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DEPARTMENT OF AGRICULTURE

QUEENSLAND AGRICULTURAL JOURNAL

Maize Paddocks in the South Burnett.

LEADING FEATURES

Soil Conservation

Green Manure Seed

Survey of Herd Recording Data

Wool and World Trade

Packing Tropical Fruits and Strawberries

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5

Contents

Soil Conservation in Queensland.

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

5. Contour Banks (*continued*).

Building Contour Banks with Light Graders.

THE method of construction described and illustrated in the following pages is applicable to all types of blade graders when used for contour bank construction on slopes of less than 6 per cent., and where soil is moved from both upper and lower sides to form the bank.

The island is marked out as for the plough method and the same island width is allowed (Plate 86); where the soil is too hard for efficient earthmoving it is preferable also to carry out the first series of three rounds as described for the plough method.

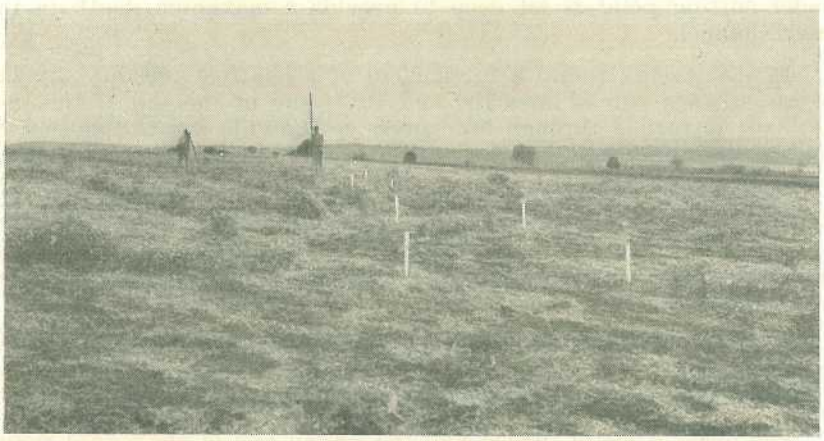


Plate 86.

The opening run of the grader is made so that the end of the blade follows the upper stake line and the soil is delivered on the upper edge of the island (Plate 87).

The return trip of this round is made with the grader centering on the lower stake line (Plate 88).

On the first run of the second round the grader is moved one foot upslope from the position for the opening run of the first round and is set so that it will cut the maximum depth; in this position the soil is delivered against the row from the first run (Plate 89).

The position of the grader for the return trip on the lower side of the bank is one foot downslope from the first round (Plate 90).

The third round is utilised to move the earth across the island; the grader is placed so that the leading point centres on the row of soil from rounds 1 and 2 on both upper and lower sides (Plates 91 and 92).

In the fourth round the grader is placed 12 inches further upslope than for the similar run in the third round, the cutting point being set as deeply as possible, and the soil spread evenly on the island (Plate 93).

In the return trip of this round the grader is placed 12 inches downslope from the position for the second round (Plate 94).

If the ground has not been ploughed prior to commencement of grading operations it is desirable to do so after the fourth round, particularly where light graders are being utilised.

Plate 95 illustrates the general method of ploughing in towards the island from upper and lower sides.

In the fifth round the position of the grader is similar to that of the third round on both upper and lower sides, the objective being to move the large volume of loose soil in to a centre position on the island (Plates 96 and 97).

In the sixth round the grader position is similar to that of the first round on both upper and lower sides, delivering soil on to the edge of the island on both sides (Plates 98 and 99). On the upper side the grader cutting point is set deep to provide a maximum depth in the water channel.

In the seventh round a further cut of a one foot upslope is taken on the outward run (Plates 100 and 101), and at the end of this run the blade is turned through 90 degrees so that the return run can be done on the upper side.

This run is used to commence the formation of the backslope into the channel, which should be a gradual slope; in this case the grader is set so that its cutting point is at ground level on the upper edge of the disturbed area, the heel of the grader being set to provide the desired slope (Plate 102).

The blade is again turned through 90 degrees at the end of the seventh round, and the first run of the eighth round used to move on to the bank the soil from the last run of round 8 (Plate 103).

The blade is again turned and the return run of the eighth round used to move the soil further up on to the bank (Plate 104).

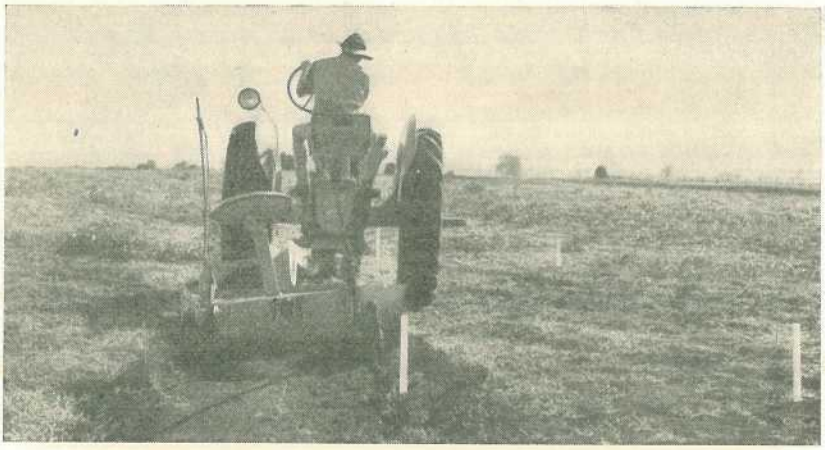


Plate 87.

Plate 88.

Plate 89.

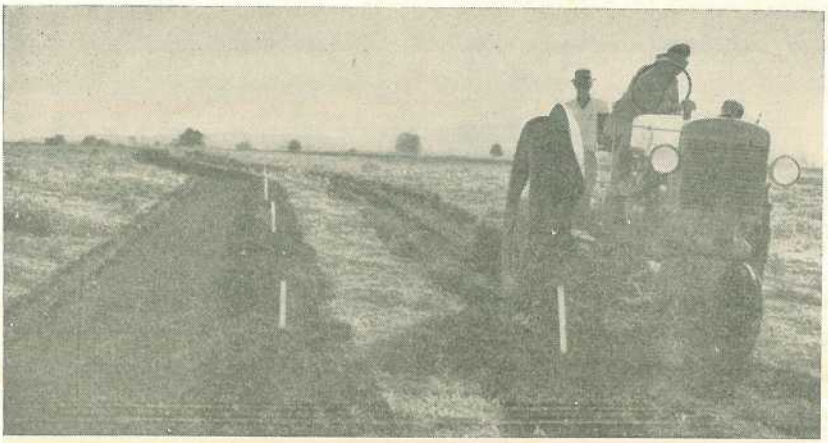


Plate 90.

Plate 91.

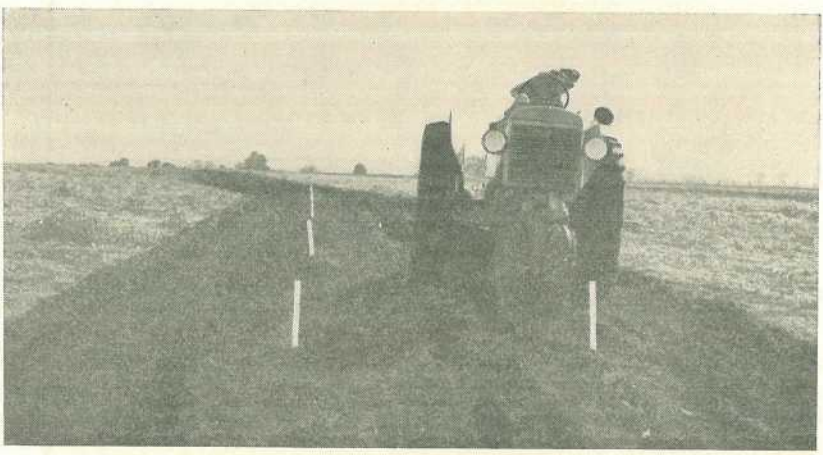


Plate 92.

Plate 93.

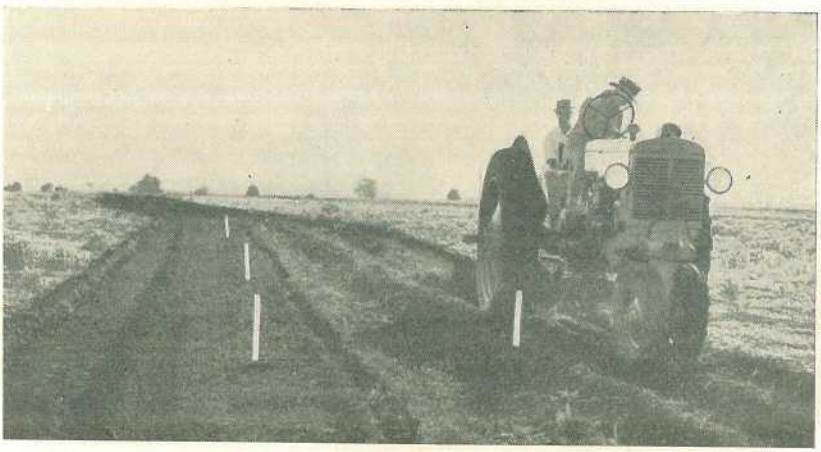


Plate 94.

Plate 95.

Plate 96.

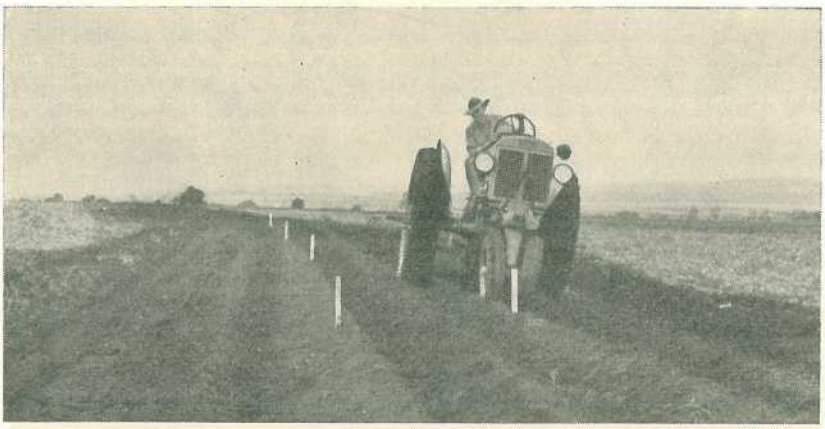


Plate 97.

Plate 98.

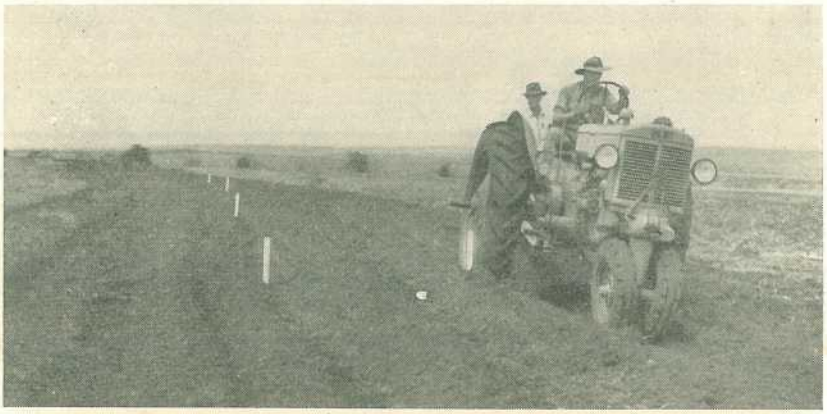


Plate 99.

Plate 100.

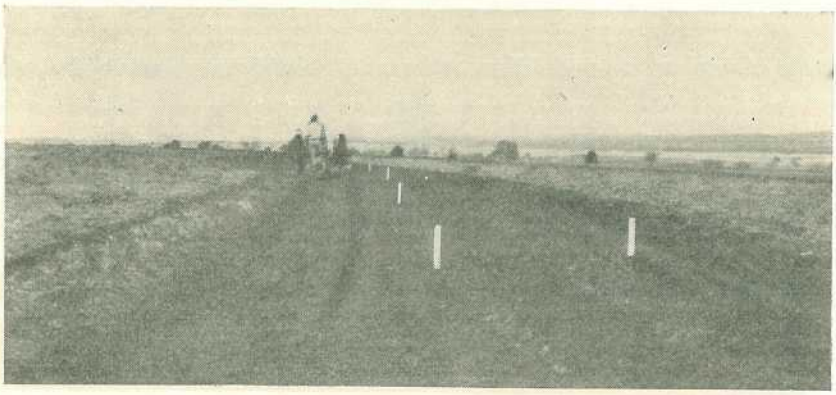


Plate 101.

Plate 102.

Plate 103.

Plate 104.

The opening run of the ninth round is carried out on the lower side of the bank to improve the general section and the return run of this round is used to form the backslope to the channel as in the return run of the seventh round (Plate 105).

The blade is turned for the opening run in the tenth round and this run is used to complete the formation of the backslope (Plate 106).

The return run of this round is used to move on to the bank the soil from the first run of this round (Plate 107).

The blade is again turned and the opening run of the eleventh round used to trim the upper section of the bank (Plate 108) and the return run to trim the lower section.

The completed bank section is illustrated in Plate 109, a typical broad base contour bank being constructed in eleven rounds with a seven-foot grader-ditcher drawn by a farm tractor.

Bank Construction with Large Graders.

Graders larger than those just described include the self-propelled motor graders and large drawn graders of a wide variety of types and sizes. Special terracing graders have also been developed for contour bank building work; the principal feature of these is their direct attachment to the tractor (absence of front wheels) to render them more suitable for this work.

Whilst procedure varies according to the design of the particular machine, the general principles of construction on moderate slopes are similar to those described for light graders.

Irrespective of the size of grader used for any of this work, the general efficiency of the work can be improved by repeatedly loosening soil ahead of the grader with either a strong plough or a ripper.

CONTOUR CULTIVATION.

These measures are often loosely described under the term "contouring," which refers to any tillage practice applied across the slope on the level—that is, on the contour. It will be obvious that a series of implement marks across the slope will serve as a series of miniature dams (Plate 110), whereas when applied up and down slope they serve as numerous drains expediting the flow of water from the land, lessening the opportunity for the soil to absorb the rain, and increasing the possibility of the removal of soil (Plate 111).

The pondage efficiency will depend on the type of implement used; the tyne marks of scarifiers on the contour will often pond the equivalent of 2 to 3 inches of rainfall, those of the harrows about half an inch.

Many of the erosive rains received in this State fall as high intensity storms of short duration; it is not uncommon to record storms in which one to two inches of rain fall in 20 minutes. The absorptive capacity of the soil varies according to soil cover, condition and type of soil, and its moisture content; in general it does not exceed half an inch in 20 minutes for many of the Queensland soils in midsummer, and consequently a high flash runoff on arable lands is associated with many of these high intensity storms of short duration. If contour cultivation

Plate 105.

Plate 106.

Plate 107.

Plate 108.

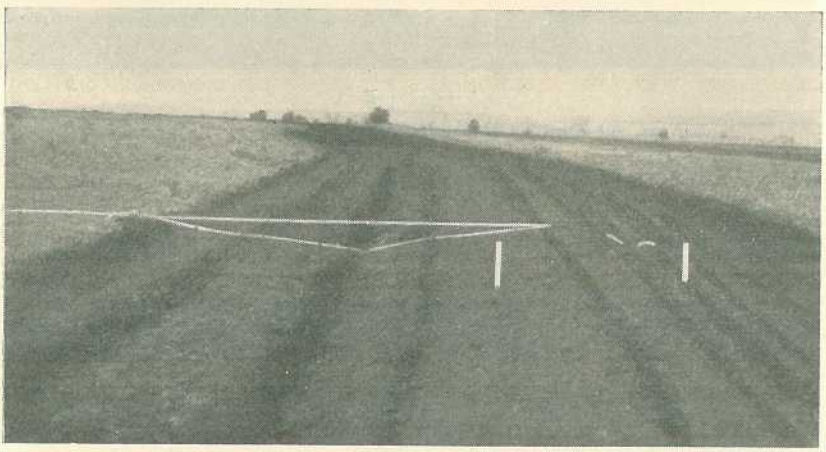


Plate 109.

is practised, even harrow tyne marks will pond an additional half-inch of rain which is absorbed by the soil *after* the storm has passed; consequently the erosion hazard is reduced and more rainfall is made available for crop growth.

These general principles apply to relatively gentle slopes, soils with a high absorptive capacity, and to any arable lands which are contour banked. When rain continues after the soil is saturated, runoff will commence despite contour cultivation methods, and unless provision is made to intercept this runoff with contour banks, serious erosion damage will occur. Rainfall exceeds the saturation capacity of the soils at least once annually in this State; therefore, in general, contour cultivation alone cannot be regarded as a complete protective measure for the arable lands unless the slopes are very gentle or the soil very absorptive. But where bank protection is provided, contour cultivation is very successful, particularly if surface puddling of the soils can be prevented by providing the maximum amount of soil cover in the form of growing crops or crop residues.

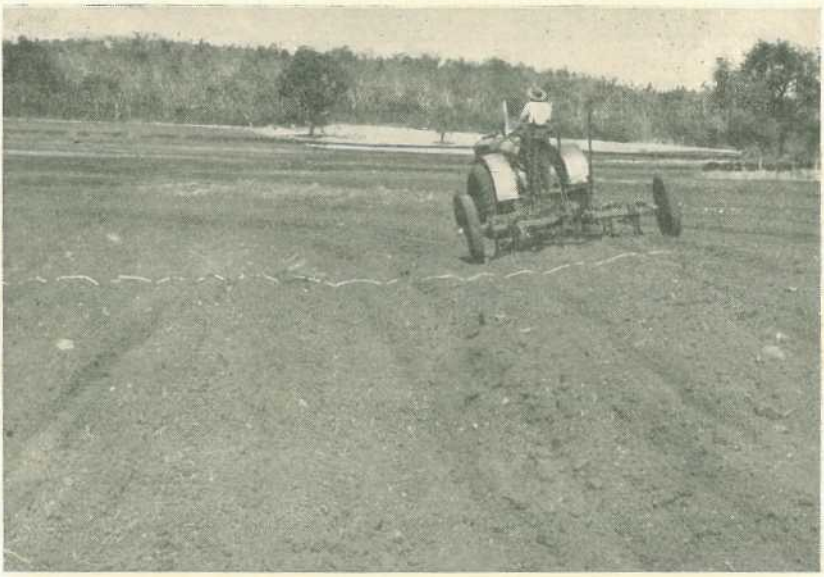


Plate 110.

Cultivation on the Contour with a Scarifier. Each tyne mark serves as a miniature dam.

Plate 111.

Severe Rilling along Wheat Rows where Round-the-Paddock Planting has been Practised.

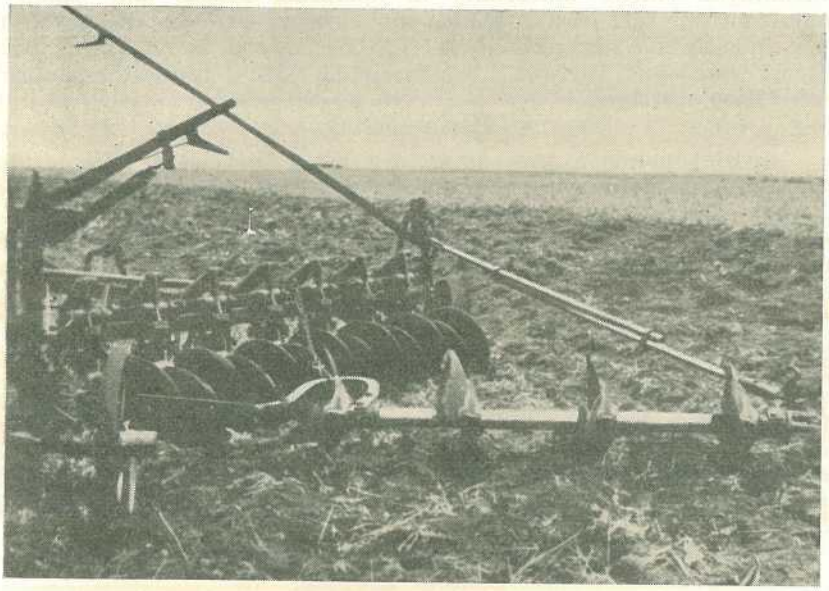


Plate 112.
The Muirhead Stormtrap Attachment Fitted to a 14-Disc Sundercut.

