VOL. 81. PART 6 DECEMBER, 1955

DEPARTMENT OF AGRICULTURE

QUEENSLAND AGRICULTURAL JOURNAL

View of Coolum Field Station, in the Wallum Country of the Near North Coast.

LEADING FEATURES

Registered at the General Post Office, Brisbane, for transmission by Post as a Newspaper.

Queensland Agricultural Journal

Contents

Tuberculosis-Free Cattle Herds.

TESTED HERDS (As at 24th November, 1955).

The Tuberculosis-free Herd Scheme (which is distinct from the tuberculosis eradication scheme operating in commercial dairy herds) was initiated by the Department of Agriculture and Stock for the purpose of assisting owners of cattle studs to maintain their herds free from tuberculosis and so create a reservoir of tuberculosis-free cattle from which intending purchasers can draw their requirements. The studs listed here have fulfilled the conditions to the date shown above.

Breed.	Owner's Name and Address.
Aberdeen Angus ..	The Scottish Australian Company Ltd., Texas Station, Texas
A.I.S.	M. E. & E. Scott, "Wattlebrae" A.I.S. Stud, Kingaroy
	F. B. Sullivan, "Fermanagh," Pittsworth
	D. Sullivan, "Bantry" Stud, Rossvale, *via* Pittsworth
	W. Henschell, "Yarranvale," Yarranlea
	Con. O'Sullivan, "Navillus" Stud, Greenmount
	H. V. Littleton, "Wongalea" Stud, Hillview, Crow's Nest
	J. Phillips and Sons, "Sunny View," Benair, *via* Kingaroy
	Sullivan Bros., "Valera" Stud, Pittsworth
	Reushle Bros., "Reubydale" Stud, Ravensbourne
	H. F. Marquardt, "Chelmer" Stud, Wondai
	A. C. and C. R. Marquardt, "Cedar Valley," Wondai
	A. H. Sokoll, "Sunny Crest" Stud, Wondai
	W. and A. G. Scott, "Welena" A.I.S. Stud, Blackbutt
	G. Sperling, "Kooravale" Stud, Kooralgin, *via* Cooyar
	C. J. Schloss, "Shady Glen," Rocky Creek, Yarraman
	W. H. Thompson, "Alfa Vale," Nanango
	S. R. Moore, Sunnyside, West Wooroolin
	H.M. State Farm, Numinbah
	D. G. Neale, "Groveley," Greenmount
	Edwards Bros., "Spring Valley" A.I.S. Stud, Kingaroy
	A. W. Wieland, "Milhaven" A.I.S. Stud, Milford, *via* Boonah
	W. D. Davis, "Wamba" Stud, Chinchilla
	Queensland Agricultural High School and College, Lawes
	C. K. Roche, Freestone, Warwick
	Mrs K. Henry, Greenmount
	D. B. Green, Deloraine Stud, Durong, Proston
	E. Evans, Wootha, Maleny
	T. L. and L. M. J. Cox, "Seafield Farm," Wallumbilla
	J. Crookey, "Arolla A.I.S. Stud" Fairview, Allora
	M. F. Power, "Barfield," Kapaldo
	A. H. Webster, "Millievale," Derrymore
	W. H. Sanderson, "Sunlit Farm," Mulgildie
Ayrshire	L. Holmes, "Benbecula," Yarranlea
	J. N. Scott, "Auchen Eden," Camp Mountain
	"St. Christopher's" and "Iona" Studs, Brookfield road, Brisbane
	E. Mathie and Son, "Ainslie" Ayrshire Stud, Maleny
	C. E. R. Dudgeon, "Marionville" Ayrshire Stud, Landsborough
	G. F. H. Zerner, "Pineville," Pie Creek, Box 5, P.O., Gympie
	T. F. Dunn, Alanbank, Gleneagle
Friesian	C. H. Naumann, "Yarrabine" Stud, Yarraman
	D. J. Pender, "Camelot," Lytton road, Lindum
Guernsey	C. D. Holmes, "Springview," Yarraman
	A. B. Fletcher, Cossart Vale, Boonah
	W. H. Doss, Degilbo, *via* Biggenden
	A. C. Swendson, Coolabunia, Box 26, Kingaroy
	C. Scott, "Coralgrae," Din Din road, Nanango
	R. J. Wissemann, "Robnea," Headington Hill, Clifton
	G. L. Johnson, "Old Cannindah," Monto
Jersey	Queensland Agricultural High School and College, Lawes
	J. S. McCarthy, "Glen Erin" Jersey Stud, Greenmount
	J. F. Lau, "Rosallen" Jersey Stud, Goombungee
	G. Harley, Hopewell, M.S. 189, Kingaroy
	Toowoomba Mental Hospital, Willowburn
	Farm Home for Boys, Westbrook
	F. J. Cox and Sons, "Rosel" Stud, Crawford, Kingaroy Line
	R. J. Browne, Hill 60, Yangan
	P. J. L. Bygrave, "The Craigan Farm," Aspley
	R. J. Crawford, "Inverlaw" Jersey Stud, Inverlaw, Kingaroy
	P. H. F. Gregory, "Carlton," Rosevale, *via* Rosewood
	E. A. Matthews, "Yarradale," Yarraman
	A. L. Semgreen, "Tecoma," Coolabunia
	L. E. Meier, "Ardath" Stud, Boonah
	A. M. and L. J. Noone, "Winbirra" Stud, Mt. Esk Pocket, Esk
	W. S. Conochie and Sons, "Brookland" Stud, Sherwood road, Sherwood
	Estate of J. A. Scott, "Kiaora," Manumbar road, Nanango
	F. W. Verrall, "Coleburn," Walloon
	C. Beckingham, Trouts road, Everton Park
	W. E. O. Meier and Son, "Kingsford" Stud, Alberton, *via* Yatala
	G. H. Ralph, "Ryecombe," Ravensbourne
	Mrs. I. L. M. Borchert, "Willowbank" Jersey Stud, Kingaroy
	W. and C. E. Tudor, "Boree" Jersey Stud, M.S. 498, Gayndah
	Weldon Bros., "Gleneden" Jersey Stud, Upper Yarraman
	D. R. Hutton, "Bellgarth," Cunningham, *via* Warwick
	J. W. Carpenter, Flagstone Creek, Helidon
	H. G. Johnson, "Windsor" Jersey Stud, Beaudesert
	W. S. Kirby, Tinana, Maryborough
	S. A. Cramb, "Trecarne Stud," Lockyer
	G. & V. Beattie, "Beauvern," Antigua, Maryborough
	J. A. & E. E. Smith, "Heatherlea" Jersey Stud, Chinchilla
	W. C. M. Birt, "Pine Hill" Jersey Stud, Gundiah
Polled Hereford ..	W. Maller, "Boreview," Pickanjinnie
	J. H. Anderson, "Inverary," Yandilla
	D. R. and M. E. Hutton, "Bellgarth," Cunningham, *via* Warwick
	E. W. G. McCamley, Eulogie Park, Dululu
	Wilson and McDouall, Calliope Station, Calliope

Tobacco Growing in the Mareeba—Dimbulah Area.

By E. W. BAIRD, Senior Adviser in Agriculture.

(*Continued from page 267 of the November issue.*)

TRANSPLANTING.

This operation does not vary in its essential features when any of the methods of growing tobacco are used. The plants after attaining the height of 4-8 inches are ready for transplanting into the field.

Ideal seedlings are strong in growth and have tough pliable stems; soft stems are easily damaged or broken. Prior to pulling the plants from the bed, water is applied to soften the soil around the roots and to avoid unnecessary damage.

When pulling seedlings, a watch must be kept for any plants suffering from mosaic. Nematodes and blue mould should not be present if seedbed management has been efficiently carried out. If mosaic is discovered in the seedbed the entire bed should be destroyed, and the hands thoroughly washed in soapy water before other seedlings are touched.

Plate 7.

Well-grown Seedlings Ready for Transplanting into the Field.

When pulling plants, only sufficient should be lifted as can be planted out during the afternoon. After pulling, the plants are placed into light boxes about the size of kerosene cases for transport to the field.

When seedlings are transplanted they suffer a considerable shock. Those plants which are too young, too soft, or in any way damaged, generally die in the field and require replacement. Such replacements should be planted as soon as possible after the original planting, or an uneven crop will result.

Furrow Irrigation.

Where furrow irrigation is used, the planting furrows are given a good watering prior to planting out. The plants are then dropped along the rows as nearly as possible to the spacing required, which is usually 18-24 in. The plants are inserted into the soil by means of a planting-out trowel, or by hand, along the side of the row which was previously fertilized.

The position the plant must take is about halfway up the side of the drill or just below the water level. This ensures that the roots are in wet soil, which must be firmed around the roots to exclude air.

It is usual to irrigate during the morning and plant during the afternoon when the sun's rays are beginning to lose their heat. In order to ensure that the plants will be well established a further irrigation is given next morning. The process is repeated section by section till the planting has been completed.

Spray Irrigation.

When spray irrigation is used, several methods are available, but the following method has proved satisfactory.

The land to be planted is given a thorough spraying, the soil being wet to the depth of ploughing. The rate of application will be that which the soil can absorb without runoff. The land is then left till implements can work upon it and weed seeds have had a chance to germinate. Drilling, fertilizing and covering are then carried out as described under Land Preparation.

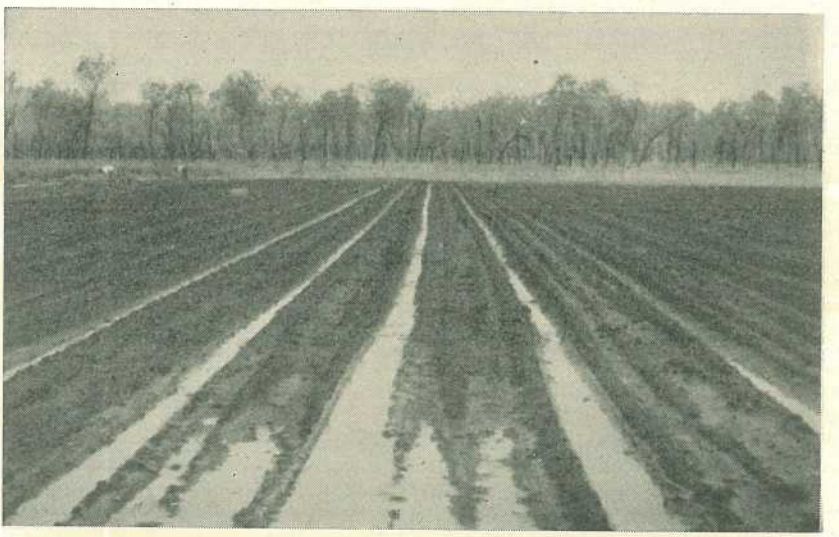


Plate 8.

Land Furrowed-out and Irrigated Prior to Transplanting. The crop is intended to be grown throughout by furrow irrigation.

Plate 9.

Planting Out Tobacco Seedlings under a Furrow Irrigation System. The well-grown seedlings are being planted into the side of the irrigation furrow, over the area where fertilizer had been previously applied.

Planting is carried out along the fertilized rows by means of a machine which delivers water to the plants as they are set in position. The fact that the soil is moist at the surface will usually obviate the necessity for covering the plants with paper shades. It will be found that plants so watered-in will give a higher percentage strike than those planted out and immediately sprayed, since the latter practice has a tendency to push the plants into the soil by the mechanical force of the falling water.

Watering-out Method.

When using the watering-out method, plants are set by hand into the watered holes previously made in the top of the hill for the purpose. When setting the plant, it is advantageous to draw dry soil around it, as this tends to prevent evaporation. Growers using this method do so during November and early December in order to have the crop established for the onset of the anticipated storm period.

Rain-grown Crops.

The establishment of wholly rain-grown crops entails the greatest risk of poor strikes in the field. It is necessary to commence when the soil has been well soaked by rain, and if possible when the weather is dull and

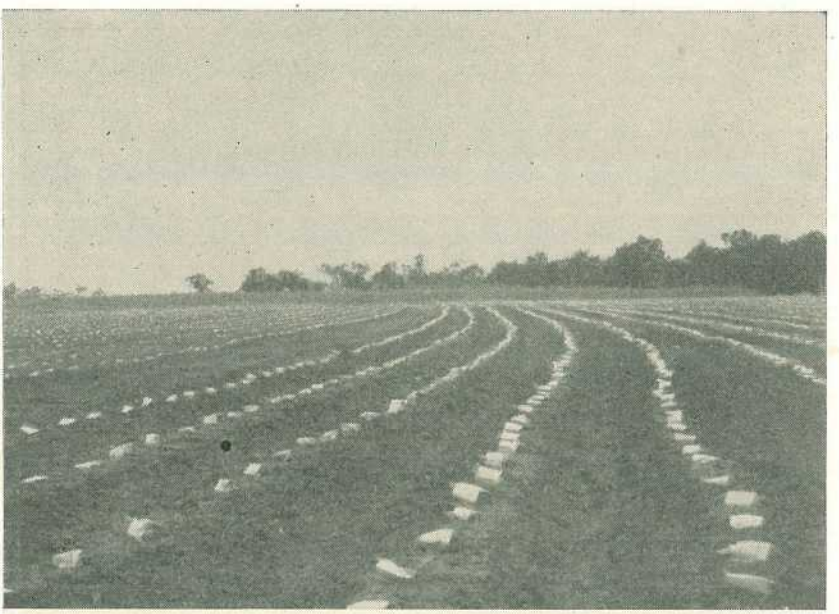


Plate 10.

Tobacco Seedlings Planted on Hills and Covered for Dry-farming Conditions. This view shows the low, flat hills and the paper covers to protect the tender seedlings from exposure to summer heat.

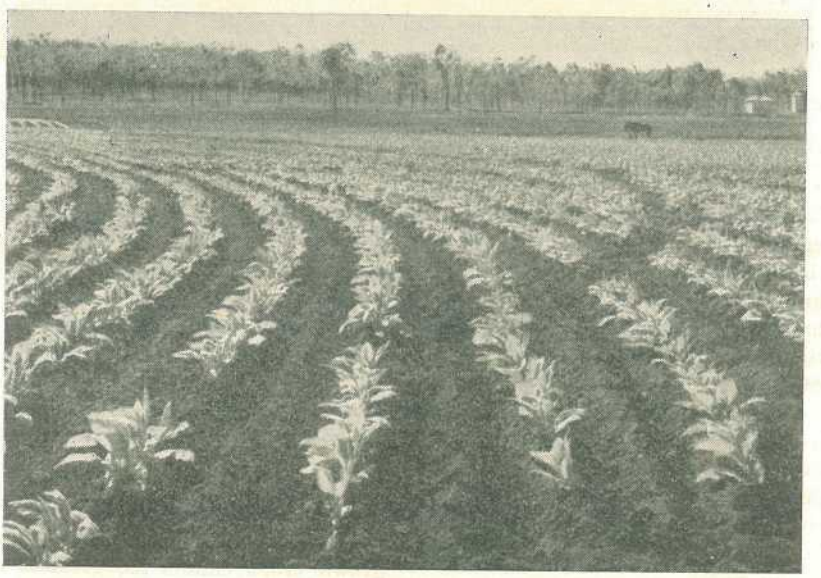


Plate 11.

Young Tobacco Plants Planted on the Contour on Sloping Country. Contour planting affords considerable protection against erosion under both dry-farming and irrigation systems.

cloudy. The time is usually between late December and February, depending on the commencement of suitable rains.

A planting-out machine provides the quickest and surest method of establishing such crops in the field. These machines carry their own water supply and deliver a small quantity to each plant as it is dropped. They also firm the soil around the plants and in this way tend to ensure the best possible strike.

COVERING.

When the crop is grown under irrigation it is not necessary to cover the plants to protect them from the effects of direct sunlight. If, however, the crop is watered-out or grown under natural rainfall conditions, particularly in midsummer, it is necessary to afford them this protection. Strips of paper or papier-mache are commonly used for this purpose.

The usual practice is to cut newspaper into strips about 12-14 in. long by 6 in. wide. These are threaded by one corner onto a piece of wire in the form of an S-hook. The other end of the wire is hooked over the belt of the operator and carried in front of him. Each sheet is easily torn off and placed over a plant in the form of a tent with its sides east and west. This gives maximum protection from the sun. Each end of the paper is pushed into the soil by a piece of tin the same width as the paper, and having one end rolled to form a handle.

It is usual to cover the plants as soon as convenient after transplanting. If sufficient men are available it is preferable to cover immediately, but if this is not the case it can be done after the afternoon's planting is finished and before the next sunrise. The covers are kept on for 7-10 days, depending on weather conditions.

IRRIGATION AND CULTIVATION.

When considering the growing of tobacco under irrigation, one of the most important essentials is to assess the amount of water which will be available during the growth of the crop. It is futile to endeavour to grow a greater area than the water supply will allow.

As has been previously indicated, the irrigation of tobacco takes two main forms:—(*a*) furrow irrigation, and (*b*) spray irrigation. A third method of partial irrigation, known as watering-out, is sometimes used where the water supply is inadequate for complete irrigation of the crop.

Furrow Irrigation.

Furrow irrigation means the flowing of water, firstly down furrows made for the purpose, and later down the centres of the spaces between the rows. It is important that the land be graded or smoothed and the furrows given the correct grade prior to planting, as on this depends the efficiency of all following irrigations.

It has been found that the best gradient for most soils is 2 in. to the chain. If the gradient is greater than this, it will be necessary to place "stops" along the row to hold the water in small ponds. This causes much extra work and expense to the grower. If the gradient is still higher, the "stops" will become inefficient and the water will run too quickly down the furrow to allow lateral penetration. This will be reflected in the uneven and stunted growth of the crop.

The length of row is an important factor. Rows should not be more than 5 chains long, as overwatering may occur at the ends close to the main drain, and underwatering may take place at the ends furthest from it.

The amount of water used at one irrigation is the amount necessary to fill but not overflow the furrows and

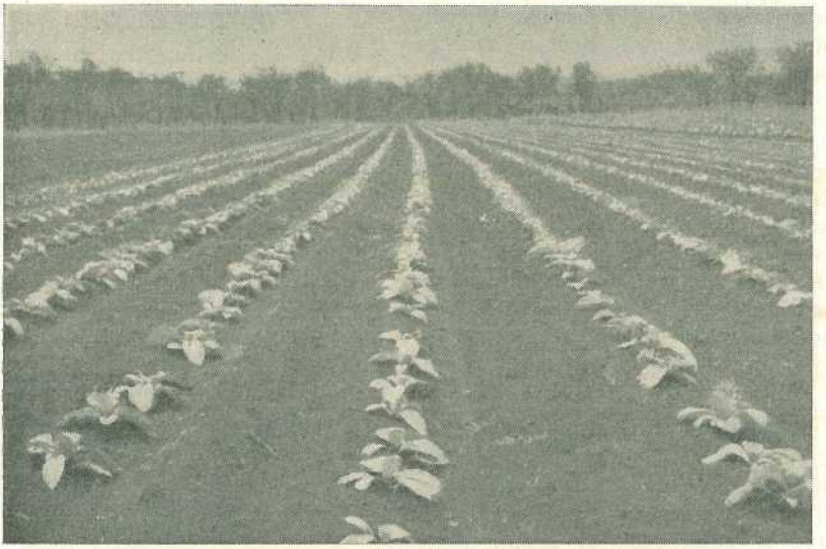


Plate 12.

Young Tobacco Plants Two Weeks after Transplanting, with Furrow Irrigation.

Plate 13.

Furrow Irrigation in Operation. Water from the head ditch is being run down the irrigation furrows, which at this stage are close to the rows of plants.

at the same time thoroughly wet the surrounding soil. The amount, therefore, will vary according to the soil type, the condition of the soil, and the weather conditions pertaining at the time.

The frequency of watering depends on the size of the plants and the rate at which they use up the water. The moisture content of the soil can be gauged accurately enough by an inspection of the soil along the row in the root area. Irrigation should aim at keeping the plants moving, and avoiding periods of stress due to drying up of the soil in the root zone.

