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QUEENSLAND AGRICULTURAL JOURNAL

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Cover picture: Colour variations of the flower of the coastal paperbark (*Melaleuca viridiflora*) are common, as this red flower shows.

EDITOR: E. T. HOCKINGS

Vol. 92 MAY, 1966 No. 5

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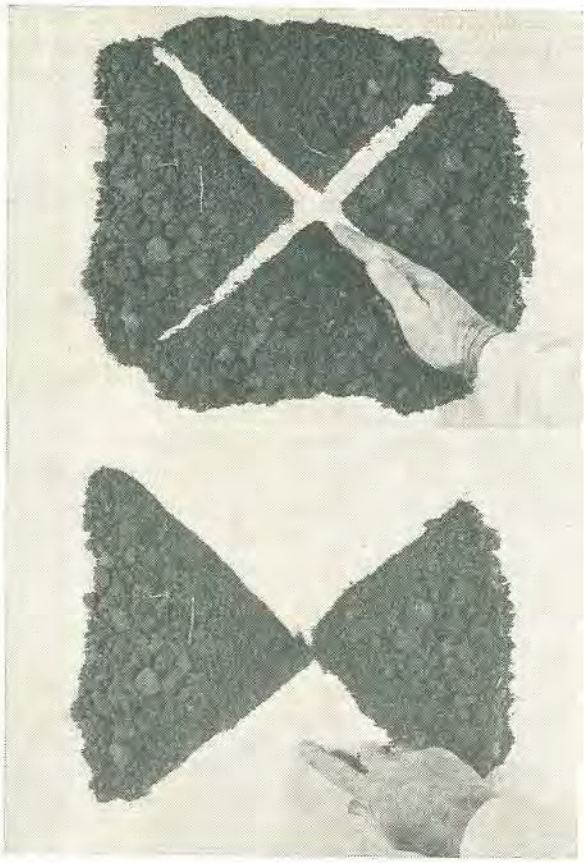


Plate 1: Soil sample divided into quarters for subsampling.

Plate 2: Opposite quarters are discarded to obtain the subsample.

Sampling Soils And Waters For Analysis

by H. Hassler, Senior Soil Technologist.

Every year, an increasing number of soil and water samples are received for analysis by the Department's Agricultural Chemist. Many of these samples are taken by farmers themselves and it is the purpose of this article to emphasise the importance of accurate sampling and to describe correct methods of taking samples.

Soils

Unless certain procedures are followed in collecting the samples, the analysis may have little or no value and could even be misleading, and could involve the farmer in unnecessary expense.

It must be stressed that any analysis is only an analysis of the sample and not of the field, so the method of sampling is all important. The more representative the sample is of the field, the more representative the analysis is of the field.

Before a soil sample is taken, it is advisable to consult the local advisory officer. In many cases, his local knowledge and his experience may enable him to give the desired information without the necessity for taking a soil sample and having it analysed.

If there is no advisory officer who can be contacted easily, and the farmer wants to know the amount and type of fertilizer to use for the crop he intends growing, he should endeavour to ensure that the sample is as representative as possible.

If the type of soil changes markedly over the area to be cultivated, separate samples should be taken for each soil type.

The simplest way to sample is to dig a hole with a vertical side to the depth of cultivation or 9–10 in., whichever is the greater.

A slice of even thickness and width is cut from the vertical face.

A number of such samples should be taken for each soil type and these samples should be thoroughly mixed on a sheet of clean canvas or plastic.

A sample of about 2 lb. weight is sufficient for analysis; it will frequently be found that the composite sample weighs much more than this. It must, therefore, be subsampled. This is done by quartering in the following manner:

The collected sample is broken up into small clods (if necessary) about half an inch in diameter, and thoroughly mixed.

The pile of soil is then flattened and divided at right angles through the centre (Plate 1).

The soil in two opposite quarters is discarded (Plate 2), and the remaining quarters again mixed.

If the sample is still too big, the process should be repeated till the sample remaining is about 2 lb. in weight.

The final sample should be placed in a clean container (*not* a fertilizer bag). Samples that have been air-dried before despatch to the laboratory can be prepared for analysis more quickly than those which are damp. Care should be exercised to prevent contamination of the sample while it is drying.

Each sample should be identified with the farmer's name and address, depth, and, when more than one sample is forwarded, a mark or number.

A covering letter should be sent to the Director, Agricultural Chemical Laboratory, Department of Primary Industries, William Street, Brisbane, giving the following information:—

1. Name of farmer.
2. Postal address.
3. Name of parish and portion number.
4. Depth to subsoil.
5. Type of subsoil.
6. Type of country—slope, flat, alluvial.
7. If virgin land, type of vegetation.
8. If cultivated, usual crops and the next crop to be grown.
9. Yields—poor, average, good.
10. Date, rate and type of fertilizer applied.
11. Date and rate of agricultural limestone or dolomite applied.
12. Reasons for requesting analysis.

Waters

The procedure for taking water samples is simpler as one sample only is required for each source of water. A sample of about a pint is sufficient and the container should be washed out thoroughly with the water to be sampled before the sample is taken. If for stock, the sample should be taken from the actual drinking point. A 26 oz. bottle such as a beer bottle is an excellent container.

Each container should be clearly marked with the name and address of the sender and an identifying mark or number should be added if more than one sample is sent.

A covering letter should be forwarded, at the same time, to the same address as for soils, giving the following particulars of each sample:—

1. Name and address of sender.
2. Name of parish and portion number of sampling site.
3. Bore; depth (registered number, if any).
   Well: depth.
   Dam: capacity, surface area.
   Watercourse: name.
4. Date of collection (state of tide when subject to tidal influence).
5. Whether required for irrigation or stock (state crop or kind of stock), domestic use, human consumption.

6. Any peculiar taste, odour or sediment.
7. What effect the water has had, if used for crops or stock.

The water should be taken from the pump after it has been operating for some time, or from the bore-head. This is the actual source of water. If stored in a tank or delivered to a trough, samples from both tank and trough should be forwarded. There have been cases in which a fairly good water has become so concentrated in a trough, by evaporation, that animals have died of thirst rather than drink the water.

Samples should be packed in such a way as to prevent breakages in transit, and should be addressed correctly to ensure prompt delivery. They should be addressed as follows:—

By rail: Agr. Chem.
Dept. Primary Industries,
Roma Street.

Other: Agricultural Chemical Laboratory,
Dept. Primary Industries,
William Street,
BRISBANE.

1966 Show Dates

The following show dates for 1966 have been announced by the Queensland Chamber of Agricultural Societies:

MAY: Eidsvold 2, 3; St. George 2, 3; Roma 4-6; Barcaldine 5, 6; Theodore 5, 6; Goomeri 6, 7; Marburg 6, 7; Mundubbera 6, 7; Longreach 9-11; Gayndah 10, 11; Mitchell 11, 12; Ipswich 11-14; Biggenden 13, 14; Winton 13, 14; Baralaba 13, 14; Kilkivan 14; Charleville 17-19; Springsure 19, 20; Biloela 19-21; Gympie 19-21; Wowan 20, 21; Brookfield 21; Capella 23; Dirranbandi 23, 24; Maryborough 23-25; Clermont 25, 26; Chinchilla 26-28; Cunnamulla 26-28; Boonah 27, 28; Blackbutt 28; Miles 30, 31; Childers 30, 31; Emerald May 31, June 1.

JUNE: Maleny 3, 4; Lowood 3, 4; Mt. Morgan 3, 4; Bundaberg 3-5; Gin Gin 6, 7; Gladstone 8-10; Toogoolawah 10, 11; Yeppoon 11, 12; Rockhampton 15-18; Hughenden 16-18; Kilcoy 17, 18; Laidley 17, 18; Pioneer Valley 18; Mackay 21-23; Mt. Isa 23-25; Mt. Larcom 24, 25; Esk 24, 25; Home Hill 24, 25; Proserpine 24, 25; Charters Towers 27-29; Bowen 28, 29; Nambour June 30-July 2; Woodford to be allotted.

JULY: Ayr 1, 2; Townsville 4-7; Gatton 8, 9; Ingham 8, 9; Caboolture 8, 9; Malanda 8, 9; Cleveland 8, 9; Atherton 11-13; Innisfail 14-16; Redcliffe 14-16; Rosewood 15, 16; Cairns 19-22; Texas 22, 23; Mt. Gravatt 29, 30; Mossman 29, 30; Collinsville 29, 30; Tully 29, 30.

AUGUST: Lawnton 5, 6; Sarina 6; Brisbane 11-20; Canungra 27; Cooroy 27.

SEPTEMBER: Wondai 2, 3; Dayboro 2, 3; Mary Valley 2, 3; Southport 3; Noosa 9, 10; Beaudesert 9, 10; Beenleigh 16, 17; Kenilworth 17; Rocklea 24.

OCTOBER: Mt. Tamborine 1; Millaa Millaa 7, 8.

The New Beef Breeds

by G. I. Alexander, Director of Cattle Husbandry.

Plate 1: A Charolaise bull photographed in Texas, U.S.A.

Plate 2: Charolaise steers in Montana.

The appearance of new breeds of stud beef cattle at the Royal National Show is a recent event and the general standard of the stock in the classes is quite good. Along with this advent of newer breeds, there is a steady improvement in the quality of the older established breeds at the Brisbane Show each year.

If the established breeds are still improving, why has interest in these other breeds developed? In Queensland, we have probably a greater range in conditions under which we run our cattle than

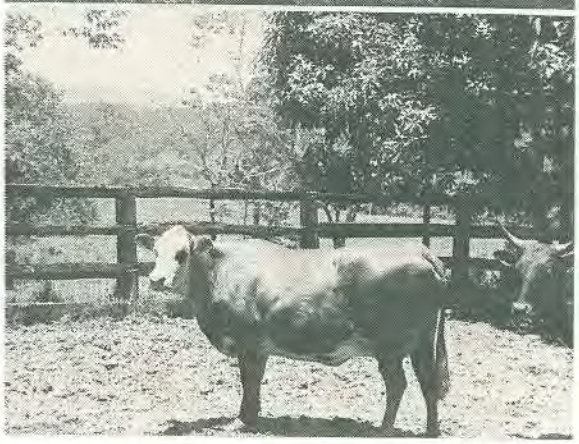


Plate 3: Brahman cross-bred cattle in Queensland.

Plate 4: A Zebu + Hereford cow.

Plate 5: An Africander bull.

in any other State. We have relied upon the Hereford and Shorthorn breeds to handle the whole of these conditions. In some instances, Angus cattle are used and in the northern hilly areas, Devons are crossed with Shorthorn to produce a more active animal able to forage over the country.

With the short wet season and long dry season so characteristic of most of our cattle country, it is common to have quite an appreciable wastage rate in breeding stock in normal years, particularly in north Queensland.

In drought years there can be quite alarming losses of stock.

Furthermore, cattle tick and tick fever complicate the issue and represent a drain on finances for insecticides as well as requiring constant vigilance to prevent severe infestations. These cause rapid loss of weight and even death of the animal. The British breeds we have been using do not possess any marked resistance to tick parasites and are not particularly drought tolerant.

The Early Importations

While some Brahman cattle were imported into Queensland before World War II, interest in the possible use of these cattle did not start until further importations were made in the early 1950's. These new importations of cattle showed quite good beef characteristics and were very easy to handle. Some of them went to the Commonwealth Scientific and Industrial Research Organization's station at "Belmont" and others to private properties.

Crosses between these Brahmans and British cattle showed greater foraging ability than either the Hereford or Devon–Shorthorn cross and also showed a greater degree of tick resistance than the British breeds. They also grew more rapidly and seemed to withstand drought conditions to a greater extent than the British breeds.

These advantages encouraged breeders to endeavour to develop new breeds based on these crosses. They aimed at the optimum blending of the British cattle's desirable features of carcass conformation and temperament with the other desirable features of the Brahman breeds.

The Droughtmaster, Braford and Brangus breeds have been developed from this beginning. Their growth has proceeded parallel with the expansion of the Santa Gertrudis breed in Queensland which was brought in at the same time as the Brahmans.

Continuous Selection

The establishment of these breeds only represents a beginning as the stud breeders will have to select continuously for high performance in all the characteristics necessary for beef production under northern conditions.

Current trends also suggest that there will be an increasing use of cross-breeding for beef cattle production in Queensland.

In the past there has been a tendency to maintain pure breeds and to improve their performance by providing a better plane of nutrition. Naturally, every producer continues to improve the plane of nutrition of his herd as rapidly as his economic position will allow him. But I think that so many breeders have seen the remarkable lift in performance achieved by cross-breeding that they will be loath to lose this asset.

Many beef cattlemen have been quite keen on the advantages of cross-breeding but they have been concerned about the step after the first cross, say, between the Brahman and Hereford. They have not known what to do with the cross-bred cow.

There are two choices. The first is that the cross-bred cow can be mated to bulls of one of the new breeds such as Santa Gertrudis, Droughtmaster, Braford or Brangus. In doing this, the effect of hybrid vigour is rapidly lost and any improvement through breeding must come through the bulls they purchase. A breeder doing this relies on the stud breeder to improve continuously the bulls he uses. He eventually develops a herd which is relatively even in type and performance, becoming a grade herd of the breed of bulls chosen.

The other method is to try to perpetuate the improvement due to hybrid vigour.

This entails the regular replacement of all the bulls in the herd by bulls of another breed. In Texas, there is a herd where Hereford bulls are used for 4 years. Then after 4 years they are replaced by Brahman bulls which are in turn replaced by Charolaise bulls for another 4 years. The cycle is then repeated.

This results in cattle of very mixed colours but of high performance. All the advantages of hybrid vigour in the growth rate of the calf and the mothering ability of the cross-bred dam are utilized.

