merridale Dimple	Giles Brothers, Woowoonga	11,686·0	471·0	Blacklands Heir	September
Bunyaview Thelma's Pride	W. D. Davis, Wambo	10,583·0	448·0	Bingleigh Royal	September
Blacklands Fairy 26th	A. Pickels, Proston	11,267·0	438·0	Blacklands Maiden's Monarch	September
Fairlie Princess 38th	S. Mitchell and Mulcahy, Warwick	10,001·0	432·0	Fairlie Credence 2nd	September
Ronnoc Mermaid 3rd	O'Connor Brothers, Colinton	10,191·0	379·0	Ronnoc Emblem	September
Fernhome Maytime	R. S. Griffiths, Moregatta	8,813·0	377·0	Glengarry Gem's Royal	September
Fernhome Goodluck	R. S. Griffiths, Moregatta	7,903·0	374·0	Glengarry Gem's Royal	September
Yarranvale Empress	W. Henschell, Yarranlea	12,964·0	481·0	Trevor Hill Bosca	October
Aynesley Rosy 4th	W. and A. G. Scott, Blackbutt	12,014·0	467·0	Alfa Vale Pride 6th	October
Alfa Vale Model 27th	W. H. Thompson, Nanango	8,908·0	406·0	Alfa Vale Stalin	October
Fernhome Lottie	R. S. Griffiths, Moregatta	7,842·0	360·0	Rosenthal Compensation	October
Fernhome Gail	R. S. Griffiths, Moregatta	7,340·0	359·0	Glengarry Gem's Royal	October

Senior, 4 Years (Standard 330 lb.).

Blacklands Foremost 40th	Estate P. Doherty, Gympie	9,441·85	373·4	Blacklands Czar	April
Glen Idol Jenny 7th	Estate P. Doherty, Gympie	9,955·8	360·119	Blacklands Count	April
Glenore May 3rd	P. J. Donaghy and Son, Malanda	13,545·8	568·292	Sunnyview Melba's Hero	May
Glenore Shamrock 3rd	P. J. Donaghy and Son, Malanda	10,860·8	452·494	Sunnyview Melba's Hero	June
Faimoye Trumps Cherry	F. W. Fowler, Felton	9,934·95	407·188	Sunbridge Regent	June
Merridale Locket 2nd	Giles Brothers, Woowoonga	8,918·4	359·286	Springlands Pigeon's Eros	June
Bunya View Scarlet 2nd	Edwards Brothers, Kingaroy	10,719·9	495·283	Trevor Hill Reflection	August

Junior, 4 Years (Standard 310 lb.).

Bunya View Duchess 4th	K. Berghofer, Athol	9,614·7	407·875	Trevor Hill Reflection	April
Trevor Hill Bonnie	W. Henschell, Yarranlea	12,685·5	547·446	Trevor Hill Bosca	May
Kapleton Foremost	Klein Brothers, Grantham	12,454·3	523·816	Rhodesview Royal Lad	May
Ronnoc Silver 7th	O'Connor Brothers, Colinton	9,972·7	384·083	Ronnoc Emblem	May
Yarranvale Duchess 3rd	K. A. Ruhle, Motley	7,341·55	363·776	Alfa Vale Pride 10th	May
Boah Peak Ruby 6th	H. L. and C. I. Bruggemann, Kulpi	8,940·5	429·548	Fairvale Musketeer	August
Kulpi Fussy	H. L. and C. I. Bruggemann, Kulpi	7,924·31	333·316	White Park Redman	August
Learmont May 4th	P. J. Donaghy and Son, Malanda	11,696·0	498·0	Sunny View Melba's Hero	September
Navillus Plumb 7th	C. O'Sullivan, Greenmount	8,130·0	337·0	Greyleigh Eros	October

Senior, 3 Years (Standard 290 lb.).

Evansvale Fairy 3rd	A. Cornish, Malanda	10,343·85	432·598	Kyndalyn's President	April
Dorravista Jean	H. A. Turner, Tarzali	8,625·2	377·993	Learmont Byron	April
Glen Idol Countess 5th	Estate P. Doherty, Gympie	10,024·35	350·355	Glen Idol Regent	April
Roshill Queenie 8th	W. Flesser, Boyland	9,190·5	334·516	Dnalwon Felix	April
Sunnyview Thelma 16th	J. Phillips and Sons, Wondai	11,150·45	453·643	Sunnyview Kitchener	May
Bantry Rosebud	D. Sullivan, Rossvale	8,275·9	365·034	Rosenthal Surplus 2nd	May
Blacklands Lady Gentle 12th	A. Pickels, Proston	7,624·0	334·52	Blacklands Czar	May
Hillfield Dora	S. J. Lester, Mulgowie	7,604·75	320·819	Blacklands Florrie's 9th Heir	May
Fairvale Opal 4th	H. L. and C. I. Bruggemann, Kulpi	9,733·24	439·743	Bingleigh Jeans Monarch	June
Ardilea Gwen 8th	Hinrichsen and Sons, Clifton	8,219·85	330·441	Newstead Musician	June
Ardilea Kitty 7th	Hinrichsen and Sons, Clifton	8,635·5	311·217	Newstead Musician	June
Beaury Grace	A. Campbell, Killarney	9,378·9	355·426	Dulcamah Monash	June
Ennismore Fuschia 2nd	E. W. Jackson, Nobby	7,541·55	309·509	Navillus Prince Henry	July
Boah Peak Model	H. L. and C. I. Bruggemann, Kulpi	6,214·65	298·302	Fairvale Musketeer	August
Sydmouth Blossom 2nd	T. Vayro, Flagstone Creek	9,638·0	358·0	Navillus Paros	September
Fernhome Tiny	R. S. Griffiths, Moregatta	7,780·0	332·0	Merravale Gentle's Commodore	September
Fernhome Francis	R. S. Griffiths, Moregatta	5,622·0	305·0	Glengarry Gem Royal	October

Junior, 3 Years (Standard 270 lb.).

Redleigh Golden Girl	H. W. Verrall, Kingaroy	9,096·2	362·236	Bingleigh Royal	April
Jamberoo Crummy 12th	R. Herzig, Clifton	8,707·35	336·717	Jamberoo Prodigal	April
Roshill Almond 6th	W. Flesser, Boyland	9,709·45	318·544	Dnalwon Felix	April
Jamberoo Winnie 10th	R. Herzig, Clifton	7,020·1	300·612	Jamberoo Prodigal	April
Bingleigh Molly 13th	J. H. Fogg, Toogoolawah	6,465·5	283·423	Blacklands Jean's Victory	April
Navillus Tiddlewinks 11th	C. O'Sullivan, Greenmount	11,281·1	461·353	Parkview Limerick	May
Fairvale Judy 20th	W. Henschell, Yarranlea	9,166·9	447·712	Fairvale Red Prince	May
Kapleton Ethel	Klein Brothers, Grantham	11,979·4	429·463	Sunnyview Evelyn's Masterpiece	May
Yarranvale Flower	W. Henschell, Yarranlea	9,934·8	409·125	Yarranvale Prospector	May
Blacklands Ettie 27th	Klein Brothers, Grantham	9,602·45	387·489	Blacklands Czar	May
Fernhome Charity 2nd	R. S. Griffiths, Moregatta	8,711·95	379·648	Glengarry Gem's Royal	May
Sunnyview Sweet Nell	J. Phillips and Sons, Wondai	9,155·9	365·009	Sunnyview Kitchener	May
Ronnoc Tottie 3rd	O'Connor Brothers, Colinton	9,027·85	338·243	Ronnoc Emblem	May
Trevor Hill Twinkle 4th	G. Gwynne, Umbiram	9,082·8	365·068	Trevor Hill Bosca	June