After transplanting, the crop is irrigated down the original planting furrow, to set the roots into the soil and promote establishment. No further water is necessary for about one week, the time depending on the weather conditions. As soon as convenient this furrow should be cultivated and the weeds chipped between the plants. During this cultivation, the soil should be drawn about the young plants.

From now on, watering in furrows on alternate sides of the plant is carried out. This is termed "back-watering" and it has the effect of making the fertilizer readily available to the plant and at the same time promoting a more extensive root system.

During the early stages of growth—for example, when the plants are about one foot high—atmospheric conditions may be such as to encourage the spread of blue mould in the field. At this stage of growth, the plants are frequently soft and sappy, and are

Plate 14.

Tobacco Plants Six Weeks after Transplanting. The remains of the previous watering furrow can be seen adjacent to the right-hand row.

thus particularly susceptible to the disease. If mould appears in the field, irrigation and cultural treatments should be directed towards discouraging the spread of the disease by making every attempt to reduce the atmospheric humidity in the region of the leaves.

Suggested means of achieving this are by (1) watering during the morning only; (2) strictly controlling the irrigation water, and not allowing it to flood out of the furrows and form pools round the plants; and (3) cultivating as soon as possible after watering, to keep a dry surface mulch around the plants. It will be clear from the requirements of (2) that careful smoothing of the land prior to planting will prove of considerable benefit. It is essential that overwatering should be avoided during periods in which the risk of blue mould incidence is evident.

After each irrigation, cultivation must be carried out for purposes of aerating the soil, eradicating weed growth and permitting better penetration of the next application. Cultivation can be carried out only as long as no damage is being done to the roots of the tobacco plants. Further chipping between the plants will also be necessary to eradicate weed and grass growth in the rows.

Plate 15.

Furrow Irrigation of Tobacco during the Later Stages. The plants are now well-grown and approaching the flowering stage. This irrigation is the first flooding of the inter-row spaces between the plant hills.

During the last complete cultivation steps are taken to form a reasonably sized hill along the row of plants, as from then on irrigation takes the form of watering down the centre of the inter-row spaces. The channels thus formed are well filled with water to enable it to penetrate well into the root zone of the crop. The centre of the channel only must be cultivated at this stage to allow water penetration by breaking up the hard top soil formed

after irrigation. This can be done only as long as no damage is caused to leaves and roots.

From the time the plant approaches maturity until harvesting is finalised, irrigation must be carried out regularly and efficiently in order to supply the extra demands of the plant at the time when its leaf surface is greatest.

The frequency of application during this period will best be determined by careful inspections of the soil as well as the appearance of the crop itself. Inadequate irrigation is indicated by the drooping and possible premature yellowing of the leaves. If these leaves are harvested in this state, a green cure will result. During periods of severe drought, particularly during the stage of mid-growth, the leaves tend to stand erect.

On the average it will be found that 12-18 in. of water are necessary to grow a crop with irrigations at approximately weekly intervals.

Equipment necessary for furrow irrigation includes a pump, an engine and sufficient piping or fluming to transport the water to the highest part of the field to be irrigated. From this point the water is usually taken by gravity in earth drains. The size of the pump depends on the amount of water to be delivered in a given time. Sufficient power must be available to cope with this rate, together with the effects of the frictional head plus the vertical head.

Tables of pump sizes, power requirements, etc., are readily available from agents handling the various brands of equipment.

Spray Irrigation.

Spray irrigation consists of the application of water through the air by means of spray nozzles attached to the pipes conducting the water. Numerous types of spray equipment are on the market, but the majority in use for field crops depend upon pipe-lines in portable sections with standards to which the sprays are attached. When a certain width of crop has been sprayed, the spray lines must then be uncoupled, carried to an adjoining section, and coupled up again before pumping re-commences. With most makes of spray equipment the amount of water applied can be regulated by varying the nozzle size, or the pump speed, or both.

Spray irrigation is usually applied to land which is too uneven or too sloping to allow effective flood irrigation. Its main advantage is that the land does not require the careful grading and smoothing which is necessary for flood irrigation. Its great disadvantages, however, are the heavier cost of equipment, the labour involved in shifting pipes, and the difficulty of working in tall crops which are nearing maturity. In some cases it has been found useful to spray-irrigate during the early stages of growth and change to furrow irrigation as the plants begin to grow up.

The rate of application should not exceed the rate at which the particular soil can absorb the water without run-off. Spray nozzles must not be too coarse, as the mechanical action of large drops will increase the erosion potential. A suitable rate of spray irrigation for these soils is usually 1-1½ in. per application. Rain gauges spaced at varying distances from the spray standards may be used to check the quantity applied.

While the method of application differs, the principles of watering and of cultivation between waterings are the same as those discussed under Furrow Irrigation.

Watering-out.

The watering-out method consists of partial irrigation to assist in the initial establishment of the seedlings. The water is applied by means of a hose from a tank to each permanent plant position on the hill formed after fertilizer application. The tanks may

be carried on a car chassis converted to a table-top wagon, and hauled by a tractor or horses. This operation can be done once or twice as required by the grower and as determined by the water supply.

If rain does not occur as required, the young crop can be re-watered from the water-cart provided a small hole to carry the required quantity of water is previously made close to each plant. In seasons of prolonged dry weather, crops have been watered by this method until they were too high to pass under the cart without damage.

Cultivation of these crops is as for rain-grown crops.

Rain-grown Crops.

In rain-grown crops, cultivation follows the same principles as those applied to other row crops. The main reasons for such cultivation are (1) to destroy weeds, which would compete with the crop for water and plant foods; (2) to aerate the surface soil; and (3) to break the surface crust and make the soil more permeable to rains.

Early cultivations may commence close to the plants, using a straddling cultivator. As the plants increase in height and in spread, greater clearance must be provided to avoid damage to leaves and roots. Light chippings will also be required during the early stages of growth to eliminate weeds in the rows and to break the soil crust round the plants.

When the plants are too tall to manage with a tractor or straddling cultivator, any further cultivations will require to be done by single-horse machines or the garden type of tractor.

Where the plants have been set out on hills, cultivation should be directed at maintaining these hills. Any cultivation away from the plants should thus be followed by a cultivation back towards the plants. If the crop has been planted on the flat, cultivation should aim at throwing up a hill along the line of plants. This hilling process must start gradually, and increase as the plants gain in size.

[TO BE CONTINUED.]

OPEN SEASON FOR SNIPE.

The open season for snipe in Queensland commenced on November 14th, 1955, and ends on March 15th, 1956, the Minister for Agriculture and Stock (Hon. H. H. Collins, M.L.A.) reminded sportsmen recently.

In order to take snipe in Queensland during the open season, each shooter should be in possession of an open season fauna permit. Applications for these permits may be made to the Department of Agriculture and Stock, Brisbane.

Mr. Collins added that the Department, as the authority controlling the hunting and trapping of all native fauna, requests the co-operation of shooters in ensuring the observance of the open season regulations.

Can Black Heart of Pineapples be Avoided?

By R. C. CANNON (Senior Horticulturist), F. W. BERRILL (Horticulturist), and K. KING (Senior Adviser in Horticulture).

Black heart, a physiological breakdown in the flesh of the maturing pineapple fruit, is responsible for losses each winter both at canneries and on the fresh fruit markets. The extent of these losses varies from year to year and has been considerable in some seasons, notably 1954 and 1955.

THE PROBLEM.

Although this disorder has been studied over a fairly long period, the precise cause of the breakdown is still not definitely established. It is certainly associated in some way with winter conditions. Losses are greatest during the months of July and August, though outbreaks sometimes occur as early as June and may continue into September. As there appears to be little prospect of preventing outbreaks of black heart, the alternative is to eliminate, as far as possible, cropping during the July-August period.

Cropping Periods.

Although pineapples flower and mature fruit at all times of the year, there are two major cropping periods in Queensland—summer and winter. As a general rule, the ratoon crop, at least in southern Queensland, is harvested about 18 months after the plant crop. Thus a summer plant crop is followed by a winter ratoon crop in the ordinary course of events. A plantation which produces a winter plant crop takes longer to produce its ratoon, and more often than not this crop is also harvested in winter.

Except in very abnormal seasons, a summer plant crop can be assured by efficient management. This entails planting at the correct time, the use of suitable planting material and good cultural treatment during the growing period. Provided growth is satisfactory, natural flowering for a summer crop will usually take place. If necessary, however, flower induction treatment can be applied to prevent "holding over" in plants which do not flower naturally.

Controlling the Ratoon Crop.

When the plant crop is produced in summer, it is sometimes possible to harvest the ratoon crop in the following summer by making use of flower

induction. However, unless the plants are well advanced and encounter favourable growing conditions, a large proportion of fruit may be undersized. A system of crop management based on the production of two successive summer crops is, therefore, not generally desirable.

Two other possibilities merit consideration. These are:—(1) Advancing the plant crop by means of artificial flower induction with acetylene or ANA solutions so that the fruit can be harvested in the January-February instead of the February-March period. Sucker growth would then be more forward prior to winter thereby improving the chances of obtaining sizeable fruit from the ratoon crop in the following summer and autumn. (2) Harvesting the plant crop at the normal time (February-March) and forcing the growth of the suckers for an autumn crop some 15 months later.

A combination of these two methods may prove the best solution to the problem of obtaining maximum yields in the minimum time and the elimination of July-August cropping. The real problem is how to provide the extra stimulation to sucker growth for the ratoon crop. Irrigation would be an advantage, but the requisite facilities are rarely available on existing pineapple farms in Queensland. On the other hand, adequate and correctly timed fertilizer application may be sufficient to produce the desired result.

These general objectives are tantamount to restricting harvesting in the pineapple crop to the summer-autumn period of the year. Provided this did not accentuate the summer peak, there should be no undue strain on cannery facilities, and the concentration of the main harvest into six months of the year may prove an advantage.

Crop management along these lines implies precise planting programmes, efficient cultural practices and the artificial control of flowering and fruiting.

PLANTING.

Under Queensland conditions, the cold winter and comparatively dry spring tend to check plant growth in the pineapple plantation. The adjustment of planting to control cropping is therefore not so simple as it would be in more equable climates where seasonal effects are less pronounced.

Seasonal Planting.

In Queensland, there are essentially two planting seasons, namely, autumn and spring. Pineapples will grow at any period of the year but the behaviour of out-of-season plantings rarely conforms to the requirements of a crop management system designed to control the crop.

The performance of different types of planting material under average conditions is well known. This knowledge can be utilised to assist in the control of cropping, but has to take into account differences in locality and aspect which influence the rate of growth. Some allowance has also to be made for the fairly wide seasonal variations which are characteristic of our climate and no system can be entirely reliable.

Tops, slips and suckers are the most commonly used types of planting material. The behaviour of butt plantings is rather less predictable, and they are of doubtful value where precise timing of the harvesting period is required.

Top Plantings.

The planting of summer tops (Plate 1) has many advantages, particularly in terms of uniform plant growth and cropping. Summer tops are planted in autumn and in all but colder localities can be expected to produce a summer crop within two years of planting. To achieve this, planting should

Plate 1.

Planting Methods. Pineapple tops (foreground) planted on the contour in autumn.

be completed before the end of March. In very favourable seasons, later plantings may succeed, but more often than not, growth is barely sufficient for the production of a profitable summer crop. On account of their greater reserves of plant foods, large tops are preferred as planting material.

The scope for early planting of summer tops is limited by the time the crop from which they are obtained is harvested. Advancing the summer plant crop by even one month would provide ample supplies of tops for planting.

There are some risks associated with autumn planting of tops, for the disease known as top rot can cause quite appreciable plant losses, particularly in a wet season. Being low-set in the ground, the hearts are exposed to infection from the soil; hence the importance of having the land well prepared with a minimum of surface irregularities.

Slip and Sucker Plantings.

Slips and suckers planted in the spring, given reasonably good growing conditions, will normally crop in the summer 18 months from planting. Here also, size (particularly of slips) is important, and the larger the plants used, the better the prospect of producing a good summer plant crop.

Suckers should be reasonably large but not old, otherwise they are liable to flower prematurely and produce worthless fruit. There is reason to believe that long-term storage before planting tends to increase the amount of premature flowering; hence it is preferable to collect and prepare suckers shortly before planting begins.

As spring in southern Queensland is usually fairly dry with occasional storm rains, sucker plantings often take some time to become established. Removal of the basal leaves to expose the young roots promotes early establishment, but this is a time-consuming operation and few growers practise it. Peeling is probably not important in a season with good spring rains when the basal leaves rot fairly quickly, but in a dry season the extra work entailed would probably pay dividends.

CULTURAL PRACTICES.

As mentioned above, black heart may be avoided by producing the ratoon crop before the July-August period. Much can be done by the use of good, vigorous planting material, and planting at the right time, but these alone are not sufficient. Sound cultural practices which will maintain maximum growth from planting onwards are essential, and particular attention must be given to the selection of land for the crop, its preparation for planting, fertilizing practices and weed control.

Choice and Selection of Land.

The growth and survival of the pineapple root system is determined by the physical condition of the soil in which the crop is grown and even temporarily defective drainage can have an adverse effect. However, the grower has to make the best use of what land is available. Where the soil is shallow and overlies a clay subsoil, ways and means of improving the drainage have to be considered. There is good reason to believe that "ripping" improves sub-surface drain-

Plate 2.

Bedding Up. In shallow soils, the land is formed into broad beds with interrow drains.

age, at least in soil types where the subsoil is not a stiff clay. In shallow soils it is also an advantage to form the land into broad beds with interrow drains (Plate 2).

In preparing land for planting, the soil should be brought to a good tilth with a minimum of surface irregularities which tend to collect water on the surface and provide conditions favourable for top rot infection.

Surface mulching with sawdust, megasse and similar materials is sometimes used to conserve soil moisture during dry periods. This practice, though frequently beneficial, is somewhat risky, particularly in damp locations, since it may hold too much moisture in the soil during the wet season. Under wet conditions, a surface mulch can actually increase the incidence of top rot and root rot wilt. During the winter, a surface mulch is also liable to increase the risk of injury from chilling. These points should be taken into account when deciding whether or not a heavy surface mulch should be applied.

Fertilizing.

Good growth in the plantation cannot be expected without an adequate supply of plant foods. This means that the pineapple crop must receive sufficient of the right fertilizers at the right time. The pineapple is a relatively heavy feeder and requires about one ton of fertilizer per acre per year for good growth and maximum yields. Fertilizer is costly, but it is false economy to reduce the amounts used below the requirements of the crop.

Pineapples require very little phosphorus but need considerable amounts of both nitrogen and potassium. Owing to the removal of soluble nutrients by leaching during periods of heavy rain, it is necessary to make several applications of fertilizer each year. The usual practice is to apply alternately a 10-6-10 mixture and straight sulphate of ammonia. This procedure is satisfactory on many soils in the more important pineapple growing areas, but some modification is needed on certain areas. For instance, the sandy soils are, for the most part, so deficient in potassium that the above schedule provides insufficient of this element. In such cases, the better procedure would be to double the amount of potassium applied by using a 10-6-10 mixture for each application. This will increase yields and could mean the difference between an early and a late summer crop.

Timing of fertilizer applications is more important than is sometimes imagined. For instance, a pre-winter dressing of fertilizer, if applied late, may be of little benefit since plants which are virtually dormant cannot make effective use of plant nutrients. For good growth in spring, it is essential that adequate supplies of nutrients be available immediately growth is resumed after the winter, and an early spring application is desirable. The usual practice is to make four applications each year—early March, early May, September, and December-January. This is the basic practice, but more frequent and lighter dressings would probably be advantageous were it not for the extra labour entailed.

High nitrogen just prior to flowering may promote excessive vegetative growth and delay natural flowering or make artificial flower induction very difficult. For this reason, it is inadvisable to apply a heavy dressing of nitrogenous fertilizer at this time. After flowering has taken place the position is quite different, for during the period of fruit development the plant requires a great deal of nitrogen and any shortage could be reflected in reduced fruit size (Plate 3). Similarly, an adequate supply of nitrogen is needed immediately after the summer crop has been harvested; the

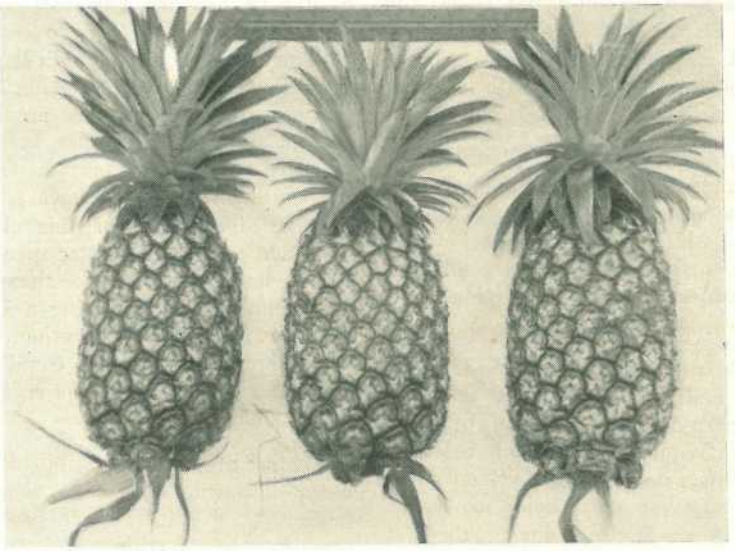


Plate 3.

Pineapple Fruits. In a well-managed plantation, the fruit should average about 4 lb. (tops off) in weight.

liberal use of nitrogenous fertilizers at this time might well determine whether or not the ratoon suckers will be sufficiently advanced to produce a May-June crop.

Weed Control.

Weeds in the plantation can greatly retard the growth of pineapple plants, particularly in dry periods when soil moisture is limited. From planting onwards throughout the cropping cycle, complete freedom from weeds of any size is most important.

Weeds soon get out of hand if proper attention is not given to spray schedules and growth of the pineapples suffers. Too much emphasis cannot be given to the advantages of pre-germination PCP sprays as against the contact sprays used to deal with established weeds.

ARTIFICIAL FLOWER INDUCTION.

Given favourable treatment and a reasonably good season, a summer plant crop of fruit can be expected, even without the aid of artificial flower induction. However, this is a valuable means of ensuring that a well grown crop does not "hold-over" and upset planned cropping. Following a summer plant crop, only a limited proportion of the first ratoon plants will flower naturally and produce a crop before winter. To achieve pre-winter cropping over the whole area, therefore, it is not only necessary to promote maximum growth in the ratoon suckers; artificial flower induction is also imperative.

In Central and Northern Queensland where temperatures generally are rather more favourable for plant growth, a summer or autumn ratoon crop is more readily attainable following a summer plant crop.

Normal Plant Crop.

The normal summer crop in southern Queensland is usually harvested from late January to March, but the period is variable depending on the district and the particular aspect of the plantation. In some of the colder

Plate 4.

Flower Induction. Plant crop at the right stage for "gassing."

Plate 5.

Flower Induction. Plants "gassed" prematurely. Note the small fruit on elongate stems.

areas, harvesting may not be completed until late in April. Suckers on a plant which matures its fruit in January are usually considerably more advanced by the onset of winter than those produced following a March crop.

To ensure uniform flowering in a given area for a summer crop, flower induction treatment may be applied in the preceding May. The value of this practice is now generally recognised, but some growers are reluctant to adopt it because they fear that poor suckering and generally reduced vigour will follow treatment. This fear is based on wrong premises, for if a plant is sufficiently well grown at the time of flowering, it will produce a normal complement of vigorous suckers, as well as a good-sized fruit, irrespective of whether the flowering process occurs naturally or is initiated artificially (Plates 4 and 5).

Time of flowering influences the amount of suckering and even a well-grown plant may not sucker satisfactorily if forced to flower out of season. An under-sized plant, on the other hand, can be induced to flower but will invariably produce a small fruit and few, if any, suckers. Experience will indicate the minimum size at which plants can be safely treated, but, as a guide, unless the largest leaves are 30 inches or more in length a grower should hesitate to induce flowering.

Advancing the Plant Crop.