To give the greatest lift from hybrid vigour, we need breeds of cattle with quite different genetic backgrounds. This is one of the reasons for the marked lift due to the hybrid vigour of the Brahman–British cross. This brings up the question—

Other Breeds

With the breeds we have available now, is it necessary to use any more breeds in Queensland?

The Brahman cross has established itself quite securely in the tropical coastal belt of the State. The Santa Gertrudis breed is being tried in the southern and western areas and will find a niche in these parts. It will be interesting to see how strongly it competes with the Hereford as the Hereford performs quite well in the south-eastern corner of Queensland.

A breed which could show promise in crosses with the Shorthorn in the western areas of the State is the Africander. While essentially an arid zone animal, the Africander has performed quite creditably at "Belmont" and I expect to see much more interest in them when they are tested in western Queensland. Africander crosses seem to be more fertile than Brahman crosses; they are much more tractable and they perform nearly as well as Brahman crosses in growth rate, foraging ability and tick resistance.

Another cross which may have possibilities is the Sahiwal cross. While developed as a dairy breed in Pakistan and India, this animal crosses well with Shorthorns and could provide a useful cross in a cross-breeding programme.

The Charolaise is a French breed which has achieved quite a lot of popularity in the United States and Great Britain. Much of the American interest stems around its crosses with Herefords and Brahman-cross cattle, while in Great Britain it is being tested extensively in crosses with dairy cattle for beef purposes. While the Charolaise cannot be expected to show tick resistance and foraging ability of the type exhibited by the Indian breeds, it should be an attractive proposition for cross-breeding in the southern areas of the State.

While we have seen quite massive changes in the breed structure of the beef cattle industry of Queensland in the last 15 years, I expect even more remarkable changes in the next 15 years. There will be an increasing emphasis on cross-breeding using the established British breeds and these newer breeds. These crosses will give the cattle the maximum advantages to be gained by hybrid vigour and so improve the efficiency of this enterprise.

Research To Aid Northern Agriculture

Plate 1: Tinaroo glycine overgrowing blady grass and weeds.

Plate 2: Maize crops and glycine pastures at Kairi Research Station.

The scientific investigations now in progress at the Kairi Research Station have been designed to assist all forms of agriculture on the Atherton Tableland.

The staff of the research station and other technical officers in north Queensland have clearly defined the problems of the area, and special attention was given to the findings of the Atherton Tableland Investigation Committee. In addition, priorities have been allotted so that immediate difficulties can be tackled at the same time as long-term investigations are continued.

The research now under way will play a decisive part in the revival of agriculture on the Atherton Tableland.

Already, the productivity of the dairy industry has been restored on many parts of the Tableland through the development of improved pastures. These highly productive pastures are based on the outstanding tropical legume, Tinaroo glycine, which has proved so well adapted to the basaltic soils.

On the Kairi Research Station, pastures based on Tinaroo glycine are producing up to 100 lb. of commercial butter to the acre in a year.

Evidence of the restorative effect of glycine-based pastures on the Tableland soils is also emerging at Kairi. The highest bulk maize yield last season, 53 bushels an acre, was obtained from land that had been under glycine pasture for several years.

by G. H. Allen, Executive Officer,
Research Stations Section.

Pasture studies at the station are being continued. Besides work on pasture establishment, the management of glycine-based pastures for continued productivity is being actively examined. This work involves plant nutrition studies and an investigation of the fertilizer requirements of Tableland soils for legume and grass growth.

The pasture programme also provides for the continuation of plant introductions and the testing of pasture species. This work is integrated with breeding and selection of glycine strains and testing other promising legumes like desmodium and dolichos.

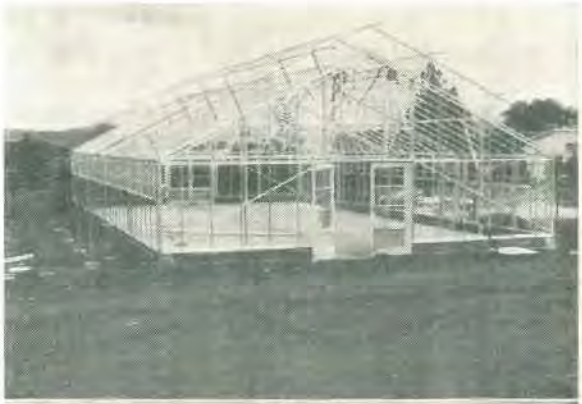
Practical methods of producing commercial supplies of seed of the pastures grown on the Atherton Tableland are also being examined. Success in this study could result in the growth of a pasture seed industry.

Work on funnel ant control is being continued so that this pasture pest may be beaten.

Maize, the staple agricultural crop on the Tableland, rates a high priority in the research programme. Breeding for resistance to rust and cob-rot diseases now includes a winter phase to speed up progress.

Glasshouse studies are supporting breeding programmes aimed at developing ear rot and rust resistance in inbreds, single crosses, hybrids, and intergenetic crosses. Varieties and breeding material are constantly being introduced from overseas.

In field trials, yield, resistance to disease, and the incidence of lodging are evaluated in crops with different plant populations and at varying levels of nutrition. This part of the work is done at both the Kairi and Walkamin research stations.



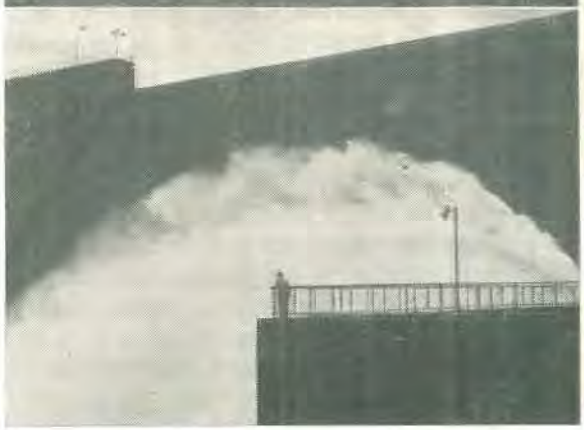


Plate 3: Prefabricated glasshouse which is now completed and used for maize breeding.

Plate 4: Release of water from Tinaroo Dam. Kairi adjoins the Tinaroo Lake, water from which services the Mareeba-Dimbulah irrigation area.

Some rust resistant hybrids bred at the Kairi Station have outyielded other varieties grown on the Atherton Tableland. However, some of the new lines are prone to lodging, and further breeding work will be necessary to correct this fault.

Promising hybrids produced in the last 2 years will be grown in commercial plantings on both the Kairi station and district farms this season in comparison with ordinary Tableland varieties.

Although breeding new hybrids is the major research on the maize crop, agronomic studies are not being neglected. Both short-term and long-term maize fertilizer trials are in progress. In this work, the aim is to develop practices capable of being applied over a large area of the Tableland. A district maize nutrition survey is also planned.

Trials and demonstrations in the Kairi piggery will include sow and litter performance studies with special attention to the practical use that can be made of accurate records. Other piggery research will deal with testing the value of north Queensland protein supplements and the place of pasture grazing in the economics of pig raising.

Disease and weed control in crops and pastures are also being investigated in projects involving plant breeding, soil fumigation, seed treatment, plant spraying and the use of chemical weedkillers.

The research at the Kairi station is carried out by nine resident technical officers of the Primary Industries Department.

Mr. R. W. George (senior experimentalist) is responsible for general station operations. Messrs. P. G. Tow and S. J. Barker (agronomists) attend to crop and pasture studies and Messrs. I. F. Martin (plant breeder) and T. E. McCarthy (field assistant) the maize breeding projects. Mr. R. W. Walker (field assistant) is in charge of plant introductions and seed production. Messrs. W. Edgley (assistant adviser) and J. Walker (field assistant) operate the animal breeding centre and carry out cattle husbandry projects with dairy and beef cattle. Mr. M. J. Gleeson (field assistant) is responsible for the piggery programme.

The staff at the station is supported by other officers stationed in north Queensland. Legume breeding is under the care of Messrs. I. B. Staples and J. E. Ferguson (plant breeders), of the Parada Research Station. Mr. W. Pont (senior pathologist) and Mr. R. Grattidge (experimentalist) are concerned with maize diseases, and Mr. G. W. Saunders (research entomologist) with funnel ant investigations. Messrs. J. Gartner (agrostologist) and Mr. M. L. Everett (cadet) assist the station staff with plant introduction work and in the evaluation of pasture plants.

These officers carry out special trials on the Kairi station as well as other trials and field investigations throughout north Queensland.

The Piggery In May

Low temperatures and cold winds will have made their unwelcome presence felt in the piggery by this time.

Pigs that are cold day and night use a big proportion of their feed merely trying to maintain body heat. This means less feed is available for growth, so cold pigs are slow growing pigs which require more feed for each pound of live weight gain.

If you rear pigs in cold surroundings they cannot return maximum profits, so check to see if your sheds are warm and free from cold draughts. Cracks in the walls and around poorly fitted windows and doors should be covered. Some at least of the summertime ventilation openings will certainly need closing. Allow only sufficient air to enter the sheds to keep the interior fresh and dry. You should increase the ventilation on mild, sunny days, but reduce it at night and on days when cold winds blow.

The few minutes occupied daily ensuring that your pigs are comfortable in winter will result in faster growth and feed saved.

Raising Pigs For Profit

by A. C. E. Todd, Husbandry Officer.

Any discussion on the profitability of pig keeping on dairy farms must first consider the position of skim-milk. In the past the pigs on a dairy farm have all too often been regarded as scavengers, used to clear up surplus skim and any other scraps or waste products. Their numbers were tailored to the supply of skim while there was little interest in improved methods of feeding and raising pigs.

In recent years it has been realised increasingly that pigs can play an important and profitable part in the farming enterprise. Many specialised pig farms have emerged, relying on purchased grain and protein concentrates. Their expansion is proof that pigs are profitable. A dairy farm with surplus skim-milk must be in a more favourable position to compete since food costs amount to about 70 per cent. of the value of gross output.

Just what is the value of skim-milk? It is common to regard 1 gal. as equal to 1 lb. of grain but it is, in fact, worth more. A gallon of milk contributes much more protein than a pound of grain, and protein, particularly high quality protein, is scarce and expensive.

Properly used, a gallon of skim-milk is worth ½ lb. of grain and ½ lb. of fish meal. With grain at 50 dollars and fish meal at 160 dollars a ton this means that a gallon of skim-milk is worth about 4.06c. With fish meal at 220 dollars a ton, skim-milk is worth nearly 8c. a gal.

You will note that I qualified the valuation by saying, "when properly used". By that I mean when used as a protein food. If skim-milk is used in quantities that provide more than the pigs' protein requirements the excess is only replacing grain and under these conditions the value drops to that of grain, about 2.08c. a gal.

This means that to get the best value from available skim it should be fed in limited amounts, with grain, so that the greatest number of pigs can benefit from its high quality protein content.

In practice this may mean keeping more pigs and being prepared to feed them on a grain-protein mixture when skim-milk is in short supply.

A useful guide to skim-milk and grain feeding, using restricted amounts of skim so that it is not wastefully fed, is as follows:

Live Weight (lb.)	Per Pig Per Day	
	Grain (lb.)	Skim (pints)
50	2	4
70	2½	4½
90	3	5
110 ..	3½	5½
130 ..	4	5½
150 and over	4½	5½

This is adapted from a table given by Professor Lucas when at the Rowett Research Institute in Scotland, the only alteration being the maintenance of the grain allowance at 4½ lb. daily from 150 lb. liveweight to reduce the possibility of down grading of the carcass; in the original table the amount of grain increased to 5 lb. at 190 lb. L.W. The amount of skim-milk used in this system may seem small but provided it is not diluted with wash water enables the largest number of pigs to benefit from its excellent qualities.

There has only been a limited amount of experimental work carried out in Queensland on the feeding of skim-milk since with limited resources it has seemed more important to concentrate on all meal feeding problems. New South Wales and Tasmania have reported some of their results and we can profit from their experience. In New South Wales every possible combination of skim-milk and grain is being fed in a long term trial; the aim is to find the best combination under various conditions of food cost and sale price. It may be some time before the results are published. Tasmanian work is of more immediate interest; they have compared:

—	1 Skim only	2 Skim + 1 lb. Grain	3 Skim + 2 lb. Grain	4 All Meal
Daily gain (lb.)	1·11	1·37	1·64	1·20
Feed dry matter per lb. gain	3·11	3·02	2·86	3·16

This indicated quite clearly that while skim-milk to appetite gave reasonable results, the feeding of 2 lb. grain daily with skim resulted in a much more economical use of food and a much faster rate of growth.

In another experiment, some pigs were fed skim with 2 lb. grain daily up to 100 lb. live weight when the grain was then reduced to 1 lb. daily. It was found that a reduction in the amount of grain did not encourage the pigs to make good the loss by drinking more milk and as a result performance suffered.

To sum up on this aspect it is clearly wasteful to feed all skim-milk, at least 2 lb. of grain should first be fed to growing pigs each day while for maximum economy, and I suggest, maximum profit, the amended Lucas scale should be adopted.

In describing this work I have simply referred to skim-milk and grain. This is not quite correct; the grain should, in fact, be a mixture of grain, vitamins and minerals. Vitamin A, in particular, is essential. It is a fat soluble vitamin and is removed in the cream. This loss must be made good either by one of the commercial preparations or by high quality green food or lucerne meal. The commercial, synthetic vitamin A is quite satisfactory and it is wise to include it at the manufacturer's recommended rate.

A mineral mixture added to the grain is also important but it is rarely necessary to use expensive commercial mixtures. Salt, in small amounts, calcium and phosphorus are usually all that are needed. A mixture of 98¼ lb. of crushed grain, 1 lb. of steamed bone meal, ½ lb. of ground limestone ¼ lb. salt and a vitamin supplement supplying at least 1,000 international units of vitamin A per lb. of food is a simple and effective grain mixture. Other minerals will normally be naturally present in the milk or the grain but it is possible, particularly in the Brisbane Valley that the amount of copper is not sufficient. As a trace element 10 parts per million of copper in the diet is adequate but there is evidence that a much higher amount (125 or even 250 p.p.m.) may stimulate growth.