PRODUCTION RECORDING—*continued.*

Animal.	Owner.	Milk Production.	Butter Fat.	Sire.	Month Compiled.
		Lb.	Lb.		
AUSTRALIAN ILLAWARRA SHORTHORN—*continued.*					
JUNIOR, 3 YEARS (STANDARD 270 LB.)—*continued.*					
Beaury Opal 25th	A. F. Campbell, Killarney	6,907·1	286·705	Dulcamah Monash	June
Rhodesview Nancy 75th	V. R. Nugent, Murgon	8,476·3	315·742	Fairvale Major	July
Fernhome Beryl	R. S. Griffiths, Moregatta	6,758·6	300·684	Merravale Gentle's Commodore	July
College Kitty 11th	Q.A.H.S. and College, Lawes	7,223·75	277·157	Alfa Vale Pride 3rd	July
Alfa Vale Model 29th (349 days)	W. H. Thompson, Nanango	17,634·65	846·644	Alfa Vale Paisley	August
Bantry Lila	D. Sullivan, Pittsworth	8,763·15	393·328	Rosenthal Surplus 2nd	August
College Rascal 19th	Q.A.H.S. and College, Lawes	6,897·3	278·688	Alfa Vale Pride 3rd	August
Ripley Park Mossrose 4th (223 days)	I. B. Skerman, Kaimkillenbun	6,748·39	270·6	Glenroy Security	August
Bunyaview Reflection's Rosette	W. D. Davis, Wambo	9,248·0	350·0	Trevor Hill Reflection	September
Cedargrove Ella 9th	F. Derrick, Monto	8,659·0	348·0	Rosenthal Scout	September
Fairvale Doris 13th	W. D. Davis, Wambo	7,221·0	327·0	Fairvale Reward	September
Alfa Vale Florrie 7th	W. H. Thompson, Nanango	8,297·0	380·0	Penrhos Pansy's Pride	October
Rhodesview Royal Primrose 6th	W. Gierke and Sons, Helidon	9,042·0	366·0	Alfa Vale Nigel	October
Fernhome Cecile	R. S. Griffiths, Moregatta	6,554·0	337·0	Glengarry Gem's Royal	October
Alfa Vale Myrtle 6th	W. H. Thompson, Nanango	8,312·0	334·0	Alfa Vale Reward 2nd	October
Grahamville Sapphire	W. J. Horrocks, Maclagan	7,185·0	306·0	White Park Ronald	October
Fairvale Dulcie	I. B. Skerman, Kaimkillenbun	6,119·0	277·0	Fairvale Red Prince	October
SENIOR, 2 YEARS (STANDARD 250 LB.).					
Glen Idol Daphne 27th	Estate of P. Doherty, Gympie	10,201·8	377·302	Glen Idol Coronet	April
Glen Idol Daphne 29th	Estate of P. Doherty, Gympie	9,765·0	345·095	Glen Idol Charmer	April
Kapleton Maiden	J. A. Lane, Kilcoy	8,132·15	324·829	Rhodesview Royal Lad	April
Hillfield Beauty 2nd	S. J. Lester, Mulgowie	6,222·85	284·15	Blacklands Florrie 9th's Heir	April
Rhodesview Queenie 32nd	W. Gierke and Sons, Helidon	6,534·2	280·252	Rhodesview Royal Lad 2nd	April
Applegarth Calm 12th	R. F. Limberg, Esk	6,444·1	279·713	Fairholm Evidence	April
Glen Idol Countess 8th	Estate of P. Doherty, Gympie	7,720·7	266·502	Glen Idol Charmer	April
Bingleigh Ettie 11th	J. H. Fogg, Toogoolawah	6,918·85	262·525	Bingleigh Jean's Sultan	April
Glenore Cherry	P. J. Donaghy and Son, Malanda	8,539·1	250·7	Alfa Vale Pride 18th	May
Fernhome Lillian	L. Emmerson, Malanda	7,274·1	317·412	Glengarry Gem's Royal	May
Cedar Grove Ellen 35th	F. Derrick, Moonford	7,881·75	307·476	Coral Grange Darby	May
Penrhos Janet 2nd	A. Sandilands, Wildash	6,765·25	269·163	Rosenthal McArthur	May
Alascan Pal	A. Lohse, Biggenden	8,415·9	268·687	Sunnyview Ruby's Elect	May
Fairvale Prince's Doris 12th	I. B. Skerman, Kimkillenbun	6,360·26	257·798	Fairvale Red Prince	May
Cedar Grove Wonder 43rd	F. Derrick, Moonford	7,246·75	253·775	Rosenthal Scout	May
Blacklands Queen 34th	A. Pickels, Proston	8,163·65	251·702	Parkview Alexander	May
Wonga Jessie	J. Coonan, Cambooya	8,349·75	380·586	Fairlie Senator	June
Blacklands Pretty Maid 21st	A. Pickels, Proston	7,763·9	378·204	Blacklands Maiden's Monarch	June
Ardilea Broady 14th	Hinrichsen and Sons, Clifton	6,950·7	284·251	Newstead Musician	June
Yarranvale My Gift	W. D. Davis, Wambo	7,787·25	281·45	Sunnyview Royal National	June
Wamba Evelyn	W. D. Davis, Wambo	6,403·5	275·557	Highfields Captain	June
Beaury Plum 13th	A. F. Campbell, Killarney	6,558·4	255·367	Carribee Aviator	June
Blacklands Foremost 44th	A. Pickels, Proston	11,310·45	450·526	Blacklands Gloucester	July
Wonga Flower	J. Coonan, Cambooya	7,991·65	371·518	Reservior Yenda	July
Wonga Cherry	J. Coonan, Cambooya	8,740·2	367·999	Reservior Yenda	July

College Rapture 9th	Queensland Agricultural High School and College, Lawes	8,302·5	291·888	Alfa Vale Magic	July
Corella Dulcie	Mrs. A. E. Powell, Chinchilla	7,233·0	269·569	Alfa Vale Jumbo	July
Penrhos Pansy 23rd	A. Sandilands, Wildash	6,840·9	264·708	Rosenthal McArthur	July
Learmont Beauty	P. J. Donaghy, Malanda	9,171·35	387·862	Sunnyview Melba's Hero	August
Greenhill Polly 11th	J. A. Lane, Kilcoy	11,609·85	343·721	Coral Grange Darby	August
Bantry Model 2nd	D. Sullivan, Pittsworth	7,554·45	320·878	Valera Monarch	August
College Stately 25th	Queensland Agricultural High School and College, Lawes	8,116·1	271·114	Alfa Vale Pride 3rd	August
College Rapture 10th	Queensland Agricultural High School and College, Lawes	7,452·7	268·56	Alfa Vale Pride 3rd	August
Kulpi Dairymaid	H. L. and C. I. Bruggemann, Kulpi	5,501·63	260·74	White Park Redman	August
Blacklands Envy 48th	G. Sperling, Kooralgin	6,020·8	251·83	Blacklands Topsy's Elect	August

SENIOR, 2 YEARS (STANDARD 250 LB.).

Cedargrove Ellen 36th	F. Derrick, Moonford	8,475·0	302·0	Rosenthal Scout	September
Calrossie Camelia 2nd	D. L. Lithgow, Jandowae	6,240·0	279·0	Aynesley Eclipse 3rd	September
Alascan Hazel	A. Lohse, Degilbo	7,691·0	319·0	Alfa Vale Review	October
Millievale Doris	A. H. Webster, Helidon	7,003·0	274·0	Corals Gold Standard	October

JUNIOR, 2 YEARS (STANDARD 230 LB.).

Cedar Valley Honeysuckle	A. C. Marquardt, Mondure	8,147·25	320·421	Kyabram Masterpiece	April
St. Andrew's Gem 16th	M. C. Lester, Glengallan	8,367·75	352·582	Tabbagong Victory	May
Kenstan Gem	T. W. Fowler, Kenstan	8,050·4	351·96	Trevor Hill Gallant	May
Bantry Bonnie 2nd	D. Sullivan, Rossvale	7,675·2	331·63	Bantry Commodore	May
Bantry Rose 4th	D. Sullivan, Rossvale	8,010·4	331·221	Bantry Commodore	May
Blacklands Carnation 18th	A. Pickels, Proston	7,114·2	285·039	Blacklands Gloucester	May
Glenore Rosetta	P. J. Donaghy and Son, Malanda	6,726·25	284·863	Alfa Vale Pride 18th	May
St. Andrew's Gentle 2nd	M. C. Lester, Glengallan	6,201·9	272·689	Tabbagong Victory	May
Emby Vale Velvet	Madge Brothers, Southbrook	6,847·7	258·465	Barkworth Master	May
Sunnycrest Una 2nd	A. H. Sokoll, Wondai	5,882·25	254·592	Sunnycrest Victory	May
Lynfield Lucy 2nd	F. E. Birt, Sexton	6,123·95	247·921	Bingleigh Jean's Victory	May
Bingleigh Ethel 3rd	S. J. Lester, Mulgowie	6,131·3	247·674	Blacklands Emblem	May
Murcott Charm 3rd	T. McLennan, Willowvale	6,358·75	238·243	Fairthorn Rainbow's Prince	May
Trevor Hill Vena	T. W. Fowler, Felton	11,278·25	469·446	Fairvale Jellicoe	June
Navillus Gem 3rd	C. O'Sullivan, Greenmount	8,768·1	387·684	Navillus Brightlight	June
Trevor Hill Marvelette	K. A. Ruhle, Motley	7,590·7	386·773	Fairvale Jellicoe	June
Kenstan Opal	T. W. Fowler, Felton	9,279·85	366·860	Trevor Hill Gallant	June
Alfa Vale Star 17th	W. H. Thompson, Nanango	8,675·6	355·606	Alfa Vale Reward 2nd	June
Cedar Valley Rosette	J. H. Fogg, Toogoolawah	8,613·05	347·714	Kyabram Masterpiece	June
Valera Roseleaf 26th	Sullivan Brothers, Pittsworth	6,906·0	317·686	Alfa Vale Pride 2nd	June
Valera Sally 7th (236 days)	Sullivan Brothers, Pittsworth	7,559·75	308·454	Alfa Vale Pride 2nd	June
Valera July	Sullivan Brothers, Pittsworth	6,854·0	306·554	Alfa Vale Pride 2nd	June
Murcott Petunia 2nd	T. McLennan, Willowvale	7,055·95	278·799	Fairthorn Rainbow's Prince	June
Moola Colleen 3rd	I. B. Skerman, Kainkillenbun	6,511·9	273·257	Navillus ReNell	June
Blacklands Flower 20th	G. G. Sperling, Kooralgin	6,122·55	269·451	Blacklands Czar	June
Blacklands Fairy 29th	G. G. Sperling, Kooralgin	6,679·8	267·591	Blacklands Czar	June
Rosemount Cherry 47th	J. H. Fogg, Toogoolawah	6,137·8	260·743	Newstead Gambler	June
Murcott Clara 5th	T. McLennan, Willowvale	6,606·75	243·305	Fairthorn Rainbow's Prince	June
Highfields Perfect 45th	G. G. Sperling, Kooralgin	7,186·2	243·21	Highfields Tiger	June
Ennismore Fancy 5th	E. W. Jackson, Nobby	6,016·65	237·66	Arolla Limerick	June
Wonga Molly	J. Coonan, Cambooya	9,199·5	423·906	Reservior Yenda	July
Blacklands Miss Jean 24th	A. Pickels, Proston	8,288·8	301·201	Blacklands Gloucester	July