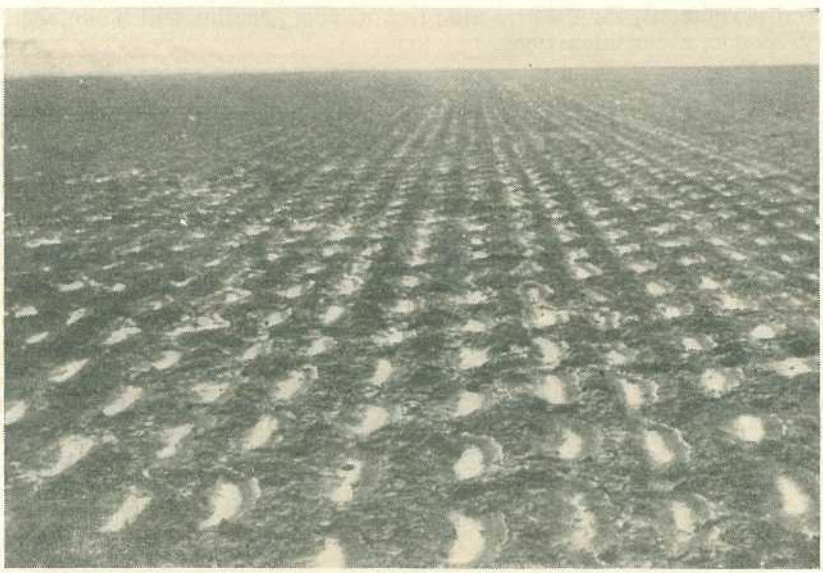


Plate 113.
Water Held in Basins Formed by the Stormtrap Attachment. The photograph was taken after a two-inch storm. Each basin has ponded the equivalent of one inch of rain which would otherwise have been lost as runoff.

The operation of implements on the contour presents obvious advantages, chiefly uniformity in operating speeds and usually a reduction in fuel costs. Finish-out furrows are on the level and consequently do not present the erosion hazard so prevalent where corner finish-out furrows are associated with "round-the-paddock" cultivation methods.

Basin Listing.

Special pondage procedures are often associated with contour cultivation methods with the object of ponding additional rainfall. In the United States of America basin listing on the contour is extensively practised. This involves the construction, with special machinery, of a series of deep parallel furrows on the contour; they are check banked at intervals along their length and present the appearance of numerous basins. This type of basin listing has not been utilised in Queensland, although a modified system has been developed on the Darling Downs, using an implement attached to a cultivating plough or sundercut (Plate 112); when ploughing operations are complete the field has the appearance of a series of small basins. The initial pondage capacity of these basins is approximately two inches of rain. This attachment, though not fully tested to date, offers considerable promise for the temporary pondage of rainfall (Plate 113), particularly during those periods when sundercuts are utilised for land cultivation.

Contour Ripping.

Where sub-surface plough-pans exist and hinder the free passage of moisture through to the subsoil, contour ripping or subsoiling procedures are proving very effective in reducing runoff. The effectiveness of this work is dependent on conditions of soil type and soil moisture; since the treatment cost is high and the benefits only semi-permanent, the general adoption of this practice will be determined by economic considerations.

APPLICATION OF CONTOUR CULTIVATION METHODS.

Where there is a variation in the width of the land between two contour banks the application of contour cultivation may present problems, particularly in relation to the planting of row crops. Standard practical procedures have been developed, and though a little more difficult than orthodox practice do not present any insuperable difficulties in their general application.

Contour Ploughing.

Apart from the advantages of contour cultivation, the success of any system of contour banking depends primarily on maintenance and management of the banks. The most important operation in bank maintenance is correct ploughing. All ploughing should be parallel to the bank, and it is preferable that a finish-out or dead furrow be located in the channel and a crown or backfurrow on the crest of the bank; in this way the cross-section of a well-built contour bank can be maintained and smaller ones can be improved.

The method of ploughing usually adopted in conjunction with contour banks is illustrated in Plate 114; this method is defective in many respects but is adopted generally because it involves the least change from orthodox agricultural practice and is suited to the large plant units used in the wheat growing areas.

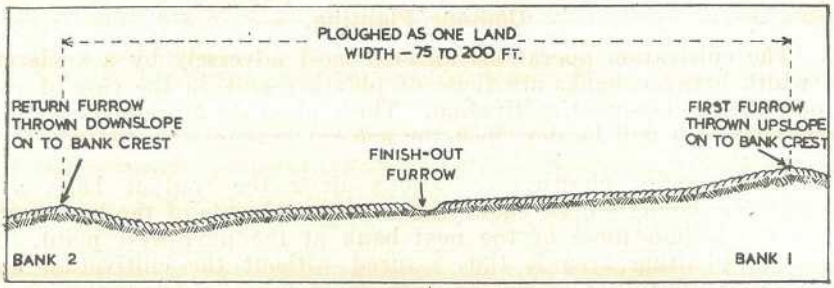


Plate 114.

The Standard Method of Contour Ploughing Usually Adopted in Queensland.

It is obvious that in areas where ploughs or sundercuts are used extensively the continuous practice of this system will result in the development of a basin at the site of the finish-out furrow and there will be a progressive movement of the soil towards each bank. The use of tyne implements where possible will assist in surmounting this problem, but where ploughs or sundercuts must be used it is desirable to vary the ploughing method each year. Alternative methods are illustrated in Plates 115 and 116; these are most suited where small manœuvrable ploughs are used, but even with larger equipment modifications of these methods may be utilised.

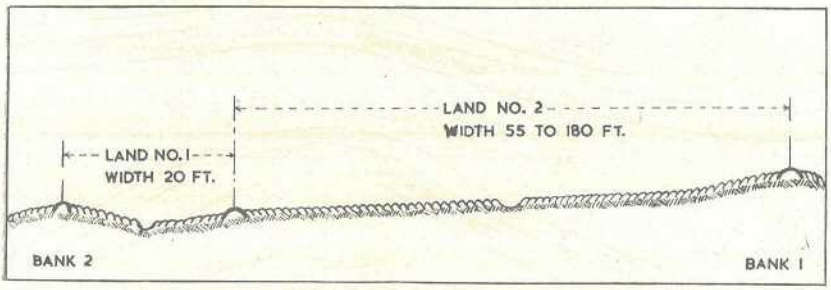


Plate 115.

A Method of Contour Ploughing Which Ensures Maintenance of Bank and Channel Dimensions. The finish-out furrow is in a different position from that shown in Plate 114.

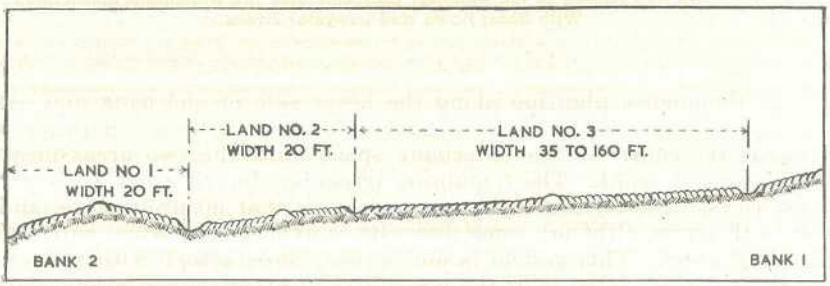


Plate 116.

A More Difficult Method of Contour Ploughing. Since it reverses the movement of soil it can be alternated with other methods.

Contour Planting.

The cultivation operations affected most adversely by a variation in width between banks are those of planting and, in the case of row crops, their subsequent cultivation. Three planting procedures may be followed; each will be described for general guidance.

1. Commence planting operations along the contour bank and extend the sowing out an equal distance on each side of the bank until the rows adjoin those of the next bank at the narrowest point. A uniform planting area is thus assured without the cultivation and harvesting difficulties associated with short rows or triangular areas. The odd sections of land are then utilised for pasture or a permanent hay crop such as lucerne. This method is illustrated in Plate 117.

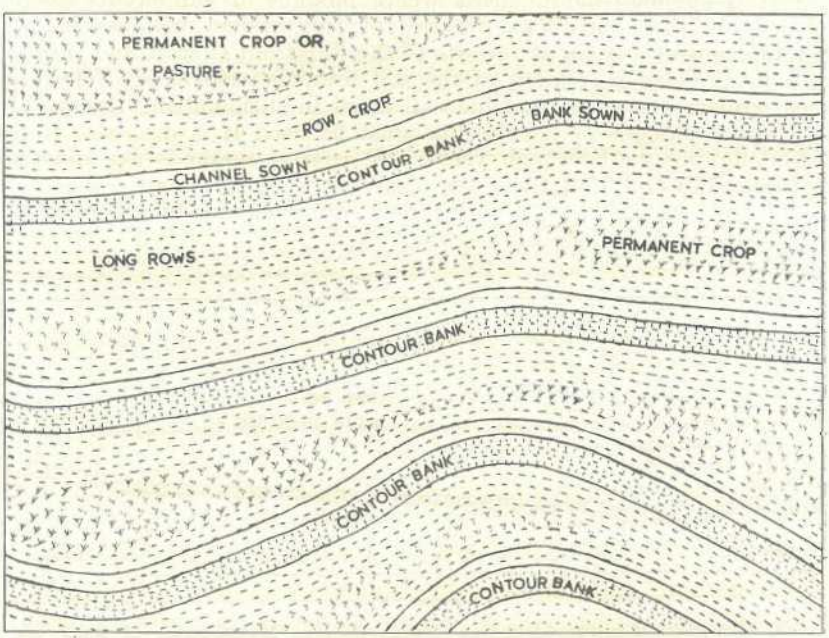


Plate 117.

This Method of Planting is the Simplest and Obviates the Difficulties Associated With Short Rows and Irregular Areas.

2. Commence planting along the lower side of one bank and along the upper side of the bank next below and continue operations in towards the centre of the interbank space until the two areas meet at the narrowest point. The remaining irregular-shaped areas are sown as short rows. The advantage of this system is that no productive land is lost to the crop, although some difficulty is experienced when cultivating the short rows. This system is not entirely satisfactory with row crops which are hilled, because of the possibility of excess runoff accumulating in the short furrows and being discharged at the centre of the interbank space; this water discharge overloads the hills of the lower rows and erosion may occur at that point. This method is illustrated in Plate 118.

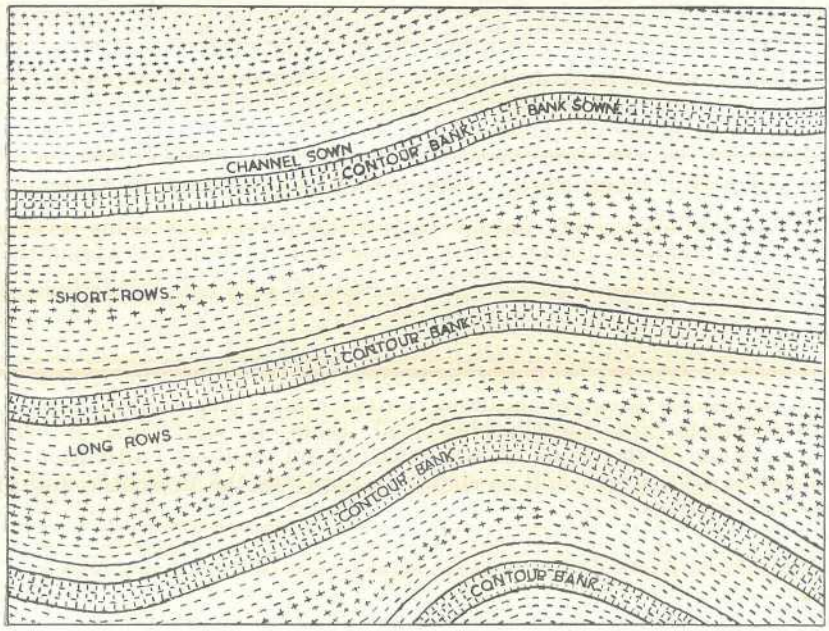


Plate 118.

More Land is Available for the Cash Crop When This Method is Used, but the Cultivation of Short Rows Presents Difficulties.

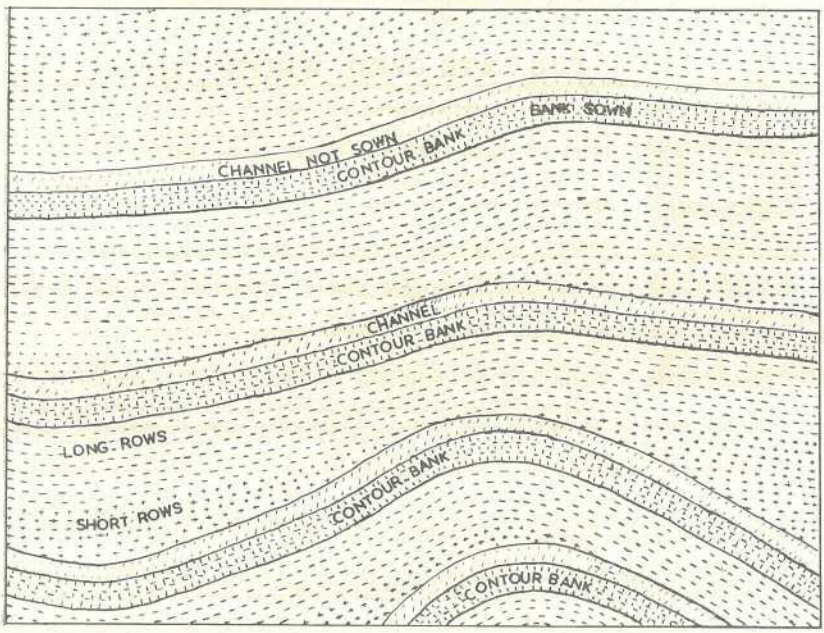


Plate 119.

In This Method the Channel is Used as a Headland to Turn Implements When Cultivating the Short Rows.

3. Commence planting along the lower side of a bank and extend the planting parallel to and below this line until the short rows end in the channel of the bank next below. The channel is left unplanted and is used as a turning point for implements used in cultivation operations. This method is the one most used in the field, and though it is not as satisfactory as the first method described, no land is lost to the particular crop being sown. This method is illustrated in Plate 119.

The application of contour cultivation procedures using existent machinery requires some minor adjustment to current agricultural methods; the saving of soil and water and the resultant maintenance or improvement in crop yields more than justify the effort.

The development of power lift implements and implements directly attached to tractors, and the increasing use of hydraulic equipment, tend to simplify the application of contour cultivation methods. As these improvements are incorporated and there is developed a wider appreciation of the value of soil conservation, contour cultivation will become as widespread and as simple to apply as the present round-the-paddock systems.

THE LATE CYRIL WHITE.

The death occurred on August 16 of Mr. C. T. White, who had been Government Botanist, attached to the Department of Agriculture and Stock, since 1917.

Mr. White was known personally to thousands of Queenslanders. His journeyings throughout the State in the interests of economic botany brought him into contact with country people in the most remote areas, and each year hundreds visited him in Brisbane to obtain his advice on native and introduced plants. Numerous articles on pasture plants, weeds and trees were written by him for this journal and other farmers' publications.

In the field of plant identification and classification, Mr. White had a world-wide reputation, and scientific organisations in many countries entrusted plant collections to him for naming. He spent a period at the Royal Botanic Gardens at Kew, in England, working on Australian collections there on behalf of the Commonwealth and State Governments.

The University of Queensland conferred a Master of Science degree on Mr. White in recognition of his services to botany, and he was for many years a fellow of the Linnean Society of London.

His wide knowledge of botany and his eagerness to assist people to know the plants of the countryside better will be sadly missed.

The Commercial Production of Green Manure Seed in the Cairns Hinterland.

E. W. BAIRD, Adviser in Agriculture.

THE practice of including a leguminous green manure crop in the cane rotation is extensively followed in the sugar-cane growing areas of coastal Queensland, and to supply the demand for seed in northern areas a considerable quantity of seed is required.

Commercial seed production of green manure legumes in the wet coastal areas is not practicable, but the soils and the drier climate of the Cairns hinterland, particularly Mareeba and the lower rainfall areas of the Atherton Tableland, are well suited to the purpose. Moreover, the fact that these districts are within easy distance of the large cane-growing areas north of Townsville is an advantage. Seed production of green manure legumes is now a useful source of income to many farmers in the Mareeba and nearby districts, and with an assured demand, which is likely to increase, there is every reason to expect that the acreage devoted to this form of cropping will expand.

Cultivation of the various legumes follows the same general pattern. As a rule the seed is sown in late December or January and the crop develops through the wet season, being harvested in the autumn and early winter months when drier conditions are normally encountered. Legume seed crops are useful in maintaining soil fertility in a crop rotation and fit in very well with the cropping programme where maize and peanuts are also grown, as is the case for example in the Carbeen district.

The main legume seeds produced are those of four varieties of cowpea—giant cowpea, Groit cowpea, Cristaudo pea and Reeves Selection. Seed of the most common green manure legume, Poona pea, which is also a variety of cowpea, is not produced. There is little demand for this legume in the far northern canefields because of its susceptibility to wilt when growing in soils which become waterlogged during the summer wet season.

Seeds of velvet beans and Gambia pea are also produced in some quantity.

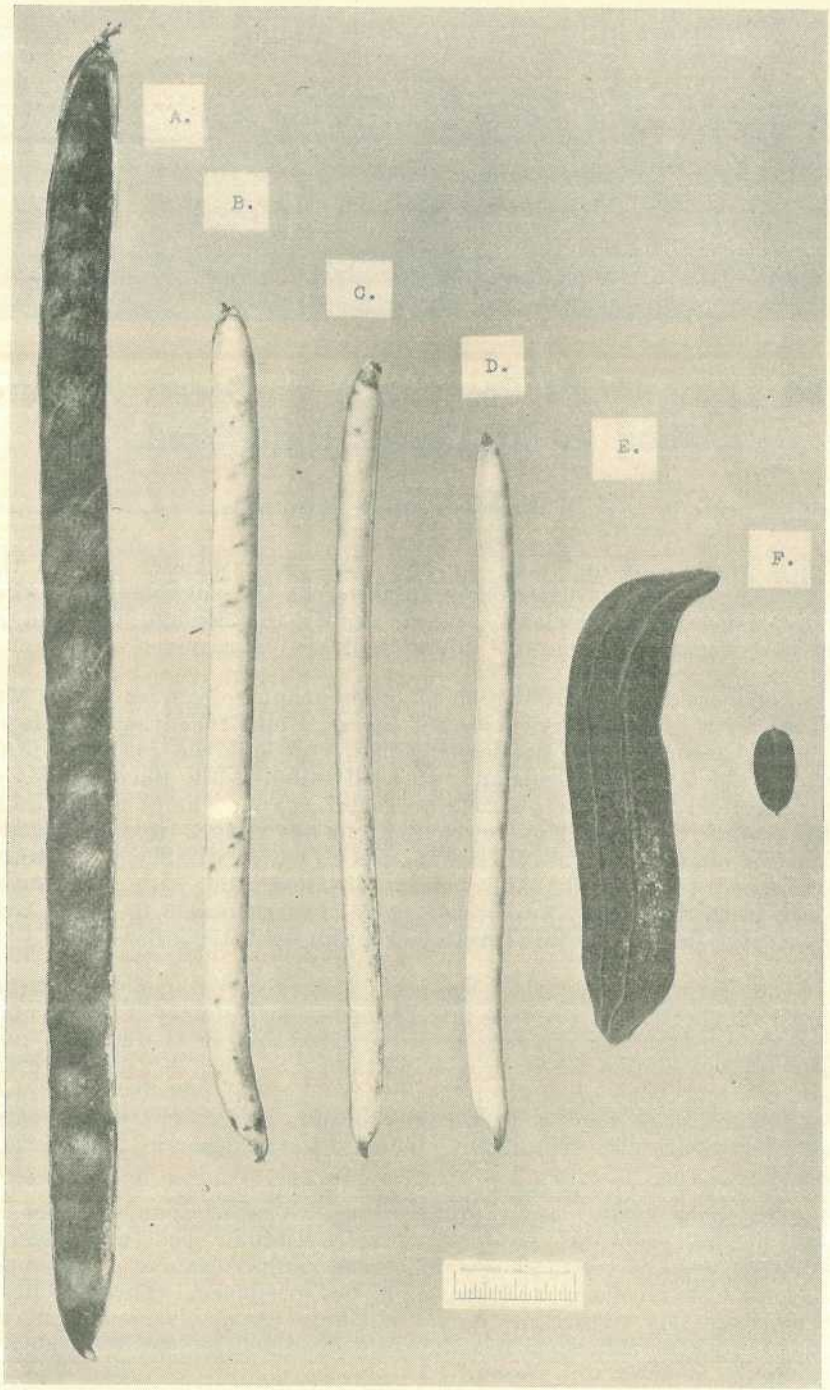


Plate 120.