All the remarks so far have concerned the feeding of growing stock, from weaning to bacon; these, particularly in the initial stages, can make the best use of skim-milk. Breeding stock and suckers are often fed skim but for the former I feel this is a wasteful use of a valuable product

and for the latter where, in theory, skim could play the most valuable part, there are dangers. Skim-milk is an excellent medium for the growth of bacteria and there is some evidence that outbreaks of scouring are more common where skim is fed. This doesn't rule out its use as a creep feed for suckers but suggests that very strict attention should be paid to hygiene, and amounts should be limited in case the greedier suckers consume too much and develop a nutritional scour.

While it is not the purpose of this article to go into the details of all meal mixtures and systems of feeding, I think it would be of interest to discuss the general economy of pig production based on experience at the three Research Station piggeries in Queensland.

On these Stations, we calculate the gross margin over food and stock costs each year. This involves a valuation of the livestock at the beginning and end of the period, a calculation of the cost, at normal market prices, of all the food brought into the piggery which is set against the value of stock sold, less any purchases. A rough indication of last year's results may be of interest:

Kairi, Atherton Tableland—13½ sows. Gross margin, 216 dollars per sow. This figure excludes the value of any grazing but includes skim-milk provided by the dairy (24,000 gal.) valued at about 2.09c. per gal.

Biloela—17 sows. Gross margin, 220 dollars per sow. Very little grazing or skim-milk was used but the skim was included in food costs. Many of the growing pigs were deliberately put on poor quality rations for experimental purposes. Deferred payments (about 10 dollars per sow) excluded.

Hermitage, Warwick—16 sows. Gross margin, 168 dollars per sow. No milk used and limited grazing available. The lower figure was due mainly to the lower number of pigs born and reared per sow (8 born 7 reared). Deferred payments excluded.

The housing and equipment at these Stations is not out of the ordinary. In fact, accommodation at Kairi is not nearly as good as that found on many farms. This is deliberate since this is essentially a demonstration unit where we are trying to show what can be done under ordinary conditions. With experimental work it's necessary to have more labour available than would be the case on commercial farms but there is no reason why these results should not be obtained by anyone. This figure should not be confused with profit. Labour and many other miscellaneous costs have to be deducted before actual profit can be found. A reasonable figure for gross output from a 30 sow herd might be 12,480 dollars (480 pigs sold at 26 dollars each). On this herd food might cost about 8,000 dollars, labour 2,000 dollars and other costs 1,248 dollars leaving a figure of 1,120 dollars for profit.

Gross output	12,480 dollars
Food . .	8,000 dollars = 65 per cent.
Labour . .	2,000 dollars = 16 per cent.
Miscellaneous	1,248 dollars = 10 per cent.
Margin . .	1,120 dollars = 9 per cent.

These figures are reached as a result of many assumptions and should be treated with some caution. For those of you who are prepared to keep fairly simple records, calculations can be made on your own property and advisory staff will help you with this work. Results may surprise you and figures of this sort are a great help in pin-pointing weaknesses and making management decisions.

Use Strain 19 For Brucellosis

Plate 1. Leaf galls of Mitchell grass due to seed-gall nematodes.

Plate 2. Galls on leaves of rusty gum (*Angophora costata*) caused by a nematode in association with a fly.

Nematodes And Their Effect On Plants

In recent years there has been an increasing awareness of the importance of nematodes as pests of Queensland crops but there is still a general lack of appreciation of the large number of species involved and the diversity of symptoms shown by infested plants.

Plate 3: Banana corm rot due to burrowing nematodes.

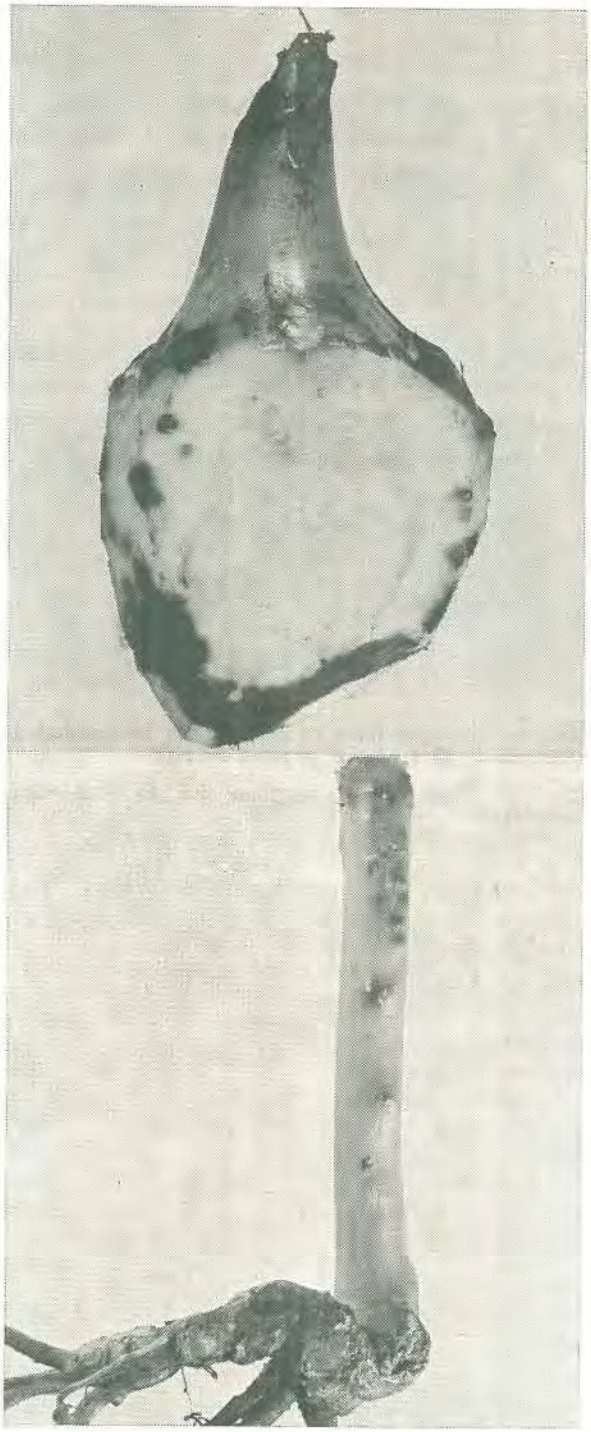


Plate 4: Galls on stems of *Dolichos lablab* due to root-knot nematodes.

by R. C. Colbran, Research Entomologist.

Root-knot nematodes have long been recognized as pests of major concern because of the distinctive swellings produced on roots and their wide distribution but the numerous other species which infest roots, leaves, stems, flowers, corms, tubers and rhizomes have for the most part been overlooked.

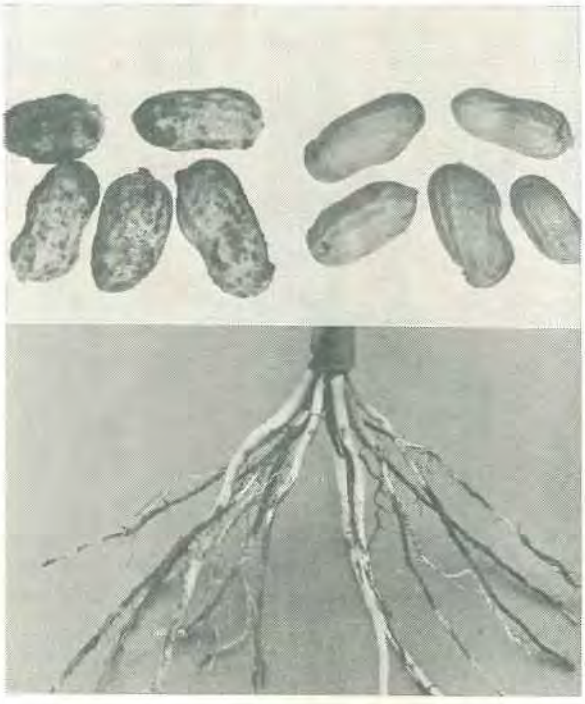


Plate 5: Pod spot (left) of peanuts due to root-lesion nematodes. Five normal peanuts on right.

Plate 6: Root rot of sorghum due to root-lesion nematodes.

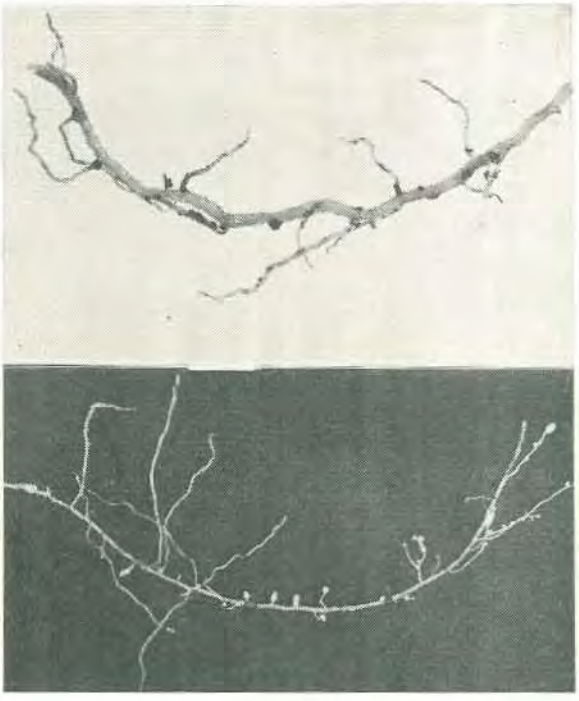


Plate 7: "Dirty" roots of maize due to reniform nematodes.

Plate 8: Terminal swellings on citrus roots due to sheath nematodes.

With the exception of stubby-root nematodes, plant parasitic species have a hollow stylet which is inserted into plant tissue, and through which the cell contents are sucked into the body. Mechanical damage as a result of feeding is usually slight and restricted to the cells pierced by the stylet. While feeding, nematodes inject secretions to which the plant may react by the formation of galls, lesions or cessation of root tip growth.

Nematode injury in a crop is indicated by poor growth patches where plants are below average in vigour, and leaves may be chlorotic and scorched along the margins. Such symptoms are not specific for nematode injury as these also occur as a result of other organisms, for example, fungi and insects attacking roots, or through a shortage of plant nutrients. Death of plants is rarely, if ever, attributable to nematodes unless

accompanied by invasion of infested tissue by other organisms, particularly fungi.

Apart from poor growth, plant tissues infested by nematodes usually show specific responses.

Nematode injury to stems, flowers and leaves

Leaf blotches. Chrysanthemums are commonly infested with the chrysanthemum leaf nematode, *Aphelenchoides ritzema-bosi,* which moves up the outside of the stem when covered by a film of moisture and enters leaves or flowers. Feeding results in the production of black angular patches in the leaves and failure of flower buds to open normally.

Galls. A seed-gall nematode, *Anguina microlaenae,* produces galls on the leaves of Mitchell grass in western Queensland.

The nematode, *Fergusobia tumefaciens,* is associated with a fly in the formation of galls on leaves of *Eucalyptus* and *Angophora* species.

Root-knot nematodes (*Meloidogyne* species) produce swellings on the stems of French beans and *Dolichos lablab* which is used as a green manure crop.

Nematode injury to roots, tubers, corms and rhizomes

Galls. Root-knot nematodes produce large swellings on the roots of many important crop plants including tobacco, tomato, papaw, pineapple, peach, potato and banana.

Internal discolouration. Root-knot nematodes produce small discoloured areas in ginger rhizomes and tubers of dahlias and potatoes.

Root rots and lesions. The burrowing nematode, *Radopholus similis,* causes a rot of bananas which destroys the roots and may extend into the corm.

Root-lesion nematodes, *Pratylenchus* species produce lesions which may girdle the root and cause extensive root rot. The following species are recorded from Queensland:

Species	*Associated disease*
Pratylenchus brachyurus	Root rot of pineapples. Pod spot, peg rot, and stem rot of peanuts. Potato pimple.
Pratylenchus coffeae	Dieback and replant failure of apple trees. Tuber rot of caladiums.
Pratylenchus neglectus	Root rot of wheat.
Pratylenchus thornei	Root rot of wheat.
Pratylenchus vulnus	Root rot of strawberries.
Pratylenchus zeae	Root rot of sorghum. Root rot of blue couch grass in lawns, bowling greens and golf greens.

Superficial necrosis. Nematodes such as the spiral nematode, *Helicotylenchus dihystera,* a common species in pineapple fields feed on the surface cells of roots, producing small superficial areas of dead tissue.

"Dirty" roots. The citrus nematode, *Tylenchulus semi-penetrans,* which occurs in most Queensland citrus orchards produces a sticky exudate in which eggs are laid and to which soil particles adhere. After washing, infested roots remain coated with a layer of fine debris.

The reniform nematodes, *Rotylenchulus parvus,* a parasite of maize near Kingaroy and *R. reniformis,* a parasite of tomatoes at Bowen and Rockhampton, produce similar symptoms.

Injured root tips. A native species of sheath nematode, *Hemicycliophora nudata,* causes citrus root tips to become swollen, and capsicum root tips to become discoloured.

Roots of plants infested by stubby-root nematodes, *Trichodorus* species, cease to grow, with little or no discolouration or other evidence of injury.

Nematodes in relation to nutritional disorders and diseases caused by other pathogens. Nematode root injury interferes with the ability of plants to utilize soil nutrients, and deficiency symptoms may be induced in the above-ground parts. Such plants often respond to nutrients applied in leaf sprays and not as soil dressings.

In addition to their direct effects on plants, nematodes reduce resistance to many soil-borne fungal and bacterial diseases, and some species are vectors of viruses.