PRODUCTION RECORDING—*continued.*

Animal.	Owner.	Milk Production.	Butter Fat.	Sire.	Month Compiled.
		Lb.	Lb.		
AUSTRALIAN ILLAWARRA SHORTHORN—*continued.*					
JUNIOR, 2 YEARS (STANDARD 230 LB.).—*continued.*					
Ronnoc Calm 5th	O'Connor Brothers, Colinton	4,913·55	237·184	Ronnoc General	July
Glen Idol Miss Jean 3rd	Estate of P. Doherty, Gympie	9,528·1	355·734	Glen Idol Coronet	August
Murcott Laurel 3rd	T. McLennan, Willowvale	10,122·45	348·345	Fairthorn Rainbow's Prince	August
Ennismore Florrie 2nd	J. Coonan, Cambooya	7,845·3	337·365	Arolla Limerick	August
Alfa Vale Pet 5th	W. H. Thompson, Nanango	7,994·95	325·045	Penrhos Pansy's Pride	August
Talgai Vale Crummy	R. Herzig, Clifton	7,956·25	325·025	Jamberoo Butter Boy	August
College Dizzy 2nd	Queensland Agricultural High School and College, Lawes	6,339·5	287·189	Alfa Vale Pride 3rd	August
Faversham Doris 40th	H. V. Littleton, Crow's Nest	6,910·9	286·872	Girraween Gideon	August
Derradale Judy	F. Derrick, Monto	6,836·75	275·181	Sunnyview Royal Ruler	August
Sunnyview Rose Petal	J. A. Lane, Kilcoy	6,689·25	264·702	Sunnyview Kitchener	August
Murcott Clara 6th	T. McLennan, Willowvale	6,016·25	238·37	Fairthorn Rainbow's Prince	August
Sunnyside Mabel 25th	S. R. Moore, Wooroolin	6,388·7	232·545	Sunnyside Moneymaker	August
Blacklands Joan 12th	A. Pickels, Proston	6,794·0	318·0	Blacklands Gloucester	September
Faversham Dawn	W. D. Davis, Wambo	7,179·0	265·0	Girraween Gideon	September
Wenlock Beauty 5th	H. G. Watson, Killarney	6,099·0	263·0	Parkview Limerick	September
Wenlock Merle	H. G. Watson, Killarney	6,058·0	247·0	Parkview Limerick	September
Wamba Evelyn 2nd	W. D. Davis, Wambo	6,229·0	245·0	Greyleigh Eros	September
Applegarth Posy 10th	F. Derrick, Moonford	6,357·0	244·0	Fairholm Evidence	September
Lynfield Matron 2nd	F. E. Birt, Sexton	6,366·0	237·0	Bingleigh Jean's Monarch	September
Trevor Hill Vena (365 days)	T. W. Fowler, Pittsworth	14,159·0	594·0	Fairvale Jellicoe	October
Trevor Hill Rosalyn	K. A. Ruhle, Motley	9,357·0	450·0	Fairvale Jellicoe	October
Cleora Gleam	K. Berghofer, Athol	7,508·0	287·0	Rocklea Comet	October
Valera Roseleaf 29th (242 days)	Sullivan Brothers, Pittsworth	6,514·0	280·0	Valera Monarch	October
Applegarth Rosebud 9th	F. Derrick, Moonford	7,261·0	272·0	Fairholm Evidence	OctoSer
Cleora Winnie	K. Berghofer, Westbrook	6,453·0	257·0	Rocklea Comet	October
Fermanagh Lila 4th (207 days)	F. B. Sullivan, Pittsworth	5,452·0	241·0	Valera Daphne's Prince	October
Faversham Gideon's Ruby	I. B. Skerman, Kaimkillenbun	4,695·0	234·0	Girraween Gideon	October
JERSEY.					
MATURE COW (STANDARD 350 LB.).					
Windsor Lady Gladys	H. Johnson, Gleneagle	10,737·8	537·384	Brooklands Sultan's Victory	April
Gem Leila	W. Bishop, Kenmore	9,679·8	526·468	Calton Lothean	April
Glenview Vanity	F. Z. Eager, Neurum	8,350·25	475·748	Trinity Governor's Hope	April
Rosedale Maud	W. R. French, Wowan	9,828·4	468·004	Carnation Queen's Duke	April
Trecarne Sweetheart 7th	C. S. Coleman, Cainbabel	7,870·05	465·287	Trecarne Some Duke	April
Tecoma Golden Pet	R. J. Crawford and Sons, Kingaroy	6,896·85	389·209	Trinity Golden Royal	April
Ashview Eva	C. Huey, Sabine	6,752·85	382·116	Trecarne Butter Queen's Officer	April
Erceldine Desire	B. T. Seymour, Kapaldo	7,770·0	370·936	Navua Royalist Prince	April
Ashview Tot	C. Huey, Sabine	7,835·65	366·06	Trecarne Victor 4th	April

Brooklands Merry Jingle Belle	W. S. Conochie, Sherwood	10,580·05	529·906	Bulby Maria's Keepsake	May
Mayfair Roseslip 5th (257 days)	J. Carpenter, Helidon	7,678·95	522·435	Trecarne Golden King 2nd	May
Strathdean Star 2nd	C. W. Carpenter, Warra	8,606·2	461·17	Navua Ladora's Ruler	May
Nairfale Lady Laura	R. J. Browne, Yangan	8,543·8	458·18	Nairfale Noble Count	May
Boree Beauty	W. and C. E. Tudor, Branch Creek	10,202·4	448·493	Boree Soldier Boy	May
Elwyn Brighteyes	E. J. Dunning and Sons, Stanmore	9,279·8	441·747	Glenside Lone Star	May
Upwell Miss Flaxman	B. Seymour, Kapaldo	7,892·25	428·438	Lindley Prince	May
Westwood Dixie	F. Porter, Cambroon	7,756·7	424·275	Westwood Combination	May
Trinity Crowning Poppy	Sinnamon and Sons, Moggill	9,374·7	422·162	Trinity Crowning Effort	May
Brooklands Gold Leaf	W. S. Conochie, Sherwood	8,351·45	414·385	Brooklands Royal Standard	May
Elwyn Favourite	E. J. Dunning and Sons, Stanmore	8,900·65	409·882	Glenside Lone Star	May
Elwyn Dairymaid	E. J. Dunning and Sons, Stanmore	9,332·85	409·747	Glenside Lone Star	May
Glenbrook Lady Lynn	J. F. Lovell, Samford	8,245·45	387·99	Glenbrook Governor	May
Palen Leda	State Farm, Palen Creek	8,024·55	384·007	Banyule Silvermine Oxford	May
Homesdale Spray	J. Oakley, Numinbah Valley	6,437·15	375·203	Homesdale Echo	May
Elwyn Golden Molly	E. J. Dunning and Sons, Stanmore	8,325·95	364·425	Glenside Lone Star	May
Tecoma Averier	A. Semgreen, Coolabunia	5,969·3	357·263	Oxford Asteroid	May
Kathleigh Silver 2nd	F. W. Kath, Moffat	10,668·13	642·567	Oxford Daffodil's Victor	June
Gem May (212 days)	W. Bishop, Kenmore	8,790·15	548·663	Laces Volunteer of Ardroy	June
Nairfale Lady Laura (305 days)	R. J. Browne, Yangan	9,215·8	498·486	Nairfale Noble Count	June
Brookland Cunning Drop	W. S. Conochie, Sherwood	10,239·7	475·684	Englorie Cunning Victor	June
Crossley Nora	L. A. Mayfield, Goomeri	9,621·2	427·576	Calton Laddie Boy	June
Ashview Lady 2nd	C. Huey, Sabine	7,164·4	407·671	Trecarne Victor 4th	June
Englebourne Goldie	M. May, Hermitage	7,985·65	403·406	Oxford Floss' Remus	June
Elwyn Juliet	E. J. Dunning and Sons, Stanmore	7,997·8	402·998	Glenside Lone Star	June
Glenrandle Luna	M. J. Kerlin, Killarney	6,996·3	396·705	Bellgarth Stylish	June
Inverlaw White Daisy	R. J. Crawford and Sons, Kingaroy	6,782·15	365·265	Inverlaw Saturn	June
Keystone Morilla 14th	R. D. Johnson, Kingaroy	7,556·75	361·53	Bonnie Vue Gay Peer	June
Palm Ridge Dewdrop	F. Z. Eager, Neurum	8,538·45	358·142	Oxford Jocular Lad	June
Glenrandle Golden Girl	P. Kerlin, Killarney	7,792·75	419·669	Bellgarth Stylish	August
Fauvic Sunnymorn	S. A. Cramb, Noosa Heads	7,980·7	413·456	Navua Kahokas Lad	August
Romsey Stylish Hope	J. Wilton, Killarney	7,613·85	400·233	Bellgarth Stylish	August
Trinity Efforts Lady	D. Wadley, Indooroopilly	8,663·5	400·035	Trinity Crowning Effort	August
Mountain View Seaspray	W. R. French, Wowan	7,062·25	394·774	Pineview Beryl's King	August
Glenrandle Lucy	P. Kerlin, Killarney	7,015·3	384·23	Bellgarth Glory King	August
Glenbrook Golden Lynn	D. Wadley, Indooroopilly	7,327·05	381·125	Lermont Golden Victory	August
Golden Hill June 2nd	J. J. Bugler, Wowan	7,605·05	376·531	Trinity Golden Chance	August
Brooklands Cream Flake	W. S. Conochie, Sherwood	7,303·0	430·0	Englorie Cunning Victor	September
Brooklands Angel Cake	W. S. Conochie, Sherwood	6,757·0	393·0	Bulby Maria's Keepsake	September
O. K. Palatine Florence (Imp.) (252 days)	Q.A.H.S. and College, Lawes	6,623·0	371·0	Lobelia Palatine Sultan	September
Trinity Cute Maisie	G. Harley, Childers	7,288·0	370·0	Trinity Cute Prince	September
Fauvic Sunnymorn (365 days)	S. A. Cramb, Noosa Heads	9,977·0	515·0	Navua Kahokas Lad	October
Palmridges Sylvina (255 days)	H. Sigley, Jaggan	9,984·0	515·0	Overlook Financier	October
Fauvic Marmay	S. A. Cramb, Noosa Heads	7,981·0	405·0	Condong Marabean	October

SENIOR, 4 YEARS (STANDARD 330 LB.).