As the aim is to produce a first ratoon crop earlier than usual to avoid harvesting in the winter period, advancing the plant crop would be an advantage. Since climatic conditions become increasingly less favourable for growth as the winter approaches, an advance of only a few weeks in the time of maturity of the plant crop could easily increase the size of the ratoon suckers before winter.

The use of artificial flower induction treatment in May has been advocated for some time as a means of ensuring uniformity in flowering for the normal summer crop. Where it is desired to induce earlier bearing it would be necessary to correspondingly advance the time of treatment. April treatment would in many areas have the desired effect. Advancing the time of treatment excessively is undesirable owing to the likelihood of producing a "prickly-eye" type of fruit in the Christmas period.

In cool districts, where the summer crop normally does not mature until well into the autumn, it is probably impracticable and undesirable to attempt to advance flowering. In such areas the normal winter ratoon crop would be so much later that it would automatically escape the critical black heart period.

Spreading the Harvest.

While uniform flowering is an advantage from many points of view there may be circumstances where concentration of the harvest in a limited period may overtax the labour force for a short time. The position may be relieved to some extent by treating the developing fruit with a high concentration of ANA, which will increase weight and slightly delay maturity. This treatment applied to portion of a cropping area would be an advantage in such cases, and the delay of about 10 days in harvesting would not be of great consequence, particularly where the crop had already been advanced by early flower induction treatment.

The above discussion of black heart in the winter pineapple crop indicates that the problem in southern Queensland may be solved by means of crop management practices designed to eliminate harvesting during the critical months of July and August.

The Honey-Flora of South-eastern Queensland.

By S. T. BLAKE (Botanist) and C. ROFF (Adviser in Apiculture), Science Branch.

(*Continued from page 290 of the November issue.*)

Paper-barked Tea-Tree.

Botanical Name.—These trees belong to species of *Melaleuca,* but their correct names are still under investigation. With some others, they have often been called *Melaleuca leucadendra* L.

Other Common Names.—Paper-bark tea-tree, broad-leaved tea-tree, soapy tea-tree, belbowrie.

Distinguishing Features.—Shrubs or trees with whitish papery bark, stiff leaves narrowed at each end, 2-6 in. long, with several veins running along their length, and thick fluffy spikes of white, cream, greenish or red flowers (Plates 135-137).

Description.—These may be shrubs or trees up to 60 ft. high with a thick, whitish bark made up of very many papery layers. The crown is usually fairly dense and green, or (especially when there is new growth) silvery. The leaves are scattered along the twigs. They are dull green or silvery, stiff, narrowed to each end, mostly 2-6 in. long, usually 2-8 times as long as wide, the narrower ones less than $\frac{1}{2}$ in. wide but the broader ones up to more than 2 in. wide, all with 5-9 prominent veins running along the length. The flowers are produced in thick fluffy spikes about 2-5 in. long and $\frac{3}{4}$-$2\frac{1}{2}$ in. thick, usually white, cream or greenish, though red-flowered trees occur. The conspicuous part of each flower consists of five bundles of stamens with a central style, but there are also five small petals of the same colour as the stamens, five tiny sepals and an ovary at the bottom. Before flowering is over the spike grows out into a leafy twig beyond the densely packed small seed-capsules.

Distribution.—Paper-barked tea-trees are abundant in coastal districts, where they often form pure stands, usually on lowlying swampy ground, but they are often found as patches in forest country on slopes.

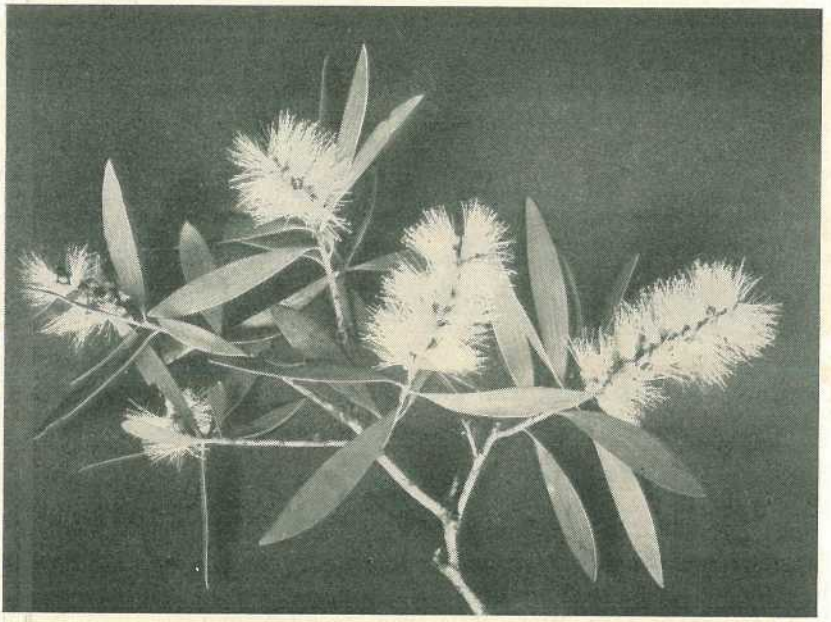


Plate 137.

A Paper-barked Tea-tree (Melaleuca sp.). Branchlet with leaves and flowers.

Plate 138.

A Paper-barked Tea-tree (Melaleuca sp.). Portion of trunk.

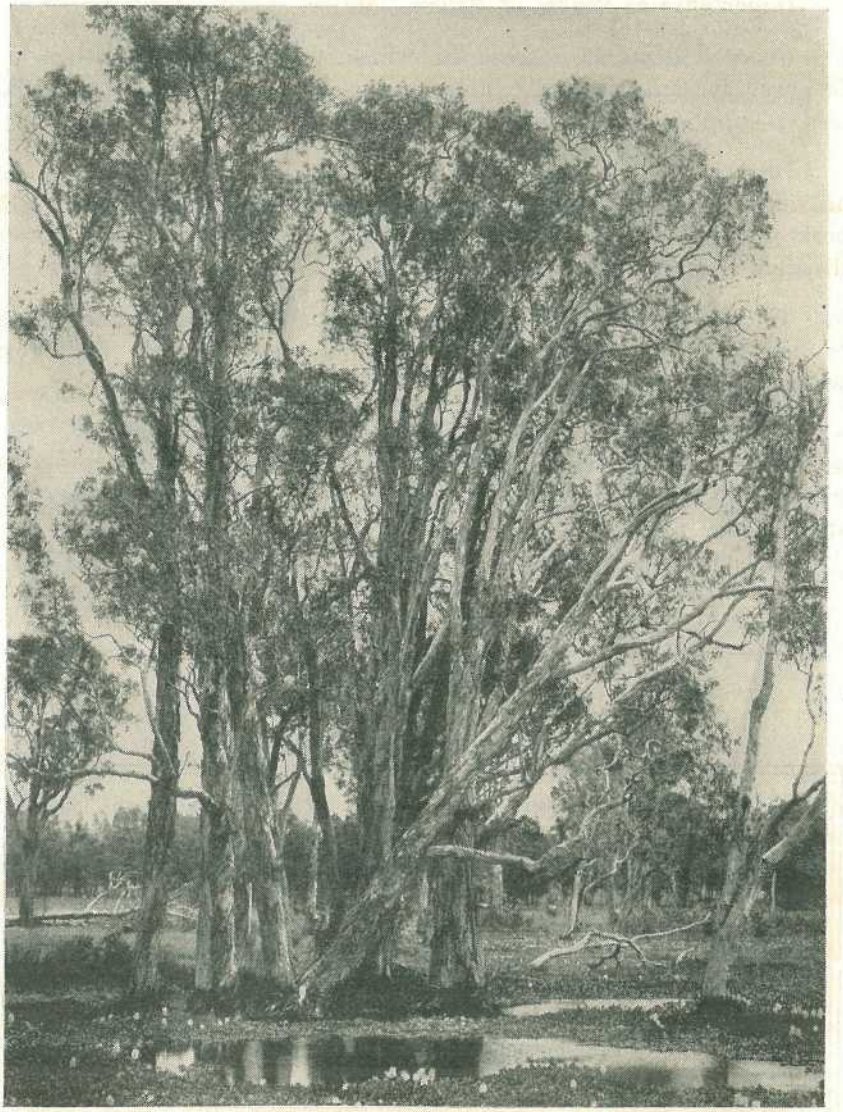


Plate 139.

Paper-barked Tea-trees (Melaleuca sp.). Clump on Nudgee Waterholes

Usual Flowering Time.—March–July.

Colour of Honey.—Medium amber.

Importance as Source of Honey.—Major.

Importance as Source of Pollen.—Major.

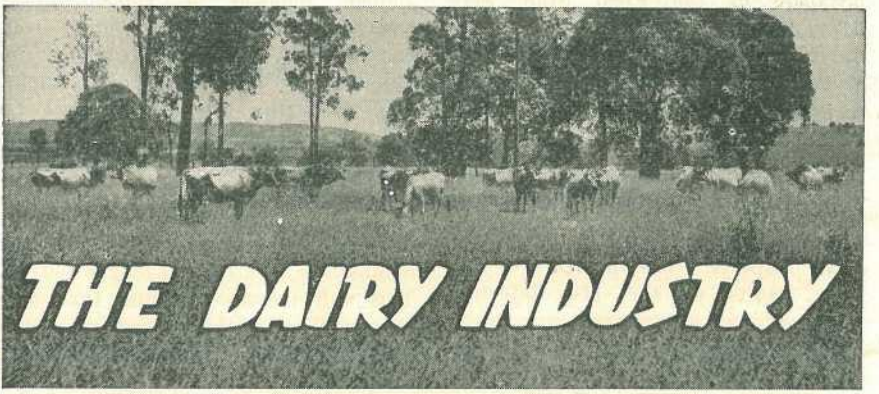
General Remarks.—Areas in which tea-trees are plentiful are favoured for autumn and winter apiary sites, as the good pollen and nectar supplies build up colony strengths.

During the flowering period the same tree may blossom a number of times, although usually only one of these is of benefit to the beekeeper. Tea-trees are more reliable as nectar-producers in coastal districts north of the Caboolture River.

The honeys are not first grade but nevertheless the smooth-grained candied forms are popular locally for table purposes. The liquid form when blended with better grade honeys is usually exported.

All tea-tree honeys have strong flavours and weak densities. They granulate quickly, with grains varying from fine creamy to coarse brown, and darken if more than moderate heat is used during extraction, straining or packing.

[TO BE CONTINUED.]



Testing of Milking Machines: A Preliminary Survey.

By J. D. ELRINGTON, Senior Adviser (Machinery), Division of Dairying.

Members of the dairying industry directly associated with milking machinery have been well aware of two things almost since milking machines were invented and developed. These are that not all new machines are efficient, and that a large number of machines become inefficient after varying periods of use. The question has always been—how can milking machines be tested?

Until comparatively recent times, examination and adjustment of milking machines had been a rather hit-or-miss method and most servicemen did not even have a clear idea of what was required of an efficient machine. Various scientists got to work and two outstanding pieces of test equipment were invented at the Ruakura Animal Research Station, New Zealand. This equipment was then manufactured by the Scientific Equipment Company, Auckland, and brought to Australia.

At the same time, many experiments which were directed towards perfecting machine milking proved successful and recommendations were made covering all parts of the machine. These developments placed in the hands of both servicemen and designers a knowledge of what is required and also the means of positively knowing if these requirements are met.

The instruments, consisting of an S.E. Air Flow Meter and a Ruakura Vacuum Recorder, are hand-made and consequently very expensive. In a State the size of Queensland, with probably 13,000 milking machines to be tested, it was difficult to see where the finance would come from to purchase the testing equipment.

The farmers' own body, the Queensland Dairymen's Organisation, investigated the position and decided to supply the necessary equipment. To date, 10 sets of instruments have been made available at a cost of over £1,100, and others are on order. This equipment is placed with Co-operative Dairy Associations, a member of the staff being trained in its use. The Queensland Dairymen's Organisation has also agreed to the use of the equipment by Field Staff of the Division of Dairying.

In order to assess the serviceability of milking machines generally and the desirability of a testing service, some

members of the Field Staff were asked to submit a report showing the number of machines tested, the number found to be correct in all respects, and a list of the faults found in the remainder.

Of 143 machines examined, 27 (approximately 19 per cent.) were found to be operating satisfactorily in all respects. The incidence of the main faults in the 116 defective machines was as follows:

Fault.	No. of Machines.
Pulsators needing attention ..	59
Vacuum pump faulty ..	47
Excessive air leaks	36
Faulty releasor flaps ..	21
Unsuitable vacuum control valves	15

These actual results suggest that there is a tremendous amount of work to be done in all dairying districts on milking machines.

Frequently the farmer is not aware of the faults, and has come to accept a certain rate of milking as normal, and also a certain incidence of mastitis and a certain quantity of milk as also normal.

Without enlarging on faults and results, two examples will be quoted:—

(*a*) Vacuum gauge faulty, reading too high. Frequently caused by sudden removal of rubber plugs causing the pointer to bump back on the stop, thus moving it on the spindle. Even if the teat cups would hold on with such a gauge set on 15", the machine would take longer than necessary to milk the cows.

(*b*) Pulsators out of adjustment, causing the inflations to collapse against the teat for too long a period. This will increase milking time and shorten the lactation period unless the cows are reasonably well milked out.

The object is to test all milking machines and advise the farmer impartially of what repairs, if any, are required. He can then have them attended to, usually through the distributor of the machine, who is anxious to have the machines sold by him give good service.

Farmers who suspect that their machines are not milking efficiently should contact the butter factory manager or Dairy Officer, particularly those farmers supplying factories in the Oakey, Killarney, Esk, Warwick, Chinchilla, Roma, Malanda, Beaudesert, Toowoomba, Gympie, Millmerran, and Pittsworth areas.

As testing is extended, a further paper will be published and information given on methods of effecting minor adjustments.

PAMPHLET ON COTTON GROWING.

A profusely illustrated pamphlet dealing with cotton growing in Queensland is available free of charge from the Department of Agricuture and Stock, Brisbane.

This publication will prove extremely useful not only to cotton growers and prospective growers but also to project club members and students doing social studies.

Dairying in Central Queensland.

By P. McCALLUM and L. T. FOSSEY, Division of Dairying.

At the beginning of the present century, Archer Bros. established the first dairy in Central Queensland at Matcham, near Rockhampton, with the object of supplying Rockhampton with milk, but later embraced the manufacture of butter and cheese.

From these humble beginnings the industry in Central Queensland has grown to such an extent that today there are four butter fatcories, one pasteurised milk factory and two ice-cream factories (one co-operative and one proprietary).

All the co-operative factories are now under the control of the Port Curtis Co-operative Dairy Association Limited, which has butter factories at Gladstone, Biloela and Wowan and a pasteurised milk, ice-cream and butter factory at Rockhampton. A cheese factory was operated at Bracewell from 1942 to 1954, and one at Theodore from 1942 to 1949. This Association also controls factories at Bundaberg, Monto and Mackay.

The Association has its own cold stores at Gladstone, and butter and cheese are exported direct from the stores through that port. It also has

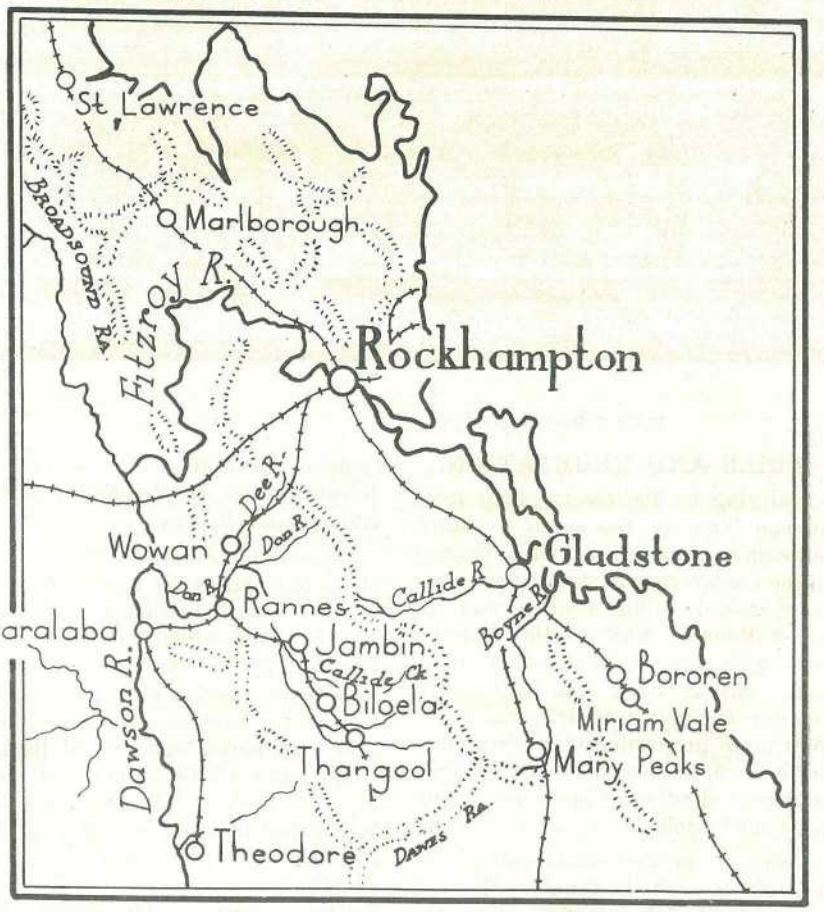


Plate 1.
Sketch Map of the Central District.

hardware/produce stores at Gladstone, Biloela and Wowan, piggeries at Wowan and Biloela, livestock marketing facilities in the Dawson and Callide Valleys for the marketing of calves and pigs by shareholders, agricultural machinery agencies at all branches, and a sheet metal plant at Gladstone for re-tinning milk and cream cans.

The Boyne Valley area in the Gladstone district is a narrow fertile strip. The flat country along the river consists of two terraces—(a) one of rich sandy loam close to the river, and (b) a higher terrace of shallow grey loam over clay.

Undulating softwood scrub country of volcanic origin is found around Mount Larcom. Softwood scrub and brigalow scrub areas also exist around Rockhampton, at Rossmoya, Dalma, Kalapa and Raglan.

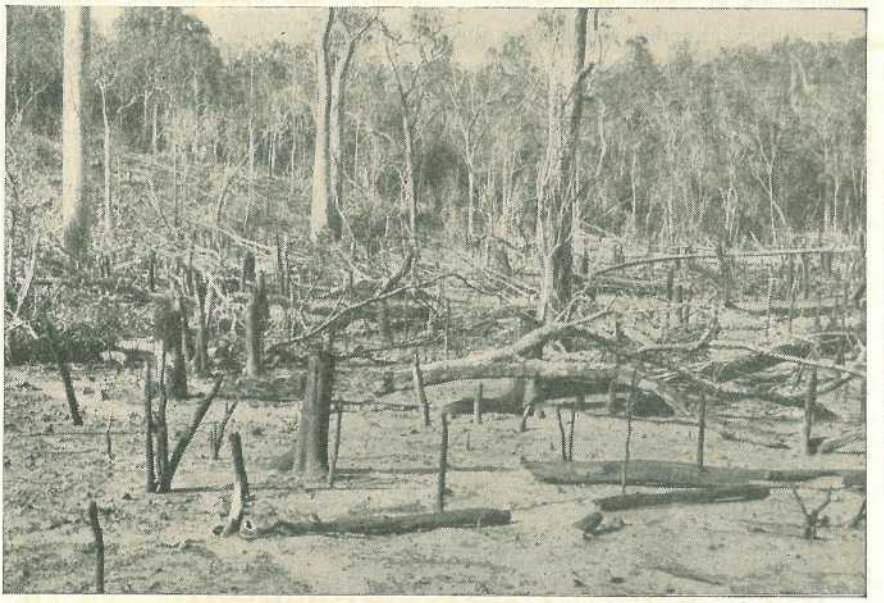


Plate 2.
Light Softwood Scrub Land After Felling and Burning.

SOILS AND VEGETATION.