Pods of Green Manures.—A., Giant cowpea; B., Cristaudo pea; C., Groit cowpea; D., Reeves Selection; E., Jubilack velvet bean; F., Gambia pea.

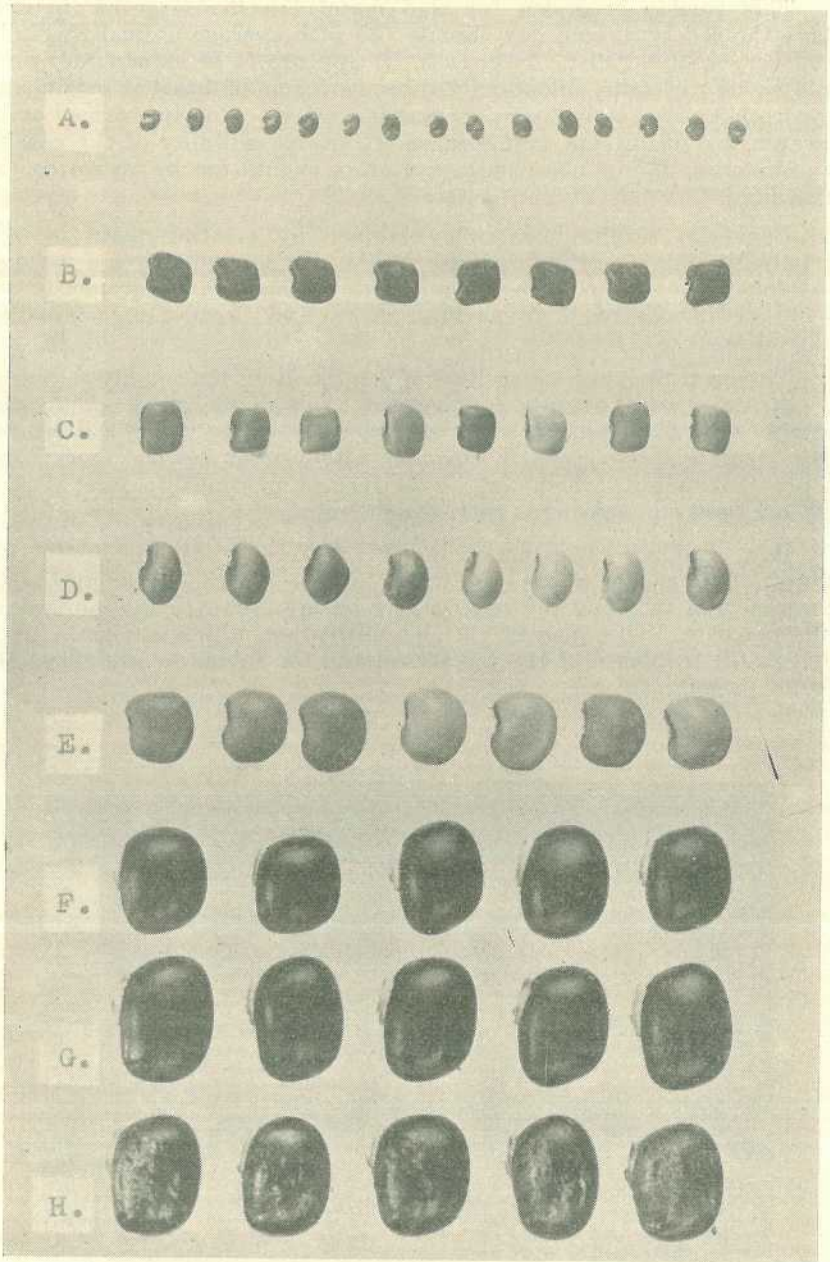


Plate 121.

Seeds of Green Manures.—A., Gambia pea; B., Groit cowpea; C., Reeves Selection; D., Cristaudo pea; E., Giant cowpea; F., Black Mauritius bean; G., Jubilack velvet bean; H., Somerset velvet bean.

COWPEAS.

Giant Cowpea.

This variety is grown for seed mainly in the Mareeba district, where the soil types and dry climate (35 inch average annual rainfall) seem very well suited to its growth. It appears to be satisfactory on a wide variety of soils, including red-brown loams of basaltic origin and brown and grey sandy loams of granitic origin. Poorly drained soils, however, are unsuitable, and because of the susceptibility of the variety to nematodes, two or more successive crops should not be grown on the same land.

Beneficial results have been obtained by rotating giant cowpea crops with maize, peanuts or grass fallow. In some districts a practice is developing of growing the legume with the main maize crop, but this is not recommended in areas of high rainfall because of harvesting difficulties.

The crop thrives best on land which has been thoroughly prepared to eliminate weed growth and conserve subsoil moisture. The most suitable time for planting is in January. On slopes where soil erosion may occur, giant cowpea, in common with similar cowpea seed crops, is planted on hills which have been formed previously; otherwise no hills are used and seeding is carried out "on the flat."

Row spacing varies according to preference of the individual grower, but usually rows 4 ft. apart are used with one or two seeds sown every 3 ft. along the row, to give an approximate seeding rate of 5 lb. per acre. This spacing permits cultivation, which is carried on as long as the incidence of the wet season and the inter-row growth of the plants permit.

Plate 122.

Early Growth of a Giant Cowpea Seed Crop.

Plate 123.

Harvesting Giant Cowpea Seed. Note the bags of pods in the background.

With a January planting the crop makes its growth through the very wet months, and the main harvesting is carried out in May and June, when drier conditions prevail. Dry harvesting conditions are essential, otherwise seed and pods may be discoloured by rain and the pods may become very brittle. In earlier planted crops, harvesting of pods may commence in late March if the weather is dry enough.

Hand harvesting of the pods is usual, the pods being stacked under cover and threshed later. They must be quite dry for threshing, which is usually most efficient when carried out during the afternoon. The pods do not split lengthwise readily and must be crushed, hence the necessity for dryness. Threshing is carried out by the usual corn or peanut thresher.

Harvesting may be spread over a considerable period, depending on the labour available. However, undue exposure of ripe seed in the field is inadvisable because of the risk of bean bruchid attack.

Because of the fleshy nature of the stalk, the prolific vine growth, and irregular ripening of the pods, giant cowpea does not lend itself readily to mechanical harvesting. There are machines which could handle the crop, but the cost is far beyond the capacity of the individual grower. This problem could best be met by the group purchase and operation of a suitable machine on a co-operative basis.

An average yield in the areas under consideration is 10 to 15 bushels per acre. The total annual production is about 6,000 bushels of seed. To produce seed of high standard, adequate seed cleaning facilities should be available on the farm. In many samples which are marketed, the trash content lowers the standard, and there is scope in this direction for considerable improvement.

Groit Cowpea.

As a green manure, Groit cowpea has been popular in the coastal cane areas for many years. The seed crop is grown almost exclusively in the Tolga-Kairi section of the Atherton Tableland, where about 2,000 bushels are produced annually.

The crop is sown at the rate of 4 to 6 lb. per acre in drills 3 ft. to 3 ft. 6 in. apart.

This fine-stemmed variety lends itself to machine harvesting. The method adopted is to cut the plants at ground level with a sharp hoe or cane knife when approximately three-quarters of the seed pods are mature and commencing to dry. The severed plants are allowed to cure in the field for several weeks, depending on weather conditions. They are then cocked, stacked, and later threshed. The whole of the vine passes through the thresher, which is adjusted suitably to take the large volume of plant material. As well as recovering a good seed sample, a good quality chaff for stock food is obtained. Sometimes it is necessary to pass the seed once more through the machine for extra seed cleaning purposes. Yields of 10 to 15 bushels of seed are commonly obtained.

Reeves Selection.

This variety has been developed as a result of selection work in Queensland and has gained popularity in coastal districts because under waterlogged soil conditions it is more resistant to wilt than Poona pea.

In growth, Reeves Selection is more inclined to a bush habit than giant cowpea and for this reason it is grown in rows which are only 3 ft. apart; seed is spaced 6 to 12 inches apart along the row, giving an approximate planting rate of about 4 lb. per acre.

Plate 124.
Early Growth of a Reeves Selection Cowpea Seed Crop.

The seed can be mechanically harvested similarly to Groit cowpea. Under average conditions, 15 to 25 bushels of seed per acre can be produced. In 1948-49, about 500 bushels of seed were produced in the Mareeba area, and production seems certain to expand.

Cristaudo Pea.

It is believed that this legume, sometimes known as Ingham pea, originated from a selection from Clay cowpea made by a farmer at Ingham. Coastal cane farmers have created a demand for seed of this variety, which is credited with pest and disease resistance of a much higher order than Poona pea.

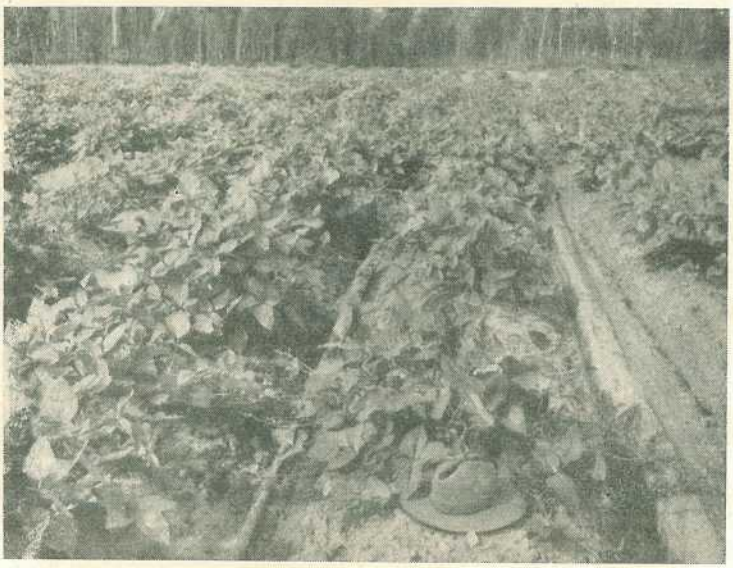


Plate 125.
A Young Crop of Cristaudo Pea Being Grown for Seed.

Cristaudo pea thrives in the Mareeba area and it is expected that seed production will increase. It is grown in rows 3 ft. 6 in. to 4 ft. apart, with 6 inches between plants in the row, giving a seeding rate of approximately 4 lb. per acre.

Like Groit and Reeves Selection, it can be efficiently harvested by machine. Yields of up to 35 bushels per acre have been obtained, but 20 bushels per acre is a satisfactory average.

VELVET BEANS.

Velvet beans will thrive on a wide variety of soil types and the plants show drought resistance of a high order. Uneven germination is a feature of this legume, but excellent strikes are obtained in the Carbeen area (average annual rainfall 40 inches), where rainfall and soil appear to suit seed production very well. Good seed yields have also been obtained from Paddy's Green in the Mareeba district.

Best results have been obtained where the velvet beans are grown in association with maize as a supporting crop to make collection of the pods easy. Care must be taken to ensure that the vigorously

Plate 126.

Black Mauritius Velvet Bean Grown for Seed on a Supporting Crop of Maize.

Plate 127.

Velvet Bean Grown on Maize for Seed. At the left, the maize is turned down below the cob to facilitate harvesting of the bean pods.

growing prolific vines are not planted so thickly as to weigh down and break the maize stalks. For this reason it is usual to plant the seed in every second row of maize, which has an inter-row space of 4 feet. One or two seeds are dropped along alternate rows 6 ft. apart, giving a planting rate of 4 lb. per acre.

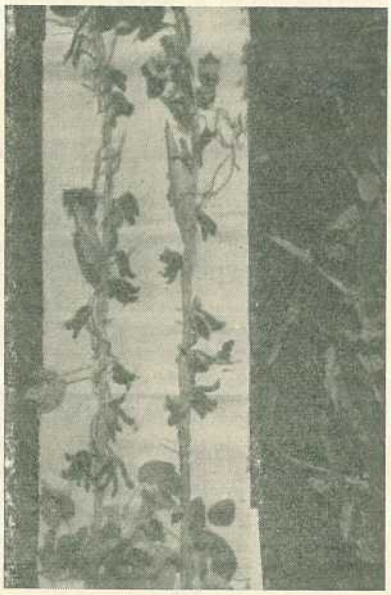


Plate 128.
Velvet Bean Supported on Maize for Seed Purposes.

Planting of the velvet bean seed is carried out after the maize has germinated and the rows can be seen clearly. It is not advisable to allow the maize seedlings to be more than 6 inches high before planting the legume, as shading seems to stunt growth.

The practice of growing velvet beans for seed in association with maize appears to be a sound one where machine harvesting of maize is not adopted. It permits of two cash crops being produced on the same land at the same time without detriment to either.

The varieties recommended for seed production are Somerset, Jubilack and Black Mauritius. In a trial at Mapee, near Tolga, in the season 1948-49, these three varieties yielded 1,257 lb., 1,192 lb. and 786 lb. of seed per acre, respectively.

Somerset is a large vine which is relatively easy to harvest. The seed is large and may not be popular with cane farmers. Jubilack produces a large vine which is also easy to harvest. Its general characteristics suggest that it would be a very useful variety for seed production purposes. Black Mauritius, although not such a heavy yielder as the two varieties already mentioned, is very easy to harvest, as the pods are borne in large clusters. All three varieties grow good green manure crops. Rate of maturity of each is about the same as that for maize.

Hand harvesting is followed, the pods being pulled from the vine, stacked, and allowed to dry thoroughly before threshing with a corn or peanut sheller. In order to facilitate hand harvesting, a practice adopted by some growers is to bend over the maize stalks just below the maturing cob. Not only does this make harvesting of the velvet beans easier, but in the event of wet weather the bent maize cobs shed water more readily and the maize appears to suffer less from cob rots.

Separation of seed from the pods is not easy, especially if the pods are not thoroughly dry, but the corn sheller does a reasonably satisfactory job. Sometimes the pods are spread on galvanised iron sheets in the sun to make the pods burst, and horses or a tractor are driven across them to complete the bursting process. This method is not recommended, as it damages the seed too much.

More than 1,500 bushels are produced annually in the Tolga-Carbeen-Mareeba area, and with increasing demand and good prices production can be expected to expand.

GAMBIA PEA.

Seed of this legume has been produced to a limited extent in rotation with the tobacco crop. Owing to the difficulties encountered in establishing it on prepared ground, it has lost favour with seed producers. However, it regenerates reasonably well on hard ground and volunteer crops are used as sources of seed supply in various areas.

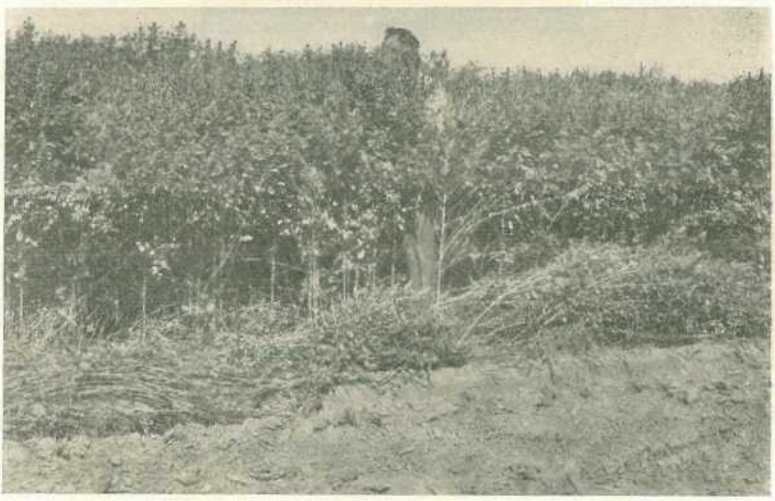


Plate 129.

Gambia Pea in Flower and Forming Pods.

Harvesting by hand is tedious because the pods and the seed are small, and this is also an unattractive feature to the seed grower. Pods must be picked at maturity. They are easily threshed, and in fact if harvesting is not carried out promptly the pods show a marked tendency to shatter and shed seed.

A trial in which a reaper and binder was used for harvesting Gambia pea seed was carried out recently in the Mareeba area. The sheaves were threshed as soon as possible to avoid loss of seed due to shedding. The seed was recovered by hitting the sheaves against the inside of a small tank, as in the old method of threshing peanuts by hand. The seed obtained was later winnowed to remove trash.

PESTS AND DISEASES.

The various cowpea varieties grown for seed in the Cairns hinterland are susceptible to bean fly injury, but under good growing conditions seed crops are rarely troubled by this pest. Reeves Selection is said to be more resistant than Poona pea. Velvet beans and Gambia pea are not worried by bean fly. Should severe bean fly infestation of any of the seed crops threaten, DDT sprays should be applied.

Pod borers affect all the seed crops, but appear to be less troublesome in velvet beans than in cowpeas. DDT preparations should be used to combat these pests.

The cowpeas are susceptible to nematode infestation, but it is rare in the Mareeba area to have a seed crop seriously affected. However, the fact that cowpeas do harbour nematodes means that they should never be rotated with nematode-susceptible crops such as tobacco. Velvet beans and Gambia pea appear to be highly resistant to nematodes and so appear to be safe to rotate with tobacco and other nematode-susceptible crops.

All the cowpea varieties described have a degree of resistance to wilt, and Giant, Reeves Selection and Cristaudo pea at least are much more resistant than Poona pea.

Harvested seed is very susceptible to attack by bean bruchids and mites, but it can be stored safely in bags or tanks after thorough treatment with 2 per cent. DDT dust used at the rate of 5-6 oz. per cornsack (150 lb. cowpea seed).

FREE EXAMINATION OF SEEDS.

Samples of seed purchased by farmers for their own sowing are examined free at the Department of Agriculture and Stock, Brisbane.

Samples should be marked to show the kind of seed, number of bags from which sample was drawn, quantity purchased, name and address of seller, and name and address of sender.

Samples should be of the following size:—

	oz.
Cereals, beans and peas	8
Lucerne, millets, Sudan	4
Grasses	2
Vegetable seeds	½

Harvesting and Packing Tropical Fruits and Strawberries.

GENERAL HARVESTING CONDITIONS.

AS in the case of other fruits, care is essential for the successful handling of tropical fruit. Climate and temperature when harvesting is in progress are big factors in the successful carriage of tropical fruits to local and distant markets. These fruits are of such a delicate nature that every care must be taken to avoid carelessness and rough handling. Care should be taken by growers to see that fruit after harvesting is allowed to cool before being packed. Close attention to this point is necessary if fruit is to be carried over long distances and is expected to be in a satisfactory condition when it arrives on the market. Fruit packed while in a heated condition holds the heat for a long period during transit, thus causing premature ripening or sweating, with the certainty of the consignment opening up in an over-ripe or wet and musty state, which is just the condition suitable for the development of moulds and transit rots. Fruit in this plight has only a short commercial life, and has to be sacrificed by the agent to distributing retailers for rapid disposal, usually necessitating a substantial reduction in price to ensure a quick sale. Such sales often have a detrimental effect on the price or the demand for sound consignments. By taking advantage of the time of the day, and picking the fruit while its condition is unheated, pre-cooling is made considerably easier. If necessary, after picking, spread the fruit out in a cool place to reduce its temperature before packing.

PACKING THE PRODUCT.

Care in Making Cases.