Wyreene Daisy Bell (365 days)	C. W. and E. M. Barlow, Boodua	11,397·4	598·626	Wyreene Marcella's Boy	April
Ashview Lady 3rd	C. Huey, Sabine	7,839·85	462·287	Trecarne Victor 4th	April
Glenview Golden Ebbis	F. Z. Eager, Neurum	6,902·6	384·13	Trinity Governor's Hope	April
Gunawah Tulip	R. D. Johnson, Kingaroy	7,590·35	366·161	Gunawah Jack Frost	April
Trinity Efforts Royal	Sinnamon and Sons, Moggill	9,355·3	474·619	Trinity Crowning Effort	May
Lermont Posy 3rd	J. Ahern, Conondale	7,461·85	404·383	Selsey Samares Hallmark	May
Marshlands Royal Lady (Imp.)	F. W. Kath, Moffat	10,605·82	607·261	Brampton's Dreaming Royal	June
Trecarne Doreen 6th	H. T. W. Barker, Devonpark, Oakey	8,501·6	479·274	Trecarne Some Duke	June
Westwood Snowbells	F. Porter, Cambroon	6,196·95	377·626	Westwood Combination	June
Inverlaw Royal Phyllis	R. J. Crawford and Sons, Kingaroy	6,725·1	373·926	Oxford Royal Lad	July
Trecarne Rosebud 8th	I. L. M. Borchert, Kingaroy	5,931·85	365·006	Trecarne Some Duke	August
Westbrook Bells 14th	Farm Home for Boys, Westbrook	7,552·25	359·927	Westbrook Ambassador 52nd	August

PRODUCTION RECORDING—*continued.*

Animal.	Owner.	Milk Production.	Butter Fat.	Sire.	Month Compiled.
		Lb.	Lb.		
	JERSEY—*continued.*				
	JUNIOR, 4 YEARS (STANDARD 310 LB.).				
Westbrook Tulip 138th	C. M. Carpenter, Warra	6,694·0	368·809	Mornmoot Clementine's Valour	May
Lermont Madeira 3rd	J. McCarthy, Greenmount	6,839·65	407·405	Trinity Noble Effort	June
Trecarne Daffodil's Jewel	H. Sigley, Jaggan	6,078·35	367·26	Trecarne Ruler	June
Gem Ida	D. Wadley, Indooroopilly	6,680·1	356·343	Bulby Oxford Gamboge	June
Strathdean Victor's Dolly	C. M. Carpenter, Warra	8,307·96	450·721	Oxford King's Victor	July
Nairfale Mayday	R. J. Browne, Yangan	6,488·6	317·708	Nairfale Count's Paymaster	August
Brooklands Merry Prudence	W. S. Conochie, Sherwood	7,292·0	404·0	Bulby Maria's Keepsake	September
Mayfair Joybell	J. W. Carpenter, Flagstone Creek	6,171·0	365·0	Lermont Double Volunteer	September
Burnlea Matilda	A. E. Trigger, Didcot	6,038·0	325·0	Woodside Rochette's Monarch	September
	SENIOR, 3 YEARS (STANDARD 290 LB.).				
Grasmere Victory's Charm	F. Z. Eager, Neurum	7,891·35	454·001	Oxford Brown Victory	April
Mountain View Fawny (243 days)	W. R. French, Wowan	7,268·5	338·029	Brookland Crumpet	April
Mountain View Brown Charm (228 days)	W. R. French, Wowan	7,048·3	301·149	Brookland Crumpet	April
Kathleigh Attraction	F. W. Kath, Moffat	9,404·07	540·925	Oxford Daffodil's Victory	May
Nairfale Likeness	R. J. Browne, Yangan	8,849·2	459·146	Nairfale Golden Recorder	May
Trinity Cute Princess 2nd	Sinnamon and Sons, Moggill	8,980·7	434·692	Samares Cute Prince 3rd (Imp.)	May
Nairfale Trinket	R. J. Browne, Yangan	6,942·6	371·224	Nairfale Count's Prominence	May
Manneum Morilla	R. D. Johnson, Kingaroy	7,081·8	364·496	Nimbrae Promoter	May
Lermont Mischief	J. Schull, Oakey	6,143·1	358·413	Trinity Noble Effort	May
Glenrandle Lottie	P. Kerlin, Killarney	6,265·3	351·008	Bellgarth Glory King 2nd	May
Mountain View Brown Charm	W. R. French, Wowan	7,856·05	344·929	Brooklands Crumpet	May
Nairfale Likeness (305 days)	R. J. Browne, Yangan	9,512·7	493·082	Nairfale Golden Recorder	June
Westwood Melva	F. Porter, Cambroon	7,956·1	482·677	Trecarne Golden King 2nd	June
Boree Cute Daisy	W. and C. E. Tudor, Branch Creek	8,562·4	441·121	Trinity Cute Commodore	June
Nairfale Trinket (305 days)	R. J. Browne, Yangan	7,505·2	404·966	Nairfale Count's Prominence	June
Palen Lotus 2nd	H.M. Prison, Palen Creek	7,007·35	355·521	Palen Optician	June
Myrtledale Rosealea	H. Sigley, Jaggan	5,507·1	319·648	Palm Ridges Golden Symbol	June
Manneum Cosmos 2nd	R. D. Johnston, Kingaroy	8,135·3	473·7	Nim Brae Promoter	August
Glenside Ellen	G. and V. Beattie, Antigua	7,879·6	373·471	Navua Dreaming Brave	August
Nairfale Gentle (305 days)	R. J. Browne, Yangan	6,336·7	330·756	Nairfale Golden Recorder	August
Nairfale Gentle	R. J. Browne, Yangan	6,049·1	312·154	Nairfale Golden Recorder	August
Hocknell Volunteer Ginger Cake	L. E. Harmer, Beaudesert	7,031·0	394·0	Navua Sporting Volunteer	September
Windsor Princess Florence	H. Johnson, Gleneagle	6,575·0	377·0	Bobs of Wingate	September
Goldlands Daffodil	C. Beckingham, Everton Park	7,586·0	378·0	Calton Lotmyle	October
	JUNIOR, 3 YEARS (STANDARD 270 LB.).				
Westbrook Bells 17th	C. M. Carpenter, Warra	8,314·56	461·199	Westbrook Silvermine Valour	May
Romsey Bonnie Beauty	J. Wilton, Killarney	7,579·7	413·673	Bellgarth Lancer 3rd	May
Brooklands Merry Rosanna	W. S. Conochie, Sherwood	7,047·2	392·026	Bulby Maria's Keepsake	May
Lermont Kitten	J. Schull, Oakey	6,404·25	328·041	Trinity Noble Effort	May
Trinity Sparkling Crescent	F. W. Kath, Moffat	8,274·28	447·256	Trinity National Victory	June

Boree Cute Beauty	W. and C. E. Tudor, Branch Creek	9,060·7	438·126	Trinity Cute Commodore	June
Kathleigh Valmay	F. W. Kath, Moffat	7,165·2	433·649	Oxford Daffodil's Victor	June
Glenrea Melody	C. Beckingham, Everton Park	7,303·74	368·186	Brampton Bandmaster	June
Woodview Fairyfly	L. E. Marsden, Canaga	5,226·9	292·407	Trecarne Royal Officer	June
Grasmere Victorious Camille	Q.A.H.S. and College, Lawes	5,628·3	274·478	Navua Victorious Samaritan	July
Glenrandle Lulu	M. J. Kerlin, Killarney	7,860·5	444·438	Oxford Noble Peer	August
Trinity National Daffodil	F. W. Kath, Moffat	6,985·6	387·004	Trinity National Victory	August
Westbrook Tulip 143rd	Farm Home for Boys, Westbrook	6,543·85	347·276	Selsey Royal Standard	August
Navua Egretta 3rd	P. J. L. Bygrave, Aspley	5,764·45	326·972	Elm Hill Voixenia Nobly Born (Imp.)	August
Nairfale Coquette	R. J. Browne, Yangan	5,934·8	304·826	Kelvinside Handsome Boy	August
Glenmoore May Rose	I. L. M. Borchert, Kingaroy	5,219·15	290·969	Glenmoore May King	August
Tecoma Averiel	A. Semgreen, Coolabunia	5,004·35	278·435	Glenview Royal Chief	August
Glenside Ivory	G. and V. Beattie, Antigua	4,801·65	270·263	Oxford Dudley	August
Kenilworth Midget	I. J. L. Evans, Cooroy	6,298·0	349·0	Rosevale War Bond	September
Nairfale Coquette (305 days)	R. J. Browne, Yangan	6,322·0	331·0	Kelvinside Handsome Boy	September
Coolbar Ramona	I. L. M. Borchert, Kingaroy	6,649·0	329·0	Glenmoore Jean's Royal	September
Nairfale Comedy's Design	R. J. Browne, Yangan	5,284·0	295·0	Kelvinside Handsome Boy	September
Lermont Golden Kate 2nd	J. Schull, Oakey	4,588·0	291·0	Trinity Graceful Duke	September
Ashview Gift	C. Huey, Sabine	5,375·0	288·0	Trecarne Victor 4th	September
Trecarne Rosebud 9th	I. L. M. Borchert, Kingaroy	5,273·0	278·0	Trecarne Golden Lad	September
Fauvic Playful	W. J. Blair, Cooroy	5,071·0	271·0	Glengarriffe Ceasar's Flavius	September
Mountain View Maiden	W. R. French, Wowan	7,673·0	398·0	Brookland Crumpet	October
Wyalla Tottie	C. M. Carpenter, Warra	6,604·0	363·0	Trecarne Supreme 3rd	October
Trinity Prim Lass	D. Wadley, Indooroopilly	5,929·0	316·0	Trinity Crowning Effort	October

SENIOR, 2 YEARS (STANDARD 250 LB.).