Dairying on the coastal strip from Miriam Vale in the south to Marlborough in the north is mainly confined to the narrow coastal strip between the poor coastal wallum country and the Coast Range. Most of the dairying country is adjacent to the main north-south railway line. The better class country is devoted to dairying, but a very large proportion of the region is devoted to beef cattle. The wallum country and adjacent areas are mainly poor sandy soils.

Away from the coast, open ironbark ridges are to be found, with small areas of alluvial gum flats along the creeks and rivers.

Better-class country is to be found along the valleys on the western side of the Coast Range and lying between it and the other inland ranges. In the Dawson and Callide Valleys there are wide areas of rich alluvial soil along the main streams. Sandy loams occur near the banks, and extend back to large areas of deep, dark-grey clay loams and clays. These soils are of higher fertility and are very suitable for grain crops and summer and winter fodder crops. These areas further extend to flat country with a shallower soil of lower fertility.

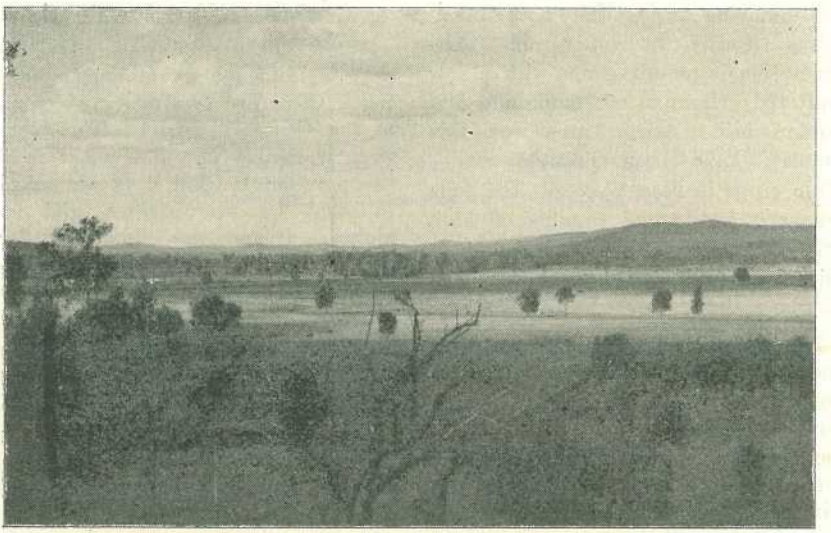


Plate 3.
Farmlands in the Callide Valley.

As the country rises and extends away from the alluvial flats, large areas of brigalow country are to be found and the soil consists mainly of grey-brown clay loams. Although the surface soil is seldom very deep, good crops of cotton and other agricultural crops can be produced and good stands of Rhodes grass pasture have been established.

On the slopes of the hills softwood scrub areas are found. The soils are friable red or brown loams and clay loams of volcanic origin. These soils do not retain moisture like the brigalow soil types.

A large area of open plain country is to be found away from the main streams. The soils are mainly friable

Plate 4.
Grassed Open Forest Country, with Ironbarks.

self-mulching types that lend themselves readily to cultivation. The vegetation is mainly grass with a few scattered clumps of bauhinia and poplar box. Large areas of this country have been brought under grain crops in recent years. The soils are very fertile and capable of high production in seasons of satisfactory rainfall. New dairying blocks have also been thrown open in recent years.

Most of the dairy farms are held under perpetual lease or freehold. Some land is in the process of being converted to freehold, while a small percentage is held as small grazing farms, small grazing homesteads, and mining homestead leases.

CLIMATIC CONDITIONS.

While local conditions play their part in influencing the climatic conditions, there are two types of climate in the Central District. The coastal strip is mainly hot and sultry in the summer, but the hot days are usually followed by sea breezes and cool nights. Inland the climate is drier and generally the extremes between summer heat and winter cold are greater. Frosts are common and sometimes severe during the winter in the Boyne, Dawson and Callide Valleys.

The average shade summer and winter temperatures for the main centres throughout the area given in Table 1.

TABLE 1.

TEMPERATURES IN CENTRAL QUEENSLAND.

——	Temperatures (°F).					
	Summer. (December, January, February.)			Winter. (June, July, August.)		
	Mean Max.	Mean Min.	Mean Temp.	Mean Max.	Mean Min.	Mean Temp.
Rockhampton	89·6	71·7	80·6	74·8	52·2	63·5
Gladstone ..	85·4	71·5	78·5	72·7	53·9	63·3
Biloela ..	89·5	72·6	81·1	72·6	42·1	57·3

As the figure for the average rainfall does not mean much from a dairying point of view, the monthly distribution for a number of centres is given below:—

TABLE 2.

AVERAGE RAINFALL AT VARIOUS CENTRES.

——	Rockhampton.	Gladstone.	Miriam Vale.	Many Peaks.	Mount Larcom.	Biloela.	Wowan.	Theodore.
Jan. ..	7·39	7·27	9·23	6·62	6·62	4·56	4·32	3·46
Feb. ..	7·74	7·29	8·67	6·61	6·99	4·75	5·24	4·40
Mar. ..	4·48	4·96	5·48	3·28	3·28	3·75	2·58	2·72
Apr. ..	2·53	2·50	3·24	2·33	2·42	1·98	2·23	2·25
May ..	2·60	1·83	2·12	1·61	1·48	2·63	1·28	1·77
June ..	2·51	2·57	2·81	2·54	2·57	1·92	2·67	1·65
July ..	1·73	1·83	1·89	1·57	1·75	1·32	1·58	1·59
Aug. ..	·82	·91	1·19	·96	0·70	·57	·72	·68
Sept. ..	1·22	1·23	1·41	1·92	·92	·83	·80	·65
Oct. ..	1·78	1·91	2·32	2·05	1·75	1·74	1·71	1·48
Nov. ..	2·48	2·84	2·96	2·79	2·45	2·77	2·88	3·25
Dec. ..	4·67	4·83	5·73	4·76	5·36	3·60	4·10	4·09
Average	39·95	39·97	47·05	37·04	36·29	30·42	30·11	27·99

Unfortunately, the rainfall is erratic and not as good as the picture presented by the averages. Dry periods of a month or six weeks in the summer cause wilting of crops due to the high temperatures experienced. Winter rainfall is also unreliable and where summer fallowing is not practised winter crop failures occur. The summer weather can, at times, be trying when temperatures reach 100°F., but the winter is usually mild and pleasant although frosts occur. The Tropic of Capricorn, which separates the torrid zone from the temperate zone, passes just below Rockhampton.

WATER FACILITIES.

Where dairying is carried out along the creeks and rivers, these streams are the main source of the water supply. In the scrub areas, and on the drier open plains and forest country, wells, bores, dams and earth tanks provide water. In the early days, shortage of water was a serious problem on some farms, but today only isolated cases of hardship are experienced in dry times. During the 1951 drought several bores and wells around Rockhampton turned so salty that they became unsuitable for stock purposes. Boring contractors and tank sinkers have done much to improve water facilities.

In the Central District nearly 10% of the farms are equipped with irrigation. Weirs, wells, rivers and creeks are the sources of water supply. The main irrigation area is at Theodore, where water is pumped from a weir on the Dawson River adjoining the area. Flood (bay and border) and furrow irrigation are the only methods practised in this area.

Another weir has been erected on the Dawson at Moura and farms are being established here.

Water supplies for dairy purposes are inadequate on some farms during prolonged periods of drought. There is a greater realisation by farmers of the value of an adequate water supply at the dairy, and elevated storage tanks for reticulating the water to various points around the home and dairy are becoming more noticeable on farms.

Plate 5.
Softwood Scrub Sown to Rhodes Grass After Burning.

Here again the shortage of materials has held up further expansion. The provision of concrete storage tanks at the milking shed should be given more thought by dairymen.

PASTURES.

Native pastures in this area are composed of a fairly wide range of species, including Queensland blue, pitted blue, desert blue, kangaroo grass, love grasses, wire grasses, black spear grass, woolly-top Rhodes grass, and purple-top Rhodes grass. Most of these grasses grow rapidly after the storms in the spring and early summer. Burning is practised on many farms in the late winter. These pastures are palatable for a short time and peak growth usually occurs in January or February. A rapid decline in nutritive value occurs after reaching maturity and dairy production falls quickly unless supplementary fodder crops are available at this time of the year.

Native legumes are of little importance, but an introduced species, phasey bean (*Phaseolus lathyroides*), is spreading throughout the district.

Many acres of softwood and brigalow scrub have been felled, burnt, and sown to Rhodes grass. This grass has been mainly responsible for the development and maintenance of the dairying industry in these districts. On sown Rhodes grass a reasonable carrying capacity is a beast to 4-5 acres. Droughts and overstocking have seriously damaged the Rhodes grass pastures in some of the softwood

Plate 6.
A Stand of Green Panic Grass in the Rockhampton District.

scrub areas, particularly around Mount Larcom, resulting in the invasion of weeds and wire grasses.

Paspalum grows along many of the creek flats but does not form an appreciable proportion of pasture land.

Many introduced species of pasture grasses have been under trial at the Regional Experiment Station, Biloela, and of these buffel grass and green panic show the most promise.

WEED PROBLEMS.

The weeds are many and varied, but most can now be controlled by the use of hormone weedicides. The two worst offending weeds as far as milk and cream quality is concerned are lesser swine cress (commonly called mustard weed) and turkey berry (also called chilli weed). The former inhabits cultivations, particularly during a wet winter, and causes heavy degradings of cream down to second grade. Cress taint is one cream taint that cannot be removed by the pasteurisation or vacreation process. Heating the cream actually accentuates the trouble. The Wowan area is possibly the worst affected area as far as this taint is concerned.

Turkey berry causes an objectionable taint in milk and cream, and the meat of animals fattened on scrub farms where it exists is also tainted. The taint in milk or cream is not completely removed by pasteurisation. The Bracewell district at Mount Larcom is the worst affected area.

The control of undergrowth is a big problem in some areas. Lantana is a serious pest on the scrub soil areas, while suckering of brigalow is a major problem on some of the farms in the Dawson and Callide Valleys.

TYPES OF DAIRYING.

There are two types of dairying practised in the Central district—(1) the production of cream for the various butter factories; and (2) milk production for wholemilk consumption, mainly marketed through the pasteurised milk factory at Rockhampton. Since the closure of the cheese factories in the area, cheese milk production has ceased.

The approximate number of suppliers to each factory during 1955 was as follows:—Rockhampton, milk and cream, 470; Biloela, 450; Wowan, 280; Gladstone, 340. Butter production at the factories of Rockhampton, Gladstone, Wowan, and Biloela during 1954-55 was 4,024 tons, during 1953-54 it was 3,575 tons, while in 1952-53 it reached the near-record of 4,200 tons. By including the other factories under the control of the Port Curtis Co-operative Dairy Association Ltd. (Mackay, Bundaberg, and Monto), butter production for 1953-54 was 6,213 tons, which was 15 per cent. of the butter produced in the State. During the drought year of 1951-52 only 3,853 tons were manufactured. The highest year in the history of the Association was 1939, when 9,302 tons of butter were produced.

Mixed farming is the general practice in most of the dairying districts. Pig raising is usually carried out as a sideline on dairies supplying cream to butter factories. Grain crops of sorghum, wheat and maize are grown for sale and also for feeding to the dairy herd and pigs. Where in the past farmers were prone to sell all their grain crop there is now a growing tendency to keep some grain on hand and feed it to the dairy herd during the dry months. Other sidelines carried on with dairying are cotton growing (mainly in the Dawson and Callide Valleys) and peanut growing at Mount Larcom. On some of the irrigated farms lucerne growing is an important sideline.

Sufficient heifer calves are reared on most farms for replacements. Unwanted heifer and bull calves and culled cows are disposed of through the meatworks at Rockhampton and Gladstone.

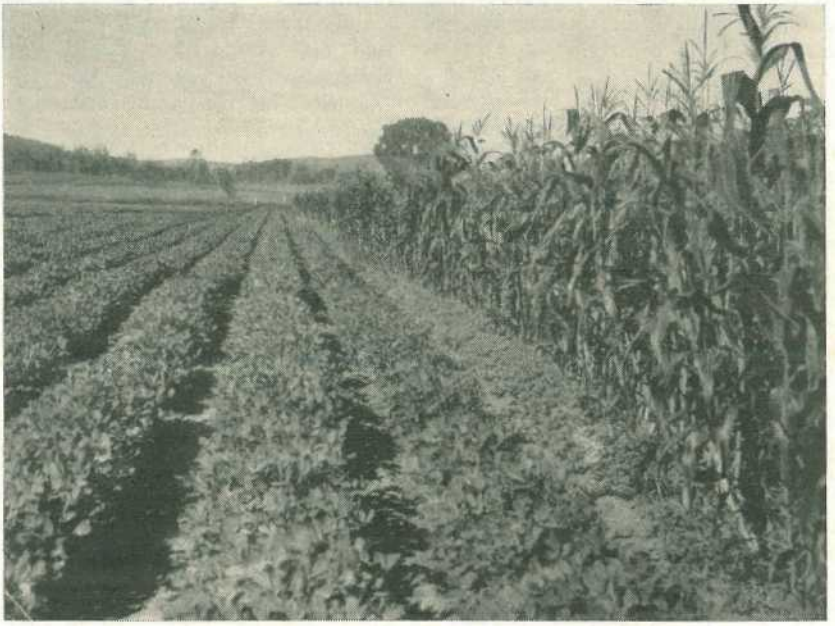


Plate 7.

Crops of Peanuts and Maize on a Mixed Farm in the Rockhampton District.

FODDER CONSERVATION.

Despite the frequent dry spells in this area, fodder conservation does not receive the attention it so strongly merits. Since the disastrous droughts of 1946 and 1951 there has been a much greater interest in fodder conservation. Around Rockhampton, at The Caves, seven 90-ton silos have recently been erected. Crops of sorghum and maize are harvested with modern forage-harvesting machinery and the materials elevated into the silos with mechanical blowers. This modern labour-saving machinery has given the greatest stimulus to this type of fodder conservation. Pit silage has also been put down at Bushley, near Rockhampton, using a modern forage harvester.

There has been a marked increase in the area sown to lucerne, with a resultant increase in the amount of lucerne hay conserved. Hay baling is now more widely practised than the conventional method of haymaking. Here again the use of modern hay-baling equipment has given a big boost to the storing of hay. Other crops are also baled for hay: these include Sudan grass, Japanese millet, white panicum, Rhodes grass, peanut hay, Poona pea, and oats. In the Boyne Valley area, a contractor during the period September 1952 to May 1955 baled over 50,000 bales of hay for farmers in this area. The charge for baling was 1s. 3d. per bale, plus 3d. per bale for raking and 3d. per bale for carting. Around Mount Larcom, another contractor baled 6,150 bales of peanut hay after the 1953 crop had been threshed. Good peanut hay is a good reserve during drought periods, and is comparable in value with fair to very fair lucerne hay.

Rhodes grass of good quality is baled on some farms and proved of great value during the 1951 drought. The shortage of materials (iron, timber, cement, &c.) following the war has been a limiting factor in fodder

conservation, as severe losses can take place if fodder is not sufficiently protected during storage.

In the Rossmoya district, near Rockhampton, sweet potatoes are used for fodder for the dairy herd. The potato vines are fed off before frost damage occurs, and during the winter months the tubers are ploughed out and the cows allowed to gather them in the field.

In some of the frost-free areas, cowcane is grown as a fodder reserve and provides succulent feed when natural pastures are dry and unpalatable. Cowcane is not a good milk producer but is capable of maintaining the herd in good condition. A good feature about it is that it will stand over for several years if not required during a particular year. Fed with small amounts of protein-rich concentrates, it is a useful fodder.

BREEDS OF CATTLE.

The most popular breed of dairy cattle in Central Queensland is the Jersey, which constitutes about 60 per cent. of the total dairy stock. The A.I.S. breed constitutes most of the remainder. There are a few Guernseys, Ayrshires and Friesians, and one Red Poll stud is being established in the Biloela district. Guernseys have gained ground in recent years and several new studs have been formed.

DAIRY HUSBANDRY.

Husbandry methods vary greatly according to the district and type of dairying conducted. On farms supplying milk for the wholemilk trade, an effort is made to maintain the supply during the winter months by supplementary feeding of the herd. The feeding of a ration of grain and concentrates in the bails is the most

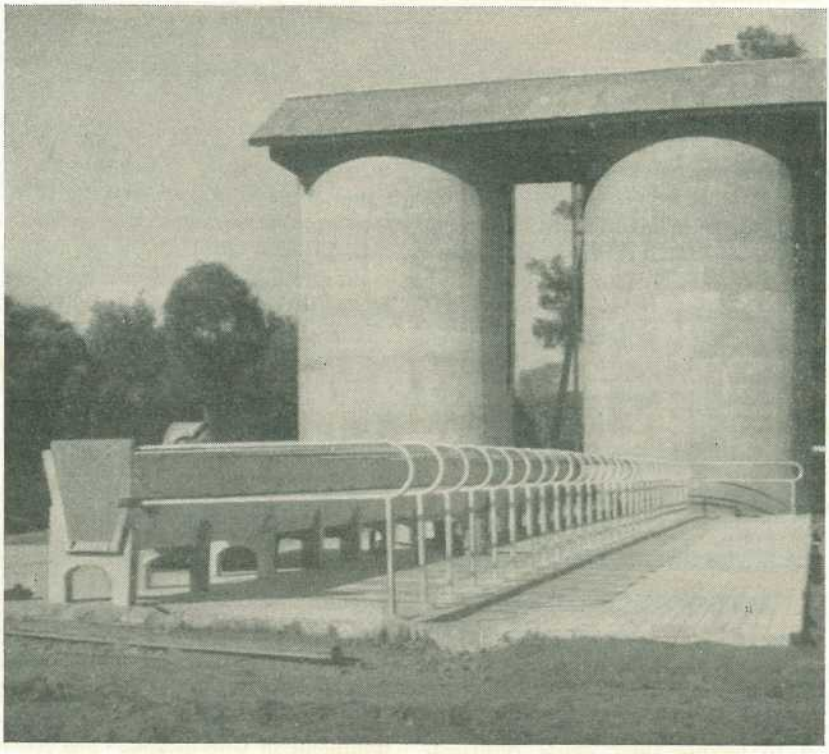


Plate 8.

Silos and Feeding Stalls under Construction on a Central District Dairy Farm.

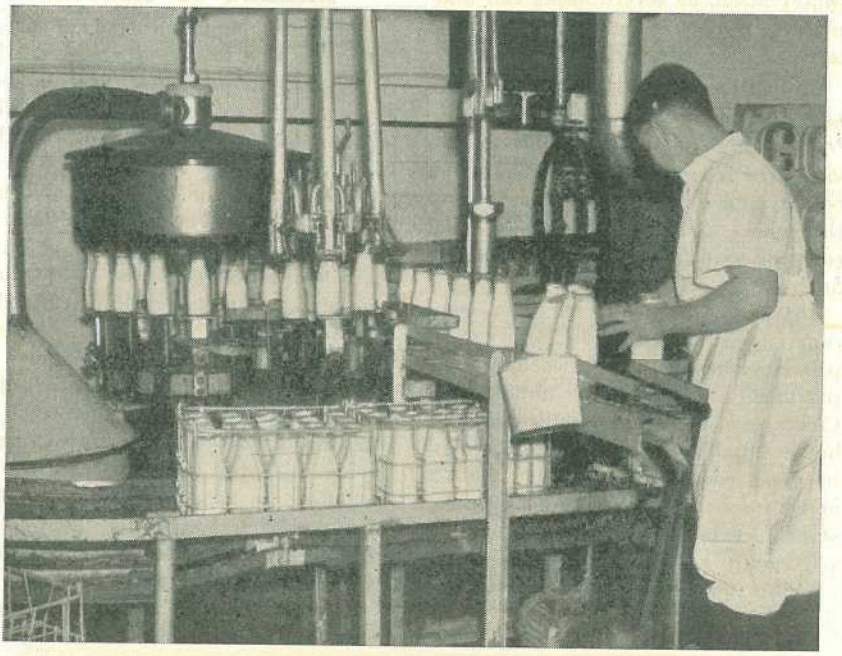


Plate 9.