Growers, after taking every care in handling their fruit while harvesting and packing, often, through carelessness in making and nailing down cases, offset an advantage already gained by careful handling. Careless nail-driving, causing nails to protrude inside the box from the timber of the case, often results in damaged fruit with consequent waste. Nail-marked fruit decays, breaks down, and affects adversely the sound fruit in the box. Nails protruding through the outside of a case are a danger to all handling it in transit, often causing bad cuts or loss of temper, and rough handling in consequence. Extra care in such matters is well worth while, and saves trouble.

The " Get Up " of the Package.

Attractiveness is the main feature to be studied, anything added or done to make the product worth more to the buyer being a big factor in quick sales and higher prices. The following points are well worthy of consideration:—

Use only clean, well-made cases. Second-hand cases should be thoroughly cleansed before using again.

Plain white or coloured paper is much more attractive and cleaner than newsprint, while the extra cost is only a fraction of a penny.

Where it is necessary to use padding, clean woodwool is preferable to most types of other material.

Fancy labels are an improvement, but if using stencils or rubber-stamps, care should be taken to apply them neatly and so avoid smudging and spoiling the appearance of the finished package. The packer's full name and address, with variety and contents of the case, as required by the Fruit and Vegetables Act, should be embodied in labels or stencils.

Wiring the case is an improvement. Often the wiring together of two small cases to make one package is an economy and an insurance against the rough handling of smaller packages. Wiring is also an attraction to the buyer who desires to despatch fruit to distant places.

CUSTARD APPLES.

Harvesting.

Picking custard apples at the right time is essential in keeping buyers and consumers satisfied, besides helping in keeping up the demand. Custard apples picked too soon inevitably go black and become unsaleable and unattractive. The fruit should be picked when it is in a firm mature condition to ensure good carrying and ripening qualities. A good indication of the correct time to harvest custard apples is when the interstices between the corrugations of the fruit have turned to a rich creamy colour. Fruit picked at this stage, if firm, will carry well and ripen excellently. Packing will present no difficulties if the operations of sizing and packing are carried out separately.

Sizing.

To obtain the best results when marketing custard apples, care should be taken to pack the fruit in the best possible manner for marketing. Clean cases, nicely stencilled with the packer's name and address and the number of fruit in the case, add to the market value of the product. Most custard apple growers consider it unnecessary to size and pack their fruit. Like all other fruits, when this is done the value is considerably raised, from both seller's and buyer's points of view. Buyers do not like to purchase fruit of mixed sizes, as they have no means of arriving at what a case containing varying sizes is going to realise when sold at so much per individual fruit at prices varying according to the size. When a case is sized this return can easily be calculated, and a price paid accordingly. When a buyer cannot calculate the actual return he is likely to receive for a case of fruit, it is only to be expected that he will be careful to safeguard himself and pay a lower price than the fruit is actually worth.

Sizing is an operation that should be carried out in the shed before packing. An excellent sizing table is one with a flat top, covered with clean sacks, with a 3-inch high beading around the edge to stop the fruit from rolling off. For best results the operator should size by hand into at least four different heaps of fruit of approximately even dimensions. It is also advisable to clean the fruit by carefully brushing if its appearance is affected by mealy bug or other pests.

Packing.

By packing two different counts from each heap, packers will size the fruit automatically into six or seven sizes. The best container is the dump half-bushel case, 18 inches by $7\frac{1}{8}$ inches by $8\frac{3}{8}$ inches internal measurements. For the larger sized fruit, with the counts, 8, 10, 12, and 14, the case is best made up in the narrow way—viz., 18 inches long by $7\frac{1}{8}$ inches wide by $8\frac{3}{8}$ inches deep (see Plate 130); but for the smaller sized fruit, with the counts 15, 18, and 21, the wide way, 18 inches long by $8\frac{3}{8}$ inches wide by $7\frac{1}{8}$ inches deep, will be found most satisfactory (see Plate 131).

Following are the packs and counts:—

NARROW CASE PACKS.

18 inches long by $7\frac{1}{8}$ inches wide by $8\frac{3}{8}$ inches deep.

Pack.	No. in First Layer.	No. of Layers.	Total.
1 x 1	4	2	8
1 x 1	5	2	10
1 x 1	6	2	12
1 x 1	7	2	14

WIDE CASE PACKS.

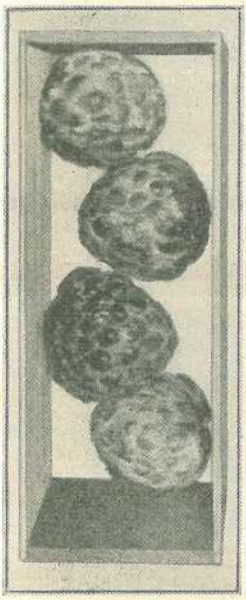
18 inches long by $8\frac{3}{8}$ inches wide by $7\frac{1}{8}$ inches deep.

Pack.	No. in First Layer.	No. of Layers.	Total.
2 x 1	8	2	15
2 x 1	9	2	18
2 x 1	11	2	21

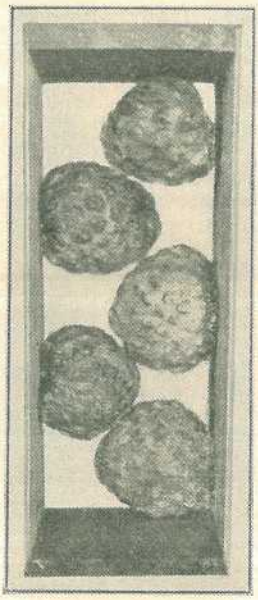
These packs and counts should pack any average sized line of custards, but growers with only a small quantity would possibly not need to do all of these counts.

With very large fruit it is better to adopt a single layer tray of a suitable depth. For distant markets the single layer tray is the best container. Owing to the irregular shape of the fruit, commonsense has to be used in getting the fruit to fit in snugly, careful selection of irregular-shaped fruit to match each other being a great help in obtaining a good pack. Force should not be used under any circumstances. A bigger latitude in sizing is necessary in handling custard apples than in handling fruit such as citrus or tomatoes. Only a quarter of an inch variation is allowed in citrus and kindred fruits, but the variation in the sizes of custard apples will greatly exceed this according to the shape of the fruit. One of the main objects of packing is the protection that it gives the fruit, and growers when packing want to keep this object in view. As custard apples soften first at the point,

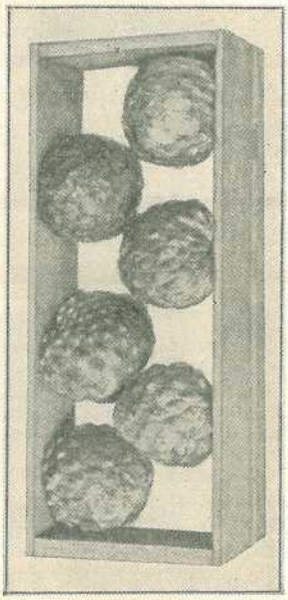
First Layer 1 x 1 Custard Apple Packs.



8 Count—1st Layer.



10 Count—1st Layer.



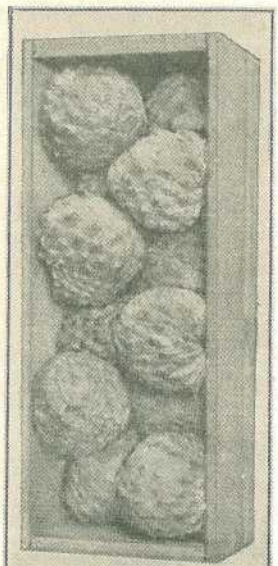
12 Count—1st Layer.

Note the protection given to the soft points of the fruit.

Finished Cases.

8 Count—Finished Case.

10 Count—Finished Case.

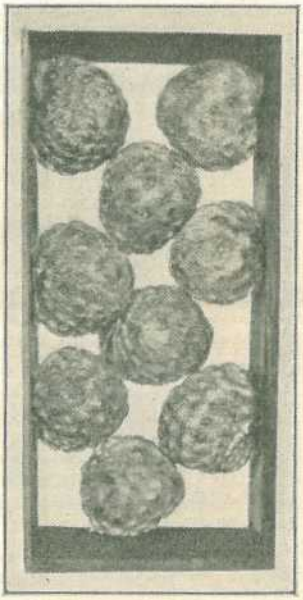


12 Count—Finished Case.

Plate 130.

Custard Apple Packing for the Local Market.—Large sizes. Australian Half Dump Case. Case made on narrow system 18" long x 7⅛" wide x 8⅜" deep.

2 x 1 Custard Apple Packs.



18 Count—1st Layer.

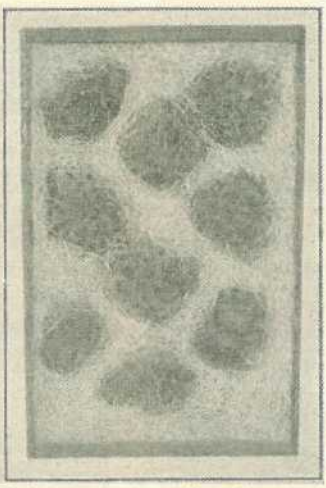
18 Count—Finished Case.

Note the protection given to the soft points of the fruit.

Plate 131.

Custard Apple Packing for the Local Market.—Small sized fruit. Case made on the wide system 18" long x 8⅜" wide x 7⅛" deep.

Case prepared with woodwool for placing the Custard Apples on.



Finished case with the top layer of woodwool removed. Note the padding between each fruit.

Plate 132.

Custard Apple Packing for Export.

or opposite end to the stalk, the packer wants to keep foremost in his mind the placing of fruit to the best advantage to protect the parts which might soften first while in transit. By keeping the point of the fruit turned inwards from the wood of the box the maximum amount of protection is obtained from bumps and vibration during handling and in transit. A study of the illustrations will help to explain this.

If a packer happens to use other counts and packs than those given here, close attention to the protection of the fruit will be of assistance in good transit and satisfactory condition on arrival at the markets. Cases should be packed high enough above the top of the box to allow a slight pressure to be placed upon the fruit by the lid when nailed down. Care should be taken that there is no loose fruit in the case, as the constant rattling and vibration in transit will soon render the fruit unfit for sale. It is well to remember that one broken custard apple will often make a mess of the whole consignment.

Packing for Export.

For long distance transport the best container in the single layer—half-bushel standard, 18 inches long by 11½ inches wide by 5¼ inches deep—tray with the fruit nested or padded in woodwool (see Plate 132). The tray is first prepared by placing a layer of woodwool on the bottom and around the ends and sides. The fruit is then placed in position in a single layer with a small space between each fruit. It is advisable not to wrap custards when sending long distances, as it hastens the process of ripening. Woodwool is then placed in the spaces between the fruit to form a small pad for each fruit, and a layer is spread on the top of the pack and the case nailed down. The whole case should be packed so that it will not rattle when shaken gently. Fruit packed in this manner carried to Tasmania for show purposes, and although soft on arrival was exhibited for three days, and was then in still good eating condition. Fruit packed without woodwool in the same type of container was unfit for consumption on arrival at the show. Care should be taken that no fruit projects above the top of the tray before nailing down. Two trays wired together make a handy package for transport over long distances. No difficulties in marketing should be experienced by growers if judgment and commonsense are used in handling these fruits.

PAPAW PACKING FOR DISTANT MARKETS.

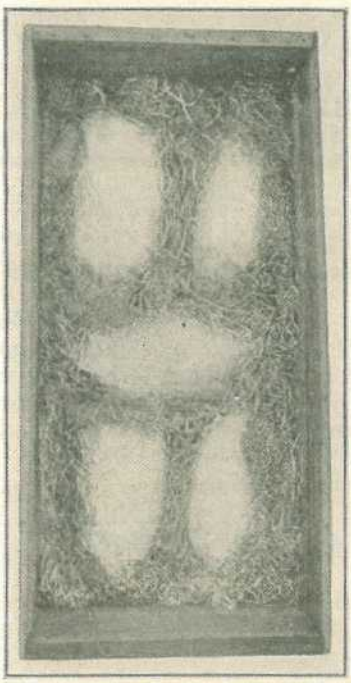
Sizing.

In packing papaws the foremost idea in the mind should be the best method of giving the maximum protection to the fruit in transit, and the packing of the fruit so that it will display to the best advantage when exposed for sale. Before being packed the fruit should be cooled and sized. To assist in making the operation of packing easier, it is a great help to endeavour to match the various-shaped papaws whilst sizing them into heaps. Four sizes should be sufficient to cover the packing of papaws for export. Sizing is easily done on a flat-topped table covered with soft bags or other suitable material. Many growers do not think it necessary to go to this trouble, failing to appreciate that the skin of the papaw is exceptionally tender, and that the slightest scratch will cause the fruit to bleed, thus damaging the appearance of the fruit.

Packing.

The best container for long-distance carriage of papaws is the tropical fruit case, 24¾ inches long by 12 inches wide by 12 inches deep, internal measurements (see Plate 133). Woodwool is the most satisfactory padding material. The box is prepared by placing a layer of

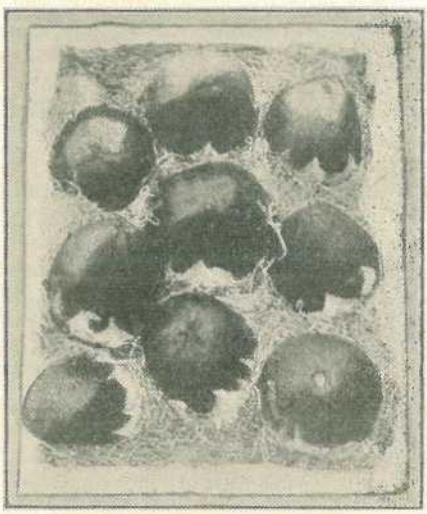
woodwool on the bottom of the case and around the ends and the sides. Each papaw is then wrapped in soft paper and placed in a single layer in the prepared box, using small pads of woodwool to make individual fruit firm and snug. A thin layer of woodwool is then placed over the top of the fruit, and the process is repeated until the case is full, finishing off with a layer of woodwool padding on the top. It is unwise to have the fruit projecting too far above the top of the box, but the lid of the case should press just firmly enough to keep the fruit snug and firm. Packers should avoid placing too much padding in the case. Care in matching the various-shaped fruit will greatly assist in this. By using a coloured wrapper in conjunction with the woodwool a very attractive package can be placed on the market. Care in eliminating all green, over-ripe, or diseased fruit when packing is absolutely necessary to ensure safe transit and satisfaction to buyers.



Packed in Tropical Fruit Case 24¾" x 12" x 12". Fruit wrapped in soft paper and nested in woodwool.

Plate 133.

Papaws Packed for Export.



Packed in the Dump Case used as a tray by removing the side; 18" long x 14¼" wide x 8⅝" deep. Note the woodwool padding between the fruit.

Plate 134.

Papaws Packed for Local Market.

Packing for Local Markets.

Growers who are near enough to their markets to be able to use motor transport have a decided advantage over those who have to send over long distances. The fruit can be left on the tree to become almost fully ripe before sending to market, and it is not necessary to pack in the same manner as when sending farther afield. Close attention should be paid to the elimination of all disease-infected or marked fruit, and sizing should also be rigidly adhered to. The Australian dump case, made in the form of a tray 18 inches long by 14¼ inches wide by 8⅝ inches deep, internal measurements, is a good container for the local market (Plate 134). The fruit is packed on end in a single layer resting

on a layer of woodwool or similar packing. As a protection against rubbing the bottom end of each fruit, it should be wrapped for about two-thirds of the way up in clean white or coloured paper, while each fruit is made snug and tight by pushing pads of woodwool in between the fruit. Papaws packed in this way have a very attractive display value, and sell much more readily than those carelessly placed in cases without padding material, the buyer being able to appreciate the quantity and quality at a glance.

MONSTERA DELICIOSA.

Packing for Distant Markets.

This is a fruit that is not well known outside Queensland. Many people tasting the monstera for the first time are favourably impressed, and are keen to know where supplies can be secured. Many specimens of this fruit bought by people, however, do not come up to expectations because growers are afraid to allow the fruit to stay long enough on the plant on account of its tendency to fall to pieces when ripening. This tendency can be overcome by winding a strip of paper around the fruit when packing, to prevent the outside shell from falling as the fruit ripens. Fruit packed like this will ripen over its entire length, and still retain its full flavour when consumed three weeks after being harvested. The standard half-bushel case, 18 inches long by 11½ inches wide by 5¼ inches deep, internal measurements, is an ideal case for the monstera. The fruit is packed in layers and made snug by placing a thin layer of woodwool on the top and bottom and between the layers. Lining the case with clean white or coloured paper is an added improvement to the appearance of the case.

PACKING STRAWBERRIES.

Containers.

Many containers are used for marketing strawberries. In some of the southern States a punnet is in general use, but as this container has the disadvantage of containing more than one layer of berries with each layer resting upon the other, it is not as good a container as the single layer packed boxes in general use in Queensland. There are two types of boxes in use—one which measures 8 inches long by 4 inches wide by 1¼ inch deep, and the other 24 inches long by 8 inches wide by 1½ inch deep. (Both are internal measurements and the latter box is measured clear of a central partition which it has). The smaller of the two containers is preferable, because it gives less latitude for mistakes and spoiling the appearance and alignment of the fruit when packing. Being smaller, it will not give the fruit as much play to become loose in the box through careless handling, so causing damage through rubbing and otherwise. It is also a better container for retailing, the larger box or tray, which contains the equivalent of six smaller boxes, holding too much fruit for the average buyer, necessitating repacking into smaller boxes. As the strawberry is such a soft fruit, it is necessary to handle it as little as possible. The smaller container also has the advantage of allowing better sizing and packing when the supply of fruit on the farm is short for marketing. Twenty of the boxes 8 inches by 4 inches by 1¼ inch will just fit comfortably into a half-dump case.

Handling.

Unlike other fruits, the strawberry does not necessitate a large, complicated, costly equipment in the packing-house to size and grade. This is done by hand, and much labour can be saved by grading while picking. Sizing is best done in the packing-house.

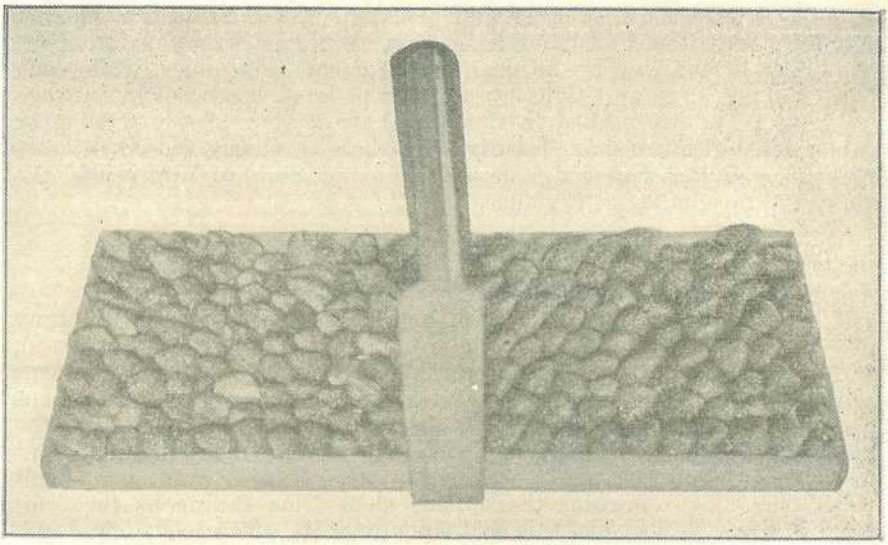


Plate 135.

Picking Tray Filled with Fruit.—Note the different grades and colour of fruit that are placed at either end of the tray when picking.

A good picking container is a tray with a handle (see Plate 135). When picking, the first-class berries fit for marketing can be placed at one end of the tray, and second-class or factory berries placed at the other. By doing this the berries are automatically graded. Berries are packed for market in three sizes—threes, fours, and fives. Sizing is done while packing, the packer having a box for each size. Women and girls usually make the best berry packers, having as a general rule a lightness of touch which is often lacking in the case of men operatives. Berries with grains of earth adhering to them, as is often the case after rain, should be gently brushed. This can be done by placing a soft lacquer brush as a fixture, standing upright in the bench, and by taking the berry by the stalk and gently running it through the bristles of the brush.