Treating Cattle Blight

by R. J. Higgins, Veterinary Officer.

Treatment of cattle blight is most effective with antibiotics such as chloromycetin and terramycin for all stages of the disease. Combined antibiotics and corticosteroids are used in the treatment of valuable animals.

Every spring and summer outbreaks of cattle blight or contagious opthalmia occur throughout the State. These vary in their severity depending on seasonal conditions, the prevalence of flies and susceptibility of the cattle population.

Plate 1: Elevated opacity of the cornea in the eye of a young calf.

In the spring of 1964, the outbreaks were particularly severe in many districts.

Cattle blight is a highly infectious disease. While there is some doubt about the cause, it is now thought to be either a virus or two or three different bacteria. It is generally accepted that it is not related to "pink eye" in sheep.

In Queensland the incidence varies greatly from year to year. There is usually some blight each year and periodically the disease becomes more widespread and increases in severity.

Again the incidence is distinctly seasonal and occurs mainly in the spring and early summer months. It is a particularly serious problem in dairy and beef herds in coastal and subcoastal areas and in certain years it extends into western areas.

In beef cattle the disease appears in the herd in a severe form every 3 or 4 years. It generally has a higher incidence in younger cattle.

It appears more regularly in dairy herds. The incidence is usually not as high and is mostly confined to calves and yearling heifers.

Though the disease affects all breeds of cattle it appears more commonly in some than others. Observations suggest that the Brahman breeds may be relatively resistant to the disease. In fact, during the 1964 outbreaks, few cases were observed in Brahman herds.

Transmission

The organism is present in lesions in the eye and also heavily contaminates the discharge from affected eyes. Transmission occurs from contamination with such agents as flies, dust or long grass.

The variable incidence of blight which in some years reaches epidemic proportions depends on stocking rates and prior exposure but mainly on the seasonal effects on the agents.

The incidence, however, varies considerably between districts and this variation is due to differences in local seasonal conditions. Spread within a district is very rapid. The disease often appears spontaneously in several areas in one district.

Persistence of the disease from year to year is believed to be by means of infected animals which will act as carriers for more than a year.

Predisposing factors are particularly important in relation to the spread and severity of the disease.

Bush flies are probably the most important means of spread and some of the more severe blight epidemics have been associated with very heavy bush fly infestations. These often follow warm winters with early summer rains.

Dust, however, can also play an important part particularly during droughts and more importantly during mustering in dry dusty yards, or travelling mobs at saleyards. Irritation of the eye membrane by dust may also predispose to infection. Stocking rates have some effect on the spread and this is emphasised under supplementary feeding conditions or during droughts where watering facilities are fewer and are more concentrated or when cattle are grazing crops, particularly in spring.

Previous exposure will confer an immunity from further attacks for up to a year and will play some part in determining the spread of the disease. In beef herds, particularly, adult cattle are often severely affected and this is probably related to very low incidence in previous years.

Clinical Findings

The incubation period of the disease varies from 2 to 4 days.

The earliest signs usually seen are a copious watery discharge from one or both eyes, the cheek becoming tear stained and the hair matted, and a tendency to continual blinking or keeping the eye partly or completely closed. A moderate fever with a depressed appetite and reduced milk production may be noticed in dairy cattle, particularly calves.

In some cases the lesions are mild or negligible but mostly the blight takes an acute form.

In a few days an opacity may appear at the centre of the cornea which may become elevated and eventually ulcerate. Some cases will run a comparatively mild course and clear up within weeks.

If the disease is severe the opacity is usually white to yellow and the cornea and conjunctiva will be covered with a granular inflammation and appear very congested. The eye colour tends to become white or pink depending on degree of cloudiness and inflammation. The discharge from the affected eye usually shows the presence of pus in the later stages.

Recovery occurs in 3 to 5 weeks—blindness is common in the recovery stage but is usually only temporary. The great majority of animals recover. However, a small percentage remain blind because of permanent opacity of the cornea.

In severe chronic cases there are more extensive changes due to secondary bacterial infection. There may be bulging of the eyeball with ulceration which may lead to rupture. Permanent blindness will result.

Affected animals lose condition because of severe pain and inability to graze. The few deaths which occur are due to misadventure caused by blindness.

The incidence is highest in young cattle, decreasing with age. In beef herds the disease would appear to take from 8 to 10 weeks to run its course through the herd. In severe outbreaks up to 10 per cent. of young cattle are affected at one time.

Treatment

Treatment of infected cattle is difficult because of the frequent applications necessary when the increased flow of tears washes out any drug used.

This is a particular difficulty in beef herds run under extensive conditions, though treatment may be applied effectively in dairy herds.

Individual treatments include a wide variety of drugs both old and new. The old include silver nitrate, boric acid and zinc sulphate solutions. In general they have been discarded for more effective remedies. Treatment is most effective with antibiotics such as chloromycetin and terramycin for all stages of the disease. The powder puffer pack preparations are used more widely, being more convenient to handle, but opthalmic ointments tend to give better results.

Commercial preparations of sulphonamides are much cheaper but not nearly so effective. Penicillin is beneficial only in the very early stages.

Combined antibiotics and corticosteroids are used in the treatment of valuable animals. Veterinary advice should be sought in these cases.

Control

The control of contagious ophthalmia is complicated by the presence of recovered animals which serve as carriers and become a constant reservoir of infection in the herd.

The prevention or control of the disease is difficult because of the method of spread. In dairy herds and studs, isolation and repeated treatment of affected animals is all that can be done.

In beef herds, animals can usually be treated only once and it is probably best to avoid handling or mustering during an outbreak so as to limit the spread.

There is no successful field-tested vaccine and because there is only temporary immunity produced to the disease it is unlikely that one will be developed.

New Safety Code For Agricultural Work

SAFETY AND HEALTH IN AGRICULTURAL WORK is a new code of practice issued by the International Labour Office (Geneva) to provide practical recommendations for safety and health precautions in all types of farm work.

Increasing mechanization and the growing use of chemicals are just two aspects of agricultural work which are now exposing the agricultural worker to occupational hazards no less serious and probably more various than those of the industrial worker. These hazards are reflected in current farm accident statistics and have prompted the publication of this new code, which was drafted by a meeting of experts convened by the ILO.

In a clear and compact form, the code provides basic information about safety and health precautions relating to farm buildings, pits, cellars and silos, fire protection, machinery, engines, land clearance and soil and crop preparation, machines for harvesting and storing produce, woodworking and metalworking machines, hoisting and transport equipment, pressure vessels, hand tools, implements and ladders, vehicles, animals, dangerous substances, electricity, handling goods, personal protective equipment, hygiene, medical aid, accommodation and feeding, farm safety and health organization, and the reporting and investigation of occupational accidents and diseases.

The code is designed for use in government agricultural services, agricultural training services, farmers and farmworkers' organizations, farm managers and all concerned with safety in agriculture.

Safety and Health in Agricultural Work (Australian Price: $1.65 including forwarding charges) can be ordered now from the ILO Sales Agency in Australia: United Nations Association of Australia, Victorian Division, 343 Little Collins Street, Melbourne, C.1., or Queensland Division, 289 Queen Street, Brisbane.

International A414

The International A414 is a general purpose tractor of 33 drawbar horsepower. It has pneumatic tyres in optional sizes 13·6, 14·9, 16·9 x 28 in. and 14·9 x 24 in. A conventional four speed gear box with a ratio change gives 8 forward and 2 reverse speeds. The tractor is designed for either drawbar or three-point linkage working. It has an International AD-154 4-cylinder 4-stroke indirect injection diesel engine of 154 cubic inches capacity.

The recommended fuel is distillate. The manufacturer's advertised value for engine power is 40 shaft h.p. for a stripped engine.

Further details, including an abstract of the manufacturer's specifications, are contained in the full Technical Report from which this abridgement has been made.

The Test Tractor

The test tractor was chosen at random from new stock in the yard at the manufacturer's Geelong works by a representative of the National Farmers' Union. As will be seen from the Performance Summary, the test tractor came fairly within the range of values that could be expected for a fully equipped engine.

It was run-in in accordance with instructions contained in the Operator's Manual supplied with the tractor, namely for 20 hr. at loads not exceeding half load. Full power was measured in a 2-hr. test after running-in; a check test after a further 45 hr. of test running showed a gain in power of 0·5 h.p.

Fuel pump calibration was within specified limits; governor setting was as indicated. Fuel used was "Mobil" distillate, weighing 8·24 lb. per gal.

Tractor identification numbers were: Serial No. A414/3283; Engine No. AD154/3258.

No water was added and no repairs or adjustments were made during the tests.

Oil consumption for the 45 hour test period was approximately 5½ pints, but, since this engine employs a chrome-plated top ring, this rate of consumption might be expected to improve with further running. The engine and transmission were partly dismantled at the end of the tests, and found to be in satisfactory condition; some slight damage to ring gear teeth suggested that the starter mechanism was in need of adjustment.

Drawbar tests were done with the tractor ballasted to the maximum recommended by the company for normal agricultural drawbar use. Total weight including the driver was 5,750 lb. (front axle 1,760 lb., rear axle 3,990). This weight included 75% water in front (6·00 x 16) and rear (14·9 x 28) tyres. Solid ballast was 1-90 lb. weight on each front wheel, 2-105 lb. weight on each rear wheel and 1-140 lb. front chassis weight. A static test showed that it was well within the capacity of the three-point linkage to transfer to the rear wheels a weight equivalent to this added ballast.

Drawbar height was 17½ in. The tests were done on a level tarmac road. Further information on the effect on performance of varying drawbar height, weight, wheel equipment, road surface and other questions of interpretation of tractor test data may be obtained from Machinery Advisory Officers of the State Departments of Agriculture or from the Tractor Testing Officers at the University of Melbourne.

Performance Summary

—	Engine Crankshaft	P.T.O.	Belt Pulley	Drawbar
Full power—h.p.	39	36	35	33
At engine speed—r.p.m.	2,000	2,000	2,000	2,000
Fuel economy—lb./h.p.-hr.	0·48	0·52	0·54	0·58
Fuel consumption—lb./hr.	18·7	18·8	18·9	19
gal./hr.	2·3	2·3	2·3	2·3

Full crankshaft torque—at rated speed 102 lb.ft.
at 1,450 r.p.m. 112 lb.ft. (max.)

Best economy—0·43 lb./shaft h.p. at 85% load between 1,200 and 1,500 r.p.m.

High idle speed—Specified, 2,200 + 25 r.p.m.; used in test (as delivered, sealed), 2,270 r.p.m.

Drawbar Performance

Gear	At Maximum Power				
	d.b.h.p.	Engine r.p.m.	Pull lb.	Speed m.p.h.	Slip %
1	17	2,170	4,250	1·5	15·5
2	27	2,120	4,150	2·4	15·0
3	33*	2,000	3,600	3·5	10·2
4	34*	2,000	3,000	4·2	7·4
5	35*	2,000	2,400	5·5	5·0
6	35*	2,000	1,750	7·6	3·5
7, 8	—	Road gears, not tested			

* These correspond with engine at full power at rated speed.

Gear	At Maximum Pull		
	Pull lb.	Engine r.p.m.	Pull limited by
1	4,500	2,150	Wheel slip
2	4,500	2,100	Wheel slip
3	3,900	1,400	Engine torque
4	3,250	1,400	Engine torque
5	2,650	1,400	Engine torque
6	1,950	1,400	Engine torque
7, 8	Road gears, not tested		

Fuel consumption—various loads, Low 3rd gear (from 10 hr. test).

Pull lb.	Speed m.p.h.	d.b.h.p.	Slip %	Fuel	
				gal./hr.	lb./ d.b.h.p. lb./ d.b.h.p.h.r.
1,400	4·1	15	3·0	1·4	0·73
2,150	3·9	23	4·5	1·7	0·60
2,700	3·8	27	6·5	1·9	0·58
3,250	3·6	31	8·0	2·2	0·57

Inspection Report

Power Take-Off. The p.t.o. fitted to the test tractor was the optional "non-live" single speed unit. The standard fitting is a "live" p.t.o.; other optional two speed fittings are also available.

The test p.t.o. gave B.S. (British Standard) speed of 545 r.p.m. at rated engine speed, 2,000 r.p.m. It is a standard 6 spline, 1⅜ in. dia. with guard and cover according to B.S. 1495, and located centre rear 25 in. above ground on 14·9 x 28 tyres. Control is by main clutch and hand lever at l.h. side of seat. A lockout device prevents this optional p.t.o. from being operated in the "high-ratio" gears.

Belt Pulley. The belt pulley unit mounts on the p.t.o. for rearward working at 1,285 r.p.m. in either direction of rotation, and gives B.S. standard belt speed 3,190 f.p.m. at rated engine speed 2,000 r.p.m.

Three-Point Linkage. The 3-point linkage conforms to BS1841 for both categories 1 and 2. Both "position" and "draft" control are provided by the I.H. "Vary-touch" system. The speed of lift can be adjusted by a manually-operated valve. External hydraulic circuits can be supplied.

Drawbar. The swinging drawbar conforms to B.S. 1495. A fixed drawbar is also fitted, and linkage mounted drawbar is available.

Driver's Accommodation. Access to the seat is adequate from either side forward of the rear wheels. Flat foot plates are provided either side of the transmission housing; in the unit tested, vibration transmitted to the l.h. side footplate was so uncomfortable that the driver could not keep his foot on it. The seat is a fabricated metal bucket seat with an unholstered rubber cushion and backrest, rigidly mounted on the tractor. Three alternative fixing positions give 2¾ in. fore and aft adjustment; a further 2 in. is obtained by a hand-operated latch.

All controls are conveniently placed and easily operated. Brake and clutch pedals are 20 in. apart and 14 in. below loaded level of seat. It was noted that the brake pedal latch repeatedly came out of engagement during running.