Filling and Capping Bottles in a Rockhampton Pasteurised Milk Factory.

popular method of feeding. Chaff and silage are fed where available, but the high cost of chaff in times of drought make it uneconomic. The high prices received for grain in recent years have caused most farmers to sell their grain crops for cash rather than feed them to their dairy herd. Many farmers tend to regard dairying as of secondary importance to other farm activities, when it is really the main source of income. However, there is now a growing tendency on the part of many dairymen to retain part of their grain crop and feed it to the dairy herd during the drier months.

HERD RECORDING.

Interest in herd recording in Central Queensland has lagged behind that in most other dairying districts. Stud breeders have not paid sufficient attention to having their herds recorded, and it is only in recent years that owners of commercial herds have exhibited interest in the group herd recording scheme operated by the Department of Agriculture and Stock. Two groups commenced operations in 1952-53—one at The Caves and one at Raglan-Marmor. Four more commenced during 1953-54, at Ridgelands, Mount Larcom, Wowan, and Biloela. As most of the groups have operated for only a short period, it is not possible at this stage to furnish any reliable information on production figures.

FACTORIES.

The standard of factories in the Port Curtis area is high and the milk and cream processing equipment is of modern design. The Port Curtis Co-operative Dairy Association Limited pioneered the introduction of the triple vacreation process of cream treatment in Queensland. The Association has a laboratory at Gladstone and employs its own dairy technologist.

What Concentrates to Buy for the Dairy Cow.

By G. I. ALEXANDER, Husbandry Officer, Cattle Husbandry Branch.

The feeding of concentrates to dairy cattle is a continual source of concern to the dairy-farmer. Experience has shown that concentrate feeding is generally not economical with low-producing cows and requires careful consideration even with the higher producers if it is to be profitable.

It is only natural that the more a cow can produce from pastures and home-grown roughages the cheaper she is to feed. Unfortunately, the food capacity of the cow limits her production off roughages alone to about three gallons a day. She cannot obtain sufficient nutrients in her daily fill of roughage to maintain herself and produce more than this amount of milk. It is at the 3-gallon level of production, therefore, that concentrate feeding should be resorted to.

WHAT COWS TO FEED.

Concentrate feeding is an expensive procedure and every care should be taken to reduce any margin of error and so reduce costs.

Herd recording plays an important part in the rationing of cows, as it enables the dairy-farmer to find out just which cows are the high producers in the herd. This is important, as it is only the high producers which are likely to give economic returns to concentrate feeding.

A further use to which herd recording can be put in this regard is that it may be used to evaluate the response to concentrate feeding in the individual cow. By this means, the farmer can, by a simple process of trial and error, select the cows most likely to be efficient users of concentrates. Even high-producing cows vary in their ability to convert concentrates efficiently into milk. Cows which are excellent producers off pastures alone very often do not give the expected response when fed concentrates.

Thus, the first step in the economic feeding of concentrates is to herd record your cows. The second step is to determine just which cows are most profitable to feed.

WHAT CONCENTRATES TO FEED.

The third step is to select the concentrate to be fed. Since concentrates vary in their food unit value and digestible crude protein content (Table 1) as well as in price, all these factors must be taken into consideration in selecting the concentrate to buy for dairy cattle.

TABLE 1.

FODDER VALUES OF COMMONLY USED CONCENTRATES.

—	Average Food Units per 100 lb. (Starch Equivalent).	Digestible Crude Protein per 100 lb.
PROTEIN-RICH CONCENTRATES.		
Blood Meal ..	65	70
Meatmeal ..	75	55
Peanut Meal ..	80	45
Cottonseed Meal	65	35
Linseed Meal ..	70	25
CARBOHYDRATE-RICH CONCENTRATES.		
Maize Grain ..	75	8
Wheat Grain ..	70	8
Oat Grain ..	60	8
Sorghum Grain..	75	7
Bran	55	10
Pollard	65	10
Molasses ..	50	Nil

The price per food unit and the price per pound of protein will determine the particular concentrate to be used, though factors of palatability and texture must be considered.

Where possible, it is preferable to feed a mixture of grains rather than one particular grain, but this general rule may be ignored if one type of grain is very much cheaper than others. For instance, if a farmer can produce sorghum grain on the farm at a low price, it would be unwise for him to purchase other grains on the open market to mix with his sorghum grain for the sake of feeding a better balanced grain mixture.

In selecting grains, therefore, the choice should be made according to cost per food unit.

In selecting protein-rich concentrates, the choice will be determined by the cost per pound of protein rather than the cost per food unit, as they are fed primarily to build up the protein percentage of the ration. They do, however, contribute food units to the ration, and sometimes a protein-rich concentrate may even be a comparatively cheap energy foodstuff. It is well to remember that cows can make carbohydrates from proteins but not proteins from carbohydrates.

Tables 2 and 3 enable a comparison of real cost of several feeds to be made. Commercial mixed feeds and some farm feeds are, of necessity, omitted.

The cost of concentrates is easily calculated. For example, in forming the bulk of the ration, if maize is selling for £16 a ton, Table 2 shows that each food unit costs 2.15d. With

TABLE 2.

TABLE OF FEEDS BASED UPON COST PER FOOD UNIT.

(A) High-Protein Feeds.

Price per Ton.	Meatmeal. S.E. 70.	Linseed Meal. S.E. 70.	Peanut Meal. S.E. 80.	Bloodmeal. S.E. 60.	Cottonseed Meal. S.E. 65.	Meat and Bone Meal. S.E. 70.
£	d.	d.	d.	d.	d.	d.
10	1·34 (L)	1·71 (s)	1·50 (s)	1·79 (L)	1·85 (s)	1·53 (L)
12	1·61	2·06	1·80	2·15	2·22	1·84
14	1·88	2·40	2·10	2·50	2·58	2·14
16	2·15	2·75	2·40	2·86	2·95	2·45
18	2·42	3·09	2·70	3·21	3·31	2·75
20	2·69	3·44	3·00	3·57	3·68	3·06
22	2·96	3·78	3·30	3·92	4·04	3·36
24	3·23	4·13	3·60	4·28	4·41	3·67
26	3·50	4·47	3·90	4·63	4·77	3·97
28	3·77	4·82	4·20	4·99	5·14	4·28
30	4·04	5·16	4·50	5·34	5·50	4·58

(B) Low-Protein Feeds.

Price per Ton.	Wheat-meal. S.E. 70.	Maize-meal. S.E. 80.	Sorg-hum. meal. S.E. 70.	Crushed Oats. S.E. 60.	Pollard S.E. 65.	Bran. S.E. 55.	Wheat. S.E. 70.	Maize. S.E. 80.	Sorg-hum. S.E. 70.	Oats. S.E. 60.
£	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.
10	1·71 (s)	1·50 (s)	1·71 (s)	2·00 (s)	1·85 (s)	2·18 (s)	1·53(L)	1·34(L)	1·53(L)	1·79(L)
12	2·06	1·80	2·06	2·40	2·22	2·62	1·84	1·61	1·84	2·15
14	2·40	2·10	2·40	2·80	2·58	3·05	2·14	1·88	2·14	2·50
16	2·75	2·40	2·75	3·20	2·95	3·49	2·45	2·15	2·45	2·86
18	3·09	2·70	3·09	3·60	3·31	3·92	2·75	2·42	2·75	3·21
20	3·44	3·00	3·44	4·00	3·68	4·36	3·06	2·69	3·06	3·57
22	3·78	3·30	3·78	4·40	4·04	4·79	3·36	2·96	3·36	3·92
24	4·13	3·60	4·13	4·80	4·41	5·23	3·67	3·23	3·67	4·28
26	4·47	3·90	4·47	5·20	4·77	5·66	3·97	3·50	3·97	4·63
28	4·82	4·20	4·82	5·60	5·14	6·10	4·28	3·77	4·28	4·99
30	5·16	4·50	5·16	6·00	5·50	6·53	4·58	4·04	4·58	5·34

S.E. = Starch equivalent. L = Long ton (2,240 lb.). s = Short ton (2,000 lb.).

TABLE 3.

VALUE OF FEEDS BASED UPON COSTS PER POUND OF DIGESTIBLE PROTEIN.

(A) High-Protein Feeds.

Price per Ton.	Meatmeal. D.P. 55%.	Linseed Meal. D.P. 25%.	Peanut Meal. D.P. 45%.	Blood Meal. D.P. 70%.	Cotton Seed Meal. D.P.35%.	Meat and Bone Meal. D.P. 45%.
£	d.	d.	d.	d.	d.	d.
10	1·95	4·80	2·67	1·53	3·43	2·38
12	2·34	5·76	3·20	1·84	4·12	2·86
14	2·73	6·72	3·73	2·14	4·80	3·33
16	3·12	7·68	4·26	2·45	5·49	3·81
18	3·51	8·64	4·79	2·75	6·17	4·28
20	3·90	9·60	5·32	3·06	6·86	4·76
22	4·29	10·56	5·85	3·36	7·54	5·23
24	4·68	11·52	6·38	3·67	8·23	5·71
26	5·07	12·48	6·91	3·97	8·91	6·18
28	5·46	13·44	7·44	4·28	9·60	6·66
30	5·85	14·40	7·97	4·58	10·28	7·13

(B) Low-Protein Feeds.

Price per Ton.	Wheat-meal. D.P. 8.	Maize-meal. D.P. 8.	Sorg-hum meal. D.P. 7.	Crushed Oats. D.P. 8.	Pollard. D.P. 10.	Bran. D.P. 10.	Wheat. D.P. 8.	Maize. D.P. 8.	Sorg-hum. D.P. 7.	Oats. D.P. 8.
£	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.
10	15·00(s)	15·00(s)	17·14(s)	15·00(s)	12·0(s)	12·0(s)	13·39(L)	13·39(L)	15·31(L)	13·39(L)
12	18·00	18·00	20·57	18·00	14·40	14·40	16·07	16·07	18·37	16·07
14	21·00	21·00	24·00	21·00	16·80	16·80	18·75	18·75	21·43	18·75
16	24·00	24·00	27·43	24·00	19·20	19·20	21·43	21·43	24·49	21·43
18	27·00	27·00	30·86	27·00	21·60	21·60	24·11	24·11	27·55	24·11
20	30·00	30·00	34·29	30·00	24·00	24·00	26·79	26·79	30·61	26·79
22	33·00	33·00	37·72	33·00	26·40	26·40	29·47	29·47	33·67	29·47
24	36·00	36·00	41·15	36·00	28·80	28·80	32·15	32·15	36·73	32·15
26	39·00	39·00	44·58	39·00	31·20	31·20	34·83	34·83	39·79	34·83
28	42·00	42·00	48·01	42·00	33·60	33·60	37·51	37·51	42·85	37·51
30	45·00	45·00	51·44	45·00	36·00	36·00	40·19	40·19	45·91	40·19

D.P. = Digestible protein. L = Long ton (2,240 lb.). s = Short ton (2,000 lb.).

wheat selling at the same price a food unit would cost 2.45d. Wheat would have to be purchased at £14 a ton to be of equal value to corn at £16 a ton. In a similar manner, all the feeds in Table 2 can be compared, as they are all medium- to low-protein feeds and are usually put in the ration to furnish food units.

In most cases, farmers will find it economical to purchase a high-protein supplement to add to their grain ration. This is especially so where low-protein roughages are fed and grains are relatively high in price. It may even be wise for a farmer growing his own grains to sell some and replace them in the ration with a purchased high-protein supplement. In other words, as a source of protein such a supplement furnishes a pound of digestible protein at a much lower cost than does grain.

WHEN TO FEED CONCENTRATES.

Farmers may find it advantageous to feed concentrates at one or more of the following times:—

(1) During summer flush growth of pasture.

(2) During the winter.

(3) During drought time.

(1) Summer Feeding.

In view of the fact that it is usually uneconomical to feed cows concentrates except when they are producing three gallons or more of milk daily, it would appear a very sound principle to feed dairy cows during the summer months. It is during this period that there is a lush growth of pasture and hence the cow is getting adequate roughage. Since it is the usual practice in cream-supply areas

to calve cows so that all cows are producing at their maximum during the summer months, it is natural that the cows will be producing at their peak off pasture at this time. This would therefore be the logical time to feed concentrates to the highest producers.

(2) Winter Feeding.

Winter feeding is not such a clear-cut story. Cattle will produce up to three gallons of milk daily off adequate good roughages and pasture. In areas like the Darling Downs where there is, as a rule, good growth of sown pasture and crops in winter, the same would apply as holds with summer feeding.

In wholemilk supply areas, the farmer is faced with the necessity of producing a considerable amount of milk during the winter. Therefore, he usually calves a proportion of his cows early in the winter so that they will be producing at their peak during the winter months. Provided that he has sufficient roughage available, this is quite practicable, and it would be equally practicable to feed concentrates to the higher producing cows.

However, concentrates are an expensive substitute for roughages and never completely fill the bill; they should not be resorted to during the winter unless the roughage requirement of the herd is satisfied.

(3) Drought Feeding.

The feeding of dairy cattle during drought time is most economical when done with home-grown roughages. Conserved fodders are the most economical and very often the only economical drought feeds. Purchased concentrates are the most uneconomical form of feeding cows. Concentrates should be regarded as part of the productive ration of the dairy cow and not part of the maintenance ration.

Where concentrates may be of value during a dry season is in the late spring. It has been found that spring calving gives the greatest production, and in following the practice of spring calving it may sometimes occur that there are no early storms and the cows calve onto dry non-productive pastures. It may be economic then to feed concentrates to the cows to maintain their body condition and production until there is sufficient pasture growth to maintain their level of production.

HOW MUCH CONCENTRATE TO FEED.

The initial step in feeding the dairy cow is to make sure that adequate pasture and/or good roughage are made available. If given all of these that they can eat, cows can obtain all the nutrients they require for maintenance and the production of about two to three gallons of milk daily or 20-30 lb. of butterfat a month. Cows capable of producing more than 30 lb. of butterfat a month may not be able to consume sufficient bulky roughage to furnish enough nutrients to maintain production at that level. It is desirable then to feed concentrates, varying the amount according to the production of each cow.

Two methods of feeding concentrates according to production are given below. The first method results in rather high concentrate feeding at low production levels and aids in building up the condition of cows for the next lactation period. This, however, is uneconomical under normal commercial conditions in Queensland. The second method is a better one for commercial production, as little or no concentrates are fed at lower levels of production, but the increase in amount fed as production rises is sharper than with Method 1.

Method 1.

Divide the number of pounds of buterfat produced monthly by six. The figure obtained is the number of pounds of concentrate to feed daily. As production declines with advance in the lactation period, the quantity of feed declines and usually no concentrates are given when the cow is dry. When concentrates are high in cost in relation to roughage, divide by eight. If very cheap, divide by four.

Method 2.

Subtract 25 from the pounds of butterfat produced per month, and divide the remainder (if any) by two to arrive at the pounds of concentrate to feed per day. This rule puts heavy feeding where it belongs—with heavy production. It removes all concentrates from the ration of extremely low producers.

INCREASING SOUTH COAST PASTURE YIELDS.

A marked improvement in pasture production on the phosphate-deficient coastal lands of south-eastern Queensland can be expected from the correct use of superphosphate.

Stating this recently, the Minister for Agriculture and Stock (Hon. H. H. Collins, M.L.A.) pointed out that these phosphate-deficient lands comprise a considerable proportion of the coastal dairying country. Since the most economical way to increase dairy production is through improved pastures, this recommendation on the use of fertilizer is of prime importance to South Coast dairy farmers.

On the South Coast, fertilizer trials on both sown pasture legumes (red and white clovers) and a naturalised legume (white clover) have again shown that the major plant food deficiency in these coastal soils is superphosphate.

This year, the Agriculture Branch of the Department laid down a trial in the Merrimac area to examine 19 fertilizer treatments which included trace elements as well as the main plant foods. The only response was to treatment with superphosphate.

Plots treated with superphosphate produced a dense growth of lush clover over 12 in. high, while land that received no treatment or a fertilizer other than superphosphate produced no worthwhile growth, plants in these plots being scarcely 1 in. high.

At Woongoolba, on paspalum and naturalised white clover pastures, similar responses were obtained, though the growth of clover in the plots receiving superphosphate was not quite as great, only 9 in. in this case. Untreated plots, even when protected from stock, produced much less growth.

On most farms in the South Coast district top-dressing with superphosphate can be recommended as a means of improving pasture production.

Timely Hints.

Early cabbages will be going in from January to April in the southern coastal districts. Transplant most varieties into rows not less than 30 in. apart, with at least 18 inches between plants.

Take precautions against poisoning when grazing cattle on Sudan grass. Give the stock a fill of other roughage before first putting them on to Sudan grass. Graze them for a quarter of an hour on the first day and gradually increase the period. Keep some photographic hypo on hand in case of poisoning. Drench at 2 oz. per pint of water per beast.

Papaw seed planted in boxes or beds will usually germinate in about 12 to 20 days. Keep the boxes or seedlings in partial shade. Transplant into the field when 4-6 in. high.

When joining rams, have your paddocks well grassed and provide as much shade and watering facilities as possible. If there is ample green feed, there is no point in drenching with vitamin A.

If worms are keeping your calves in poor condition, drench with phenothiazine. Then reduce the worm contamination of the pasture by rotating the calves around small paddocks, giving each paddock a spell of at least a month.

Athel tree cuttings planted in the nursery in the spring should be root pruned in January in readiness for transplanting in February or March.

Grade all pineapple planting material by weight before setting it out in the field. Uniformity within each section of the plantation makes harvesting easier.

Mastitis is more common in older cows. To protect the herd from the spread of the disease, milk in the following order:—first-calf heifers, young cows, old cows, cows responding to treatment, cows with mastitis.

DDT is the most effective and economical insecticide for controlling grass caterpillars. On heavy grass, use 8 oz. of active ingredient per acre in sufficient water to cover well. Break it down to 4 oz. on light grass.

Best stands of buffel grass are obtained on well prepared fallowed land. Plant during the wet season at 4-5 lb. per acre on the coast down to 2 lb. in the 15-20 in. rainfall districts.

Cuts and bruises caused by stones and holes in yards increase foot-rot infection of cattle in wet weather. Keep yards in good condition.

Fleece Measurement for Queensland Stud Masters.

Part 1. WHAT CAN BE ACHIEVED BY SELECTION.

By G. R. MOULE, Director of Sheep Husbandry.

Fleece measurement is a versatile tool, but like all tools it has to be used correctly. Fleece measurement is not a method of classing—it is just an aid to selection. It is not a method of breeding, but used the right way it can increase the rate of improvement in sheep from breeding.

Queensland is in a fortunate position. Its 74 Merino studs supply about 75 per cent. of all the flock rams required annually. The progress made in the studs is passed down to the flocks that buy their rams. Combining fleece measurement with the usual methods of classing increases the rate of improvement in sheep. Therefore the flock man has a better chance of "buying progress" with rams from a stud that is using fleece measurement.

This and subsequent articles outline the methods of applying fleece measurement in breeding stud Merino sheep in Queensland.

WHAT CAN BE ACHIEVED BY SELECTION.

Selection is simply the choosing of parents. Selection can be for desirable characters such as high wool weights, adequate staple length and optimum trade count. It can also be against faults such as wool blindness, devil's grip, low wool weights, short staple length and wool that is too strong or too fine.

In most Merino studs in Queensland the young rams are brought in for their initial classing when they are 2-tooths. The reserves are selected and the culls are marked. The remainder are graded for sale. Next year, when the reserve rams are 4-tooths, they are classed again and a final selection is made of replacements to the ram flocks to be joined with the top stud ewes, and the ewes in the "firsts" and the "seconds."

Similarly, the best young ewes are selected at the 2-tooth classing. They are graded as replacements for the ewes in the "tops," the "firsts" and the "seconds."

The sheep that go into the "tops" are all-important in effecting genetic improvement in any stud. Provided they are the best available for the purpose the stud should progress. Their offspring, or the rams they leave, are used to sire sale rams. If the stud is progressing the flock that purchases its sale rams will progress with it.

TABLE 1.