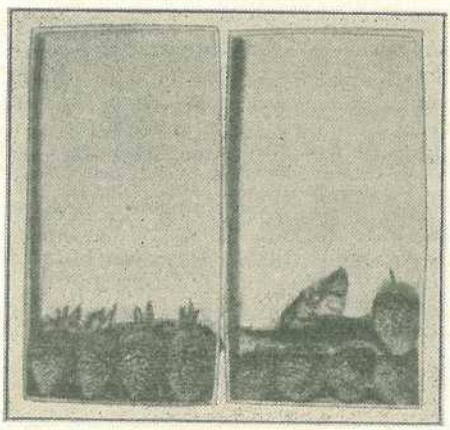


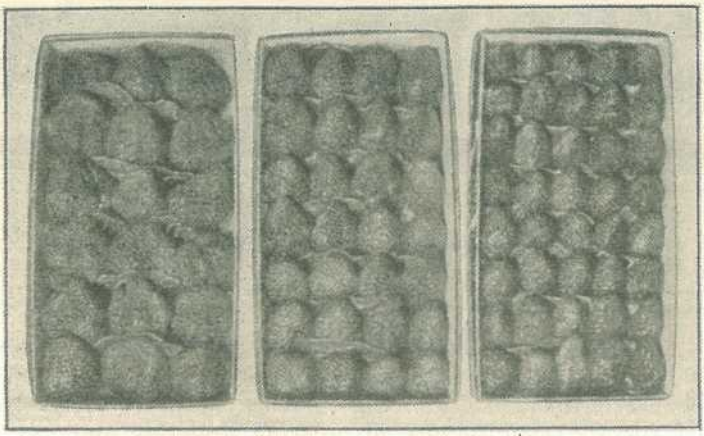
Plate 136.

Me'hod of Starting to Pack.—Note the placing of the leaves to separate the fruit.

Packing.

The method of packing is simple enough. The box is first prepared by placing a prepared leaf across the end of the box—passion fruit leaves are very suitable, while fern leaves are sometimes used where passion fruit leaves are not available—with the leaf projecting high enough to reach to the top of the box, and at the same time being bent enough to place thereon the first line of berries—threes, fours, or fives, according to size. The berries should be placed on their stalk ends with the points up, allowing the point of the

fruit to reach to the level of the top of the box (see Plate 136). Another prepared leaf is then placed in the box, bent so as to rest on the bottom of the box to have the next line of berries placed thereon, while the remainder of the leaf rests against the first line of berries and acts as a separator of the lines of fruit. This process is repeated until the box is filled (see Plate 137). For travelling, a layer of leaves placed on top of the finished pack is an assistance.



Threes. Fours. Fives.

Plate 137.

Finished Boxes.—Note the alignment of the fruit in each box, also the placing of the leaves between each row of fruit.

Points to be watched are—

See that the fruit is placed so that it will come as near as possible to the top of the box, and it will then keep snug when the lid is placed in position.

Avoid packing too high.

Keep the alignment of the fruit straight both across the box and from one end to the other (see illustrations of packed boxes).

Avoid placing too large pieces of packing leaves between the berries.

See that the berries do not rattle in the box after the lid is placed in position.

Keep all badly-coloured berries out of the box, as they spoil the commercial appearance of the package when displayed for sale.

On no account pack damaged berries, no matter how slight the damage—they spoil the keeping qualities of the box. One bad berry soon makes a whole boxful practically unsaleable.

It is recommended that growers should stamp the pack of the fruit on the lid of each box, so that when being sold the seller can see at a glance whether they are threes, fours, or fives without having to remove the lids. This would be in addition to the name and address of packer required by law in letters $\frac{3}{16}$ inch at least in height to be stamped on the top of the lid and the end of the box. Use rubber stamps, as they are quick in application and make a finished job. When sending away packed in cases, see that stencilling is done neatly and free from edge of the stencil plate smudges.

Wool and World Trade.

G. R. MOULE, Director of Sheep Husbandry.

World Wool Production.

WOOL is produced in nearly every country in the world, and it may be classified broadly into two types:—(1) Clothing wools, which are used for the manufacture of wearing apparel; and (2) Carpet wools, which are made into carpets and floor coverings.

England, Spain and Germany held pride of place as the world's main wool producers until the second half of the 19th century. With the development of the sheep industry in countries of the southern hemisphere, the combined sheep population of Britain, France, Germany and Spain fell from 90 millions to 72 millions in the 70 years 1840-1910. At the same time the sheep population of Australia, South Africa, New Zealand, Argentine and Uruguay rose from 5 millions to 240 millions. In Australia the increase in numbers was accompanied by an increase in cut per head from an average of 4.9 lb. (greasy) in the 5-year period 1876-81 to an average of 8.18 lb. (greasy) in the 5-year period 1935-39. Further expansion in sheep numbers during the interwar period brought the Australian clip in 1940 to 1,077 million lb. (greasy); South Africa produced 333 million lb. (greasy), and New Zealand 260 million lb. (greasy) in the same year. Of the world total of 4,000 million lb. of wool, over half was produced by the five southern hemisphere countries—the three British Dominions, Argentine and Uruguay. Australia contributed a quarter of this amount, and is the greatest single producer of apparel wool.

The United States of America, Canada, the United Kingdom, Germany and France occupy the 6th to 10th places amongst producer countries and they are also the first five deficit countries. Of the five, the United States has the largest domestic production, though this has decreased appreciably in the last decade. However, even when America's annual clip was 450 million lb. it was insufficient for her domestic requirements; the present precarious state of her wool industry may have an important influence on the future of world wool.

The annual averages for the 5-year periods 1909-13 and 1939-43 show that there was an increase in world production of apparel wool from 1,685 million lb. to 2,182 million lb. over the 30 years. During this

period cotton production increased from 10,000 million lb. to 13,000 million lb., and rayon and staple fibres, which had just entered the field prior to the first world war, rose to 2,589 million lb. per annum by 1939. Substitute fibres now provide 14 per cent. of the world's apparel fibre, and wool, despite the increase in world wool production, supplies only 12 per cent.

Year-to-year changes in the amount of wool produced in the world have been relatively small. In only two years out of 34 has it varied by as much as 10 per cent. and these fluctuations have been mainly in Merino wool. They have been caused by factors largely beyond the control of the grower, such as droughts, parasites and diseases. Deliberate changes in production have occurred, such as in Australia, where there was a swing to crossbred sheep during the war years in response to a call for coarser wool and more mutton. However, because of a lack of alternative uses to which the land can be put, and the rigidity of fixed production costs, the grower often has little opportunity to vary the type of wool produced.

This means that world wool production has expanded in response to a steady demand for wool. Future production seems assured, although increases like those witnessed over the last 50 years are unlikely to be repeated, as most of the sheep pastoral areas in the world are developed. There may be increases in the cuts per head and decreases in preventable economic loss as pests are controlled and the effects of drought are ameliorated. The future of wool production will be controlled, however, by the continuance of economic production.

World Wool Consumption.

With the exception of the two post-war periods, the annual world carry-over of wool has been small. The combined total stocks of the three British Dominions and Argentine have been below 7 per cent. in 11 of 14 consecutive years. They did not exceed 10 per cent. in any year, the highest being 9.7 per cent. at the end of 1931-2. The two principal Merino countries, Australia and South Africa, have had the lowest carry-over, which has usually been less than 3 per cent.

However, the composition and intensity of world demand has been subject to strong fluctuations, which have been reflected in price changes rather than in volume of trade.

Up to 1938, the United Kingdom and European countries (mainly France, Belgium and Germany) dominated the market, purchasing between them up to 80 per cent. of the surplus apparel wool exported from the five main producer countries. Japan entered the market after the first world war and increased her annual purchases of Australian wool from 2 per cent. of the clip in the 5-year period 1909-13 to 18 per cent. in the 5-year period 1929-33.

Importations of Australian wool by the United States of America have always been erratic. In 1935 they were 95 million lb. (greasy); in 1936, 32 million lb.; in 1937, 69 million lb.; and in 1938, 6.5 million lb. These variations have been closely connected with changes in American home production, which averaged in the vicinity of 450 million lb. per annum. The 1934-38 per capita consumption of wool in America was in the vicinity of 2.5 lb. (clean) per annum, which compares unfavourably with that of European countries which have a high standard of living. The per capita consumption of the United Kingdom, for instance, during

the same 5-year period was 5.27 lb. (clean). Australia's average for the period was 4.63 lb. (clean), while that of Japan was 1.26 lb. (clean), of Poland .99 lb. (clean) and of the Soviet Union .87 lb. (clean). The low rate of wool consumption in America is due to differences in living conditions, as well as to the tariff barrier which gives other fibres a favourable price differential. Since 1939 there has been a decrease in the number of sheep in the United States. However, high ruling rates in the world's wool markets, coupled with high labour costs in America's manufacturing industries, have restricted American importations during more recent years.

Despite the fact that the Soviet Union, India, Pakistan, and China contain three-quarters of the world's population, they absorb only 2-4 per cent. of the world's wool.

The average wool consumption per head, as well as an income basis, is shown in Table 1.

Wool consumption has fallen from 14 per cent. of the world's apparel fibre in 1909-13 to 12 per cent. in 1939-43, when it supplied 2,540 million lb. (clean). At the same time, world consumption of staple fibres has increased. In the 5-year period 1909-13 they provided 2 per cent. of the apparel fibres, and in 1939-43, when total production was 2,851 million lb., they provided 14 per cent.

While there is competition on a fibre basis, there is also rivalry on a fabric basis; for example, a brief visit to any surfing beach in Queensland will reveal the trend towards non-woollen swimming costumes. Finally, there is competition on a price basis. Synthetic "tops" were quoted at $22\frac{1}{2}$ pence per lb. when woollen "tops" varied from $28\frac{1}{2}$ to $48\frac{3}{4}$ pence per lb. at a time when greasy wool was 15 pence per lb.

Wool Prices.

It is well known that wool prices have always been subject to violent fluctuations, but it should be remembered that, in the inter-war period, they were about as great as those of other commodities. The fluctuations were more marked in crossbred than in Merino wools, but the crossbred industry had the stabilising effect of mutton and lamb sales.

As wool is sold by open auction, supply and demand have an important bearing on price. These relationships might be summarised as being:—

The Influence of Supply on Price.—Large variations in individual clips are usually small when compared with the variation of the world's wool; the maximum variation in world supply is about 5 per cent. (except during unusual times such as war, when large stock piles may accumulate).

The Influence of Price on Supply.—Short-term variations in price are unlikely to influence supply because of high capital charges and the time factor in production. However, long-term depression in prices can be important, and may lead to variations in the type of husbandry practised.

The Influence of Demand on Price.—The cost of the raw wool in a manufactured article is low and accordingly changes in price have little effect on the price of the end product. On the other hand, the variation in the income which can be spent on clothes is great and thus

demand fluctuates. During depressed periods, the adverse effect of falling incomes on the level of wool consumption is likely to be much greater than the counteracting effect of lower raw wool prices.

To sum up, then, it is safe to say that the influence of variations in wool price on demand for wool is much less than the influence of changes in demand on wool price.

The Influence of the War.

During the recent war, the main wool producing countries were comparatively unaffected except for shortages of labour and materials, while the principal manufacturing countries were disorganised.

Marketing would have been interrupted except that the Governments of the allied countries bought up the world's surplus wool. Over 10 million bales produced in three Dominions went into store, besides the large stocks which were built up in America under the control of the Commodity Credits Corporation.

The "shoddy" trade, which re-uses wool from discarded garments, lapsed. The woollen manufacturing industries in Australia, Canada, South Africa, the United States, and presumably Russia, expanded, and the majority of the new mills were equipped with new machinery.

At the end of the war most wardrobes were worn out and there was a tremendous demand for wool. During the first year of auctions the United States bought 300 million lb. of Australian wool, while the Continental mills were going through a period of readjustment. During the next year (1947) Continental competition became more intense and prices rose. In 1948 the United Kingdom and Europe dominated the market, with Australian mills in full support. The Soviet Union pushed prices still higher, although its purchases were restricted in quantity. Finally, in 1949 Japan entered the market.

In the meantime, American buyers concentrated on the Argentine clip, which sold at lower prices, as wool was not included in Marshall Aid. The proportion of Merino wool purchased in Australia decreased, and the proportion of coarser crossbred wool used in the United States increased.

Queensland's Position and the Future.

Queensland's sheep population has not increased appreciably since 1890, when the State carried practically 20 million sheep. The present population is about 16 millions, although it was 24 millions in 1942. However, the cut per head has increased and the total wool production has also improved.

The value of the State's overseas exports rose from £151 million for the 10-year period 1911-1922 to £278 million for the 10-year period 1934-1945. Of these totals, wool provided £74 million and £111 million respectively. The value of Queensland wool for the last 4 years has totalled over £100 million.

The present decline in Queensland's sheep numbers is consistent with world trends. The number of apparel wool producing sheep in the world has decreased to 318 millions, against an average of 341 millions and a 1942 peak of 357 millions. Apparel wool production has decreased to below the 1934-1938 level and Merino wool production is lower than in any year since 1920. Seven-eighths of Joint Organisation stocks have been disposed of and consumption of wool is 20 per cent.

above the pre-war average. While a decline in consumption may be expected in the United States, this may be offset somewhat as far as Australia is concerned by the devaluation of sterling. An increase in consumption may be expected in Europe and Japan, but competition from other fibres will have to be met on a price and quality basis.

TABLE 1.

Country.	Average Wool Consumption, per Head, 1934–8. Lb. Clean.	Wool Consumption, per Head.	Income, per Head.
		Order of Magnitude.	
United Kingdom	5·27	1	3
New Zealand	4·65	2	2
Australia	4·63	3	6
Belgium	4·55	4	10
Sweden	3·55	5	8
France	3·52	6	7
Switzerland	3·32	7	4
Argentine	3·00	8	5
Germany	2·87	9	9
U.S.A.	2·66	10	1

In preparing the series of articles on wool which have appeared in this journal during recent months, information published by the following workers has been drawn upon freely:—Prof. A. F. BARKER (University of Leeds), Mr. H. B. CARTER (C.S.I.R.O.), Mr. W. R. LANG (Gordon Institute of Technology, Victoria), Mr. P. R. MCMAHON (Sydney Technical College), and Mr. E. H. MERCER (C.S.I.R.O.).

Publications of the Australian Wool Board and the International Wool Secretariat have also been used.

TUBERCULOSIS-FREE CATTLE HERDS (AS AT 18th AUGUST, 1950).

Breed.	Owner's Name and Address of Stud.
Aberdeen Angus ..	The Scottish Australian Company Ltd., Texas Station, Texas
A.I.S.	F. B. Sullivan, " Fermagh," Pittsworth D. Sullivan, Rossvale, *via* Pittsworth W. Henschell, Yarranlea Con. O'Sullivan, " Navillus Stud," Greenmount H. V. Littleton, " Wongalee Stud," Hillview, Crow's Nest J. Phillips and Sons, " Sunny View," Kingaroy
Ayrshire	L. Holmes, " Bencecula," Yarranlea
Friesian	C. H. Naumann, " Yarrabine Stud," Yarraman J. F. Dudley, Yarraman
Jersey	W. E. O. Meier, " Kingsford Stud," Rosevale, *via* Rosewood J. S. McCarthy, " Glen Erin Jersey Stud," Greenmount J. F. Lau, " Rosallen Jersey Stud," Goombungee G. Harley, Hopewell, Childers Toowoomba Mental Hospital, Willowburn Farm Home for Boys, Westbrook F. J. Cox and Sons, Crawford, Kingaroy Line

A Survey of Data on Group Herd Recording, 1948-49.

S. E. PEGG, Senior Adviser (Herd Recording).

THE original object of a herd production recording scheme was to obtain reliable information on the productive capacity of each cow in the herds of farmers joining the scheme which could be used as a basis for improving individual herds. Herd recording is still practised basically for this purpose, but in recent years it has been found that the mass of information accumulated in connection with herd recording may yield on thorough analysis valuable information on many factors of great importance to dairy farming economy generally.

Preliminary investigations of herd recording data have been commenced in Queensland. This article deals with surveys made of information derived from the first year's operations of group herd recording. The group system, commenced in January, 1948, replaced the "farmer's own sample" scheme which had operated since 1920. As the group scheme is only in its infancy in Queensland, it must be recognised that the information contained in this survey is only a guide; moreover, due to the vagaries of the seasons in this State, the real effect of many factors on various aspects of dairying can only be determined reliably in the light of a survey covering a number of years. In view of the different pastures, fodder crops and other environmental conditions in the various dairying districts, it may also well be that surveys of some aspects of herd recording data must be conducted on a district basis.

So far as the present survey is concerned, the results will also be affected to a minor extent by the fact that production records included for cows which calved between February and June will be only those of animals with very short lactations.

Length of Lactation.

The average length of lactation of cows which completed lactation periods was 220 days.

The average length of lactation for the various districts was:—

District.	Days.
Darling Downs	222
South-eastern Queensland	221
South Burnett	211
Upper Burnett	214
Atherton Tableland	232
Average for Queensland	220

The percentage of cows milking for the various lengths of lactation is shown in Table 1.

The objective should be to have cows in milk for ten months, with a dry period of two months before again freshening. This is not always possible where the bulls are not controlled, and in such cases it is not uncommon to have cows calving again within ten months.

The fact that 29.6 per cent. of the cows had lactation periods of 180 days or less calls for some action. It is pleasing to record that many of these animals have already been culled. In some instances the low lactation period may have been caused by sickness or accident, but in a large number of cases the cause was either an inherited tendency or a lack of feed. Where a short lactation period is inherited, the animals concerned should not be selected for breeding purposes, as the progeny will inherit this tendency.

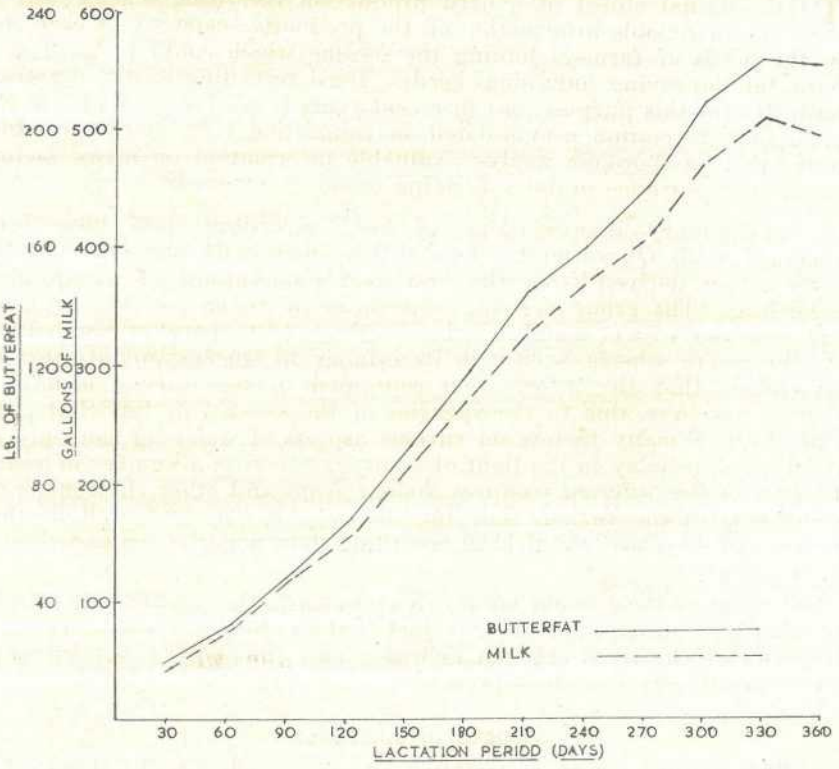


Plate 138.

Graph Showing Production of Butterfat and Milk According to Length of Lactation.

TABLE 1.

AVERAGE PRODUCTION ACCORDING TO LENGTH OF LACTATION.