Cedars Silver Wattle	C. M. Carpenter, Warra	7,017·62	397·465	Cedars King	April
Tecoma Fern	R. D. Johnson, Kingaroy	5,120·0	266·783	Trinity Golden Royal	April
Morago White Xmas (225 days)	W. R. French, Wowan	6,123·0	266·764	Brookland Merry Charmer	April
Trinity Keeper's Darling	D. Wadley, Indooroopilly	5,141·0	263·552	Trinity Cute Effort	April
Trinity National Daisy	Sinnamon and Sons, Moggill	8,244·5	441·527	Trinity National Victory	May
Wyalla Crescent 2nd	Farm Home for Boys, Westbrook	7,037·0	401·953	Trecarne Supreme 3rd	May
Cedars Dandelion	C. M. Carpenter, Warra	7,144·17	398·357	Cedars King	May
Brooklodge Ada	J. Ahern, Conondale	6,027·75	358·645	Trinity Mighty Prince	May
Nairfale Idol's Delight	R. J. Browne, Yangan	6,428·1	341·128	Nairfale Golden Recorder	May
Mayfair Lady Gay	J. W. Carpenter, Helidon	5,334·9	328·193	Lermont Double Volunteer	May
Lermont Silverbell 3rd	J. Schull, Oakey	5,759·85	315·172	Trinity Graceful Duke	May
Connemara Mistress Olga	J. Ahern, Conondale	5,205·75	315·042	Glenview Lochiel	May
Brooklands Regal Maid	W. S. Conochie, Sherwood	5,571·05	312·721	Brooklands Regalia	May
Inverlaw Cynthia	R. J. Crawford and Sons, Kingaroy	5,428·7	302·756	Inverlaw Royalist	May
Trinity Crowning Royal	Sinnamon and Sons, Moggill	5,540·4	299·837	Trinity Crowning Effort (Imp.)	May
Carnation Peeress	W. Spresser and Son, West Ipswich	5,050·0	257·686	Oxford Fawn's Victor	May
Carnation Marina	W. Spresser and Son, West Ipswich	5,660·2	256·261	Oxford Fawn's Victor	May
Manneum Dawn's Pride	R. D. Johnson, Kingaroy	5,649·3	297·818	Nimbrae Promoter	May
Windsor Royal Beatrice	H. Johnson, Gleneagle	8,559·4	420·231	Brookland Merry Monarch	June
Nairfale Idol's Delight (305 days)	R. J. Browne, Yangan	6,962·1	370·503	Nairfale Golden Recorder	June
Boree Effort's Lily	W. and C. E. Tudor, Branch Creek	7,345·07	357·137	Trinity Daffodil's Effort	June
Sunny Glen Vera 3rd	J. McCarthy, Greenmount	7,375·9	349·162	Ivy Bank Lad	June
Inverlaw Princess Phyllis	R. J. Crawford and Sons, Kingaroy	6,314·35	343·928	Inverlaw Royalist	June
Brooklodge Carolyn	J. J. Ahern, Conondale	5,881·25	330·088	Trinity Mighty Prince	June
Inverlaw Lenora	R. J. Crawford and Sons, Kingaroy	6,224·35	295·833	Inverlaw Royalist	June
Inverlaw Royal Dairymaid	R. J. Crawford and Sons, Kingaroy	5,413·45	277·908	Oxford Royal Lad	June
Minidong Maid (305 days)	R. J. Browne, Yangan	7,281·9	384·454	Balwyn's Fancy Baron	August

PRODUCTION RECORDING—*continued.*

Animal.	Owner.	Milk Production.	Butter Fat.	Sire.	Month Compiled.
		Lb.	Lb.		
	JERSEY—*continued.*				
	SENIOR, 2 YEARS (STANDARD 250 LB.)—*continued.*				
Minidong Maid	R. J. Browne, Yangan	7,087·5	370·548	Balwyn's Fancy Baron	August
Brooklodge Joyful Girl	J. Ahern, Conondale	6,359·9	351·376	Trinity Mighty Prince	August
Hillsdale Charm	A. S. Grant, Greenwood	5,444·7	312·678	Rosallen Laddie	August
Tecoma Blue Columbine	A. Semgreen, Coolabunia	5,764·9	291·744	Austral Park Double Blue	August
Trinity Cute Lady 2nd	D. Wadley, Indooroopilly	6,215·6	285·776	Trinity Cute Effort	August
Hillsdale Eileen	A. S. Grant, Greenwood	5,612·9	285·483	Rosallen Laddie	August
Grasmere Noble Gleam	M. May, Hermitage	6,266·55	273·954	Springhurst Noble Oak	August
Boree Efforts Auriel	G. and V. Beattie, Antigua	5,777·0	267·0	Trinity Daffodil's Effort	September
Westwood Majesty	F. Porter, Cambroon	6,464·0	442·0	Trecarne Golden King 2nd	October
Ashview Hazeldale	C. Huey, Sabine	5,960·0	312·0	Trecarne Some Tot's Duke 2nd	October
Laurena Royal Tulip	L. E. Harmer, Beaudesert	5,867·0	301·0	Golden View Some Hope	October
	JUNIOR, 2 YEARS (STANDARD 230 LB.).				
Brookland Regal Laurel Leaf	W. S. Conochie, Sherwood	5,736·2	313·22	Brooklands Regalia	April
Myrtledale Sweetheart	H. Sigley, Jaggan	5,571·7	312·528	Palm Ridges Golden Victory	April
Nairfale Chenille (365 days)	R. J. Browne, Yangan	6,069·6	298·947	Kelvinside Handsome Boy	April
Ashview Some Lady	C. Huey, Sabine	5,286·8	298·347	Trecarne Some Tot's Duke 2nd	April
Inverlaw Dark Petal	R. D. Johnson, Kingaroy	5,557·3	293·508	Oxford Royal Lad	April
Brooklands Regal Monica	W. S. Conochie, Sherwood	5,797·8	287·742	Brooklands Regalia	April
Brooklands Regal Rose	W. S. Conochie, Sherwood	5,388·7	284·776	Brooklands Regalia	April
Bellgarth Nancy	D. R. Hutton, Cunningham	4,790·3	271·483	Gem Rodney 2nd	April
Nindet Ana Ila	D. Wadley, Indooroopilly	4,748·85	267·348	Trinity Valiant Effort	April
Hill 60 Golden Thread	R. J. Browne, Yangan	4,934·9	257·241	Kelvinside Dream Boy	April
Fauvic Refund	H. Cochrane, Kin Kin	5,054·9	256·487	Fauvic Trial Link	April
Carnation Kitty	W. Spresser and Son, Rosewood	5,413·85	244·212	Oxford Fawn's Victor	April
Trinity Effort's Duchess	J. S. McCarthy, Greenmount	4,518·65	236·501	Trinity Crowning Effort	April
Westwood Sunglow	F. Porter, Cambroon	5,905·9	389·222	Devon Park Madiera's Victorious	May
Westwood Rainbird	F. Porter, Cambroon	6,992·75	358·859	Devon Park Madiera's Victorious	May
Mayfair Golden Girl	J. W. Carpenter, Helidon	5,716·2	358·702	Trinity Crowning Admiral	May
Trinity Crowning Gem	Sinnamon and Sons, Moggill	6,300·75	336·002	Trinity Crowning Effort	May
Westbrook Tulip 147th	Farm Home for Boys, Westbrook	5,718·25	334·414	Westbrook Comet 17th	May
Inverlaw Remus Syria	R. J. Crawford and Sons, Kingaroy	5,873·25	329·427	Oxford Royal Lad	May
Oxford Corinne	V. Granger, Numinbah Valley	6,220·85	311·577	Glenview Royal Chief	May
Tecoma Blue Pet	A. Semgreen, Coolabunia	4,795·7	312·468	Austral Park Double Blue	May
Glen Erin Viola	J. McCarthy, Greenmount	5,851·4	308·211	Ashfield Prometheus	May
Inverlaw Brown Phyllis	R. J. Crawford and Sons, Kingaroy	5,492·45	305·814	Grasmere Brown Victory	May
Westwood Minion	F. Porter, Cambroon	5,036·2	300·111	Devon Park Madiera's Victorious	May
Brook Lodge Viole	J. Ahern, Conondale	4,797·7	297·51	Trecarne Some Victor 4th	May
Trinity Victory's Princess	Sinnamon and Sons, Moggill	5,801·1	294·661	Trinity National Victory	May
Brook Lodge Petunia	J. Ahern, Conondale	4,908·05	292·755	Trecarne Some Victor 4th	May
Glenview Skipton's Gay Girl	V. Granger, Numinbah Valley	5,703·5	282·599	Oxford Skipton	May
Brookland Regal Cream Lass	W. S. Conochie, Sherwood	5,117·2	281·219	Brookland Regalia	May
Brookland Regal Myrtle	W. S. Conochie, Sherwood	4,873·75	276·856	Brookland Regalia	May
Nairfale Sapphire	R. J. Browne, Yangan	5,933·6	274·347	Kelvinside Handsome Boy	May