SHOWING THE GREASY FLEECE WEIGHTS OF APPROXIMATELY 380 YOUNG RAMS. THE TOP LINE SHOWS THE WEIGHTS OF THE FLEECES—THE LOWER LINE THE NUMBER OF FLEECES IN EACH WEIGHT GROUP.

Greasy Fleece Weight (lb.)	9	9½	10	10½	11	11½	12	12½	13	13½	14	14½
Number of Fleeces..	1	2	2	4	7	8	12	17	26	33	36	39
Greasy Fleece Weight (lb.)	15	15½	16	16½	17	17½	18	18½	19	19½	20	20½
Number of Fleeces..	39	37	33	30	18	12	9	6	3	3	2	1

This raises two questions. Firstly, how can the stud master know those he has selected as replacements in the "tops" are the best sheep? Secondly, how can the stud master know what progress he is making as the result of his selection?

Sheep have frequently been likened to mobile factories that harvest grass and convert it into wool. That is something of an over-simplification. All kinds of things affect the quantity of wool a sheep produces. The amount of grass that is available to the sheep depends upon the rainfall and the stocking rate, so both these factors have to be remembered. The worms a sheep carries decrease its appetite, and therefore the amount of wool it grows. The start a lamb gets in life influences its growth rate and the weight of its 2-tooth fleece. This, in turn, is influenced by the amount of milk its mother had and even by its mother's age.

All of these things, as well as inheritance, will affect the young sheep when they come up for classing. Consequently some sheep will cut more than others. If fleeces of all the 2-tooth rams are weighed after shearing and arranged in groups so that each fleece is ½ lb. heavier than the previous one, a definite pattern will be obtained. There will be few very light fleeces, and as the weights increase the number of fleeces in each group will increase. If you arrange a table to show the number of fleeces in each weight group, the results will be similar to those shown in Table 1.

You will get a better idea of the distribution of the fleece weights in the various weight groups if you arrange them in picture form as in Fig. 1.

Here you will notice that the average weights of the fleeces in each group are arranged across the page in intervals of half-a-pound. The height of each column represents the number of fleeces in each weight group. The scale to which these heights are drawn is on the left-hand side of the page. You can see that the number of fleeces in each group weight rises by fairly even steps until it reaches the highest point at about 15 lb.

By drawing a line through the mid points at the top of each column you obtain a bell-shaped curve of the type shown in Fig. 2. This is known as a curve of normal distribution,

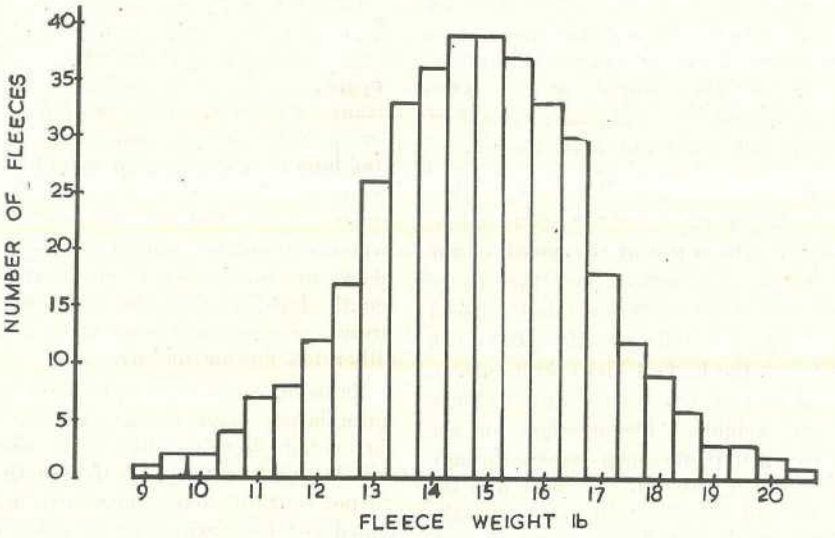


Fig. 1.

Showing the Distribution of Fleece Weights in the Different Weight Groups. The different weight groups are arranged across the page and the number of fleeces is shown on the vertical column on the left. The height of each block indicates the number of fleeces in each weight group.

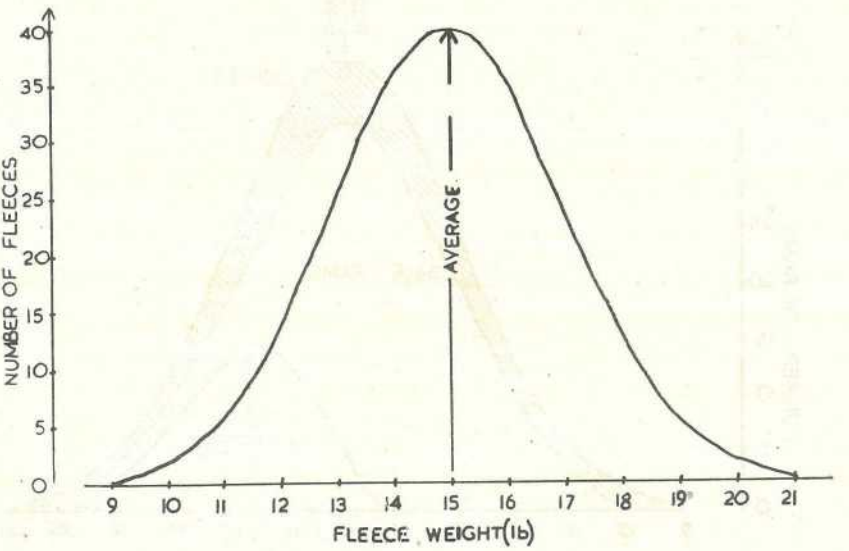


Fig. 2.

Showing the Kind of Curve you Obtain from Drawing a Line through the Centre of the Top of each Column Depicting the Number of Fleeces shown in each Weight Group in Fig. 1. The average cut per head of the unclassed flock is almost 15 lb. of greasy wool, and there are about as many sheep above the average as below.

because it is the sort of curve you get if you measure any character such as greasy fleece weight, clean scoured fleece weight, staple length, fibre diameter or liveweight in a group of sheep that have not been classed.

There are two or three points that are important about a distribution curve. The width of the mouth of the bell at the bottom of the curve measures the variation within the flock; that is, it indicates the difference between the highest and lowest cutters, if the curve has been drawn to show fleece weights. The average for the whole group of sheep passes through the highest point of the curve and the centre of the base line. About the same number of fleeces occur on each side of the average line.

When you select your sheep you have to arrange them so that those falling in different places in the distribution curve are put to their appropriate uses.

This can happen in the following way. Let us suppose a group of young rams are put before you for classing. To start with you will remove the culls. These will go out for such faults as undershot jaws, wool blindness, devil's grip, open backs, turkey hocks, bad feet or pasterns, under- or over-development, smallness, over-size resulting from over-long legs, black or brown wool, short staple length, harshness of the wool, hairy breech, or wool that is off-type, being either too fine or too strong.

Naturally some of the sheep will cut quite heavy fleeces; some will be in the average fleece weight group; others will be light cutters. So by the time 25 per cent. of young rams have been culled for the various faults inherent in the flock the average cut per head of those remaining in the flock is little different from that of the unclassed flock. The best of the remaining rams are required as reserves; the others can be graded for sale. If a large number

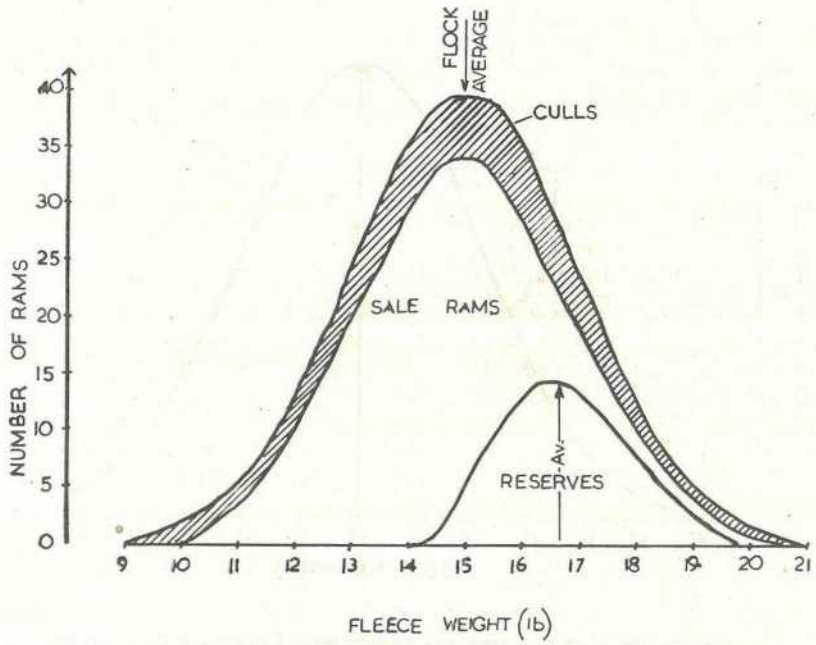


Fig. 3.

Showing how the Fleece Weights of the Culls, the "Reserve Rams" and the Sale Rams might be Expected to be Distributed in a Flock of Rams.

of rams are selected as reserves their fleece weights will form another small distribution curve, at the right-hand end of the large curve.

The fleece weights of the various grades of sale rams would fill up the remainder of the curve in the manner indicated in Fig. 3.

Similarly, if the fleece weights of the youny ewes were recorded a comparable distribution would be noticed. Some of these ewes would be required as replacements in the "tops", others would go into the "first" or "second" studs.

In many respects 2-tooth fleece weight is a fair indication of the productivity of sheep. In many parts of Queensland wool is the only product the woolgrower has to offer for sale. The price that wool commands will depend upon its yield and its type, which in turn will be governed by staple length, crimp, fibre diameter, handle and colour.

Therefore, the sheep that grow the heaviest clean scoured fleeces that fall within the desired tolerances of diameter, crimping, length, colour and type can be judged the most productive. If all the sheep have grown up under identical conditions (that is, in the same paddock), it is fairly safe to say that those that give the highest commercial return are the sheep most suited to the district.

Fleeces grown after lamb shearing and up to the time they are 2-tooths are likely to be the best indication because they are less likely to be affected by such things as age, twin births or the mother's milk supply than are lamb fleeces, and by lambing and suckling as are fleeces grown by older sheep.

BIG DEMAND FOR GRASS SEED FORECAST.

Farmers and graziers, by harvesting seed from their own pastures, can help to relieve an expected shortage of grass seed this summer. The greatest demand will be for seed of Rhodes, green panic and buffel grasses—the three main summer species grown in Queensland.

This year, farmers and graziers have cleared large areas of brigalow and gidyea scrub by both aerial spraying and mechanical means. Up to 100,000 acres of scrub land, now cleared of timber, are expected to be sown to improved pastures this summer.

With so much land waiting to be grassed, an exceptionally heavy demand for grass seed is forecast. In fact, it is feared that, unless grass seed harvesting is extended to additional areas, the supply will not be able to meet the demand.

Landholders with pure stands of any of these grasses on their properties would be well advised to harvest what seed they can, either for sale to seed merchants of for their own use.

However, seed intended for sale must conform to certain standards regarding germination, purity and freedom from weed seeds and prohibited matter.

Persons interested in offering grass seed for sale should consult the Standards Branch of the Department regarding the quality standards that are required.

DAIRY BULL PROVING SCHEME.

First calves born in Queensland's dairy bull proving project are expected about the middle of next year, the Minister for Agriculture and Stock (Hon. H. H. Collins, M.L.A.) said recently.

The project was commenced last spring, and in its first month over 500 cows in 58 herds were mated artificially with selected bulls. Before the breeding season ends late in December, it is planned to have inseminated about 1,500 cows.

The bull proving scheme aims at identifying an outstanding sire that can be used for large-scale improvement of the State's dairy herds. With the use of artificial breeding, such an animal could sire very large numbers of calves. In this way, proven sires could make an outstanding improvement in dairy production through breeding. It is a long-term project and preliminary results cannot be known for more than three years, but in terms of herd improvement, the reward is likely to be very well worthwhile.

Four young Jersey bulls from selected studs are being mated artificially with herds in the Nambour, Kenilworth, Maleny and Mooloolah districts. These districts have been chosen to start the scheme because they contain a fairly heavy concentration of herds that are being production-recorded under the Group Herd Recording Scheme. The Jersey breed was selected because that was the dominant one in the area.

Heifer calves born of these artificial matings will be reared on the farms and production-recorded during their first lactation. From the average production of their daughters, it will be possible to assess the breeding value of the bulls.

Although feeding and management of the calves will vary on the different farms, each bull will be affected equally. Being distributed throughout the area, the progeny will be subject to the same degree of variation in conditions. Again, because matings are randomised in all herds, each bull stands an equal chance of siring daughters from high and low producing cows.

VALUE OF TOBACCO LEAF.

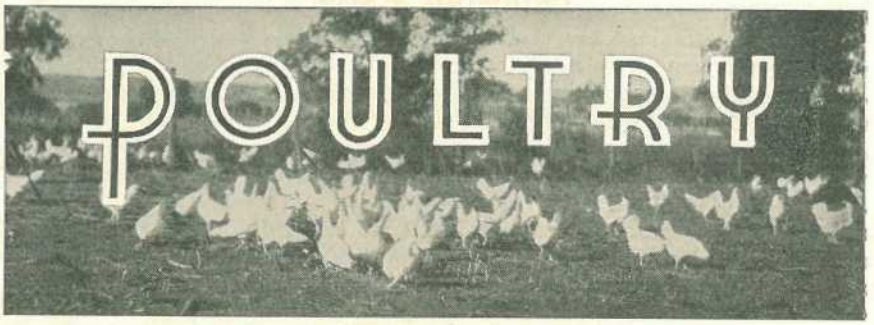
The Minister for Agriculture and Stock, the Hon. H. H. Collins, M.L.A., said recently that sales of Queensland tobacco leaf this year had reached the record figure of £2,650,406.

In addition, tobacco leaf marketed through the Queensland Tobacco Leaf Marketing Board by New South Wales growers had realised £359,591, bringing the Board's total turnover for the season to more than £3,000,000.

The average price of 162.38d. per pound was much higher than last year's figure of 132.3d. and this also was a record.

The normal selling season is now finished but there remains on hand some 345,122 lb. of leaf (equivalent to 7 per cent. of the total crop), and further efforts are being made to sell some of this leaf. Last year's figure of unsold leaf was also 7 per cent.

Mr. Collins went on to say that the crop handled was the biggest for several years and included 4,199,380 lb. of Queensland-grown leaf and 627,627 lb. from New South Wales. However, production during the coming season is expected to be much greater provided seasonal conditions during the next few months remain favourable. Increased acreages have been planted in all districts and although it is too early as yet to give a reliable estimate of yields, prospects at this stage are very good.



How to Build a Poultry House.

By A. R. PRICE, Poultry Inspector.

Poultry houses with lean-to or skillion type roofs are, by and large, very popular in Queensland. They have proved very satisfactory under our semi-tropical and tropical conditions and have the added advantage over other types such as gable and hip roof of easier and cheaper construction.

Once the type has been decided upon, the next point is the size, which is governed by the number of birds to be kept and the system under which they are to be kept. It is well also to give some consideration to future expansion, to make the best use of the site available and to have buildings erected in an orderly manner.

Table 1 gives the size recommended for housing fowls under both intensive and semi-intensive or house-and-yard systems. Under the intensive system the fowls are confined to the house, whereas with the house-and-yard system 20-30 square feet of outside run should be provided for each bird.

TABLE 1.

NUMBER OF BIRDS TO BE KEPT UNDER INTENSIVE AND SEMI-INTENSIVE CONDITIONS.

Size of house.	Intensive.	Semi-Intensive.
10 ft. x 8 ft.	15	30
16 ft. x 14 ft.	45	90
20 ft. x 20 ft.	100	200
30 ft. x 30 ft.	280	500

If the poultry are to be kept on an intensive system and houses are to be erected either in front of or at the back of an existing house, a space of about 20 feet should be left between the rows of buildings. This space allows the sun to enter the house during some period of the day. Sunlight helps to keep the litter dry and adds to the comfort of the birds, especially during the winter months. The ultra-violet rays in sunlight enable the bird to synthesise its own supply of vitamin D_3, and have a germicidal effect on the surface of the litter.

CHOOSING A SITE.

Aspect and slope are the main factors in choosing a site. A north to north-east aspect, to admit maximum sunlight and afford protection against cold westerly winds, is most desirable. The steepness of the slope, which should be a gradual one to the north or north-east, may seriously increase the capital cost of construction. Too steep a slope will necessitate excavation and terracing in order to provide a level floor area. Alternatively, if wooden floors are used, the foundations must be set on posts with the result that one side of the shed is well above ground level. This could make for extra labour in routine feeding and collection of eggs.

STEPS IN PEGGING OUT THE SITE.

(1) Drive a peg (D) into the ground leaving about six inches above ground level. This peg marks the highest point of the site and the right back corner of the building.

(2) From the top of peg D, which is six inches above ground level, with a straight-edge and level transfer this height to pegs A, B and C as shown in Fig. 1 to give you the level of the floor. Connect the pegs with boards at this level to form a profile.

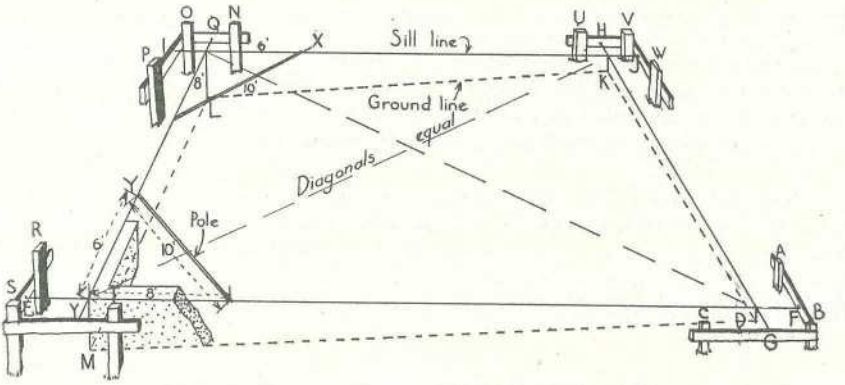


Fig. 1.
Laying Out the Poultry House.

(3) With a measuring tape, measure the approximate length of the building and about this point erect a profile UVW.

(4) Attach one end of a line to a nail driven into the top of profile at G and from G run a line over peg D to a point H on profile UVW. This line represents the back alignment of the building.

(5) With the tape, measure the approximate depth of the building, approximately at right angles to the back alignment GH, and erect a third profile RST.

(6) From a point F on the original profile ABC run a line over D at right angles to GH to a point E on profile RST. The method of determining the right-angle is the 6-8-10 method and is illustrated in Fig. 1 with the profiles RST and PON.

(7) Measure the width of the building accurately from point D, and at the required distance drive in a peg at M.

(8) With the tape, again measure a distance equal to the length of the back of the building approximately at right angles to line FE and erect a fourth profile PON.

(9) Attach a line at point Y on profile RST and run it over point M to point Q on profile PON at right angles to FE.

(10) From point M, measure the length of the front of the building accurately and put in a peg L.

(11) Attach a line from point I in profile PON over point L and at right-angles to YQ to a point J on profile UVW. The intersection of lines IJ and GH should mark the fourth corner peg K.

(12) Check the building for square by measuring the diagonals LD and KM. These must be equal.

PREPARING AND LAYING THE FOUNDATIONS.

To obtain the line for excavations plumb down with level from the floor line as shown in Fig. 1. Lines are held in position by nails driven into the profile boards. They must be removed for excavation purposes. The nails in the profile give the correct alignment. If a wooden floor is required and posts are to be used, shift the floor lines outward half the thickness of the posts to be used. The posts are now cut off level with the new floor line. The bottom plates can now be placed on the posts and floor joists nailed to the plates.

If a concrete floor is to be provided, it is necessary to erect a baffle wall to prevent rats harbouring under the floor. This wall needs to be three inches wide and two feet in the ground when the necessary excavation is completed. Forming is constructed flush and level with the floor lines. This forming is held in position by stakes driven into the ground and braced to other pegs as shown in Fig. 2.