Operating features. Turning circles (minimum outside diameters on a consolidated dry gravel surface with track widths, front 46½ in., rear 53 in.) were as follows: No brakes—25 ft.; with brakes 20 ft.

Ground clearance is 16 in. to the underside of drawbar fittings. Centre of gravity is 24 in. ahead of and 2 in. above the rear axle for a fully ballasted tractor. The steering is manual, and was easy and sensitive at all loads.

Standard and Optional Equipment. Standard equipment includes ammeter, water temperature and oil pressure indicators (band markings only), tachometer incorporating hour meter, dial graduated also to read m.p.h. road speeds in each gear for 11 x 38 tyres.

A "live" 545 r.p.m. single speed p.t.o. and 3-pt. linkage are also standard.

Optional equipment fitted on the test tractor comprised "non-live" p.t.o. belt pulley unit, wheel weights and front chassis ballast weight. Other optional features not fitted include lights, 2-speed "live" p.t.o. and remote control hydraulic equipment.

Users' Service. The usual minimum kit of hand tools, and a reasonably satisfactory illustrated Operator's Manual are supplied. Service is available throughout Australia from I.H. dealers and agencies.

Australian Tractor Testing Committee.

Plate 1: Yapunyah (*Eucalyptus ochrophloia*) approximately 27 miles south-west of Charleville.

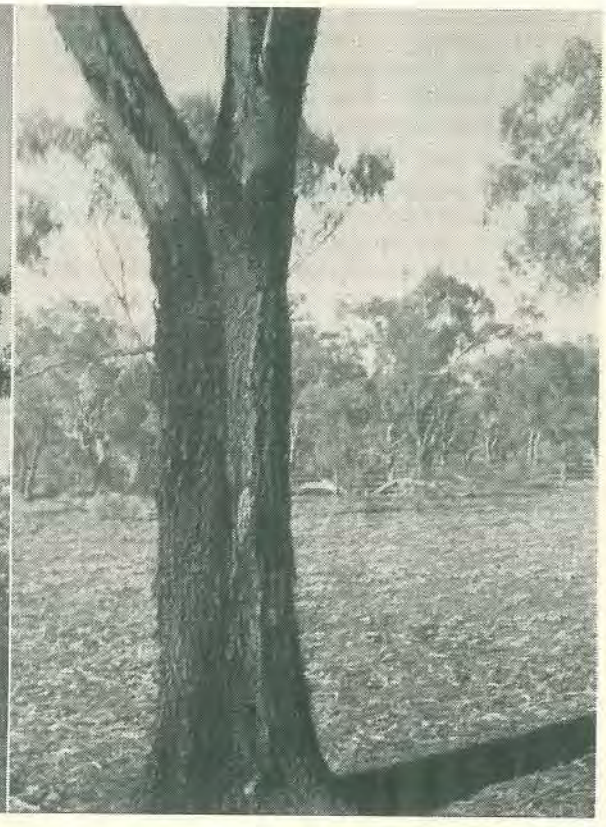


Plate 2: Yapunyah trunk, showing the blackish-brown, thick, "box" bark.

Yapunyah—A Source Of Honey

In south-western Queensland the eucalypt, yapunyah, will achieve importance as a nectar-producing tree as roads make it more accessible.

Of recent years, in north-western New South Wales, beekeepers have migrated on to stands of yapunyah along the Paroo River north of Wilcannia. Upwards of 100 lb. of honey per colony have been harvested.

This tree is pollen deficient as far as honeybees are concerned, and colonies working this species often dwindle. Accordingly, pollen

Plate 3: Yapunyah branchlet with leaves, buds, flowers and seed capsules.

by C. Roff, Beekeeping Adviser.

supplements should be fed to apiaries on yapunyah, and, as the habitat is dry, sufficient water for colony requirements must be transported.

The following particulars will be useful to beekeepers:

Usual flowering time—May-October.

Importance as Source of Honey—Medium.

Importance as Source of Pollen—Minor.

Honey Characteristics—Colour is extra light amber (Pfund Colour Grade range 41·8 mm to 44·8 mm); of light density (78-79 per cent. total solids) with a good flavour; candies rapidly with a firm, smooth, deep cream grain.

Official Common Name—Yapunyah.

Other Common Names—Napunyah, Lapunyah.

Botanical Name—Eucalyptus ochrophloia F. v M.

Distinguishing Features—A tree with a blackish-brown, spongy, persistent "box" bark on the trunk and brownish-yellowish smooth bark on the upper parts. The leaves are glossy green, and the buds and cylindrical seed capsules are fairly long.

Description—A tree 30 to 50 ft. high with blackish-brown, spongy, persistent "box" bark on the trunk as far as the lower limbs; the bark on the smooth limbs ranges from brownish-yellow to greyish on the branchlets. The thick, slightly sickle-shaped, glossy green leaves are alternate, often unequal at the base, mostly 4-6 in. long, and usually ½-1 in. broad, with lateral veins fairly steeply ascending. The branchlets are slightly angular. The flowers are cream-white about $\frac{5}{8}$ in. wide when fully out, and borne on stalks in stalked clusters among the leaves. The buds taper to both ends and attain a length of about ¾ in. before opening; the lid is conical with a beak-like tip. The seed capsules are about ¾ in. long, somewhat cylindrical and tapering into the stalk; inside are three, occasionally four, sunken valves and cells.

Distribution—Occurs mainly on channels and flood plains of the inland Warrego, Paroo, Bulloo and Wilson Rivers to Kyabra Creek.

Book Review

Bobby Boutflour

The Life and Reminiscences of Professor Robert Boutflour, C.B.E., M.Sc. Crosby Lockwood & Son Ltd., London, England. (Copies from the publishers or local booksellers.)

Those who remember Professor Boutflour's visit to Australia in 1955 will be pleased to find this biography is available. Professor Boutflour was one of the leaders in the agricultural revolution of this century in which the art of farming and livestock husbandry was replaced by the science of farming and livestock husbandry.

Finding one of his great interests lying with dairy cattle husbandry, Bobby Boutflour developed a systematic approach to the feeding of dairy cattle. This approach, promoted in his dynamic fashion, was credited with having lifted Britain's supply of milk by more than a million gallons a day enabling the entire population to have fresh milk throughout the years of World War II.

This story of Professor Boutflour is also one of the Royal Agricultural College at Cirencester and its development. Students from the Royal Agricultural College have spread throughout the Commonwealth. Some have come to Queensland, indicating that the influence of Professor Boutflour through his successors and the students at the College has indeed been wide and lasting.

In Queensland we are seeing many changes in education including agricultural education and this book is recommended to those who are concerned about the training of our rural youth as it contains valuable lessons for us all.—*G. I. Alexander, Director of Cattle Husbandry.*

Summer Rains Fail

Relief rains at the end of March, for the most part, improved rural prospects in the south-eastern districts extending northward to the Callide Valley. The remainder of the State, except a few favoured areas on or near the coast, continued to dry off as normal summer rains failed to materialize. The central inland received only patchy rain while the area west from Winton to the State border and southward to the Warrego has reverted to drought. However, a few areas of the channel country have benefited from flood run-off. Some isolated localities in the south-west have received no worthwhile drought relief at all. The dry grass existing in many inland regions could constitute a fire risk, given the right weather conditions.

A high proportion of the sheep country faces renewal of drought conditions unless early relief is received. Mulga pushing has been resumed in the south-west. Stock are still in fair to good condition but the winter prospects are poor. Only on the Darling Downs and closely adjacent districts is the outlook reasonably good. Wool prices have firmed slightly, presumably in anticipation of a shortage.

Cattle are in a better position. Earlier good rains in the Carpentaria region have provided ample feed. There is still plenty of relief country available on which to move stock from the west and the central inland. In addition, the fodder situation is much improved compared with that of last November.

The outlook for dairying remains good in the south-east, particularly since the recent rains, although a few dry pockets persist. However, prospects are still very variable in the central districts where recently some farmers were still carrying water. The pig industry appears to face a fairly safe winter with anticipated improvement in summer grain output. However, much depends on the proportion of the harvest retained for the local market.

Grain sorghum production is forecast at 8,000,000 bushels (215,000 tons). This is considerably in excess of earlier expectations and is attributable to the timely break in the weather on the Darling Downs where about 134,000 tons (more than 5,000,000 bushels) are expected to be harvested. Prospects are poor, however, in central Queensland where output is estimated at only 55,000 tons. Maize production is expected to be about a normal 4,500,000 bushels (112,500 tons), a considerable improvement on the 3,300,000 bushels estimated to have been harvested last year.

Peanuts were set back by below normal summer rainfall in the South Burnett district. Recent relief will improve prospects for the late plantings but average yields per acre at this stage are expected to be slightly below normal. Widespread incidence of mould has also caused serious concern. Cotton prospects remain good. Rains in the Lockyer and Darling Downs districts have created harvesting problems but the earlier estimation of 9,000 bales of raw cotton is still expected to be realized.

Some tobacco crops at Inglewood were reported to have been virtually destroyed by a hailstorm. Elsewhere, however, crop prospects are generally good, and the 14,000,000 lb. State quota is expected to be met. Sugar cane in the north has generally been set back by the dry weather. Recent rains have given non-irrigated areas in southern Queensland welcome relief.

The outlook for potatoes and onions in southern Queensland is good to excellent, and on the Atherton Tableland prospects have improved in recent weeks. The fruit and vegetables position in the south-east is very sound having received a boost from the recent soaking rains. Citrus prospects are now good and a heavy pineapple crop seems to be assured.—*C. H. Wheatley, Marketing Officer.*

Knowing The Value Of Fodders

by K. J. Rowan, Husbandry Officer.

Plate 1: Hereford weaner steers grazing cereal hay.

Knowing the nutritive and productive values of foodstuffs as well as their limitations, allows graziers and dairymen to make better use of them. It also aids in property management including property design and improvements, utilization of crops and pastures, fodder conservation and finally the type of production most suited to the property. The nutritive and productive values of animal fodders are closely correlated so that one can be predicted to some degree from a knowledge of the other.

NUTRITIVE VALUES OF FODDERS

The three things that indicate the nutritive value of a fodder are:

(i) protein value
(ii) energy value
(iii) essential minerals

(i) *Protein Value.* The protein value of a fodder is governed by its nitrogen content which can be readily determined by chemical analysis. Protein percentage is then calculated as 6·25 x, the nitrogen percentage giving the crude protein content. Not all the protein in a fodder is digested so that the proportion digested is known as the digestible protein of a fodder.

(ii) *Energy Value.* The energy value of a fodder is usually expressed by either T.D.N. (Total Digestible Nutrients) or S.E. (Starch

Plate 2: Cows on a daily grazing of nutritious lucerne.

Equivalents). The T.D.N. is readily calculated from the chemical analysis of a fodder and so is more generally used. The total digestible nutrients is the sum of the digestible carbohydrates or starches plus the digestible fibre plus the digestible protein plus the digestible fat (x 2·5). Fat has two and one half times more energy value than the other components of a fodder. These all combine to give the T.D.N. assessment of the energy value of a fodder.

(iii) *Minerals.* Calcium (Ca) and phosphorus (P) are the two most important minerals in animal nutrition. Not only must the total daily intake of each of these two minerals be considered, but also their ratio.

Factors affecting Nutritive Values. Seasonal conditions, especially soil moisture, can influence the nutritive value of crops and pastures. Soil fertility also exercises an influence through its effects on plant composition and rate of growth.

The two plant categories, legumes and grasses, have quite different nutritive values but stage of growth does influence them both, with a marked decline in nutritive value after maturity. This rate of decline is more severe in grasses. Legumes at the same stage of growth have a higher protein content than grasses but have a lower energy value than grasses of similar protein content. Legume seeds have higher protein and energy values, the latter being due to the high oil content.

The calcium content of legumes is higher but the phosphate content is lower than grasses of a similar stage of growth. All cereal grains are low in calcium (0·05% in wheat, 0·02% in maize, 0·07% in pollard). Most oil seeds have a reasonable level of calcium. Cottonseed meal has 0·2% and linseed meal 0·35% calcium.

The cereal grains have reasonable levels of phosphorus (wheat 0·4%, maize 0·28%, bran 1·3%). Legume seeds are generally adequate in phosphorus (cottonseed meal 1·1%, linseed meal 0·9%).

CROPS

Under seasonal conditions in Queensland, cropping programmes are built around summer and winter crops.

Summer Crops

Production from summer crops is far superior to that derived from both improved and non-improved dry land pasture with good management. It is largely dependent on adequate soil moisture which overshadows other growth and production factors, although soil nutrients, particularly nitrogen and phosphorus, are important.

(*a*) *Non-Leguminous Summer Crops.* In this category are such crops as sweet sorghums, hybrid grazing sorghums, sweet sudan, white panicum, and millets. All are of similar chemical composition and nutritive value at equivalent stage of growth. Production potential of this group, growth factors being comparable, would be largely dependent on management influencing palatability, digestibility and dry matter production per acre.

Generally speaking, nutritive value of non-leguminous summer crops closely resembles that of the general grass species in which high values occur when the plant is young and growing, but fall off rapidly after maturity. Protein fluctuation is most marked, declining from approximately 17-20% in the young growing stage to 5-6% on maturity. Decreased energy content is also apparent with maturity but the fall is not so drastic as that of protein. The fall in T.D.N. or energy value is closely related to the rise in fibre content, which, in itself, renders mature crops less palatable and decreases intake. Digestibility also decreases with maturity, and although there may be greater bulk of feed with the increased fibre content production generally suffers.

In the growing stage these crops are capable of weight gains in beef cattle of over 2 lb. a day and milk production from dairy cows of over 2 gal. a day. This rate of production gradually declines as crop maturity approaches and fibre content increases.