District.	30 days.		60 days.		90 days.		120 days.		150 days.		180 days.		210 days.		240 days.		270 days.		300 days.		330 days.		360 days.	
	Milk.	Fat.	Milk.	Fat.	Milk.	Fat.	Milk.	Fat.	Milk.	Fat.	Milk.	Fat.	Milk.	Fat.	Milk.	Fat.	Milk.	Fat.	Milk.	Fat.	Milk.	Fat.	Milk.	Fat.
	gal.	lb.	gal.	lb.	gal.	lb.	gal.	lb.	gal.	lb.	gal.	lb.	gal.	lb.	gal.	lb.	gal.	lb.	gal.	lb.	gal.	lb.	gal.	lb.
All Queensland	387 (0·33)*	17	761 (1·25)	32	1,169 (2·46)	49	1,600 (4·56)	69	2,143 (8·04)	93	2,687 (13·01)	116	3,266 (18·57)	143	3,691 (19·74)	161	4,066 (26·21)	179	4,736 (2·47)	209	5,122 (1·31)	223	4,937 (2·04)	222
Sth-eastern Queensland	347 (0·29)	17	682 (1·25)	30	1,026 (2·57)	46	1,483 (4·5)	66	1,876 (8·03)	84	2,356 (12·96)	106	2,775 (18·52)	125	3,140 (20·16)	142	3,432 (25·12)	154	4,086 (2·60)	186	4,300 (1·39)	195	4,293 (2·60)	193
Darling Downs	354 (0·29)	14	878 (1·13)	35	1,355 (2·24)	54	1,790 (4·07)	76	2,464 (7·32)	105	3,162 (13·01)	134	3,931 (19·05)	171	4,518 (20·39)	192	4,957 (26·87)	217	5,716 (2·61)	246	6,301 (1·58)	267	6,750 (1·44)	301
South Burnett	453 (0·52)	17	726 (1·29)	30	1,176 (2·79)	50	1,573 (5·73)	65	2,261 (10·17)	90	2,754 (16·37)	112	3,354 (18·59)	139	3,653 (16·37)	149	4,059 (24·83)	169	4,652 (1·60)	197	5,248 (0·77)	219	4,438 (0·98)	197
Upper Burnett	603 (0·64)	21	958 (2·42)	37	1,610 (3·44)	60	1,918 (6·88)	81	2,705 (10·57)	114	3,317 (9·68)	132	4,116 (16·18)	169	4,566 (17·20)	192	4,530 (28·54)	195	6,239 (1·66)	275	6,439 (0·51)	246	5,843 (2·29)	263
Atherton Tableland	295 (0·32)	15	668 (0·85)	31	1,109 (1·06)	48	1,409 (3·29)	66	2,168 (5·41)	96	2,715 (9·24)	121	3,464 (18·47)	150	3,878 (21·55)	167	4,438 (33·86)	191	4,924 (3·08)	209	5,324 (0·85)	222	5,570 (2·02)	247

* The figures in brackets represent the percentage of cows in each case.

TABLE 2.

EFFECT OF MONTH OF CALVING ON AVERAGE PRODUCTION.

District.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
	Milk.	Fat.	Milk.	Fat.	Milk.	Fat.	Milk.	Fat.	Milk.	Fat.	Milk.	Fat.	Milk.	Fat.	Milk.	Fat.	Milk.	Fat.	Milk.	Fat.	Milk.	Fat.	Milk.	Fat.
	gal.	lb.	gal.	lb.	gal.	lb.	gal.	lb.	gal.	lb.	gal.	lb.	gal.	lb.	gal.	lb.	gal.	lb.	gal.	lb.	gal.	lb.	gal.	lb.
All Queensland	2,883 (7·92)*	125	2,573 (4·90)	115	2,784 (3·82)	123	2,918 (3·65)	129	3,373 (3·48)	149	3,752 (4·76)	163	3,728 (7·46))	163	3,753 (9·73)	164	3,513 (13·30)	154	3,308 (15·34))	144	3,218 (14·06)	141	3,107 (11·57)	136
Sth-eastern Queensland	2,495 (8·11)	113	2,346 (4·89)	108	2,454 (3·73)	109	2,641 (4·04)	119	2,856 (3·42)	128	3,087 (4·59)	136	3,138 (7·14)	140	3,236 (8·76)	146	2,957 (13·07)	134	2,845 (15·74)	128	2,815 (14·67)	128	2,739 (11·83)	124
Darling Downs	3,403 (7·90)	145	3,180 (5·03)	141	3,293 (4·78)	145	3,608 (3·75)	159	4,074 (4·57)	180	4,688 (5·64)	205	4,638 (8·06)	202	4,406 (11·05)	191	4,311 (12·37)	187	4,034 (14·03)	169	3,845 (12·19)	165	3,668 (10·63)	157
South Burnett	2,830 (8·21)	116	2,234 (5·82)	92	2,330 (3·04)	98	2,585 (3·17)	108	3,536 (2·26)	153	3,738 (4·33)	152	3,369 (6·79)	144	3,856 (10·61)	160	3,498 (14·55)	145	3,188 (14·68)	135	3,122 (14·94)	125	2,981 (11·58)	125
Upper Burnett	2,862 (4·57)	116	1,956 (2·68)	84	3,353 (2·83)	141	2,950 (2·52)	128	3,624 (2·68)	148	4,387 (3·46)	184	4,200 (10·08)	175	4,062 (11·18)	169	4,398 (16·06)	184	3,915 (16·53)	164	3,899 (15·28)	161	3,113 (12·13)	128
Atherton Tableland	3,873 (8·32)	165	2,428 (4·34)	107	2,811 (1·88)	125	2,058 (1·41)	97	2,201 (1·29)	102	3,518 (3·63)	154	3,964 (6·57)	163	3,696 (9·03)	159	3,823 (15·71)	167	3,819 (18·76)	167	3,806 (15·47)	168	3,951 (13·60)	174

* The figures in brackets represent the percentage of cows in each case.

Effect of Length of Lactation on Production.

In order to emphasise the need to concentrate on cows with a normal lactation period, a survey of the average production of animals according to the length of the lactation period was made.

The results are shown in Table 1, and are also depicted in Plate 138.

It will be seen that there is a constant increase in production as the lactation period increases up to 330 days (11 months), thus indicating the need to maintain cows in milk for a long period during each lactation.

Effect of Month of Calving on Production.

A survey of the effect of month of calving on production, carried out on data available from the farmer's own sample recording scheme, was published in this Journal for March, 1948.

The information for the 1948-49 season is affected by (*a*) the season, and (*b*) the fact that in several groups the only figures available for some of the months are for cows with short lactation periods.

If all cows were fed adequately throughout the year, there should be little, if any, difference in production between cows calving in different months. However, to gain the maximum advantage under the conditions which exist generally, it will certainly pay to so regulate matings that cows calve in the third quarter of the year—that is, from July to September.

The effects of month of calving shown by the 1948-49 figures are similar to those obtained in the previous survey, except that in 1948-49 higher production was given by cows which calved in June to August, inclusive, compared with July to September in the previous survey. In 1948-49, cows calving between June and August produced 40 lb. butterfat more than cows calving in the first quarter of the year. Indeed, in one small area, where figures were available for a 20-month period, the increase was as much as 50 per cent. The Atherton Tableland results differed from those of other districts, as production was highest from cows which calved from September to December, but it must be pointed out that the Tableland experienced a much better season than usual, particularly during the spring months. This may have caused the production of cows which calved in these months to be higher than usual.

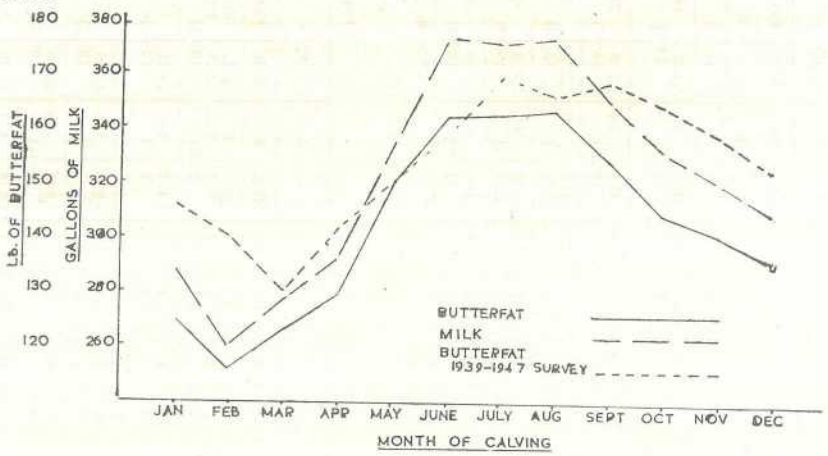


Plate 139.

Graph Showing the Effect of the Month of Calving on Production.

TABLE 3.

Effect of Month of Calving on Average Length of Lactation.

District.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
	Period.	Period.	Period.	Period.	Period.	Period.	Period.	Period.	Period.	Period.	Period.	Period.
All Queensland	days. 192 (7·92)*	days. 185 (4·90)	days. 200 (3·82)	days. 218 (3·65)	days. 230 (3·48)	days. 239 (4·76)	days. 238 (7·46)	days. 235 (9·73)	days. 228 (13·30)	days. 216 (15·34)	days. 208 (14·06)	days. 200 (11·57)
South-eastern Queensland	190 (8·11)	187 (4·89)	204 (3·73)	225 (4·04)	231 (3·42)	241 (4·59)	241 (7·14)	238 (8·76)	229 (13·07)	215 (15·74)	210 (14·67)	199 (11·83)
Darling Downs	198 (7·90)	196 (5·03)	201 (4·78)	218 (3·75)	232 (4·57)	238 (5·64)	236 (8·06)	230 (11·05)	227 (12·37)	220 (14·03)	209 (12·19)	205 (10·63)
South Burnett	185 (8·21)	164 (5·82)	178 (3·04)	195 (3·17)	237 (2·26)	226 (4·33)	230 (6·79)	236 (10·61)	220 (14·55)	208 (14·68)	192 (14·94)	189 (11·58)
Upper Burnett	157 (4·57)	131 (2·68)	192 (2·83)	201 (2·52)	224 (2·68)	240 (3·46)	221 (10·08)	223 (11·18)	225 (16·06)	203 (16·53)	193 (15·28)	177 (12·13)
Atherton Tableland	209 (8·32)	171 (4·34)	195 (1·88)	168 (1·41)	172 (1·29)	259 (3·63)	249 (6·57)	244 (9·03)	240 (15·71)	233 (18·76)	226 (15·47)	227 (13·60)

* The figures in brackets represent the percentage of cows in each case.

TABLE 4.

Average Production according to Test Range.

District.	Under 3·0.		3·0–3·4.		3·5–3·9.		4·0–4·4.		4·5–4·9.		5·0–5·4.		5·5–5·9.		6·0–6·4.		6·5–6·9.		Over 7·0.	
	Milk.	Fat.	Milk.	Fat.	Milk.	Fat.	Milk.	Fat.	Milk.	Fat.	Milk.	Fat.	Milk.	Fat.	Milk.	Fat.	Milk.	Fat.	Milk.	Fat.
All Queensland	gal. 2,310 (0·63)*	lb. 64	gal. 3,388 (6·55)	lb. 112	gal. 3,727 (20·97)	lb. 141	gal. 3,459 (28·98)	lb. 146	gal. 3,139 (20·24)	lb. 148	gal. 2,988 (14·35)	lb. 155	gal. 2,935 (5·69)	lb. 166	gal. 2,640 (2·05)	lb. 163	gal. 2,148 (0·40)	lb. 143	gal. 1,485 (0·13)	lb. 107
South-eastern Queensland ..	2,520 (0·44)	71	3,090 (5·36)	102	3,082 (15·56)	115	2,838 (26·91)	120	2,847 (24·49)	134	2,743 (18·13)	142	2,653 (6·54)	151	2,360 (2·0)	146	2,036 (0·41)	136	1,444 (0·15)	105
Darling Downs	2,093 (0·68)	57	3,746 (7·09)	124	4,353 (25·43)	164	4,260 (31·78)	178	3,932 (15·07)	185	3,710 (11·20)	193	3,601 (5·82)	204	3,149 (2·59)	194	2,963 (·27)	195	1,335 (0·06)	97
South Burnett	2,317 (1·60)	65	3,208 (10·74)	107	3,476 (31·49)	130	3,259 (29·48)	137	3,009 (14·25)	140	2,828 (8·0)	146	2,513 (2·58)	143	2,530 (1·34)	157	1,847 (0·36)	125	2,135 (0·15)	154
Upper Burnett	1,764 (0·64)	44	3,469 (7·39)	116	4,271 (28·54)	161	3,993 (31·72)	168	3,416 (19·87)	162	3,590 (8·66)	185	3,307 (1·91)	179	2,177 (0·89)	136	1,375 (0·38)	92	.. ..	.. ..
Atherton Tableland	3,135 (0·22)	89	4,327 (5·41)	141	4,607 (19·85)	173	4,131 (30·36)	173	3,317 (20·49)	156	2,803 (13·59)	146	2,730 (6·69)	155	2,157 (2·02)	133	1,938 (1·06)	129	1,160 (0·32)	83

* The figure in brackets represents the percentage of cows in each case.

Table 2 shows the average production of milk and butterfat, as well as the percentage of cows calving in each month, according to district. Plate 139 shows the production according to month for all recorded cows.

Effect of Month of Calving on Length of Lactation.

The average length of lactation of cows calving in the various months is shown in Table 3 and Plate 140.

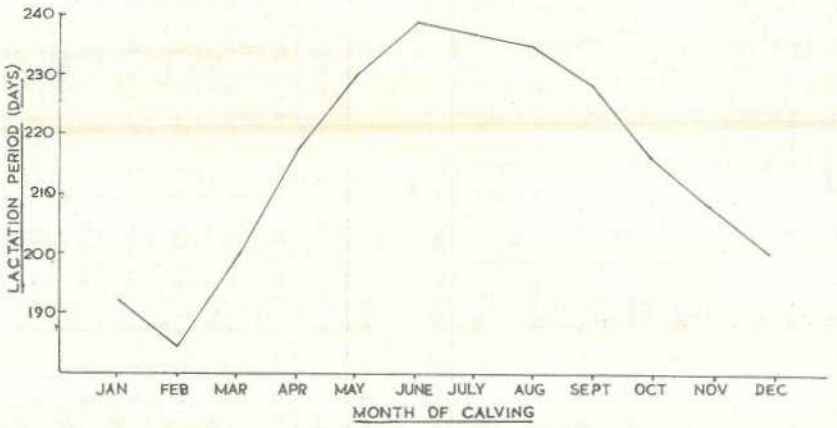


Plate 140.

Graph Showing the Effect of the Month of Calving on the Length of Lactation.

It will be noted that cows which calved during June to August in the season surveyed not only gave higher production but also milked longer.

Cows calving in June had an average lactation period of 239 days, compared with 185 days for cows which calved in February.

It would appear that cows which calved in June, July or August obtained the benefit of the flush growth of pasture after they had been milking from 5 to 6 months, and that this tended to prolong the lactation and increase production. On the other hand, cows which calved in January and February entered a dry period, with pastures low in nutritive value, after milking for six months, and this hastened the end of the lactation period.

Table 3 also shows the percentage of cows which calved in each month.

Relationship of Test to Production.

Most dairy farmers in Queensland supply butter or cheese factories and payment for their produce is based on the quantity of butterfat supplied. The amount of butterfat produced, therefore, is of more importance in these cases than the amount of milk.

The survey of the 1948-49 figures was carried out without considering breed, but henceforth the work will be done on a breed basis.

Table 4 shows the average production of milk and butterfat of cows within the various test ranges, and the percentage of cows in each range. The trend is also illustrated in Plate 141.

It will be noted that the highest average yield of milk (352 gallons) was found in the test range of 3.5-3.9 per cent., while the highest average yield of butterfat (166 lb.) occurred in the 5.5-5.9 per cent. range.

Work done by the New Zealand Dairy Board has shown that, within breeds, there is a strong correlation between butterfat test of the milk and the total yield of butterfat, and the conclusion has been drawn that to raise the level of butterfat production farmers should endeavour to breed from families which combine better-than-average tests with high milk yield.

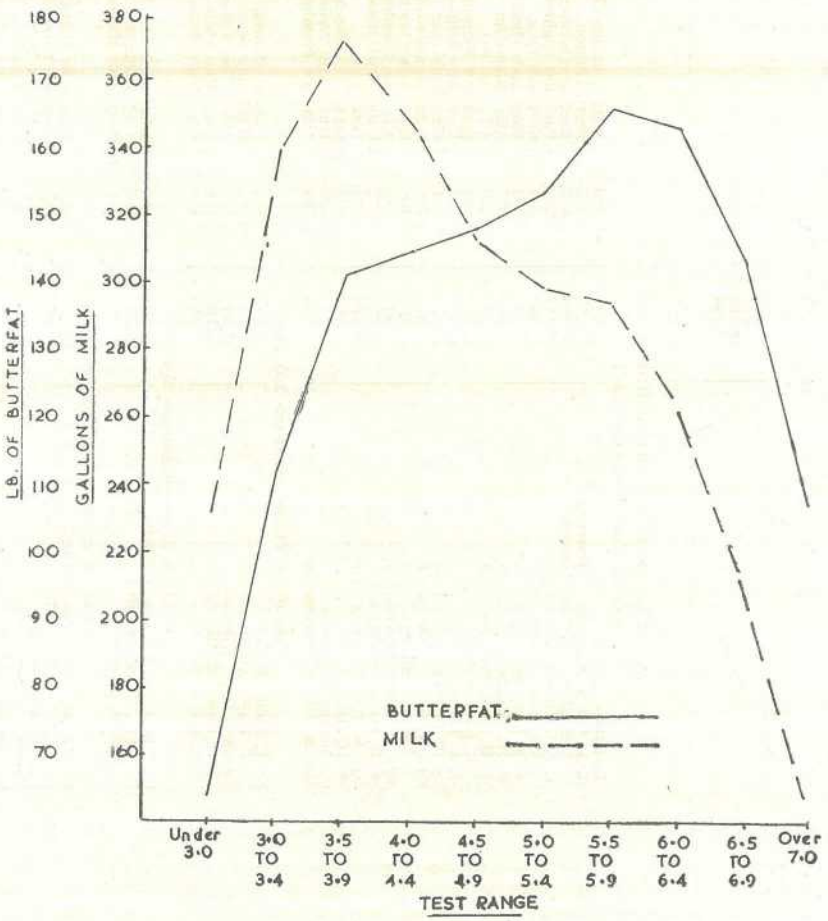


Plate 141.

Graph Showing the Relationship Between Butterfat Test and Production.

WATCH FOR HEMLOCK WEED.

The poisonous hemlock weed has been reported from the Mt. Sylvia area in the Lockyer, and farmers on creeks draining into the Brisbane River are advised to keep a watch for any unusual plant springing up on their properties. Hemlock can be distinguished by its large, green, carrot-like leaves and its white, parsnip-like taproot.

PRODUCTION RECORDING.

List of cows and heifers officially tested by Officers of the Department of Agriculture and Stock, which qualified for entry into the advanced register of the A.I.S., Jersey, Guernsey, Ayrshire, and Friesian Societies' Herd Books, production records for which were compiled during the months November and December, 1949, and January and February, 1950 (273 days unless otherwise stated). The records have been calculated to the nearest pound.