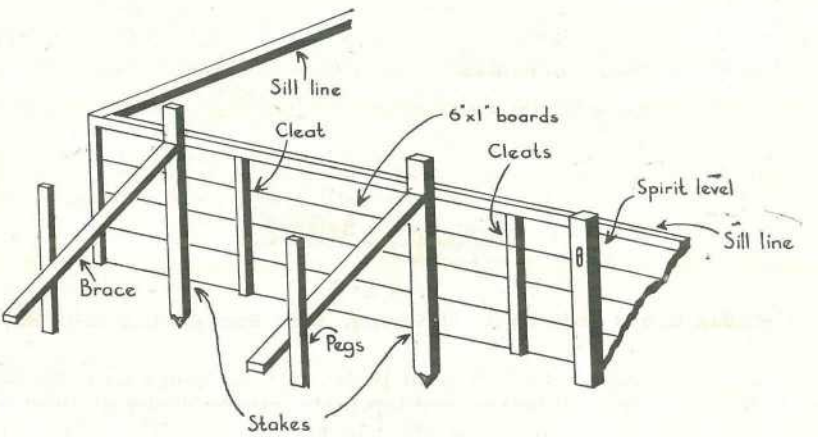


Fig. 2.
Forming for Concrete.

Concrete in the proportion of one part of cement, two parts of sand and five parts of gravel is now mixed and poured into the excavations.

As the thickness of a poultry house floor should be about two inches, the concrete can be kept that distance below the form boards. The ground between the forms should be now graded, levelled and rammed to the required thickness of the floor. Wire netting to act as reinforcement should now be laid over the ground and the concrete poured upon it. To avoid cracking, the concrete is laid in sections.

The forms act as screed boards, and when a straight-edge is drawn across these forms, the floor is levelled. Bolts are set in the concrete, 1½ in. from the outside of the wall, to which the ground plate is bolted.

CUTTING OUT THE HOUSE AND TIMBER TO USE.

The most suitable timber for building a poultry house is hardwood, and the size of the timbers will depend upon the size of the house. The depth of the poultry house has a great bearing on the thickness of the rafters to be used. When a house is over 10 feet deep, the rafters should be supported by posts in its centre to prevent sagging.

The following table is a guide to timbers to use:—

Plates (top and bottom)	3 x 2
Corner studs	3 x 3
Intermediate studs	3 x 2
Rafters up to 10 feet	4 x 2
Roof battens on edge	3 x 2

The front and back plates, both top and bottom, are cut identical lengths. The two end plates are cut identically in length and a scarf three inches long is cut on each end of the bottom plates as shown in Fig. 3.

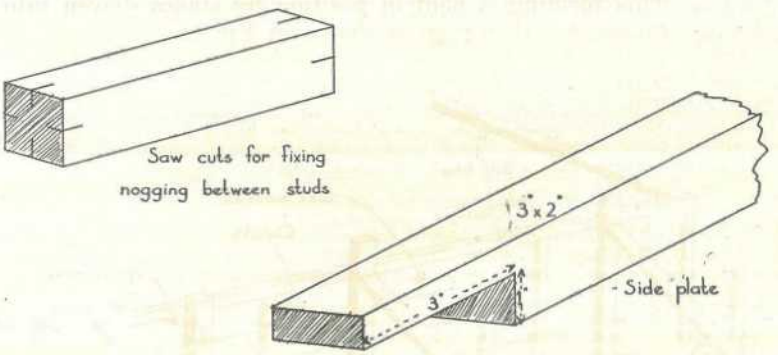


Fig. 3.

Left, Saw Cuts to Assist Nailing of Nogging. Right, Scarf Cut in Bottom Plate.

Holes are bored in the bottom plates to correspond with the bolts set in the concrete. All bottom and top plates are checked half-an-inch to seat the foot and head of the studs. Be sure to gauge from the bottom of the bottom plates and gauge from the top of the top plates. The studs for the back of the house are now cut to identical length, say at

least 5 ft. 6 in. This distance permits ample head-room in the back of the house. The roof should have a reasonable slope to enable the water to drain freely from the roof.

A suitable pitch is one which rises 1½ in. for every 1 ft. depth of the house—for example, if the house is to be 10 ft. deep, the rise would be 10 times 1½ in.—that is, 1 ft. 3in. The front studs would be 1 ft. 3 in. longer than the back studs. Once the length of the front studs is determined, these are cut to identical length. As the house is netted in the front, except for the first 2 ft., the studs can be spaced about 6 ft. apart.

The studs on the ends and back of the building should be spaced to suit the building material—for example, 3 ft. or 4 ft. fibro sheets.

ERECTING THE SHED.

When the bottom plates have been bolted to the concrete, erect, plumb and temporary brace (both ways) one corner stud as shown in Fig. 4. Continue to plumb all corner studs.

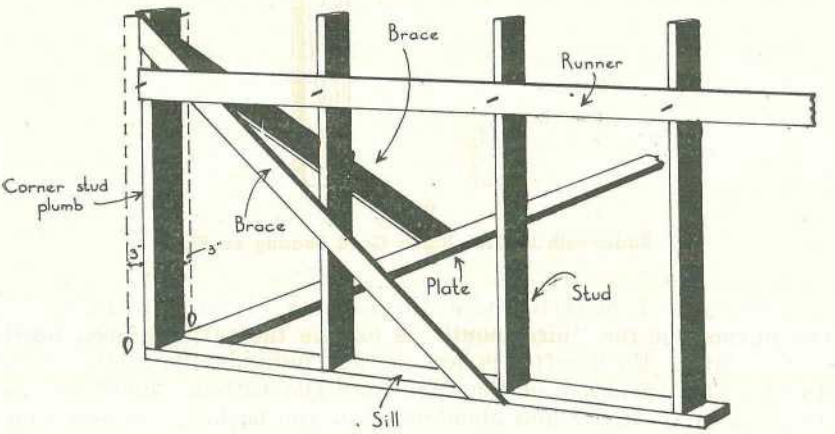


Fig. 4.
Method of Bracing Corner Stud.

Next mark your runners identical with the front and back bottom plates. Nail these runners temporarily but securely about half-way up the corner studs, and nail the intermediate studs to the stud marks on the runners. These runners hold the studs in position until the top front and back plates are secured. The top plates are now straightened by stretching a line from the corner studs. These plates are held straight by temporary braces until the rafters are fixed. Permanent braces in opposite corners are checked into the top of the studs and bottom plates.

The building is now ready for the roof structure. The rafters are spaced evenly (3 ft. 6 in. to 4 ft. apart), and their positions marked on the top plates. The rafter is laid across the front and back top plates as shown in Fig. 5.

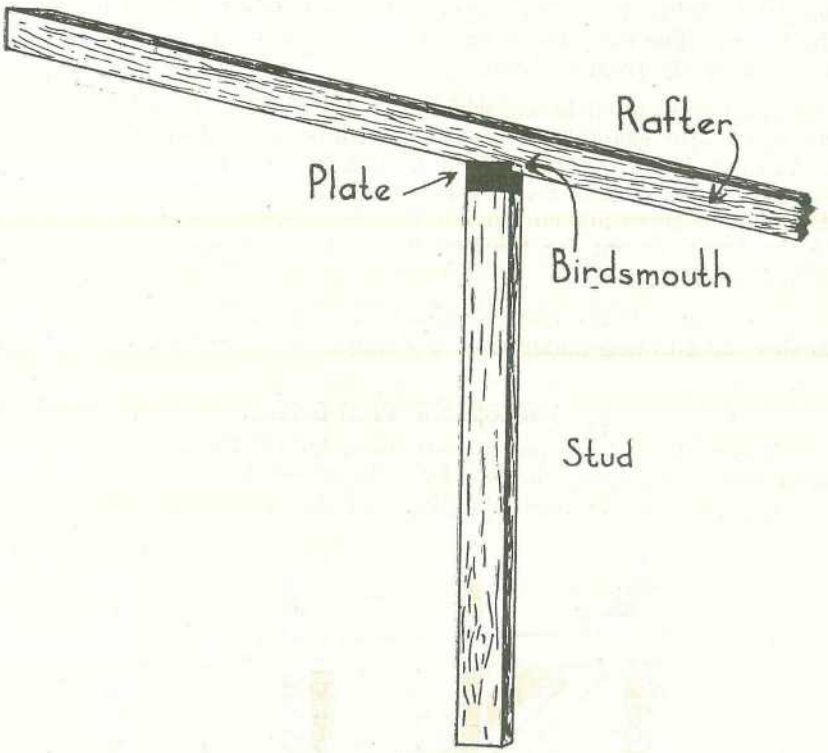


Fig. 5.
Birdsmouth to Give Rafter Good Bearing on Plate.

The rafter is marked, and a "birdsmouth" is cut out of the rafter. The purpose of the "birdsmouth' is to give the rafter a good bearing on the plates. Each rafter is best marked individually, as this method obviates any variation in the timbers. The rafters should overhang 30-36 in. in the front and about 6 in. at the back. This overhang is cut off to a line stretched across the two end rafters, and plumbed with a level.

The roofing battens are now nailed to the rafters at distances to suit the length of the roofing material. Heavy fibro roofing is very suitable for roofing material, as it is strong and cool. The studs on the ends of the building are now plumbed, and cut on to the end rafters. An intermediate rail or nogging is now fixed between the ends and back studs. This nogging adds rigidity to the building and also gives backing for the fibro. The nogging is made easier to nail to the studs if saw-cuts are made in the timber as shown in Fig. 3.

EXTRA DOORS FOR VENTILATION AND CLEANING.

Good ventilation is essential for the health of the fowls, and in designing a poultry house consideration must be given to adequate ventilation, especially in the summer months. As the general house for housing poultry is open in the front, sufficient fresh air enters from

this direction. Some consideration should be given to ventilating the back of the house. A door in the back of the house, as well as in the front, serves two purposes. It allows extra ventilation to enter the shed and also facilitates cleaning the house. This door may be netted on the inside and a small door hinged to the styles of the door as shown in Fig. 6.

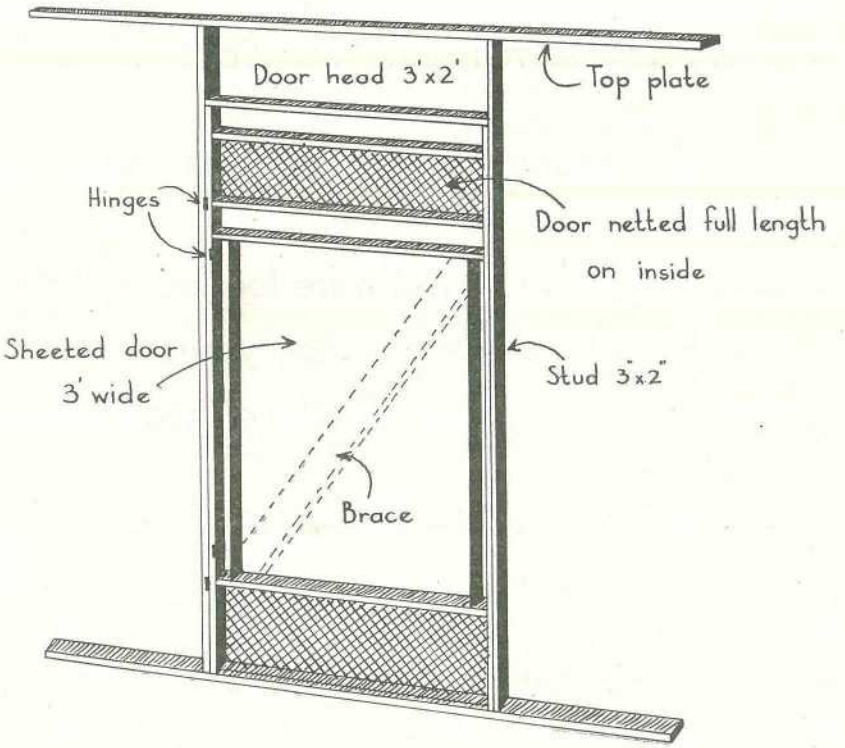


Fig. 6.
Sketch of Suitable Door.

NEW LEAFLETS.

The following new leaflets are available to Queensland primary producers on request to the Department of Agriculture and Stock:—

Infectious Laryngo-tracheitis of Poultry.
The Dairy Calf: Its Feeding and Management.
White Cedar is Poisonous to Pigs.
Cowpox.
Guinea Grass.
Salmonellosis of Livestock in Queensland.
Successful Hatching.
A Timber Rake Attachment for a Bulldozer Blade.
Hybrid Maize.

SPORTSMEN!

Conserve Yourselves and Your Fauna.

Care with firearms and fire saves lives and game.

Respect every gun as if it were loaded.

Be certain of your target before you shoot.

Be prepared to care for all game meat taken.

Prevent Forest and Grass Fires!

While hunting—

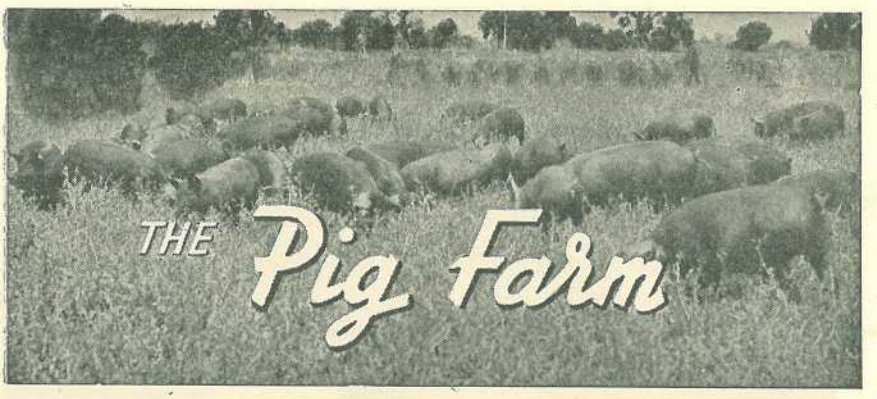
Be careful when smoking in the forest or field.

Build campfires in gravel or mineral soil only.

Leave campfires dead out.

Forest and grass fires destroy wildlife and its living places.

This affects your hunting and trapping.



Baconer Carcase Competitions, 1955.

By F. BOSTOCK, Officer in Charge, Pig Branch.

The Australian Meat Board, in association with the Department of Agriculture and Stock and with the co-operation of all sections of the industry, conducted its eighth annual Baconer Pig Carcase Competition on a district basis during 1955.

The championship was awarded to Mr. C. Schulz, of the Moreton district, who entered a purebred Large White carcase of 140 lb. dressed weight which secured 91½ points, only half a point below the Queensland record for these competitions. The carcase was very nicely proportioned and scored well in all points.

RESULTS.

Prizewinners in their respective districts were as follows:—

Prize.	Owner.	Breed.	Weight.	Points.
			Lb.	
		NORTH QUEENSLAND.		
1st ..	Soley Bros.	Large White X Berkshire ..	146	87½
2nd ..	W. Drury	Large White X Large White / Berkshire	136	86
3rd ..	E. J. Phillips ..	Berkshire X Large White ..	134	85½
		CENTRAL QUEENSLAND.		
1st ..	D. and L. Keleher ..	Wessex Saddleback X Large White	137	87
2nd ..	H. A. C. Iker ..	Berkshire	145	86½
3rd ..	R. M. K. Worrick ..	Berkshire	126	86
		SOUTH QUEENSLAND.		
1st ..	C. Schulz	Large White X Large White / Berkshire	140	91½
2nd ..	H. Gibson	Large White	122	91
3rd ..	A. N. McInness ..	Large White	131	83½
		DARLING DOWNS.		
1st ..	A. E. Pechey ..	Berkshire	125	89½
2nd ..	J. H. Hickey ..	Berkshire	149	87
3rd ..	V. S. Mason ..	Berkshire	144	86½

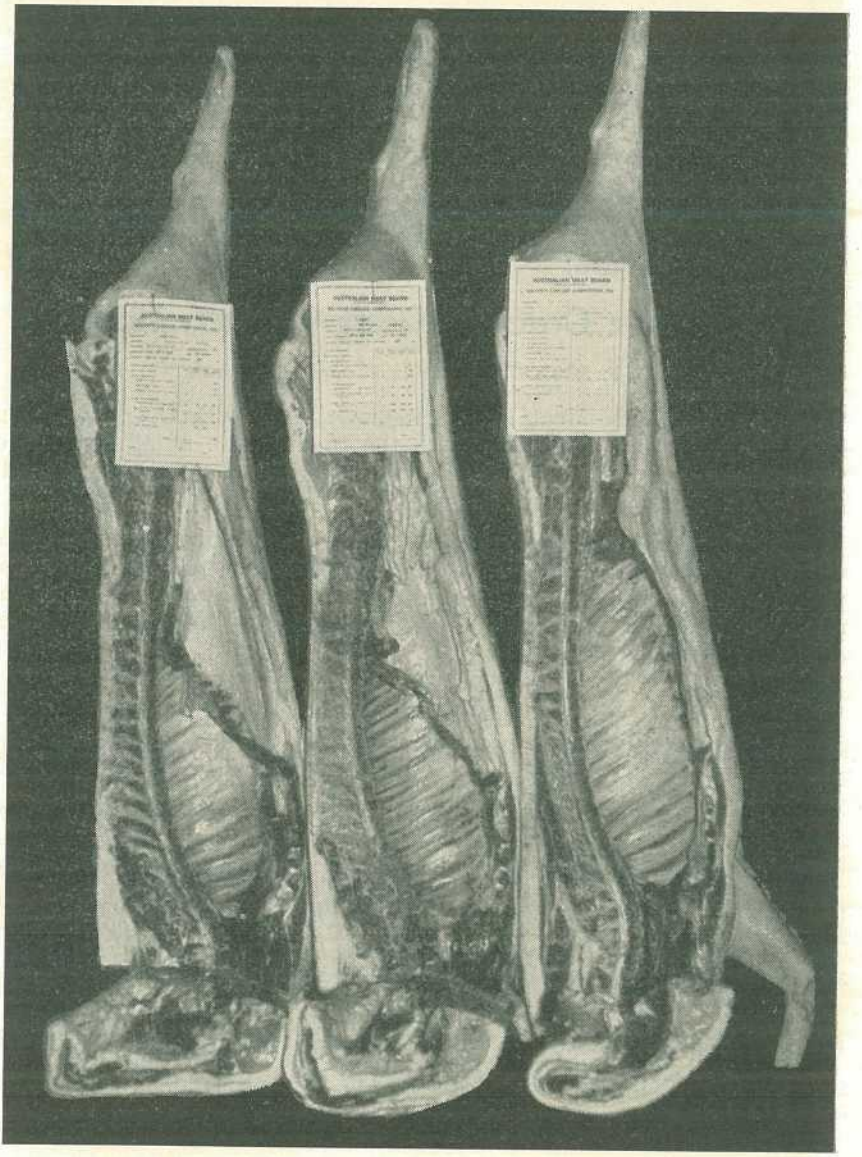


Plate 1.

First, Second, and Third Prizewinners in North Queensland.

FIELD DAYS.

The customary field days were arranged to coincide with the judging in only three of the districts, it being decided that owing to the poor attendance of farmers in the Brisbane district in past years the Brisbane field day be abandoned and the winners in the Brisbane district be exhibited at the Toowoomba field day. There was a good attendance of farmers at each field day.