Although the digestibility of the plant as a whole is decreasing, animals are capable (up to a point) of compensating for this fall by selective grazing, with the resultant nutritive value of feed intake being superior to that of the whole plant. Selectivity, while increasing the value of the diet, has its limitations, and production suffers as feed intake and palatability decrease.

An important consideration with sorghums is the H.C.N. (prussic acid) content which can cause toxicity in grazing cattle. This varies with the species, stage of growth and seasonal conditions.

Plate 3: Harvesting silage under wet field conditions.

Plate 4: Dehorned Friesian cows strip-grazing a barley crop.

TABLE 1

NUTRITIVE VALUES OF WHOLE CROP AND THAT PORTION SELECTED BY STOCK

Time from Planting	Protein %		T.D.N. %		Ca		P	
	Whole Plant	Selected	Whole Plant	Selected	Whole Plant	Selected	Whole Plant	Selected
			Summer Crop (Sorghums)					
4 weeks	19	20	60	60	0·45	..	0·30	..
6 weeks	17	20	57	60	0·43	..	0·28	..
8 weeks	16	20	55	59	0·41	..	0·25	..
10 weeks	14	19·5	54	58	0·40	..	0·22	..
12 weeks	11	19·5	53	57	0·35	..	0·21	..
14 weeks	8	18·5	52	56	0·30	..	0·20	..
16 weeks	6	18	47	54	0·27	..	0·19	..
18 weeks	5	16·5	40	50	0 25	..	0·15	..
20 weeks	4·5	14	40	46	0·23	..	0·10	..
			Winter Crop (Cereals)					
4 weeks	20	20	65	65	0·45	..	0·30	..
6 weeks	19	20	60	63	0·44	..	0·28	..
14 weeks	17	20	60	62	0·42	..	0·26	..
18 weeks	16	20	60	61	0·41	..	0·24	..
22 weeks	15	19	55	59	0·40	..	0·22	..
26 weeks	12	16·5	50	56	0·34	..	0·20	..
30 weeks	9	13	50	53	0·27	..	0·19	..
34 weeks	4	6	40	45	0·25	..	0·10	..

(*b*) *Summer Legumes.* Included in this category are the several varieties of cowpeas, dolichos lablab and velvet beans. These species have a characteristic chemical composition, being a rich source of protein, with energy adequate to maintain good production until growth is halted by severe frosting or continuous cold weather.

Their protein content of from 25 to 30% during the initial stages of growth, falling to 15 to 20% on maturity is more than sufficient to maintain animals in a positive protein status when grazing such crops.

Dolichos lablab is a fairly recent introduction and is becoming a very popular summer grazing crop. It has a greater tolerance to dry conditions than most other summer legumes. Its palatability is not high and grazing is usually confined to the leaves. This enables regrowth to come away from the undamaged stems and provides high quality grazing into the winter.

Cowpeas are more palatable than dolichos but have the disadvantage of being susceptible to stem rot.

TABLE 2

COMPARISON OF GREEN WEIGHT AND DRY MATTER LB./ACRE—FIRST CUT ONLY

Crop	Green Weight	Dry Matter
Dolichos lablab	11,547	1,905
Cowpeas	12,148	1,817
Velvet Bean	6,206	1,118
Sudan	12,725	3,487
White Panicum	7,193	1,238

TABLE 3

DAILY MILK YIELD (ON STANDARD COW BASIS)

Crop	Production Milk (lb.)			
	January	February	March	April
Dolichos lablab ..	34·7	34·0	32·3	32·0
Cowpeas	29·2	27·4	35·2	38·2
Velvet bean ..	31·4	27·3	30·2	29·7
Sudan	28·5	29·7	30·8	31·2
White panicum ..	30·0	27·4	32·9	34·8

Winter Crops

Winter crops can play an important role in bridging the nutritional gap caused by the poor winter productivity of our pastures. The most important winter crops are oats, barley, wheat and safflower. Oats are the most commonly used for grazing because of their superior yield and productivity. More interest is being shown in safflower as a grain crop. It can be expected also to be used more widely as a grazing crop with its different growth habit and greater resistance to dry conditions.

The protein content of oats is of the order of 18–8% depending on stage of growth and a T.D.N. value of 60-65%, and is capable of providing adequate nutrition for all classes of beef and dairy stock, with weight gains of 1·1–3 lb./day and milk production of 2–3 gal./day.

In crop fattening studies using oats for the period 1958-60, it was found that the crops were usually grazed over June to October, even commencing in some cases in March, and later crops lasting until December. The average live weight grain per head was 1·98 lb. a day, ranging from 1·1 to 3·1 lb. a day. Oats were also studied in the feed lot in 1963-64, giving live weight gains averaging 2·0 lb. per day per head in 1963 and a lower average of 1·4 lb. per day per head in 1964. The range in gains over the 2 years was between 1·0 and 2·5 lb. per head per day.

On a per acre basis grazing oats gave on the average 132 lb. carcass gain per acre as compared with approximately 200 lb. carcass gain per acre for the feed lot. However, these comparisons need to be made over a longer period to provide a better coverage of the seasons and conditions likely to be encountered.

Stock take to the crop readily but in the young growing stage excessive moisture content (80%) can result in scouring and a fall in the butterfat content of milk. In 1964 there was a drop in protein content (from 14–16% to 3–6%) due to overlush growth and severe frosting. Production was limited as indicated by weight gains in beef cattle of only 0·5 to 1·5 lb./day. However, this was an extremely rare and exceptional situation.

Oat varieties can be divided into three distinct classes depending on growth rate and maturity. Plant analysis and productive records indicate very little difference between varieties when grown under average conditions. Differences which do occur between varieties with varying growth periods and growth habits can be attributed to seasonal influences favouring one variety.

TABLE 4

OAT VARIETY PRODUCTIVITY AND NUTRITIONAL VALUES

Variety	B.D.G./ Acre	Daily Weight Gain	Protein %	P%	Ca%
Garry ..	102·7	2·3	19·6	0·25	0·26
Bentland	100·6	2·4	19·8	0·17	0·18
Algerian	92	2·5	20·6	0·16	0·18

Safflower is comparable with oats in nutritive value and productive capacity, but animal acceptability is poor until a taste is acquired, usually after 2-3 days. Its protein, T.D.N. and mineral content is high during the early growing stage, being capable of maintaining production from all classes of livestock. At maturity, the increased fibre content and prickly nature of the plant greatly reduce its palatability so that grazing must be regulated to prevent the plant from getting away from the stock.

TABLE 5

SAFFLOWER/OATS COMPARISON, 1965

Date	Crop	Protein	Fibre	P	Ca
15 September, 1965 ..	Safflower	27·4	13·1	0·44	1·22
15 September, 1965 ..	Oats	17·1	22·5	0·35	0·46
25 October, 1965	Safflower	15·2	22·8	0·32	1·23
25 October, 1965	Oats	14·6	25·1	0·37	0·64

Crop	Beast Days Grazing/Acre	Production lb. Milk/Day
Safflower	112	30·1
Oats	87·5	29·7

TABLE 6

REPRESENTATIVE ANALYSIS OF CROPS

Species	% Moisture	% T.D.N. As is	% T.D.N. on Dry Matter Basis	% Protein Dry Matter Basis	P	Ca
Hybrid sorghums	75	13–17	52–68	13	·30	·45
Sudan (young)	78	14·5	65·9	11	·30	·45
Sudan (in bloom)	76	15	62·5	6	·19	·27
Japanese millet	78	14·5	65·9	12	·30	·45
White panicum	75	15	60	12	·30	·45
Cowpeas	83	11	64·6	25	·07	·45
Dolichos lablab	80	12·5	62·5	27	·06	·44
Velvet beans	80	12·4	62	19	·06	·42
Lucerne (½ bloom)	75	15	60	22	·07	·52
Lucerne (past bloom)	71	14·6	50·3	15	·06	·34
Winter Crops—						
Oats, wheat, barley—						
Young shot blade	85	9·5	63·3	16	·33	·46
Milky dough stage	74	17	65·4	8	·25	·41
Stubble	65	12	34·3	2·5	·10	·25
Safflower	78	13·6	62	27	·44	1·22

PASTURES

Dry Land Pastures

Because of the summer incidence of rainfall, growth of native pastures is restricted to this season, supplying adequate nutrition for animal production for approximately 4–5 months of the year. The nutritional value of pasture is high during the initial stages of growth, but limits production after maturity is reached. Protein and T.D.N. values (of 12–18% and 60–65% respectively) during this initial growth stage are adequate for weight gains of 2 lb. a day and milk production of 2 gal. a day.

Quality fluctuations in native pastures and not availability or bulk determine animal performance unless drought conditions prevail or gross overstocking is practised. Protein content first deteriorates, reaching a level of 4–8% soon after maturity. Palatability and digestibility also fall, reducing appetite. Intake suffers, adversely affecting animal performance. This is associated with a similar downward trend in T.D.N. or energy concentration, eventually reaching a value of 30–40%, which is insufficient to maintain any form of production.

Improved dry land pasture without a legume follows a similar basic pattern to native pastures, doing little to alleviate the winter stress period. However, if adapted to the environment, improved pastures will lift overall production. They are generally superior in bulk, palatability and digestibility, and retain their nutritional value longer than native species so that the period of low quality fodder availability in winter is shorter.

To reduce this non-productive period still further, the first need is to improve the protein content of the pasture by incorporating legumes into the pasture.

TABLE 7

FLUCTUATIONS IN NUTRITIVE VALUES OF NATIVE PASTURES

Month	Crude Protein%	T.D.N.%	Ca	P	Dry Matter%
July	1–3	35–40	0·25	0·10	90
August	1–3	35–40	0·25	0·10	90
September	1–3	35–40	0·25	0·10	90
October	1–3	35–40	0·25	0·10	90
November	1–20	60–57	0·46	0·30	12
December	17–15	57–53	0·44	0·25	17
January	15–11	53–46	0·42	0·22	20
February	11–7	46–42	0·38	0·16	25
March	7–4	42–40	0·35	0·13	50
April	3–1	40–37	0·25	0·10	85
May	3–1	40–35	0·25	0·10	90
June	3–1	40–35	0·25	0·10	90

Irrigated Pastures

Irrigation provides one method of ensuring year-round, high quality fodder. Irrigated pasture mixtures can contain white clover, strawberry clover, phalaris, cocksfoot, perennial prairie and lucerne.

Management of these pastures is extremely important. It is possible to achieve production from beef cattle of 2–3 lb. a day and milk production of 3 gal. a day from these pastures which are high in moisture (80–85%), protein (18–25%), and T.D.N. (65–72%). Excessive moisture and bloat can cause problems with these pastures.

CONSERVED PASTURES

Conserved fodders can be divided into four basic groups, dependent on their nutritive value and the form they take:

1. Bulk Fodders
2. Concentrates
3. Mineral Concentrates
4. Vitamins

Conserved fodders are rarely used to provide the full ration, but they are employed extensively as supplements. To do this effectively, knowledge of both the basic and supplemental portions of the diet is absolutely essential. With increased interest in lot and stall feeding, conserved fodders are becoming more important. Therefore, understanding of the animal requirements from, and the nutritive value of, conserved fodders is essential for their efficient use.

Bulk Fodders

Bulk fodders include such materials as silage, lucerne hays, cereal hays and stubbles and can be divided into high quality and low quality groups depending on the level of protein. They are fed in substantial amounts due to their low nutritive value, except under particular circumstances, for example, drought feeding and as a feed regulator.

Low quality roughages include silage made from summer-grown crops, cereal hays and stubbles. The protein content of these materials ranges from 3–9% with a T.D.N. rarely exceeding 50%. Stock on this class of fodder usually require additional protein for maintenance and both protein and energy for production.

High quality roughages include legume hays and silage made from immature crops or pastures containing a high legume component. The protein content of such fodders is usually in excess of 10% with a T.D.N. level of about 50%.

TABLE 8

Description	Protein %	T.D.N. %
SILAGE—		
Sweet Sorghum, Sudax, Zulu, Sudan, White Panicum—		
Conserved when dough stage	5–7%	50%
Dough stage and legume	8%	50%
Fully mature	3–5%	45–47%
Fully mature + legume	5–7%	45–47%
Maize Silage—		
Early Dent.	7%	50–53%
Mature	5%	50%
LUCERNE HAY—		
Good quality lucerne hay	14–16	55
Fair quality lucerne hay	12	50
Poor quality lucerne hay	10	45
CEREAL HAYS AND STRAWS—		
Cereal Hay—		
Good quality	9	50
Fair quality	7	47
Barley, Wheat and Oats Straws	3	42

Concentrates

(*a*) *Protein Concentrates*: Protein concentrates can be divided into two basic groups, according to their chemical composition—

(i) non-protein nitrogen, e.g. urea.

(ii) true protein.

(i) NON-PROTEIN NITROGEN: Urea, a synthetic, non-protein, nitrogenous compound can be utilized effectively by ruminants, provided it does not form more than one third of the animal's protein requirement. Protein produced from urea by ruminal microflora is more efficient when there are ample phosphorus, trace minerals, sulphur and a source of readily available carbohydrate in the rumen of the animal.

Because of its high nitrogen content, urea is equivalent to over 2½ x its own weight of protein. Consumed in large amounts or in a concentrated form, urea can be toxic, so that the intake must be regulated and kept below 3 oz. daily.

(ii) TRUE PROTEIN: In ruminant feeding, total crude protein content of the individual product is of greatest importance. With pigs and poultry the quality of the protein needs to be considered but this is not a factor with cattle or sheep.

Some protein concentrates, particularly those of animal origin, contain appreciable amounts of calcium and phosphorus. This is often overlooked in compounding rations.

All protein concentrates other than urea have high T.D.N. values, but this is of little importance since they are used in such small quantities.