Trinity Lady Lass	Sinnamon and Sons, Moggill	5,153·0	264·972	Trinity National Victory	May
Navua Cecilia's Strike 2nd	P. J. L. Bygrave, Aspley	5,751·94	261·049	Navua Sociable Designer	May
Glenrae Ballerina	J. Oakley, Numinbah Valley	4,684·0	259·748	Oxford Skipton	May
Glenrae Sea Foam (234 days)	D. R. Winchester, Numinbah Valley	4,826·35	258·952	Trecarne Some Duke	May
Oxford Royal Francis	E. Burton and Sons, Wanora	5,017·3	256·822	Glenview Royal Chief	May
Ashview Larkspur 2nd	C. Huey, Sabine	5,053·1	251·074	Trecarne Victor 4th	May
Inverlaw Hilda	H. Sigley, Jaggan	4,188·25	244·949	Inverlaw Councillor	May
Heatherlea Blossom	J. A. Smith, Chinchilla	4,796·4	240·353	Colindale Socks	May
Oxford Royal Creole	E. Burton and Sons, Wanora	5,398·15	239·196	Glenview Royal Chief	May
Burnlea Doris	A. E. Trigger, Didcot	5,272·85	233·931	Woodside Rochette's Monarch	May
Kathleigh Royal Lady	F. W. Kath, Moffat	7,353·08	426·545	Kathleigh Masterman	June
Boree Cute Coral	W. and C. E. Tudor, Branch Creek	8,009·55	396·099	Trinity Cute Commodore	June
Westwood Royal Joy	F. Porter, Cambroon	6,682·5	385·104	Devonpark Madiera's Victorious	June
Weelu Hardship's Effort	C. W. and E. M. Barlow, Boodua	5,077·05	383·068	Trinity Lily's Effort	June
Windsor Royal Ruth	H. Johnson, Gleneagle	6,273·0	339·745	Brookland Merry Monarch	June
Connemara Cream Maid	J. Ahern, Conondale	6,001·95	339·613	Glenview Lochiel	June
Westwood Vienna	F. Porter, Cambroon	6,046·75	336·75	Devon Park Madiera's Victorious	June
Grasmere Golden Skylark	F. Z. Eager, Neurum	6,354·7	315·012	Oakleigh Golden Pride	June
Oxford Victorious	E. Burton and Sons, Wanora	6,013·4	310·837	Oxford Franklyn	June
Nairfale Sapphire (305 days)	R. J. Browne, Yangan	6,388·7	297·308	Kelvinside Handsome Boy	June
Connemara Royal Bangle	J. Ahern, Conondale	4,920·4	294·005	Belgonia's Flashlight	June
Glen Erin Molly	J. McCarthy, Greenmount	5,513·3	292·044	Ashfield Prometheus	June
Nindethana Louise	D. Wadley, Indooroopilly	5,633·65	285·541	Trinity Cute Effort	June
Oxford Florizel	E. Burton and Sons, Wanora	6,125·2	272·005	Glenview Royal Chief	June
Westwood Bubbles	F. Porter, Cambroon	4,832·55	269·902	Devon Park Madiera's Victorious	June
Grasmere Twinkle's Gloria	F. Z. Eager, Neurum	5,055·6	268·552	Grasmere Twinkle's Victory	June
Elwyn Charming	E. J. Dunning and Sons, Stanmore	5,653·5	265·874	Navua Noble Lad	June
Oxford Royal Flake	E. Burton and Sons, Wanora	5,202·15	258·195	Glenview Royal Chief	June
Oxford Floretta	E. Burton and Sons, Wanora	5,829·0	252·447	Glenview Royal Chief	June
Fairford Design's Lupin	L. A. Mayfield, Goomeri	5,551·9	251·692	Trinity Crowning Ensign	June
Mount Carmel Trixie's Maid	A. S. Grant, Greenwood	4,241·95	237·82	Hocknell Volunteer Bounce	June
Upwell Miss Noteworthy	E. W. Goody, Bancroft	4,404·0	236·657	Glenview Some Sultan	June
Parkview Merry Tot	H. T. W. Barker, Oakey	4,945·45	234·608	Brookland Merry Cavalier	June
Upwell Fay Fawn	E. W. Goody, Bancroft	4,483·5	230·297	Glenview Some Sultan	June
Carnation Princess June	Queensland Agricultural High School and College, Lawes	6,933·5	382·897	Oxford Fawn's Victor	July
Parkview Merry Lass	H. T. W. Barker, Oakey	7,121·25	362·02	Brookland Merry Cavalier	July
Carnation Cream Girl	Queensland Agricultural High School and College, Lawes	5,906·7	353·904	Oxford Fawn's Victor	July
Tecoma Myrtle	A. Semgreen, Coolabunia	5,933·95	328·67	Austral Park Double Blue	July
Parkview Merry Princess	H. T. W. Barker, Oakey	6,314·15	266·465	Brookland Merry Cavalier	July
Gem Cream Lily	W. Bishop, Kenmore	4,279·55	249·127	Gem Loyal Highness	July
Coraldale Pretty Maid	W. A. White, Peeramon	4,268·15	241·319	Peeramon Britain	July
Ashview Golden Peal	C. Huey, Sabine	4,916·6	231·722	Trecarne Victor 4th	July
Laurena Lady Belle	L. E. Harmer, Beaudesert	4,647·2	230·901	Brookland Merry Signalles	July
Boree Efforts Briar (365 days)	D. J. Louttit, Moonford	12,411·25	616·47	Trinity Daffodil's Effort	August
Kathleigh Silversheen	F. W. Kath, Moffat	7,612·09	438·374	Kathleigh Masterman	August
Kathleigh Noble's Daffodil	F. W. Kath, Moffat	7,703·35	416·464	Oxford Fawn's Noble	August
Glen Erin Viola (365 days)	J. McCarthy, Greenmount	7,318·25	405·282	Ashfield Prometheus	August
Boree Cute Peggy	W. and C. E. Tudor, Gayndah	7,914·25	396·829	Trinity Cute Commodore	August
Kathleigh Pontorson	F. W. Kath, Moffat	6,689·41	369·075	Oxford Fawn's Noble	August
Ellerdale Watfern Berenice	J. McCarthy, Greenmount	5,721·0	351·153	Ellerdale Watfern Gamboge	August
Golden Hill Roselean	J. Bugler, Wowan	5,788·55	310·125	Golden Hill Joker	August
College Florette 11th	Queensland Agricultural High School and College, Lawes	5,899·9	265·583	Westbrook Ambassador 52nd	August
Glenside Dalice	Queensland Agricultural High School and College, Lawes	5,153·4	262·636	Oxford Dudley	August

PRODUCTION RECORDING—*continued.*

Animal.	Owner.	Milk Production.	Butter Fat.	Sire.	Month Compiled.
		Lb.	Lb.		
JERSEY—*continued.*					
JUNIOR, 2 YEARS (STANDARD 230 LB.).—*continued.*					
Glenside Goldenia	Queensland Agricultural High School and College, Lawes	5,005·0	259·776	Oxford Dudley	August
Mount Carmel Silver Moonbeam	A. S. Grant, Greenwood	4,680·55	238·901	Hocknell Volunteer Bounce	August
Oxford Louella	Queensland Agricultural High School and College, Lawes	4,300·9	232·427	Oxford Franklin	August
Nairfale Noble's Esteem	R. J. Browne, Yangan	5,714·0	333·0	Nairfale Pride's Noble	September
Mayfair Charm	J. W. Carpenter, Flagstone Creek	5,662·0	329·0	Lermont Double Volunteer	September
Windsor Royal Melody	H. Johnson, Gleneagle	5,550·0	306·0	Brookland Merry Monarch	September
Silverbrook Belarine	J. Schull, Oakey	5,351·0	305·0	Trinity Graceful Duke	September
Myrtledale Duchess	H. Sigley, Jaggan	4,877·0	294·0	Palm Ridges Golden Victory	September
Willow Bank Gold Wings	I. L. M. Borchert, Kingaroy	5,450·0	289·0	Inverlaw Observer	September
Willow Bank Mottle Fortune	I. L. M. Borchert, Kingaroy	4,233·0	281·0	Brampton Daffodils Peer	September
Brook Lodge Silicia 2nd	J. Ahern, Conondale	4,314·0	279·0	Trecarne Some Victor 4th	September
Fauvic Marion	W. J. Blair, Cooroy	5,445·0	247·0	Fauvic Cornet	September
Willow Bank Glee	I. L. M. Borchert, Kingaroy	4,603·0	233·0	Inverlaw Observer	September
Westwood Waratah	F. Porter, Cambroon	7,093·0	397·0	Glenview Lochiel	October
Nairfale Noble's Esteem (305 days)	R. J. Browne, Yangan	6,173·0	365·0	Nairfale Pride's Noble	October
Westwood Silver Leaf	F. Porter, Cambroon	5,493·0	292·0	Devon Park Madiera's Victorious	October
Laurena Majesty Belle	L. Massam, Gleneagle	5,943·0	267·0	Golden View One More	October
Woodview Elaine	L. E. Marsden, Canaga	3,914·0	231 0	Woodview Officer	October
GUERNSEY.					
MATURE COW (STANDARD 350 LB.).					
Willowbrae Verture	L. G. McKewen, Binjour	8,546·42	369·27	Linwood Peace Boy	May
Willowbrae Victoria	L. G. McKewen, Binjour	7,933·53	351·659	Linwood Peace Boy	May
Linwood Birdie	E. G. Foxton, Maleny	7,547·55	418·959	Linwood Rex	August
Tattenbah Primrose	W. A. K. Cooke, Witta	8,536·85	410·253	Laureldale Trump	August
SENIOR, 4 YEARS (STANDARD 330 LB.).					
Brookside Narelle	E. R. Evans, Loganlea	7,229·8	357·266	Brookside Harry Lauder	April
Oakwood Winkie	D. C. Johnston, Beaudesert	6,830·0	394·0	Fairfield Winner	October
JUNIOR, 4 YEARS (STANDARD 310 LB.).					
Oakwood Fay	D. C. Johnston, Logan Village	8,614·35	375·953	Fairfield Winner	April
Glenfield Empress (210 days)	A. A. Huth, Roadvale	6,777·7	332·826	Maidavale Baron	May
Oakwood Gloria	D. C. Johnston, Logan Village	7,349·3	359·364	Fairfield Winner	June
SENIOR, 3 YEARS (STANDARD 290 LB.).					
Adaville Honest Girl	G. Miller, Chamber's Flat	7,992·0	331·505	Laureldale Pluto	April
Oakwood Cherry	W. H. Doss, Degilbo	7,323·15	298·296	Fairfield Winner	May
JUNIOR, 3 YEARS (STANDARD 270 LB.).					
Fernhill Rose Royal	D. C. Johnston, Beaudesert	6,939·0	356·0	Cooroora View Chance	October