Animal.	Owner.	Milk Production.	Butter Fat.	Sire.
		Lb.	Lb.	
AUSTRALIAN ILLAWARRA SHORTHORN.				
Mature Cow (Standard 350 lb.).				
Jamberoo Marjorie 10th	Hart Bros., Clifton	12,751	520	Murray Bridge Florrie's Prince
Highfields Ethel 4th	R. A. and N. K. Shelton, Hivesville	13,032	467	Berry Trenton
Eachamvale Queen	J. K. English and Sons, Malanda	11,294	457	Eachamvale Standard
Arolla Lady Sal	A. F. Campbell, Killarney	10,411	382	Parkview Highbrow
Navillus Showgirl 4th	C. O'Sullivan, Greenmount	19,322	709	Greyleigh Eros
Glenroy Enid	W. F. Kajewski, Glencoe	8,944	396	Blacklands Sheik
Alfa Vale Eveline 11th	W. H. Thompson, Nanango	8,589	377	Alfa Vale Stalin
Alfa Vale Gentle 11th	W. H. Thompson, Nanango	11,327	559	Alfa Vale Pat
Lynfield Golden 2nd	F. E. Birt, Sexton	12,312	526	Parkview Ransom
Dorravista Beauty	H. A. Turner, Tarzali	11,304	503	Evansvale Eclipse
Blacklands Lady Gentle 14th	Estate P. Doherty, Gympie	10,925	484	Blacklands Czar
Tara Cleo 3rd	Mrs. K. Henry, Greenmount	9,215	432	Tara Magnet's Gift
White Park Pendant 27th	J. Coonan, Cambooya	9,101	388	Karawarra Standard
Tara Magnet 3rd	Mrs. K. Henry, Greenmount	9,837	386	Alfa Vale Plumber
Cairossie Empress 5th	W. D. Davis, Chinchilla	8,778	372	Ehlma Park Bosca
Tara Laura 7th	Mrs. K. Henry, Greenmount	9,412	369	Tara Osiris
Yarranvale Gentle	W. D. Davis, Wamba	8,489	367	Trevor Hill Bosca
Bunya View Thelma 5th	G. Sperling, Kooralgin	9,179	363	Trevor Hill Perfection
Tara Cinderella 2nd	Mrs. K. Henry, Greenmount	7,898	355	Alfa Vale Plumber
Senior, 4 Years (Standard 330 lb.).				
Corunna Isabel (239 days)	K. A. Ruhle, Motley	9,007	388	Fairvale Duncan
Glenroy Princess	W. F. Kajewski, Glencoe	8,034	382	Blacklands Sheik
Bunya View Scarlet 2nd (365 days)	Edwards Bros., Kingaroy	13,386	611	Trevor Hill Reflection
Glenroy Birdie	W. F. Kajewski, Glencoe	9,752	434	Blacklands Sheik
Springleigh Buttercup 32nd	H. F. Moller, Boonah	8,045	370	Blacklands Melba's Pride
Junior, 4 Years (Standard 310 lb.).				
Learmont Lovely	P. J. Donaghy and Son, Malanda	8,485	428	Alfa Vale Pride 18th
Sydmouth Blossom	T. Vayro, Flagstone Creek	8,918	347	Navillus Paros
Blacklands Ethel 32nd	A. Pickels, Proston	9,261	384	Blacklands Maiden's Monarch
Senior, 3 Years (Standard 290 lb.).				
Learmont Shiny	P. J. Donaghy and Son, Malanda	11,140	488	Sunnyview Melba's Hero
Fernhome Bonnie	R. S. Griffiths, Moregatta	8,508	387	Glengarry's Gem Royal
Bantry Nellie 2nd	D. Sullivan, Rossvale	8,808	347	Rosenthal Surplus 2nd
Glen Idol Countess 7th	Estate P. Doherty, Gympie	7,611	321	Blacklands True Blue
Navillus Countess 5th (239 days)	C. O'Sullivan, Greenmount	11,728	465	Parkview Limerick
Glenroy Jane	W. F. Kajewski. Glencoe	7,233	334	Fairholm Lewis
Tara Cleo 5th	Mrs. K. Henry, Greenmount	7,076	327	Alfa Vale Plumber
Dorravista Dot (231 days)	H. A. Turner, Tarzali	6,973	327	Learmont Byron
Dorravista Annie 5th (234 days)	H. A. Turner, Tarzali	6,826	315	Learmont Byron
Tara Isis 6th	Mrs. K. Henry, Greenmount	8,108	304	Alfa Vale Plumber

Junior, 3 Years (Standard 270 lb.).

Penrhos Sally 4th	A. Sandilands, Wildash	6,886	308	Rosenthal Macarthur
Sunnyview Roan Fairest	A. Lohse, Degilbo	8,233	294	Newstead Ambassador
St. Andrew's Violet	M. C. Lester, Glengallan	10,682	471	Bingleigh Premier
Yarranvale Tot	K. Berghofer, Athol	7,187	320	Sunnyview Royal National
Merridale Dell 2nd	Giles Bros., Woowoonga	8,067	309	Blacklands Oxford
Learmont Young Posey	P. J. Donaghy and Son, Malanda	7,249	296	Alfa Vale Pride 18th
Learmont Dolly	P. J. Donaghy and Son, Malanda	6,421	275	Alfa Vale Pride 18th
Glen Idol Florrie 17th	Estate P. Doherty, Gympie	9,790	382	Blacklands True Blue
Cedargrove Lady Prim 21st	F. Derrick, Monto	8,324	342	Rosenthal Scout
Cedargrove Wonder 44th	F. Derrick, Monto	8,792	340	Rosenthal Scout
Tara Isis 8th	Mrs. K. Henry, Greenmount	7,722	337	Alfa Vale Plumber
Cedargrove Strawberry 21st	F. Derrick, Monto	7,343	312	Rosenthal Scout

Senior, 2 Years (Standard 250 lb.).

Valera Bonny 14th	Sullivan Bros., Pittsworth	9,222	383	Alfa Vale Pride 2nd
Learmont Poppy	P. J. Donaghy and Son, Malanda	9,359	344	Sunnyview Melba's Hero
Bunyaview Queenie	A. E. Powell, Chinchilla	9,037	321	Trevor Hill Progress
Blacklands Lady Jean 30th	A. Pickels, Proston	8,796	303	Blacklands Maiden's Monarch
Cloverdale Dove 2nd	A. E. Powell, Chinchilla	8,227	298	Haroldale Barrister
Glen Idol Lady Gentle	Estate P. Doherty, Gympie	8,645	298	Glen Idol Charmer
Valera Dahlia	Sullivan Bros., Pittsworth	6,562	294	Alfa Vale Pride 2nd
Sydmouth Una 2nd	T. Vayro, Flagstone Creek	6,943	292	Navillus Paros
Blacklands Ethel 37th	A. Pickels, Proston	6,977	250	Blacklands Gloucester
Millievale Charlotte 2nd	A. H. Webster, Helidon	10,066	418	The Corals, Gold Standard
St. Andrew's Gem 10th	M. C. Lester, Glengallan	8,685	350	Tabbagong Victory
Glenroy Bangle	W. F. Kajewski, Glencoe	7,696	333	Cosey Camp Ida's Patron
Glenroy Eleanor	W. F. Kajewski, Glencoe	7,124	313	Fairholm Lewis
Glenroy Minnie	W. F. Kajewski, Glencoe	7,176	310	Fairholm Lewis
Glenroy Bloss	W. F. Kajewski, Glencoe	5,474	295	Fairholm Lewis
Glenroy Eunice	W. F. Kajewski, Glencoe	6,073	285	Fairholm Lewis
Fairvale Dulcie 10th	K. A. Ruhle, Motley	6,374	285	Fairvale Dairy Lad
Glenroy Sally 2nd	W. F. Kajewski, Glencoe	5,984	273	Fairholm Lewis
Glenroy Eileen	W. F. Kajewski, Glencoe	5,809	269	Fairholm Lewis
Glenroy Pearl	W. F. Kajewski, Glencoe	6,252	268	Fairholm Lewis
St. Andrew's Gem 11th	M. C. Lester, Glengallan	8,333	318	Tabbagong Victory
Springleigh Mavis 8th	H. F. Moller, Boonah	7,189	315	Blacklands Melba's Pride
Blacklands Carnation 17th	A. Pickels, Proston	6,723	270	Blacklands Gloucester
Kulpi Lovely	H. L. and C. I. Bruggemann, Kulpi	7,020	270	Fairvale Ethel's Monarch

Junior, 2 Years (Standard 230 lb.).

Learmont Pearl	P. J. Donaghy and Son, Malanda	7,094	291	Alfa Vale Pride 18th
Glen Idol Thelma 11th	Estate P. Doherty, Gympie	7,365	274	Glen Idol Charmer
Meadowvale Gold 31st	O'Connor Bros., Colinton	6,552	274	Parkdene Major
Bantry Model 3rd	D. Sullivan, Pittsworth	6,415	263	Bantry Commodore
Kulpi Jean 2nd	H. L. and C. I. Bruggemann, Kulpi	6,566	259	Fairvale Ethel's Monarch
Ardilea Mayflower	Hinrichsen and Sons, Clifton	5,169	236	Ardilea Socialist
Tara Cleo 6th	K. Henry, Greenmount	7,109	298	Alfa Vale Plumber
Millievale Cora 4th	A. H. Webster, Helidon	7,092	275	Alfa Vale Pride
Ripley Park Sweet Brier	I. B. Skerman, Kaimkillenbun	6,854	272	Trevor Hill Reflection
St. Andrew's Gem 19th	M. C. Lester, Glengallan	9,852	338	Tabbagong Victory
Applegarth Mavis 8th	F. Derrick, Monto	8,705	316	Fairholm Evidence
Blacklands Buttercup 17th	A. Pickels, Proston	8,558	311	Parkview Alexander
St. Andrew's Envy	M. C. Lester, Glengallan	7,920	305	Tabbagong Victory
Navillus Carnival's Plum 8th	C. O'Sullivan, Greenmount	6,971	300	Navillus Carnival
Spring Valley Dahlia	Edwards Bros., Kingaroy	8,509	299	Aynesley Charmer
St. Andrew's Gentle	M. C. Lester, Glengallan	7,517	296	Tabbagong Victory
Glenroy Show Lass	W. F. Kajewski, Glencoe	6,072	285	Fairholm Lewis
Kulpi Tulip 2nd	H. L. and C. I. Bruggemann, Kulpi	6,646	245	Fairvale Ethel's Monarch

PRODUCTION RECORDING—*continued.*

Animal.	Owner.	Milk Production.	Butter Fat.	Sire.
		Lb.	Lb.	
	JERSEY.			
	MATURE COW (STANDARD 350 LB.).			
Nairfale Princess Beth (305 days)	R. J. Browne, Yangan	9,460	504	Nairfale Noble Count
Nairfale Princess Beth	R. J. Browne, Yangan	8,593	460	Nairfale Noble Count
Fauvic Marmay (365 days)	S. A. Cramb, Noosa Heads	10,252	512	Condong Marabean
Glenrandle Dairymaid	P. Kerlin, Killarney	7,440	453	Bellgarth Stylish
Lermont Brightgirl	J. Schull, Oakey	5,493	351	Selsey Samares Hallmark
Nairfale Princess Beth (365 days)	R. J. Browne, Yangan	10,931	584	Nairfale Noble Count
Trinity Crowning Meadowsweet	D. J. Louttit, Monto	9,173	479	Trinity Crowning Effort
Trinity Cute Daffodil 2nd	J. McCarthy, Greenmount	7,355	464	Samares Cute Prince 3rd (imp.)
Glenview Brittannia	D. J. Louttit, Monto	8,490	459	Trinity Governor's Hope
Hazeldean Springtime	D. J. Louttit, Monto	8,232	413	Glenview Crusader
Glenrandle Fashion Lady	P. Kerlin, Killarney	6,416	361	Bellgarth Stylish
	SENIOR, 4 YEARS (STANDARD 330 LB.).			
Gem Dolores	W. Bishop, Kenmore	8,490	386	Bulby Oxford Gamboge
	JUNIOR, 4 YEARS (STANDARD 310 LB.).			
Palen Bluebell 2nd	H. M. Prison Farm, Palen Creek	6,481	313	Westbrook Ambassador 51st
Glenrandle Spotted Lady	P. Kerlin, Killarney	7,321	436	Oxford Noble Peer
Ashview Locket 3rd	C. Huey, Sabine	8,290	434	Trecarne Victor 4th
	SENIOR, 3 YEARS (STANDARD 290 LB.).			
Bellgarth Bluebird	P. Kerlin, Killarney	5,653	327	Bellgarth Victory
Gunawah Skylark	R. D. Johnston, Kingaroy	7,543	368	Austral Park Montrose Blue
	JUNIOR, 3 YEARS (STANDARD 270 LB.).			
Nairfale Coquette (365 days)	R. J. Browne, Yangan	7,068	374	Kelvinside Handsome Boy
Nairfale Comedy's Design (305 days)	R. J. Browne, Yangan	5,626	315	Kelvinside Handsome Boy
Tarana Lady Nell	J. F. Lovell, Samford	5,984	281	Lermont Golden Victory
Bellgarth Royal Lady	D. R. Hutton, Cunningham	6,300	366	Romsey Spotted King
Nairfale Comedy's Design	R. J. Browne, Yangan	6,135	346	Kelvinside Handsome Boy
Viewmont Lady Evelyn	M. L. Massam, Beaudesert	5,458	290	Windsor Sultan Leslie
Sunny Glen Nellie	J. McCarthy, Greenmount	5,867	364	Ivy Bank Lad
Glenrandle Chimes	P. Kerlin, Killarney	6,703	336	Bellgarth Glory King 2nd
Lermont Pride	J. Schull, Oakey	6,050	326	Trinity Graceful Duke
Gem Naomi	W. Bishop, Kenmore	6,730	309	Trinity Cute Effort
Kathleigh Soya 2nd	C. W. Barlow, Boodua	5,344	306	Oxford Fawn's Noble
	SENIOR, 2 YEARS (STANDARD 250 LB.).			
Benvue Betty	R. W. Webb, Stafford	6,988	336	Navua Royalist Prince
Bellgarth Golden Gwen	D. R. Hutton, Cunningham	5,787	294	Trinity Gleaming Effort
Connemara Fancy Dress	J. Ahern, Conondale	4,182	286	Glenview Lochiel
Silverbrook Mable 2nd	J. Schull, Oakey	5,248	279	Trinity Noble Effort
Myrtledale Sweet Marie (244 days)	H. Sigley, Jaggan	6,257	361	Palm Ridges Golden Victory
Boree Effort's Auriel (305 days)	G. and V. Beattie, Antigua	6,508	303	Trinity Daffodil's Effort

Lermont Connie	J. Schull, Oakey	5,076	280	Trinity Graceful Duke
Boree Effort's Auriel	G. and V. Beattie, Antigua	5,777	267	Trinity Daffodil's Effort
Lermont Gentle 4th	J. Schull, Oakey	4,309	263	Trinity Graceful Duke
Parkview Merry Maiden	H. T. W. Barker, Oakey	5,215	259	Brookland Merry Cavalier
Ashview Queen 3rd	C. Huey, Sabine	5,226	256	Trecarne Victor 4th
Boree Cute Charming	W. and C. E. Tudor, Gayndah	7,003	380	Trinity Cute Commodore
Tecoma Success	A. Semgreen, Coolabunia	8,588	361	Austral Park Double Blue
Carnation Felicity	Queensland Agricultural High School and College, Lawes	7,172	360	Oxford Fawn's Victor
The Lodge Sadie	W. Bishop, Kenmore	7,462	331	Gem Loyal Highness
Gem Alexia	W. Bishop, Kenmore	6,366	326	Bulby Maria's Keepsake
Westbrook Tulip 148th	Farm Home for Boys, Westbrook	6,355	322	Westbrook Comet 17th
Westbrook Bells 18th	Farm Home for Boys, Westbrook	5,693	310	Westbrook Comet 17th
Glenrandle Brown Maid	P. Kerlin, Killarney	6,232	298	Waltham Farm Brown Boy
College Fleur 7th	Queensland Agricultural High School and College, Lawes	6,094	272	Westbrook Ambassador 52nd
Bona Vista Roselie	D. R. Hutton, Cunningham	4,426	253	Belgonia Standard
Bellgarth Lady Gleam	D. R. Hutton, Cunningham	4,599	250	Trinity Gleaming Effort

JUNIOR, 2 YEARS (STANDARD 230 LB.).

Westwood Courtship	F. Porter, Cambroon	5,549	310	Devon Park Madeira's Victorious
Romsey Brown Lady	J. Wilton, Killarney	5,189	286	Oxford Flying Fox
Westwood Nita	F. Porter, Cambroon	4,447	276	Devon Park Madeira's Victorious
Tarana Lady Au-Lynne	J. F. Lovell, Samford	5,214	272	Oxford Bruno
Romsey White Rose	J. Wilton, Killarney	5,252	271	Oxford Flying Fox
Romsey Larkspur's Pride	J. Wilton, Killarney	5,086	261	Oxford Flying Fox
Glenrandle Joan	P. Kerlin, Killarney	7,048	387	Gem Rodney
Glenrandle Winsome Lady	P. Kerlin, Killarney	6,021	364	Gem Rodney
Glenrandle Fair Lassie 2nd	P. Kerlin, Killarney	5,452	337	Gem Rodney
Glenside Ivy 2nd	Queensland Agricultural High School and College, Lawes	4,997	302	Oxford Dudley
Burnlea Matilda 2nd	A. E. Trigger, Didcot	4,970	253	Yuruga Golden Noble
Westbrook Sylvia 26th	Farm Home for Boys, Westbrook	6,473	296	Mornmoot Clementine's Valour
Glenrandle Evenbelle 2nd	P. Kerlin, Killarney	5,239	282	Gem Rodney
Westbrook Silvermine 3rd	Farm Home for Boys, Westbrook	5,735	278	Westbrook Comet 26th
Ashview Ladyette 2nd	C. Huey, Sabine	5,567	276	Trecarne Some Tot's Duke 2nd
Westbrook Sylvia 27th	Farm Home for Boys, Westbrook	6,093	276	Westbrook Silvermine's Valour
Bellgarth Fairy 6th	D. R. Hutton, Cunningham	4,498	276	Trinity Gleaming Effort
Ashview Queen 4th	G. Ralph, Ravensbourne	5,592	256	Trecarne Victor 4th
Grasmere Sam's Tulip	W. Bishop, Kenmore	4,528	242	Navua Victorious Samaritan
Westbrook Wyndotte 11th	Farm Home for Boys, Westbrook	4,523	230	Westbrook Silvermine's Valour

FRIESIAN.

JUNIOR, 2 YEARS (STANDARD 230 LB.).

Yarrabine Dell	C. H. Naumann, Yarraman	6,556	233	St. Athans Belle Piebe 3rd

GUERNSEY.

MATURE COW (STANDARD 350 LB.).

Evermore Josie	J. Murdock and M. J. Wrigley, Preston	5,834	361	Yarraview Commander
Adaville Olwyn	H. Sanderson, Monto	7,477	391	Fernhill Rose Boy
Evermore Tess	J. Murdock and M. Wrigley, Preston	6,054	387	Yarraview Commander
Evermore Maytime	J. Murdock and M. Wrigley, Preston	5,738	376	Yarraview Commander
Fernhill Golden Laurel	D. C. Johnston, Beaudesert	8,303	400	Cooroora View Pilgrim

SENIOR, 4 YEARS (STANDARD 330 LB.).