TABLE 9

AVERAGE COMPOSITION OF CONCENTRATED FEEDS

—	%T.D.N.	%C.P.	%D.P.
Protein Concentrates—			
Liver meal	70	65	55
Meat and bone meal	65	50	40
Cottonseed meal	75	40	30
Skim-milk powder	80	35	30
Butter milk powder	80	35	30
Linseed meal	75	35	25
Blood meal	70	70	60
Energy Concentrates—			
Sorghum	80	10	8
Maize	80	9	8
Wheat	80	13	11
Barley	75	12	9
Oats	65	11	8
Pollard	75	15	12
Bran	65	15	13
Molasses	50	3	0

(*b*) *Energy Concentrates*: These include the various grains and grain by-products and molasses, their protein level being below 15 per cent. Most of the grains are similar in nutritive value. Oats and barley, because of their higher fibre content, are slightly lower in energy value than the other grains. All contain quite high levels of phosphorus but are low in calcium.

The productive capacity of a diet, provided protein is adequate, is determined by its T.D.N. or energy content. Energy concentrates are often employed to improve production whether it be in the form of milk or meat. By increasing the energy concentration of a diet, production increases until a point is reached where the amount of production increase per unit of energy supplied is uneconomic.

Mineral Supplements

Although many minerals are necessary for animal production, only phosphorus and occasionally copper have been found to be deficient in the diet of grazing animals in Queensland. However, when animals are confined and unable to select their own diet, mineral deficiencies often occur. Commonly, when large amounts of grain are fed, calcium needs to be incorporated in the diet.

TABLE 10

AVERAGE COMPOSITION OF MINERAL SUPPLEMENTS

—	%Ca	%P.
Ground Calcium Carbonate	38	..
Bone Flour	23	11
Superphosphate Supernatant Fluid	5	4
Christmas Island Phosphate	33	16

Vitamins

Vitamins are organic compounds necessary in very small amounts for specific functions in all body processes. Because of the nature of bovine metabolism, only vitamins A and D are likely to be lacking. As vitamin D synthesis is dependent on the action of sunlight on the animal's skin, this vitamin is never lacking under Queensland grazing conditions.

Deficiencies of vitamin A are not common as it is stored in the liver to such an extent that the liver stores can tide an animal over quite lengthy periods of no vitamin A intake. If anywhere, the effects of vitamin A deficiency would be seen in young animals under extreme drought conditions since the liver of the newborn calf or lamb contains very little vitamin A and it must rely on diet for this vitamin. In drought time there is little green feed containing the vitamin precursor, carotene, to enable a build-up of liver storage in the calf.

Vegetable Planting Guide

Varieties For July

by Officers of Horticulture Branch.

Vegetable	Granite Belt and Southern Downs	Lockyer and Fassifern	Coastal Southern Queensland	Central Queensland and Dry Tropics	Wet Tropics
Beans (French)	..	..	Brown Beauty Redlands Greenleaf	Brown Beauty Redlands Greenleaf Redlands Belle Redlands Pioneer	Brown Beauty Redlands Greenleaf Redlands Pioneer Redlands Autumn-crop
(Culinary)	..	..	..	Cannellini Borlotto Saluggia Black Rye Mandaloni	..
Beetroot	..	Detroit Dark Red Chieftain Parramatta	Detroit Dark Red Chieftain Parramatta Early Wonder	Early Wonder Derwent Globe Crimson Globe Wonder Green	Early Wonder Detroit Dark Red Chieftain Parramatta
Cabbages	Ballhead Hybrid Enkhuizen Glory Sugarloaf	All Seasons Ballhead Hybrid Enkhuizen Glory Sugarloaf	Ballhead Hybrid Enkhuizen Glory Sugarloaf Early Jersey Wakefield	Ballhead Hybrid Sugarloaf Early Improved Vanguard	Jubilee Hybrid Enkhuizen Glory Early Improved Vanguard
Carrots	..	All Seasons Western Red Topweight	All Seasons Topweight Western Red King Chantenay	All Seasons Topweight Chantenay Market King Western Red	All Seasons Western Red Topweight
Cauliflowers	..	..	..	Russian 2A Snowball Y	..
Celery	South Australian Selections	..	..	..	..
Cucumbers	..	Long Green Palmetto Marketer Crystal Apple	Marketer Palmetto Crystal Apple Ashley	Polaris Ashley Crystal Apple Palomar Marketer	Palomar Ashley Polaris Marketer Crystal Apple

Vegetable Planting Guide—Varieties for July—continued

Vegetable	Granite Belt and Southern Downs	Lockyer and Fassifern	Coastal Southern Queensland	Central Queensland and Dry Tropics	Wet Tropics
Lettuce	..	Yatesdale Winterlake	Winterlake Imperial Triumph	Pennlake Great Lakes Yatesdale Imperial 847	Pennlake Yatesdale Winterlake
Peas (Fresh Market)	Greenfeast Massey Victory Freezer	Victory Freezer Massey Providor Greenfeast	Greenfeast Massey Victory Freezer Providor Fiesta	..	..
Peas (Processing)	..	Victory Freezer Massey Providor	Victory Freezer Massey Providor Fiesta	..	..
Tomatoes	..	Grosse Lisse Q3 Indian River	Grosse Lisse Indian River Q2 Q5	*Rockhampton Region—* Grosse Lisse Indian River *Bowen Region—* Q3 C1402 Manalucie	Grosse Lisse Q2 Indian River

Farm Safety Films

The Queensland Health Education Council has commenced an extensive film tour of the north showing general interest, health, and farm safety films.

Two films dealing with farm safety were made here in Queensland last year and are entitled "Cane Harvesting with Safety" and "Tractor Safety". They are both in colour.

"Cane Harvesting with Safety" depicts many of the hazards associated with using the cane harvester and suggests ways to overcome them. There is also a short sequence on manual cane cutting.

"Tractor Safety" shows a remote-controlled experimental tractor. An Australian-made safety cab is shown.

Pygmy Geese In Australia

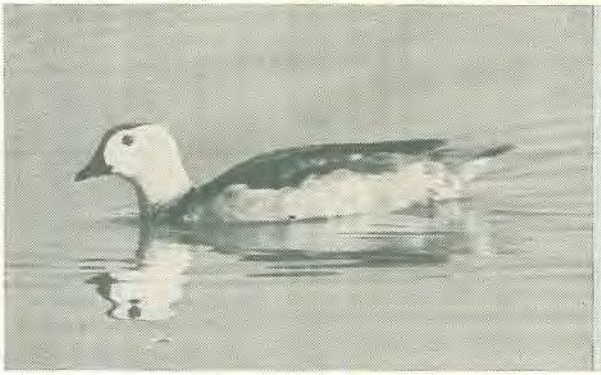


Plate 1: An adult male Australian pygmy goose showing the distinguishing predominance of white on the head and neck.

Plate 2: An adult male green pygmy goose showing predominance of green on head and neck.

- Pygmy geese are actually perching ducks and not true geese.
- Of the three species in the world two are found in Australia.
- Little has been recorded of these small, highly ornamental waterfowl.

The Australian (or white-quilled) pygmy goose, *Nettapus coromandelianus albipennis* Gould, a close relative of the Indian cotton teal, *N. c. coromandelianus* (Gmelin), is predominantly white. The crown, neck-ring, back and upper tail are finely marked grey. The secondary wing feathers are tipped white with a broad white

by H. J. Lavery, Research Entomologist.

Plate 3: A pair of Australian pygmy geese; female (foreground) with dark stripe through eye.

Plate 4: Pair of Australian pygmy geese settled on waterlily leaves for roosting and preening.

band also across the primaries of the male. The neck is white. The face, *including above the eye,* is white, with the female and immatures having a brown line through each eye. The beaks of all birds are black and the legs olive-green; the irises of adult males are bright red, of females brown and of immatures varying from grey to brown. Male Australian pygmy geese are larger than females, weighing respectively 14½ and 13½ oz.; body lengths of both approximate to 11½ in.

The green pygmy goose, *N. pulchellus* Gould, is predominantly dark metallic-green in colour; the underparts are white with flank, upper breast and tail feathers distinctly edged grey. The secondary

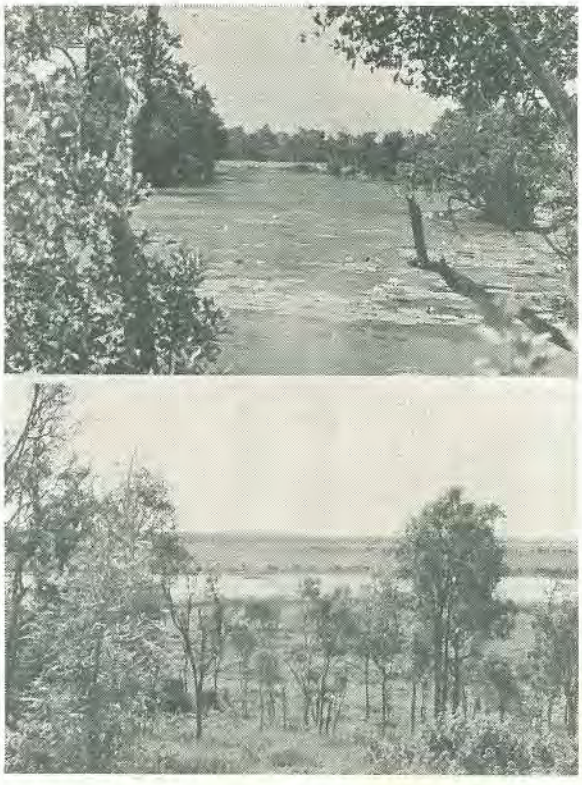


Plate 5: Typical habitat of both pygmy geese, "Nulla Waterholes" near Bowen, September, 1963.

Plate 6: Present-day site of the largest flocks of Australian pygmy geese, "Mt. St. John" near Townsville, February, 1960.

wing feathers are white. The neck is dark green (adult male) or grey (female); the cheeks are small white patches that *reach up to the eyes* in the female. The beak and legs are dark grey and the irises are brown or grey. There is no difference in size between males and females, both weighing approximately 12½ oz. and measuring 11 in. in body length. As with the Australian pygmy goose, the green pygmy goose young resembles the female adult of the species.

The call of each species is characteristic, that of the Australian pygmy goose being a distinctive, melodious, nasal cackle while that of the green pygmy goose is a simple short whistle.

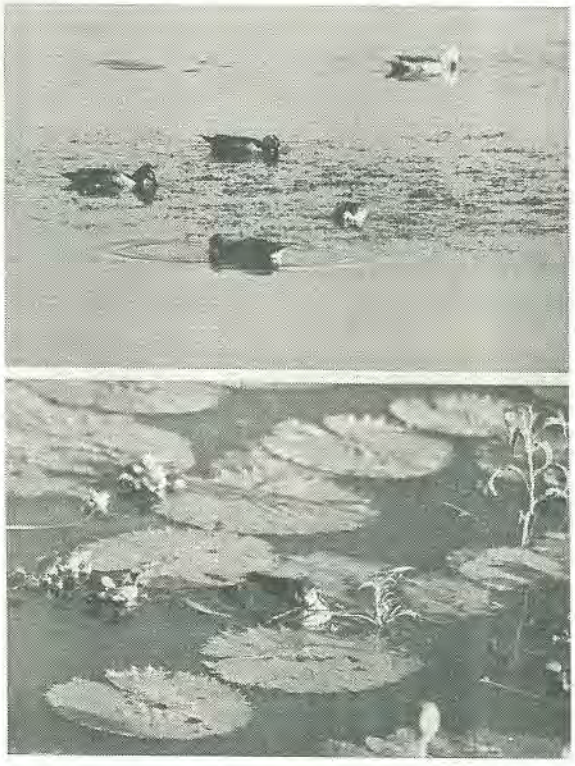


Plate 7: Flock of Australian pygmy geese feeding on submerged aquatic vegetation.

Plate 8: Green pygmy goose feeding by stripping seeds from an emergent smartweed.

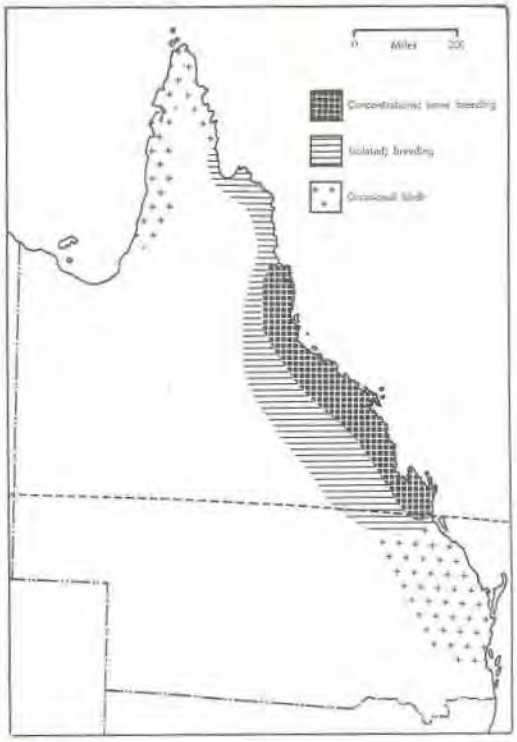


Plate 9: Present distribution of the Australian pygmy goose.

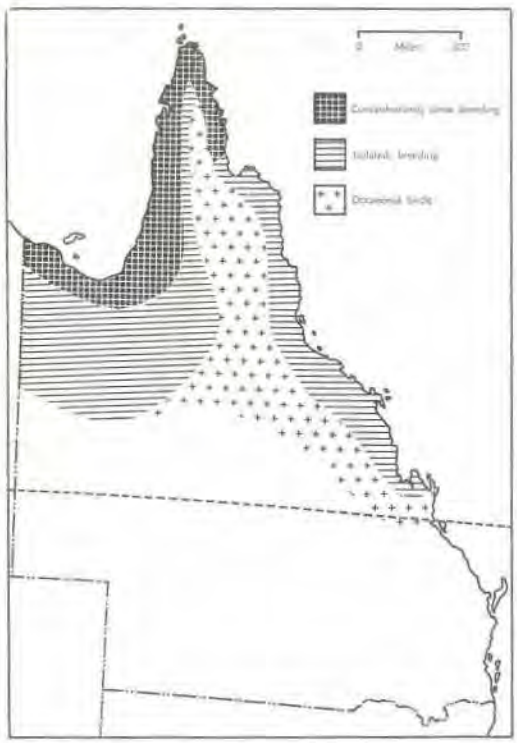


Plate 10: Present distribution of the green pygmy goose in Queensland.