SENIOR, 2 YEARS (STANDARD 250 LB.).							
Fernhill Julie	G. Miller, Chamber's Flat	6,540·65	311·247	Cooroora View Chance			April
Adaville Caress	J. M. Cooke, Witta	7,332·4	329·976	Linwood Guess			June
Adaville Sweet Girl	J. M. Cooke, Witta	6,075·1	290·44	Linwood Guess			June
Adaville Moonshine	J. M. Cooke, Witta	5,575·7	275·917	Linwood Guess			June
Adaville Musk	J. M. Cooke, Witta	5,650·85	252·986	Linwood Guess			June
JUNIOR, 2 YEARS (STANDARD 230 LB.).							
Oakwood Honour	W. H. Doss, Degilbo	7,254·4	315·7	Fairfield Winner			May
Brookland Leah	J. M. Cooke, Maleny	5,663·4	297·5	Brookland Landes Lad			May
Toba Beauty	E. G. Foxton, Maleny	5,315·2	252·063	Linwood Hurricane			June
Brookland Leah (amended)	J. M. Cooke, Witta	5,440·2	292·362	Brookland Landes Lad			July
Brookland Winsome (amended)	J. M. Cooke, Witta	5,216·5	256·075	Brookland Landes Lad			July
Brynworth Peace Lady	A. A. Huth, Roadvale	5,221·05	242·234	Moongi Bonnie Willie			July
Brynworth Charm	A. A. Huth, Roadvale	5,159·9	240·943	Moongi Bonnie Willie			July
Toba Choice	E. G. Foxton, Maleny	5,431·15	268·797	Wirrawong Winter			August
Fernhill Queen Anne	D. C. Johnston, Beaudesert	6,322·0	317·0	Laureldale Violet's Sequel			September
Toba Butterfly	E. G. Foxton, Maleny	4,118·0	240.0	Wirrawong Winter			September
Brookland Neridah	J. M. Cooke, Witta	4,494·0	234·0	Brookland Landes Lad			September
AYRSHIRE.							
MATURE COW (STANDARD 350 LB.).							
Eleresley Leila	Stimpsons Ltd., Loganlea	9,396·8	386·334	Benbecula Banker			April
Eleresley Mona	Estate of Stimpsons Ltd., Loganlea	8,550·8	356·338	Holly Green Gold Prince			May
Benbecula Rosamund	L. Holmes, Yarranlea	8,836·75	379·76	Myola Jean's Monarch			June
Benbecula Lady Bliss	L. Holmes, Yarranlea	8,140·35	355·227	Benbecula Tina's Willie			August
Benbecula Luxurious	L. Holmes, Yarranlea	9,746·0	374·0	Myola Jean's Monarch			September
JUNIOR, 3 YEARS (STANDARD 270 LB.).							
Benbecula Bernadette (254 days)	Lovell Holmes, Yarranlea	6,721·65	286·85	Benbecula Marquis			April
Benbecula Bernadette	L. Holmes, Yarranlea	6,800·5	291·478	Benbecula Marquis			May
Eleresley Miss Bee 2nd	Estate of Stimpsons Ltd., Loganlea	7,091·45	287·222	Auchen Eden Miracle			May
Eleresley Fay 2nd	Stimpsons Ltd., Loganlea	7,612·8	296·921	Auchen Eden Miracle			August
Benbecula Theresa	L. Holmes, Yarranlea	7,693·05	282·959	Benbecula Marquis			August
Eleresley Gay Girl 2nd	Stimpsons Ltd., Loganlea	8,303·0	340·9	Oaklands Q. Dan			September
SENIOR, 2 YEARS (STANDARD 250 LB.).							
Eleresley Mamie 4th	Stimpsons Ltd., Loganlea	7,448·5	280·828	Oaklands Q. Dan			August
JUNIOR, 2 YEARS (STANDARD 230 LB.).							
Fairhill Hulda	M. J. Brownlie, Nangwee	5,077·7	241·638	Myola Master 2nd			May
Leafmore Sonda Henie	J. P. Ruhle, Motley	7,460·5	305·611	St. Christoper's Hazel Boy			June
Leafmore Huly	J. P. Ruhle, Motley	6,811·5	301·622	St. Christopher's Hazel Boy			June
Leafmore Sherryl	J. P. Ruhle, Motley	6,521·95	279·929	Myola Jaunt 2nd			June
Leafmore Humerous	J. P. Ruhle, Motley	6,944·0	272·825	St. Christopher's Hazel Boy			June
Fairhill Anita	M. J. Brownlie, Nangwee	6,559·2	273·494	Myola Master 2nd			July
Eleresley Cynthia 2nd	Stimpsons Ltd., Loganlea	6,461·15	274·882	Auchen Eden Miracle			August
Leafmore Phyllis 2nd	J. P. Ruhle, Motley	6,562·75	256·754	St. Christopher's Hazel Boy			August
Leafmore Hedley (242 days)	J. P. Ruhle, Motley	5,460·75	235·337	St. Christopher's Hazel Boy			August
FRIESIAN.							
MATURE COW (STANDARD 350 LB.).							
St. Athans Sunny Angel	C. H. Naumann, Yarraman	14,994·85	480·308	Tent Hill Sunlight			June
St. Athans Piebe Annette 2nd	C. H. Naumann, Yarraman	15,984·0	506·0	Greenvale Segis Piebe 3rd			September
JUNIOR, 4 YEARS (STANDARD 310 LB.).							
Brigalow Dutchmaid 9th	C. H. Naumann, Yarraman	10,903·2	371·767	Inavale Tresiland Chief			April

ANIMAL HEALTH

"Blight" (Ophthalmia) in Farm Animals.

A. L. CLAY, Assistant Director, Division of Animal Industry.

BLIGHT is an inflammatory condition affecting one or both eyes of farm animals, especially cattle and sheep; pigs are rarely affected, but it is met with fairly commonly in horses. It is also sometimes known as "pink eye" or yet again as infectious keratitis.

It is distinctly seasonal in occurrence, being largely confined to the late summer and early autumn months. Some cases are, however, to be seen in winter, and this is especially the case where calves are concerned.

The condition appears to be world-wide in its distribution.

Cause and Method of Spread.

Blight is in the nature of an infectious disease, although finality is still lacking in the matter of the actual agent or agents involved. There is probably some variation as between different countries and even as between different outbreaks of the disease in the same country.

Spread of the disease is in all probability by means of flies. Close contact of animals, as when yarded for milking or for dipping, branding, or other purposes, especially under dusty conditions, almost certainly assists its spread.

Recovered animals may remain carriers for lengthy periods.

Symptoms.

Symptoms will be well known to most farmers and graziers. One (usually) or both (sometimes) eyes may be affected. There is an excess of tears in the affected eye, the cheek becomes tear stained, and the hair in the area matted. The affected eye takes on an added sensitivity to light, with the result that it is kept partly, and at times completely, closed.

The conjunctiva (inner surface of the eyelid) is inflamed and swollen. A scum or cloudy film appears on the surface of the eyeball; this film may show the presence of highly injected blood vessels not seen in the normal eye. In severe cases there is a bulging of the eyeball and an ulcer forms at the most prominent point of the bulge. The eye then presents a very "angry" appearance indeed.

Without doubt there is pain, and often there is considerable loss of condition. Milk flow (in the case of cows) may be much depressed. Temporary blindness may occur, in which case the loss of condition is much more marked.

Course of the Disease.

Recovery will in most cases occur in 7-14 days without treatment. Severe cases naturally run a more protracted course, but even so it is nothing short of extraordinary how frequently they do eventually return to normal. Often a small white scar remains on the surface of the eyeball, but this is not considered to constitute any serious disability except perhaps where riding horses are concerned.

In a small percentage of cases the disease leads to the loss of sight in the affected eye.

Prevention and Treatment.

Substances which have been used in the past as "cures" are many and various, a sure indication that none among them is outstanding. Kerosene, sugar, salt, calomel, quinine sulphate, iodine, castor oil, milk, zinc sulphate, argyrol, mercurochrome, silver nitrate, bluestone, boric acid, and yellow oxide of mercury have all been recommended at various times.

Whatever one decides to use it has to be accepted that treatment must be carried out more than once or twice daily if best results are to be obtained. The aim should be to instil a non-irritant preparation into the eye, hourly. It is realised, of course, that where animals are concerned there are serious practical difficulties in the way of doing this, but one can only do the best he can to approach the ideal in the matter.

Argyrol is an example of a non-irritant preparation. It is available from chemists and should be obtained in 20 per cent. or even 30 per cent. solution. It is applied to the eye as drops, with the aid of an eye dropper.

Another non-irritant preparation which can be used as often as desired is neutral proflavine sulphate, 1 part in 5,000 parts of water. It also is obtainable from chemists.

Penicillin also lends itself to use in this regard, but there are disadvantages as regards keeping qualities. It is necessary to use freshly dispensed solutions, which should be kept in a refrigerator or ice box when not in actual use.

A more recent remedy, on which it is not yet possible to pass final judgment, is sulphacetamide. It is used as a 10 per cent. watery solution of sodium sulphacetamide.

Zinc sulphate solutions which have been used for many years are tending to go out of favour. They have been used in strengths varying from ½ per cent. to 2½ per cent. in water or in boric acid solution.

Many people prefer to use powders rather than "drops," holding that they are easier to place in the eye. There is probably some merit in this claim, but a suitable "blower," reserved for the purpose, is desirable. Suitable powders to use are boric acid; or a mixture of boric acid 2 parts and sulphanilamide 1 part; or better still, boric acid 2 parts and sulphacetamide 1 part.

For those who prefer to use ointments (placed on the conjunctiva), and they have much to recommend them, penicillin eye ointment is the best preparation. Sulphacetamide can also be obtained in the form of an eye ointment and is worthy of trial.

Whatever the treatment decided upon, it will be of considerable assistance to keep affected animals in a barn or shed where there is subdued light. Where this is not possible, a shade should be made and hung over the affected eye so as to protect it from direct light and also from flies.

Needless to say, where valuable animals are concerned, the services of a veterinary surgeon should, if practicable, be enlisted.

In the matter of prevention there is reason to believe that dipping cattle in DDT preparations has a useful effect in the direction of preventing or reducing the spread of blight in a herd. The assumption is that this results from the control of bush and house flies effected by the DDT. This suggests that it might be a useful procedure to spray the faces of healthy animals with a 5 per cent. solution of DDT once every 7-10 days during periods when blight is prevalent.

The use of vaccines as a preventive has received some attention, but in Australia up to the present time there is little to indicate that a reliable vaccine is in sight. As an attack of the disease followed by recovery does not appear to give lasting immunity, the prospects of ever obtaining a reliable vaccine are only slender.

BETTER DAIRYING DEMONSTRATIONS.

The Minister for Agriculture and Stock (Hon. H. H. Collins) said recently that approved practices recommended for increasing dairy production per cow and per acre have already been applied on the 46 dairy farms selected for the series of demonstrations initiated by the Department.