Oakwood Biddy	D. C. Johnston, Beaudesert	7,650	372	Fairfield Winner
Adaville Olive	J. M. Cooke, Witta	6,793	351	Laureldale Pluto

PRODUCTION RECORDING—*continued.*

Animal.	Owner.	Milk Production.	Butter Fat.	Sire.
		Lb.	Lb.	
	JUNIOR, 4 YEARS (STANDARD 310 LB.).			
Oakwood Fay (amended)	G. Miller, Chambers Flat	6,829	317	Fairfield Winner
	SENIOR, 3 YEARS (STANDARD 290 LB.).			
Oakwood Pam (amended)	D. C. Johnston, Beaudesert	8,614	376	Fairfield Winner
Evermore Merle	J. Murdock and M. J. Wrigley, Preston	4,700	317	Yarraview Commander
	JUNIOR, 3 YEARS (STANDARD 270 LB.).			
O Kay Hollyhock	H. Sanderson, Monto	6,261	312	Linwood Goldfinder
Linwood Sonia	E. G. Foxton, Maleny	5,882	279	Wirrawong Winter
	JUNIOR, 2 YEARS (STANDARD 230 LB.).			
Toba Marie	E. G. Foxton, Maleny	6,379	281	Wirrawong Winter
Toba Bettina	E. G. Foxton, Maleny	5,021	250	Koojan Ace's Marshall
Toba Pansy	E. G. Foxton, Maleny	4,817	241	Linwood Hurricane
Fernhill Peacebelle	D. C. Johnston, Beaudesert	5,771	312	Wollongbar Remus
Toba Brightly	D. C. Johnston, Beaudesert	6,634	307	Linwood Hurricane
	AYRSHIRE.			
	MATURE COW (STANDARD 350 LB.).			
Eleresley Josephine	Stimpsons Ltd., Loganlea	10,592	437	Benbecula Banker
	JUNIOR, 4 YEARS (STANDARD 310 LB.).			
Crescent Farm Joyous	N. J. Mann, Broxburn	10,848	411	Myola Orphan Boy
	SENIOR, 3 YEARS (STANDARD 290 LB.).			
Leafmore Bonnie's Queen	J. P. Ruhle, Motley	6,872	296	Leafmore Jerrard
	JUNIOR, 3 YEARS (STANDARD 270 LB.).			
Benbucula Thistledown	L. Holmes, Yarranlea	7,544	283	Benbecula Marquis
	SENIOR, 2 YEARS (STANDARD 250 LB.).			
Crescent Farm Monnie	N. J. Mann, Broxburn	9,683	415	Myola Orphan Boy
Crescent Farm Pussy	N. J. Mann, Broxburn	7,259	277	Myola Orphan Boy
	JUNIOR, 2 YEARS (STANDARD 230 LB.).			
Crescent Farm Annabelle	N. J. Mann, Broxburn	9,964	359	Myola Orphan Boy
Leafmore Lady Vee	J. P. Ruhle, Motley	5,888	242	Myola Jaunt 2nd
Benbecula Tranquil	L. Holmes, Yarranlea	7,614	310	Benbecula Marquis
Crescent Farm Venice	N. J. Mann, Broxburn	7,755	286	Crescent Farm Bell Boy
Leafmore Vestage	J. P. Ruhle, Motley	5,982	273	Myola Perfection
Leafmore Handsome 2nd	J. P. Ruhle, Motley	6,154	262	Myola Perfection
Auchen Eden Bessie	J. N. Scott, Camp Mountain	5,867	245	Oaklands Duke

A Boom Spray for Weed Control.

IN the March issue of this Journal, four spraying units used for weed control purposes were described and illustrated. These were the "Marino," "P.M.S.," "Wilmist," and "Buzacott-Wolseley" sprayers.

The "Klean Krop" boom spray is now available in Queensland and is illustrated in Plates 142 to 144.

This outfit consists of a 1.2 h.p. air-cooled engine, gear pump, 20-gallon metal tank, and brass boom. The pump is fitted with a relief valve and pressure gauge and is capable of delivering two gallons per minute at 100 lb. pressure. Lower pressures can be obtained by adjusting the relief valve. The boom is in lengths of six feet and its height above the crop is adjustable. Nozzles delivering a cone spray are spaced at 14-inch intervals. A control cock and a gauge filter for the booms are fitted.

The manufacturers state that at a vehicle speed of 4 m.p.h. the rate of application at 25 lb. pressure is 4 gallons per acre; at 50 lb., 5 gallons; and at 100 lb., 7 gallons.

Plate 142.
Boom Spray in Operation.

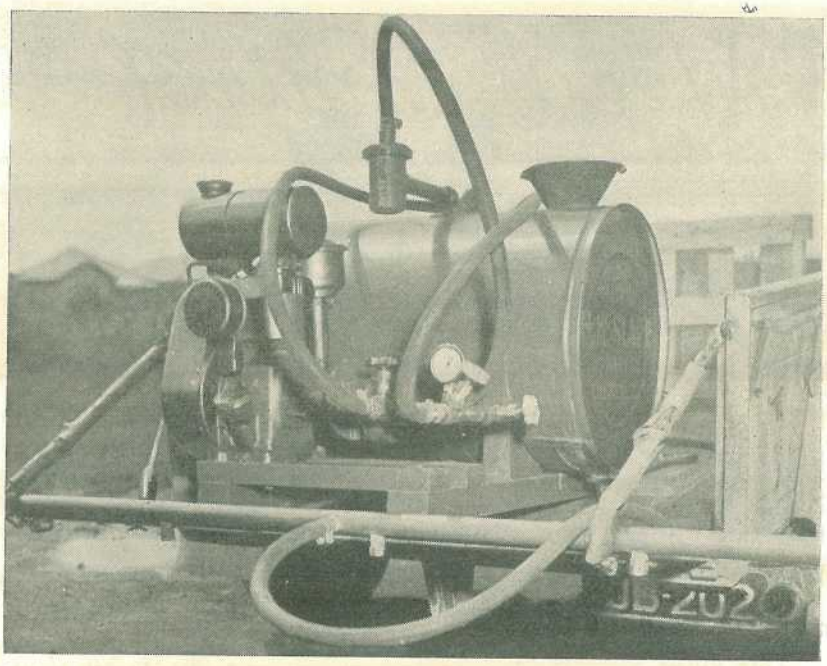


Plate 143.
View of Outfit on a Utility Truck.

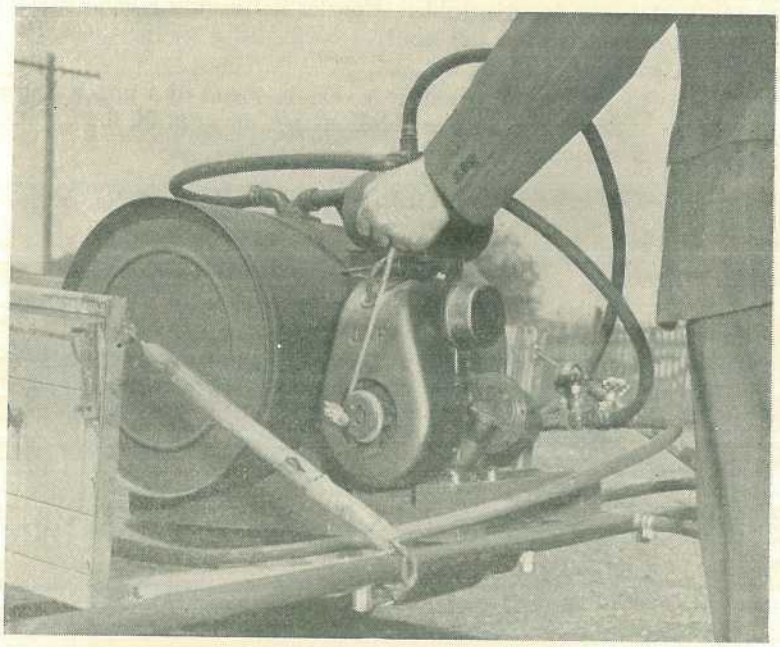
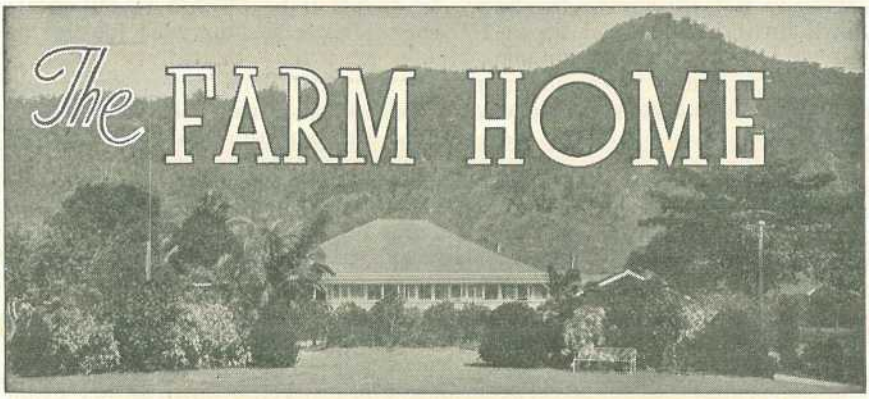


Plate 144.
Starting the Motor.



A Baby "Talks" on "Crying."

IF you are one of these parents who are nearly driven to distraction by a baby who cries most of the day and night, take heart, for your misery and the baby's is usually preventable and easily remedied.

First of all you must remember that a baby's cry is his only method of expression and sometimes he has so much to say to parents who do not seem to understand! Moreover, that which he has to say (by crying) is nearly always worth saying and worth taking note of, for young infants are too innocent and guileless to cry just for the "heck of it" or merely to annoy their parents, although some crying of course is quite natural and healthy.

Let us now consider some of the things that baby is frantically trying to say. Let baby speak for himself: "I'm terribly hungry and you have no idea how painful it is to be kept waiting. Bother the clock on the wall, I'm the best judge of when I'm hungry. I want more to eat—how can a chap be expected to be a lawful citizen, to do his daily kicks, play, grow and gain weight on insufficient food? I can't even sleep because hunger pains are very painful to me. But don't try and fill me too full because that's just as painful. When I indicate that I've had enough, I've usually had enough and it's no earthly good trying to force me to take more. It will only make matters worse and then we will all get upset. And remember, a chap's appetite varies on occasions, especially when he's feeling a bit 'off,' or is over-tired, or teething, or over-excited or it's terribly hot. Please make allowances and don't try to regiment me too much, I'm a pretty wise guy when it comes to regulating my own diet."

"Most important, too, never neglect to give my 'wind' a chance to come up after a feed. It may take some time and patience but it's usually worth it. If you lay me down with the 'wind' still inside, it gives me dreadful tummy-ache and you will just get your deserts if I scream the roof down!"

"Now, just in case you may think I'm a typical male, always thinking of my stomach, I'll explain a few more things I may have occasion to tell you in a high pitched voice:

"I've got a wet or soiled nappy and it's most uncomfortable and certainly not conducive to sleep. In fact I'll be blowed if I'll settle down until I'm cleaned up and changed. Again, I may be too hot or too cold and generally uncomfortable, or I may be thirsty or over-tired. I'm really sorry to have to bother you, but I'm so weak and helpless without your loving care. However, I'm not a block of wood, I'm a living human being with as keen feelings and sensations as you have. All I ask is to be changed, made comfortable and tucked in again. Of course, a little cuddle, a few reassuring words and a smile always gives me a warm feeling of security inside and never do me any harm. But don't take me up and nurse me in the middle of the night nor take me into the warmth of your own bed or I may come to expect this 'spoiling' and give you a terrible time if I don't get it."

"However, during the day, things are different and I may have good reason to complain in no uncertain voice that I'm being neglected, I'm lonely and I'm bored. Sometimes, I'm left lying down in my pram outside for many hours a day, often without any toys and no one to take any interest in me. I know you are very busy washing my 'naps,' &c., but please don't leave me alone with nothing to do for too long or I shall get miserable and cross. I like to be talked to occasionally, and cuddled and played with, for then I know that you love me and that I'm wanted and secure. And when I get a bit older I like to sit up for a bit to watch all the interesting things that are going on around me—only thus can I broaden my horizon and gain a knowledge of my identity in the scheme of things. Again, when I reach the stage of crawling and walking please give me a chance to try out and practise these maturing abilities."

"Now, seeing that I am really getting things off my chest, I'm going to tell you another thing that upsets and distresses me and that is family disharmony. You would be surprised how keenly I can sense the tension in the air, apart from the shouting and the noise which makes open warfare obvious! I know very well when Mum and Dad are over-tired, worried, anxious, nervous and fretful and I'm afraid it just makes me the same way. I know it only makes matters worse but I'm such a small little baby and so dependent on you grown-ups for my happiness and security, so please try to be calm, cheerful and at peace with the world. It makes everything so much more pleasant and easy for everyone."

"You will be glad to hear that I can't think of anything else that makes me cry unduly, at the moment, except of course illness and real physical pain, such as I sometimes get when teething. But when I am really ill there will usually be some other symptoms and signs and then you should not hesitate to send for the doctor. I'm too precious to be treated by Grandma, Mum-in-law or the Neighbours and beware of some of the old-fashioned traditional remedies like castor oil. They often do more harm than good."

Any further information on this and other matters connected with children may be obtained by communicating personally with the Maternal and Child Welfare Information Bureau, 184 St. Paul's Terrace, Brisbane, or by addressing letters "Baby Clinic, Brisbane." These letters need not be stamped.

ASTRONOMICAL DATA FOR QUEENSLAND.

OCTOBER.

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

TIMES OF SUNRISE AND SUNSET.

At Brisbane.		
Date.	Rise.	Set.
	a.m.	p.m.
1	5·29	5·47
6	5·23	5·49
11	5·18	5·52
16	5·13	5·55
21	5·07	5·58
26	5·03	6·01
31	5·00	6·04

MINUTES LATER THAN BRISBANE AT OTHER PLACES.

Place.	Rise.	Set.	Place.	Rise.	Set.
Cairns	37	21	Longreach ..	32	31
Charleville	28	26	Quilpie	34	36
Cloncurry	55	44	Rockhampton ..	14	7
Cunnamulla ..	29	30	Roma	18	16
Dirranbandi ..	18	20	Townsville ..	31	18
Emerald	23	15	Winton	44	35
Hughenden ..	40	29	Warwick	3	4

TIMES OF MOONRISE AND MOONSET.

At Brisbane.		
Date.	Rise.	Set.
	p.m.	a.m.
1	10·26	8·02
2	11·22	8·44
3	..	9·31
	a.m.	
4	12·15	10·24
5	1·05	11·20
	p.m.	
6	1·50	12·20
7	2·31	1·22
8	3·08	2·23
9	3·43	3·25
10	4·16	4·29
11	4·49	5·34
12	5·24	6·41
13	6·02	7·52
14	6·46	9·04
15	7·37	10·15
16	8·34	11·21
17	9·38	..
		a.m.
18	10·44	12·20
19	11·49	1·10
	p.m.	
20	12·52	1·51
21	1·52	2.28
22	2·49	2·59
23	3·44	3·28
24	4·37	3·56
25	5·31	4·24
26	6·26	4·54
27	7·22	5·26
28	8·18	6·01
29	9·14	6.41
30	10·08	7·26
31	10·58	8·17

MINUTES LATER THAN BRISBANE (SOUTHERN DISTRICTS).

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

MINUTES LATER THAN BRISBANE (CENTRAL DISTRICTS).

Date.	Emerald.		Longreach.		Rockhampton.		Winton.	
	Rise.	Set.	Rise.	Set.	Rise.	Set.	Rise.	Set.
1	10	29	25	44	0	20	27	52
6	10	29	26	44	0	19	28	52
11	20	16	36	32	11	8	42	36
16	30	8	46	23	21	0	54	25
21	24	13	40	29	15	3	46	32
26	13	24	28	40	3	16	32	47
31	9	31	25	46	0	22	26	54

MINUTES LATER THAN BRISBANE (NORTHERN DISTRICTS).

Date.	Cairns.		Cloncurry.		Hughenden.		Townsville.	
	Rise.	Set.	Rise.	Set.	Rise.	Set.	Rise.	Set.
1	5	52	35	65	19	50	5	44
3	2	55	33	67	17	52	3	45
5	2	56	33	67	17	53	3	46
7	10	49	37	63	22	49	9	41
9	20	36	43	55	28	44	17	31
11	32	23	52	45	36	30	26	20
13	44	10	61	37	45	23	37	10
15	54	2	67	32	51	17	44	3
17	56	3	68	32	52	18	46	4
19	51	6	65	34	49	20	42	7
21	40	14	57	40	42	25	33	14
23	29	26	50	47	35	33	25	22
25	19	37	42	56	27	41	17	32
27	9	46	37	61	21	47	8	38
29	2	53	33	66	17	51	3	44
31	2	57	33	68	17	53	3	47

Phases of the Moon.—Last Quarter, October 4, 5.53 p.m.; New Moon, October 11, 11.33 p.m.; First Quarter, October, 18, 2.18 p.m.; Full Moon, October 26, 6.46 a.m.

On 15th October the Sun will rise and set about 10 degrees south of true east and true west respectively, and on the 11th and 23rd the Moon will rise and set at true east and true west respectively.

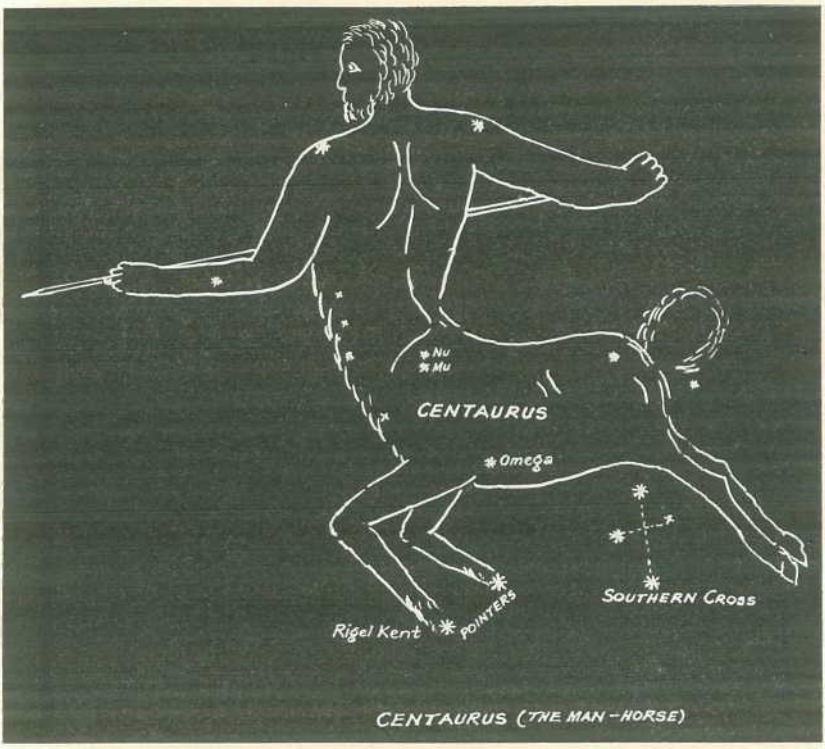
Mercury.—Not suitably situated for observation during this month, though on the 1st, in the constellation of Leo, will rise 45 minutes before the Sun, reaching greatest angle west of the Sun on the 3rd. On the 6th it will pass from west to east of Saturn, and by the end of the month, in the constellation of Virgo, will be in line with the Sun.

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

Mars.—At the beginning of October, in the constellation of Scorpio, will set between 10.8 p.m. and 11.15 p.m., the Moon passing close on the 15th. By the end of the month, in the constellation of Ophiuchus, will set between 9.50 p.m. and 10.15 p.m.

Jupiter.—In the constellation of Aquarius, will set between 3.45 a.m. and 5 a.m. at the beginning of the month; the Moon passing close on the nights of the 20th-21st. By the end of the month will set between 1.45 a.m. and 3 a.m.

Saturn.—Too close in line with the Sun for observation at the beginning of the month, but at the end of the month may be seen low in the east during morning twilight, in the constellation of Virgo.



CENTAURUS.

As mentioned in last month's Journal, this constellation adjoins the constellation of the Southern Cross, and it is easily seen from the diagram how simple it would have been to include the Cross in the constellation of Centaurus—in fact, Centaurus seems incomplete without it. The Centaurus group is said to represent the brave and kindly centaur, Chiron, who succoured the young Jason and taught the arts of peace and war to many of the mythological heroes. Being situated near the Milky Way it contains many interesting doubles and clusters, as well as several bright stars, the most brilliant stars in the constellation being the ''pointers'' to ''the Cross.'' The star of the pointers farthest from ''the Cross'' is known to navigators as Rigel Kent, the Kent being an abbreviation for Kentauri, a variation of Centauri. This star is the third brightest in the heavens, and though it appears to the naked-eye as a single star, under magnification it appears as three separate stars all revolving round a common centre of gravity. One of the stars of this group, now called Proxima Centauri, is the closest known star to Earth, being 4.2 light-years away—a light-year is 5,878,000,000,000 miles.

Other interesting objects in this constellation are the beautiful globular cluster, Omega Centauri, which can be seen with the naked-eye as a star of about fourth magnitude but which with optical aid appears as a ''heap of pearls''; the naked-eye doubles of Mu and Nu and Epsilon, and the telescopic cluster of about 200 stars—47 Centauri.

Like the Southern Cross, this constellation is an evening object from about March to September, though from Queensland it is below the horizon for only about 4 hours every day. On October 1st it reaches the Meridian or North-South line about one hour after noon, setting about 7 p.m. It will reach the Meridian about 2 hours earlier each month, so that by April 1st it will be on the North-South line about 1 hour after midnight.