Officers of the Department of Agriculture and Stock, with the co-operation of the factory works management in each district, went to considerable trouble and expense to make these field days as instructive and interesting as possible by arranging for addresses on subjects dealing

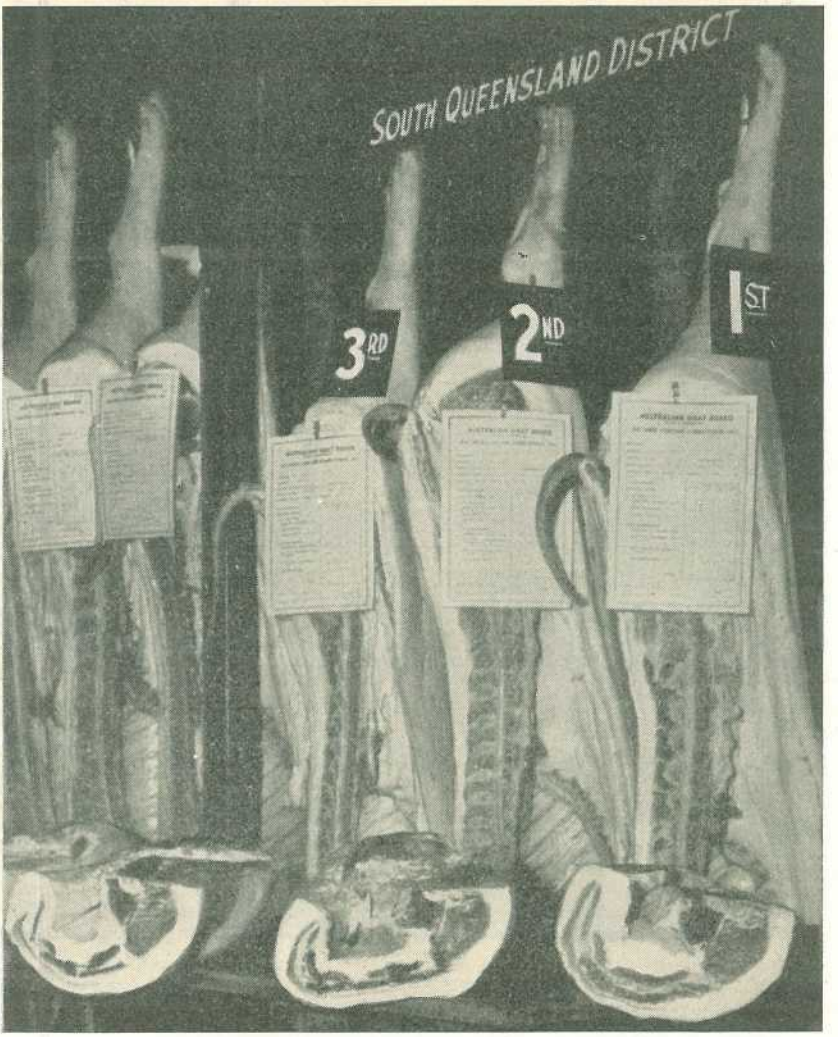


Plate 2.
South Queensland Prizewinners.

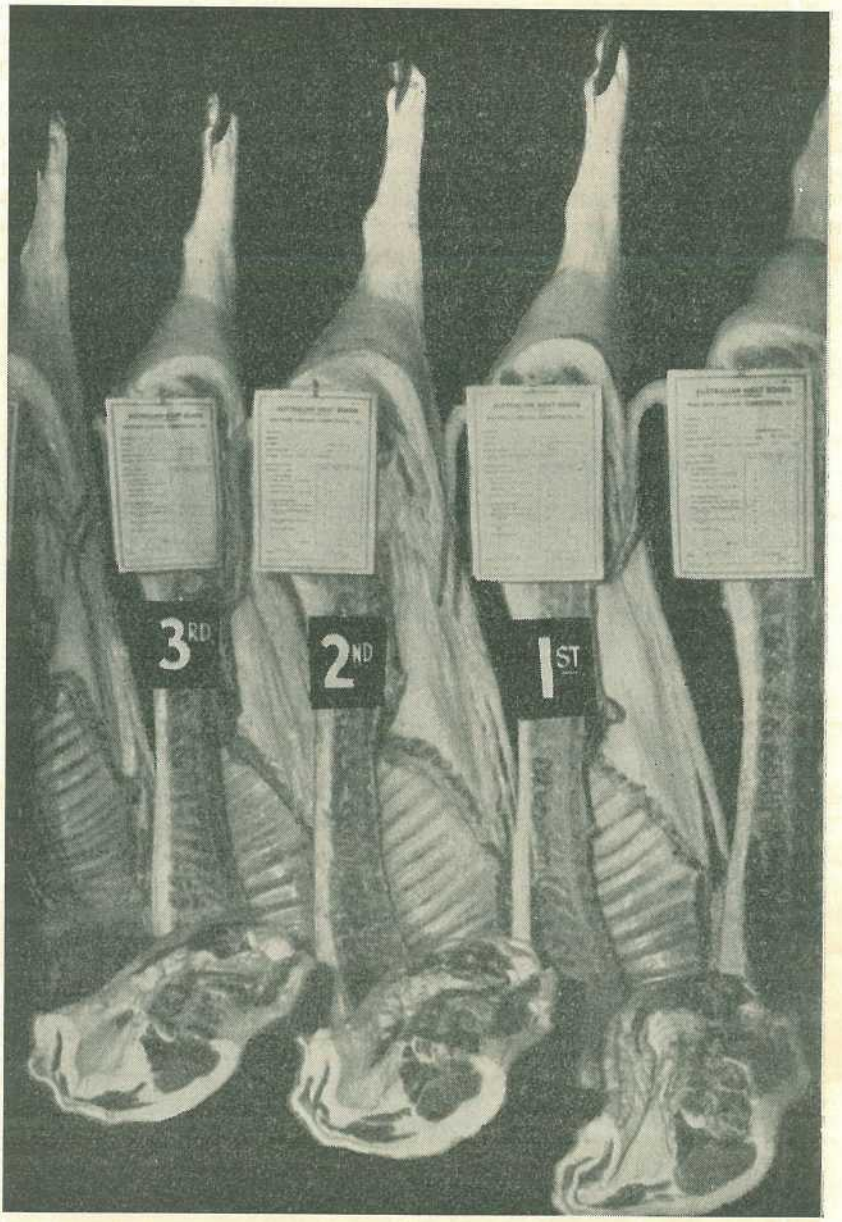


Plate 3.
Darling Downs Prizewinners.

directly with pig production. Farmers were afforded the opportunity of inspecting the carcases competing in the competitions, together with the scorecard. Arrangements were made for them to inspect the bacon factory or meatworks.

At Mareeba, light refreshments were provided, and at Lakes Creek in Central Queensland the management provided luncheon, which was much appreciated. I would like to express my thanks and appreciation to the management of each of the works concerned for their co-operation and assistance in making facilities available for judging and carcase display.

COMMENTS.

The Hammond system of carcase appraisal was again used for judging; to qualify for entry into the competition the pig must have been sired by a purebred boar and the dressed carcase weigh not less than 120 lb. and not more than 160 lb.

Entries totalled 182, of which 156 were presented for judging; of these 8 were disqualified, 7 being underweight and one overweight, leaving 148 to compete for the championship, or 27 more than in 1954.

There is little doubt that the Cured Baconer Carcase Competitions conducted by increasing numbers of country Show Societies are having a detrimental influence upon the number of entries in the fresh carcase competitions. However, where it was possible for officers of the Pig Branch, during their routine visits throughout their respective districts,

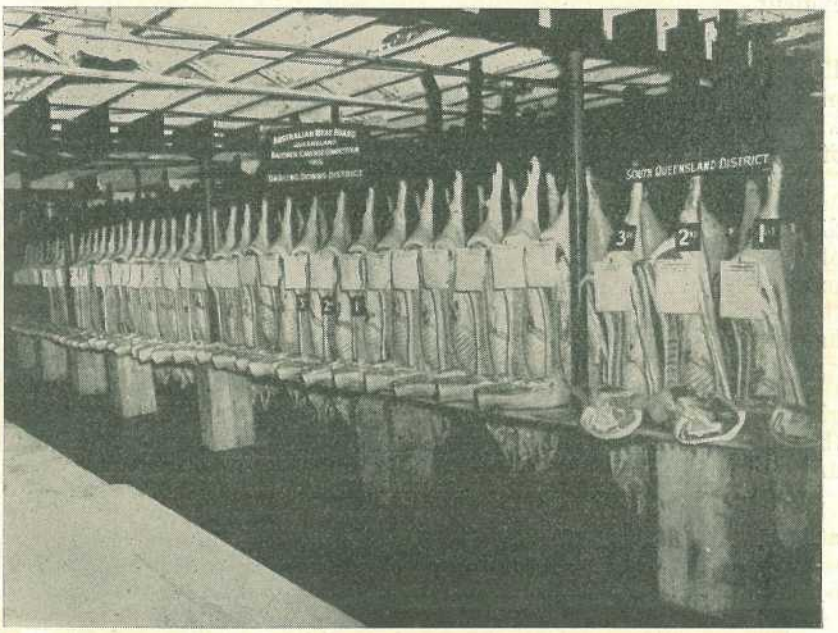


Plate 4.

General View of Entries on the Darling Downs, Together with South Queensland Prizewinners.

to draw farmers' attention to the competition, date of entry, etc., an increased number of pigs resulted, as was the case in the Toowoomba area this year, with 84 carcases presented for judging.

A most pleasing aspect of the competition was the absence of the overfat carcase. While there has been a progressive improvement in this section over the years, this year overfatness was conspicuous by its absence in all districts.

At Mareeba, of the 15 entries judged 12 qualified for first class certificates and 3 for second class; at Rockhampton, 16 qualified for first class, 1 for second class certificate and 1 no recognition; at Brisbane, 26 qualified for first class, 1 for second class certificate and 3 no recognition; at Toowoomba 69 qualified for first class, 13 for second class certificate and 2 no recognition.

The top score of 91½ is only half a point less than the record established last year, but the overall percentage of 75·78 is the highest yet recorded and indicates a general improvement in the quality of carcases entered.

Taking all entries into consideration and treating each section of the scoreboard individually the following comments can be made.

The hams have improved slightly. Those of the second prize carcase in the Brisbane section were outstanding and were awarded full points.

Shoulder development again scored well. Only a few heavy shoulders, fairly well distributed throughout the different districts, were evident.

Eye muscle scored well again. It was approximately the same as in 1954, but a considerable improvement on all other years. It was pleasing to see the increased proportion of well-developed eye muscles, which indicates that breeders are paying greater attention to the feeding of their pigs during the early stages of growth.

As previously mentioned, overfat carcases were not entered in any district. No doubt the advent of grading has stressed the desirability of producing lean baconer pigs to meet consumer requirements. If the present trend of marketing pigs when in prime condition is continued, there will be little to fear from the problem of the overfat pig, which has been responsible for so much loss in the past.

Body length has again improved and apparently breeders have given greater attention to the selection of their breeding stock. However, this practice should be continued if the present high standard is to be maintained.

Leg length was again disappointing, breeders not paying sufficient attention to this section. It is hoped to see an improvement in this section at future competitions. However, breeders must not sacrifice body length for leg length.

The overall percentage (75·78) is the highest yet recorded and is a very creditable effort. My congratulations to all prize winners as well as to all competitors on the quality of the carcases exhibited and the friendly spirit which existed throughout the competitions.

AVERAGE FOR EACH SECTION OF JUDGING.

Section.	1948.			1949.		1950.		1951.		1952.		1953.		1954.		1955.	
	Possible Points.	Average Points Obtained.	Percentage of Possible Points.	Average Points Obtained.	Percentage of Possible Points.	Average Points Obtained.	Percentage of Possible Points.	Average Points Obtained.	Percentage of Possible Points.	Average Points Obtained.	Percentage of Possible Points.	Average Points Obtained.	Percentage of Possible Points.	Average Points Obtained.	Percentage of Possible Points.	Average Points Obtained.	Percentage of Possible Points.
By Inspection—																	
Hams ..	8	5·604	70·050	6·27	78·40	6·097	76·213	6·44	80·52	6·286	78·571	6·67	83·37	6·12	76·5	6·19	77·40
Shoulders ..	7	5·562	78·029	5·92	84·57	5·849	83·564	5·92	84·60	5·947	84·959	6·02	86·00	6·06	86·6	6·05	86·67
Streak ..	12	6·764	56·367	5·57	46·40	7·766	64·724	7·41	61·79	6·982	58·185	8·29	69·08	7·52	62·7	7·59	63·24
By Measurement—																	
Eye Muscle	28	11·775	58·875	18·04	64·42	14·262	50·936	20·15	71·96	19·114	68·265	19·15	68·39	20·82	74·4	20·88	74·56
Backfat Thickness	20	15·489	77·445	15·26	76·30	14·572	72·864	15·45	77·23	14·729	73·643	15·97	79·85	16·00	80·0	15·87	79·36
Body Length	20	12·500	44·643	13·06	65·30	13·388	66·941	12·98	64·92	14·814	74·072	14·99	74·95	15·47	77·4	16·21	81·02
Leg Length	5	3·111	62·220	3·02	60·40	3·281	65·631	3·21	64·22	2·757	55·142	3·27	65·40	2·95	59·0	2·97	59·48
Total ..	100	60·805		67·97		65·218		71·57		70·629		74·87		74·94		75·78	

Brucellosis-Tested Swine Herds (As at 24th November, 1955)

Berkshire.

A. P. and N. Beatty, "Deepdene," Barambah road, Nanango
S. Cochrane, "Stanroy" Stud, Felton
G. Handley, "Handleigh" Stud, Murphy's Creek
J. L. Handley, "Meadow Vale" Stud, Lockyer
O'Brien and Hickey, "Kildurham" Stud, Jandowae East
G. C. Traves, "Wynwood" Stud, Oakey
Westbrook Farm Home for Boys, Westbrook
M. K. Collins, "Kennington" Stud, Underwood road, Eight Mile Plains
H.M. State Farm, "Palen" Stud, Palen Creek
A. R. Ludwig and Sons, "Beau View" Stud, Beaudesert
H. H. Sellars, "Tabooba" Stud, Beaudesert
D. T. Law, "Rossvill" Stud, Trouts road, Aspley
R. H. Crawley, "Rockthorpe" Stud, *via* Pittsworth
F. R. J. Cook, Middle Creek, Pomona
Mrs. I. M. James, "Kenmore" Stud, Cambooya
H. L. Stark, "Florida," Kalbar
J. H. N. Stoodley, "Stoodville," Ormiston
H.M. State Farm, Numinbah
N. F. Cooper, Maidenwell
R. H. Coller, Tallegalla, *via* Rosewood
E. J. Clarke, "Kaloon" Stud, Templin
M. G. and R. H. Atkins, "Diamond Valley" Stud, Mooloolah
W. F. Ruhle, "Felbrie" Stud, Kalbar
L. Puschmann, "Tayfeld" Stud, Taylor
Dr. B. J. Butcher and A. J. Parnwell, "Hartley Grange" Stud, 684 Logan Road, Greenslopes
C. E. Edwards, "Spring Valley" Stud, Kingaroy
G. McLennan, "Murcott" Stud, Willowvale
H. M. Wyatte, "Deepwater" Stud, Rocky Creek, Yarraman
C. F. W. and B. A. Shellback, "Redvilla" Stud, Kingaroy
R. J. Webber, "Webberberry" Stud, 35 Caxton st., Petrie Terrace
J. C. Lees, "Bridge View" Stud, Yandina
F. Thomas, "Rosevale" Stud, M.S. 373, Beaudesert
A. C. Fletcher, "Myola" Stud, Jimbour
Q.A.H.S. and College, Lawes
E. F. Smythe, "Grandmere" Stud, Manyung, Murgon
The Marsden Home for Boys, Kallangur
M. F. Caliaghan, Lower Mount Walker, via Rosewood
J. B. Lotz, M.S. 794, Kalbar
G. J. Hutton, Woodford
E. R. Kimber, Coalstoun Lakes
K. B. Jones, "Cefn" Stud, Pilton
A. J. Potter, "Woodlands," Inglewood
Regional Experiment Station, Hermitage
L. Pick, Mulgeldie
J. W. Bukowski, "Secreto" Stud, Oxley

Large White.

H. J. Franke and Sons, "Delvue" Stud, Cawdor
Garrawin Stud Farm Pty. Ltd., 657 Sandgate road, Clayfield
J. A. Heading, "Highfields," Murgon
K. B. Jones, "Cefn" Stud, Pilton
R. Postle, "Yarralla" Stud, Pittsworth
B. J. Jensen, "Bremerside" Stud, Rosevale, *via* Rosewood
E. J. Bell, "Dorne" Stud, Chinchilla
L. C. Lobegeiger, "Bremer Valley" Stud, Moorang, *via* Rosewood
H. R. Gibson, "Thistleton" Stud, Maleny
H.M. State Farm, Numinbah
K. A. Hancock, "Laurestonvale" Stud, Murgon
V. P. McGoldrick, "Fairymeadow" Stud, Cooroy
S. T. Fowler, "Kenstan" Stud, Pittsworth
G. J. Hutton, Woodford
H. L. Larsen, "Oakway," Kingaroy
Dr. B. J. Butcher and A. J. Parnwell, 684 Logan road, Greenslopes
G. I. Skyring, "Bellwood" Stud, *via* Pomona
O. J. Horton, "Manneum Brae" Stud, Manneum, Kingaroy
F. K. Wright, Narangba, N. C. Line
O. B. Vidler, Manneum, Kingaroy
K. F. Stumer, French's Creek, Boonah
Q.A.H.S. and College, Lawes
R. S. Powell, "Kybong" Stud, Kybong, *via* Gympie
S. and S. Ouglitchinin, "Pinefields," Old Gympie road, Kallangur
C. Wharton, "Central Burnett" Stud, Gayndah
S. Jensen, Rosevale, *via* Rosewood
Kruger and Sons, "Greyhurst," Goombungee
V. V. Radel, Coalstoun Lakes
H. R. Stanton, Tansey, *via* Goomeri
L. C. and C. P. F. Hill, Kingaroy

Tamworth.

S. Kanowski, "Miecho" Stud, Pinelands
N. R. Potter, "Actonvale" Stud, Wellcamp
D. F. L. Skerman, "Waverley" Stud, Kaimkillenbun
A. C. Fletcher, "Myola" Stud, Jimbour
Salvation Army Home for Boys, "Canaan" Stud, Riverview
A. J. Surman, "Namrus" Stud, Noble road, Goodna
Department of Agriculture and Stock, Regional Experiment Station, Kairi
E. C. Phillips, "Sunny View," M.S. 90, Kingaroy
F. N. Hales, Kerry road, Beaudesert
T. A. Stephen, "Withcott," Helidon
W. F. Kajewski, "Glenroy" Stud, Glencoe
L. Herbst, "Hillbanside" Stud, Bahr Scrub, *via* Beenleigh
H.M. State Farm, Numinbah
Dr. B. J. Butcher and A. J. Parnwell, 684 Logan road, Greenslopes
G. H. Sattler, Landsborough
F. Thomas, "Rosevale" Stud, M.S. 373, Beaudesert
H. J. Armstrong, "Alhambra," Crownthorpe, Murgon
Q.A.H.S. and College, Lawes
R. H. Coller, Tallegalla, *via* Rosewood
A. J. Potter, "Woodlands," Inglewood
P. V. Campbell, "Lawn Hill," Lamington
L. C. and C. P. F. Hill, Kingaroy

Wessex Saddleback.

W. S. Douglas, "Greylight" Stud, Goombungee
J. Gleeson, "Iona Vale" Stud, Kuraby
C. R. Smith, "Belton Park" Stud, Nara
H. H. Sellars, "Tabooba" Stud, Beaudesert
D. T. Law, "Rossvill" Stud, Trout road, Aspley
J. B. Dunlop, "Kurrawyn" Stud, Acacia road, Kuraby
F. K. Wright, Narangba, N. C. Line
R. A. Collings, "Rutholme" Stud, Waterford
W. R. Dean, "Trelawn," Tandur, *via* Gympie
M. Nielsen, "Cressbrook" Stud, Goomburra
G. J. Cooper, "Cedar Glen" Stud, Yarraman
Mrs. R. A. Melville, "Wattledale Stud," Beenleigh road, Sunnybank
S. and S. Ouglitchinin, "Pinefields," Old Gympie road, Kallangur
A. J. Hicks, M.S. 98, Darlington, *via* Beaudesert
Kruger and Sons, "Greyhurst," Goombungee

British Large Black.

H. W. Naumann, "Parkdale" Stud, Kalbar