Th purpose of the demonstrations is to provide an object lesson for dairymen in what may be achieved by the adoption of improved production methods. The 46 farms where owners have agreed to adopt various approved practices on their properties are situated in the Ipswich, Toowoomba, Dalby, Kingaroy, Gympie and Caboolture districts and the Atherton Tableland.

Each group of demonstration farms is supervised by an officer specially appointed for the purpose and data from each farm are being collated to properly assess the value of the demonstrations. Valuable co-operation is being given by the Irrigation and Water Supply Commission and the Bureau of Investigation.

TUBERCULOSIS-FREE CATTLE HERDS
(AS AT 1st JANUARY, 1950).

Breed.	Owner's Name and Address of Stud.
Aberdeen Angus	The Scottish Australian Company Ltd., Texas Station, Texas.

ASTRONOMICAL DATA FOR QUEENSLAND.

MARCH.

Supplied by W. J. Newell, Hon. Secretary of the Astronomical Society of Queensland.

TIMES OF SUNRISE AND SUNSET.

At Brisbane.			MINUTES LATER THAN BRISBANE AT OTHER PLACES.					
Day.	Rise.	Set.	Place.	Rise.	Set.	Place.	Rise.	Set.
	a.m.	p.m.						
1	5.41	6.20	Cairns	29	29	Longreach	35	35
6	5.44	6.15	Charleville ..	27	27	Quilpie	35	35
11	5.46	6.10	Cloncurry	50	50	Rockhampton ..	10	10
16	5.49	6.04	Cunnamulla ..	29	29	Roma	17	17
21	5.52	5.59	Dirranbandi ..	19	19	Townsville ..	25	25
26	5.54	5.53	Emerald	19	19	Winton	40	40
31	5.57	5.48	Hughenden ..	35	35	Warwick	4	4

TIMES OF MOONRISE AND MOONSET.

At Brisbane.		
Day.	Rise.	Set.
	p.m.	a.m.
1	4.19	1.48
2	5.03	2.51
3	5.43	3.57
4	6.19	5.04
5	6.53	6.10
6	7.27	7.15
7	8·03	8.21
8	8.41	9.29
9	9.25	10.38
10	10.15	11.47
11	11.10	p.m.
		12.54
12	..	1.56
	a.m.	
13	12.11	2.51
14	1.14	3.38
15	2.17	4.19
16	3.17	4.53
17	4.15	5.24
18	5.11	5.53
19	6.04	6.20
20	6.57	6.47
21	7·50	7.15
22	8.43	7.46
23	9.38	8.20
24	10.34	9.00
25	11·31	9.45
	p.m.	
26	12.27	10.35
27	1.20	11·32
28	2.09	..
		a.m.
29	2.54	12.33
30	3.35	1.37
31	4·12	2.42

MINUTES LATER THAN BRISBANE (SOUTHERN DISTRICTS).

Charleville 27; Cunnamulla 29; Dirranbandi 19; Quilpie 35; Roma 17; Warwick 4.

MINUTES LATER THAN BRISBANE (CENTRAL DISTRICTS).

Day.	Emerald.		Longreach.		Rockhampton.		Winton.	
	Rise.	Set.	Rise.	Set.	Rise.	Set.	Rise.	Set.
1	10	30	26	45	0	21	28	53
6	21	19	37	35	12	10	43	39
11	31	9	47	23	22	0	54	26
16	26	14	42	29	17	4	49	33
21	15	24	30	40	6	15	35	46
26	9	31	25	46	0	22	26	54
31	14	25	30	41	5	16	34	48

MINUTES LATER THAN BRISBANE (NORTHERN DISTRICTS).

Day.	Cairns.		Cloncurry.		Hughenden.		Townsville.	
	Rise.	Set.	Rise.	Set.	Rise.	Set.	Rise.	Set.
1	6	55	35	67	20	52	6	45
3	15	46	40	61	25	47	14	38
5	27	34	49	54	33	39	23	29
7	40	21	57	44	42	29	33	18
9	51	9	65	36	49	22	42	9
11	57	2	69	32	53	17	47	3
13	56	3	68	32	52	18	46	4
15	51	10	65	37	49	23	42	10
17	40	20	57	44	42	29	33	18
19	30	31	51	51	35	36	25	26
21	20	40	43	58	28	43	17	34
23	10	50	37	63	22	49	9	42
25	3	56	34	67	18	53	4	46
27	2	56	33	67	17	53	3	46
29	8	52	36	65	21	50	8	44
31	18	43	42	59	27	45	16	36

Phases of the Moon.—Full Moon, 4th March, 8.34 p.m.; Last Quarter, 11th March, 12.38 p.m.; New Moon, 19th March, 1.20 a.m.; First Quarter, 27th March, 6.09 a.m.

On the 21st March at 3 p.m. the Sun wil cross the Equator on its apparent journey from South to North and on this day wil rise and set at true east and true west respectively.

On the 6th and 19th the Moon will rise and set aproximately at true east and true west respectively.

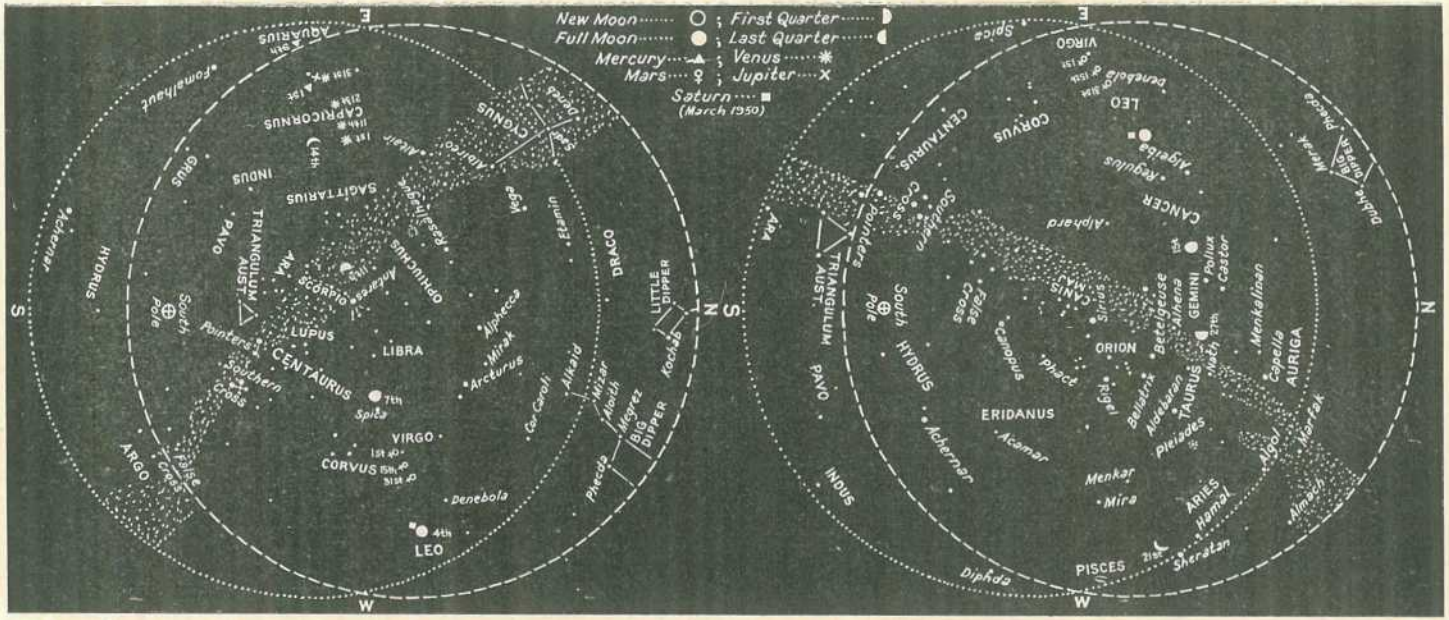
Mercury.—At the beginning of March, in the constellation of Capricornus, will rise 1½ hours before the sun and will remain a morning object until the 28th. By the end of the month, in the constellation of Pisces will set 10 minutes after the Sun.

Venus.—Now a conspicuous object in the morning sky. On the 1st, in the constellation of Capricornus will rise 2½ hours before the Sun and will attain greatest brilliancy on the 6th. By the end of the month, in the constellation of Aquarius, will rise 3 hours 25 minutes before the Sun.

Mars.—Throughout this month favourably placed for observation for almost the whole night. On the 1st, in the constellation of Virgo, it will rise between 7.48 p.m. and 9 p.m. On the 23rd it will be opposite the Sun and at the end of the month, still in the consellation of Virgo, will rise between 5.20 p.m. and 6.30 p.m.

Jupiter.—At 1 a.m. on the 2nd Mercury will pass about one degree south of Jupiter so at the beginning of the month Mercury and Jupiter will be close. At the end of the month, in the constellation of Capricornus, Jupiter will rise between 2.45 a.m. and 4 a.m.

Saturn.—Also favourably placed for observation throughout this month. On the 1st, in the constellation of Leo, will rise between 6.30 p.m. and 8 p.m.; on the 7th will be opposite the Sun and at the end of March will rise during the daylight hours.



Star Charts.—The chart on the right is for 7.15 p.m. in the south-east corner of Queensland to 8.15 p.m. along the Northern Territory Border on the 15th March (for every degree of longitude we go west the time increases by 4 minutes). The chart on the left is for 9 hours later. On each chart the dashed circle represents the horizon as viewed from Cape York and the dotted circle is the horizon for places along the New South Wales border. When facing North hold "N" at the bottom; when facing South hold "S" at the bottom and similarly for the other directions. Only the brightest stars are included and the more conspicuous constellations named. The stars which do not change their relation to one another, moving east to west, arrive at any selected position about 4 minutes earlier each night. Thus, at the beginning of the month the stars will be in the positions shown about 1 hour later than the time stated for the 15th and at the end of the month about 1 hour earlier than that time. The positions of the Moon and planets, which are continually changing in relation to the stars, are shown for certain marked days. When no date is marked the position is for the middle of the month.