Distributions

The Australian pygmy goose, one of the rarer waterfowl of the world, occurs only along the north-east Australian coast and has not been sighted more than 150 miles inland. It has been referred to as "possibly extinct" but recent counts throughout its range indicated that the population was of the order of 1,500 birds.

The green pygmy goose is more widespread, inhabiting the north from Broome (Western Australia) to Rockhampton and as far inland as Mt. Isa.

Habitats and General Habits

The principal habitats are the deep lagoons associated with rivers and creeks along the coastal plains; these often are simulated by earth tanks and dams constructed as stock-watering sites, which in time become heavily vegetated with two predominant plant groups of lagoons—the blue waterlilies (*Nymphaea* species) and the submerged and floating aquatics such as hydrilla (*Hydrilla verticillata* Casp.), hornwort (*Ceratophyllum demersum* L.), eelgrass (*Vallisneria* sp.), bushy pondweed (*Najas graminea* Del.), duckweed (*Lemna oligorrhiza* Kurz.), algae (*Chara* sp.), and others. Other habitats, frequently

with both pygmy geese present, are the large permanent freshwater lakes of which only relatively few exist within the species' range (for example at "Valley of Lagoons" west of Ingham), the long deep rivers and small isolated creeks edged with waterlilies, water snowflake (*Nymphoides indica* (L.) O.K.) and, in particular, pondweeds (*Potamogeton* species) which grow profusely during the drier months of the year, and finally the many shallow freshwater swamps with their wide variety of vegetation (notably bulkuru sedge (*Eleocharis dulcis* (Burm. f.) Trin.)).

Swamps and creeks are inhabited during wet seasons, lagoons during the wet and early stages of dry seasons, and rivers and lakes mainly in the later months of dry seasons, that is, from September to November.

Both pygmy geese species fly rapidly, twisting from side to side while flying low over water. Longer flights usually are accomplished overnight. Pygmy geese rarely have been seen out of water and then usually only when perched on low overhanging branches; the birds are clumsy walkers.

Feeding

Pygmy geese feed only on the surface of the water by dabbling and picking; feeding continues throughout the day, with less activity during the hot mid-day hours, and also at night. Both species feed on habitats with an abundance of vegetation.

The Australian pygmy goose prefers areas of water disturbed by submerged aquatics; short flights are made to other suitable patches when the birds are disturbed. Feeding flocks are the result of food availability rather than social requirements. Roosting and preening during feeding hours are accomplished, as with the green pygmy goose, by climbing on to waterlily leaves over which they normally scramble readily in the search for food.

The green pygmy goose is found frequently among waterlilies. The birds feed while swimming slowly, stripping seeds, flowers and stems. from emerging water plants. Feeding continues for long periods alone or in loose flocks. The diet consists predominantly of vegetable matter—waterlily seeds and hydrilla are eaten often; minor foods include the seeds from flooded plants of barnyard grass (*Echinochloa colonum* (L.) Link.), water snowflake and pondweeds. Insects eaten include the aphid, *Rhopalosiphum nymphaea* (L.), found on waterlily leaves.

The food habits of both pygmy geese are consistent with habitat preferences and available vegetation. No fundamental difference in diet between the two species is noticeable.

Breeding

Breeding by both species follows a somewhat similar pattern and takes place during the wetter months (November–April). Flocks are dispersed and the birds are seen usually as pairs.

Australian pygmy geese move inland from the low-lying coastal plains to the swamps and lagoons in a wide belt along the Great Dividing Range where rains may fall earlier; breeding occurs on the coast also.

Green pygmy geese breed more frequently on the coastal swamps of the north-eastern region but may move inland to breed in other parts of their range.

Most nests of both species are built in trees and in long grass on the edges of swamps. Clutches of 8 to 10 whitish-coloured eggs have been recorded.

Broods of three to five Australian pygmy geese are not uncommon; the downy young are usually in the care of the female parent although occasionally both adults may be present. The plumage pattern of these young readily reveals the relationship of the Australian pygmy goose and Indian cotton teal. After all are hatched, the young Australian pygmy geese are led immediately to water where, with the parents, they feed voraciously on the seeds of barnyard grass and water snowflake, and on some insects. These feeding sites are evacuated usually by June when young appear with parents on the coastal plains. Young male Australian pygmy geese retain the plumage appearance of the female at least until August and the bursa of Fabricius at least until November. Unlike the Indian cotton teal, the adult males have no eclipse plumage; the bright coat of the breeding season is retained throughout the year. Examinations of reproductive systems suggests that young are capable of breeding in the subsequent wet season.

Parasites, Diseases and Predators

Mites, lice, tapeworms and flatworms parasitize pygmy geese. Incidence of the most damaging of these, the helminths of the intestinal tract, is low. Other deepwater ducks, with a greater proportion of animal diet, have considerably higher burdens in northern Australia.

There are a variety of predators ranging from freshwater eels, *Anguilla reinhardti* Steindachner, to swamp harriers, *Circus approximans* Peale; crocodiles, *Crocodylus porosus* Schneider, water rats, *Hydromys chrysogaster* Geoffrey, and snakes, *Boidae,* also take toll. Neither pygmy goose is as readily alarmed by potential predators as are other waterfowl.

Conservation

Few pygmy geese are taken by shooters; their small size, ornamental appearance and comparative rarity protect them from serious consideration as game.

Strict conservation laws, provision of sanctuaries, and an increasing number of well-dispersed, suitable, artificial habitats also favour pygmy geese.

From Gilbert's diary (cited by A. H. Chisholm (1944) "Birds of Gilbert's diary" *Emu 44,* p. 148) and results of surveys over the past 5 years, numbers of these geese in northern Queensland have not varied appreciably in 120 years.

Record Profits From Recorded Herds

Infertility Means Financial Loss

by B. A. Woolcock, Divisional Veterinary Officer.

Low fertility is a common and complex problem in dairy herds in Queensland. Infertility has many causes. Careful investigation of each problem is necessary to determine whether infectious diseases, nutritional deficiencies, management or genetic factors are involved.

Fertility may be defined as the capacity of the cow to produce a live calf every 12 months. Surveys show that at least 1 in every 20 cows becomes infertile each year. This represents serious financial loss to individual herds and to the industry as a whole.

In well-managed herds, a low level of infertility will appear in some years. In such herds, a normal level of fertility is represented by the following:—

1. At least 90 per cent. of the cows reproducing without difficulty at any given time,
2. At least 70 per cent. of all cows settling at first service, and
3. For each year an average of no more than 1·3 services per conception.

Breeding management plays a vital role in fertility. Control of bulls, after calving care of cows, 2 months' sexual rest before service, and keeping of records are essential in order to avoid and control infertility. Where these practices are not employed, the normal fertility level will be considerably lower than stated, and the danger of infertility problems will be increased.

Farmers should always be on the lookout for signs of infertility problems and should seek veterinary assistance if any of the following appears:—

1. Abortions,
2. Retained afterbirth,
3. Three or more services required before conception occurs,
4. Irregular heat—less than 15 or more than 28 days,
5. Failure of empty cows to show heat,
6. Abnormal discharges from the breeding organs.

The keeping of simple but orderly service and other breeding records is essential if dairy farmers are to keep a close watch on the breeding performance of their cows. Records are also essential for the veterinary surgeon investigating infertility problems.

Feeding has a direct and most important effect on fertility. Cows must receive adequate nutrients to maintain body condition in order to reproduce normally. Deficiencies of phosphorus, copper and Vitamin A may also lower fertility.

Infertility in bulls is not uncommon. This may be present from birth or may occur as the result of disease, under-nutrition or over-work. Failure to control bulls leads to over-work and is a frequent cause of herd infertility. It also leads commonly to the introduction of reproductive diseases.

Disease is a major cause of infertility. Brucellosis, despite the availability of Strain 19 vaccine for nearly 20 years, is still the most important cause of reproductive wastage. Vibriosis is also common.

Q A J

PICTURE PUZZLE

Have a good look at these two pictures and see if you can discover what they represent. What stories do they tell? Both have been chosen because they show things of practical interest and value to countrymen. Can you guess what these are?

Check your answers by turning to page 302.

A QUICK QUIZ

1. The phosphoric acid and lime guarantees that have been familiar sights on stock food labels for years are being changed to guarantees of phosphorus and calcium. How can the differences be calculated?

2. Is there a cure for mucosal disease in cattle?

3. What are the points to be watched when bulking tobacco leaf?

4. What is the ABC of correct preparation of a cow for milking?

5. How often should you drain the tractor fuel tank to wash out any foreign matter that may have accumulated?

6. What can be done to alleviate market losses of papaws due to fruit fly damage?

Picture Puzzle (Answers)

The picture at top right shows a mixed pasture of siratro and molasses grass. This is an ideal mixture for the poorer types of forest country in coastal areas. Both components grow satisfactorily in low quality soils. A siratro-molasses grass mixture would be the most suitable to sow in burnt blady grass without cultivation.

The bottom picture shows the leaf, flower and seedpod of Dolichos lablab. The Rongai strain of Dolichos lablab is probably the most important leguminous forage crop released in recent years. Apart from its value as grazing, it is an excellent crop to use before the establishment of permanent pasture. On many sites, Dolichos will replace velvet beans as a green manure or grazing crop, and for autumn-early winter grazing it is generally much better than cowpea.

QUIZ ANSWERS

(1) The phosphorus equivalent of phosphoric acid can be calculated by multiplying the phosphoric acid by 3 and dividing by 7. Similarly to obtain the calcium level, multiply the calcium oxide figure by 5 and then divide by 7. Phosphorus is $\frac{3}{7}$ of phosphoric acid and calcium is $\frac{5}{7}$ of lime.

(2) There is no effective treatment for mucosal disease and 50 per cent. of affected cattle will probably die. Isolation and destruction are recommended, and early diagnosis is essential to prevent spread.

(3) Never bulk leaf that is over-conditioned. Excessive moisture in the bulk will cause mould to develop, bringing severe losses.

If a number of picks are to be made into one bulk, separate each one with newspaper. Leaf from each pick comes from a similar plant position, so, if you keep each one separate, grading is much simpler.

Each day, when bulking is completed, place boards on top of each stack, to compact the leaf. This will help to develop the aroma, and prevent any drying out.

Cover each bulk with hessian or calico, and examine regularly for the presence of mould.

(4) A. Thoroughly wash the udder, with running water if possible. B. Massage the udder for 30 to 60 seconds. C. Put the cups on only when milk let-down has occurred.

(5) The usual recommendation is to drain the tractor fuel tank every 1,000 hours.

The filter in the fuel tap or sediment bowl will prevent large particles entering the system. But water as well as dirt can block fuel filters so check the sediment bowl to see if there is any water in the system. Wash the bowl out and wipe it thoroughly with a non-fluffy piece of cloth. When replacing the bowl, see that the filter is seated accurately so as to prevent a fuel leak.

(6) Firstly, papaws must be very close to ripe, or at least coloured, before they are stung on the tree. After due consideration of marketing requirements there is a possibility here of picking greener. Secondly, if stung fruit can be recognised, they should be rejected before they leave the farm, so saving wasted effort. Thirdly, start a spray programme in the plantation to save the rest of the crop. DDT is a good spray for this purpose. Alternatives which may be suitable for testing are dimethoate and fenthion, particularly where all fruit are destined for canning.

Survey Proves Herd Recording Is Reliable

by S. E. Pegg, Chief Adviser (Herd Recording).

The value of herd production recording lies in the fact that it provides a comparison of performances between cows in the same herd.

It does not provide a reliable comparison between cows in different herds. In these cases environment differs from farm to farm, and this affects production more than the genetical quality of the animals.

A statement is often heard that the production of herds being recorded is boosted on the day of test by feeding the herd at a higher standard using either supplements or by feeding from a better pasture paddock. Another allegation is that the times of milking on test days are altered to give a period greater than the normal 24 hours.

In order to test out the correctness of these allegations, a survey of 227 herds was undertaken checking production records with factory supply.

Herds were selected belonging to farmers who supplied all their produce as milk. The survey covered the 6 months from July to December, 1964.

Milk delivered to the factory each day usually includes the results of the evening-morning milkings which coincides with the milkings on which a herd is recorded.

A comparison was made of the milk delivered to the factory on the date of the completion of the test, with the average daily amount delivered on 4 days prior to, and 4 days following, the date of test.

A total of 227 herds was examined and it was found that 0·90 per cent. more milk was delivered on the date of test. This represents 9 lb. more per 1,000 lb. milk usually delivered, or approximately 1 gal. in every 100 gal.

Group Recording Results—The 197 selected farms recorded under the Group Scheme showed an increase of 0·64 per cent.

Pure Bred Scheme—A total of 30 farms recorded under the Pure Bred Scheme was included in the survey. The results of these herds showed that the amount delivered on the date of test was 2·53 per cent. more than the average of the 4 days before and after.

Table 1 shows the number of herds in each scheme in various ranges of variation.

TABLE 1

Range of Variation (%) Below (−) or Above (+) Normal Production	Group Herds	Pure Bred Herds
	Number of Herds	Number of Herds
More than −4·0 per cent. ..	7	..
−3·6 to −4·0 per cent. ..	5	..
−3·1 to −3·5 per cent. ..	7	..
−2·6 to −3·0 per cent. ..	3	..
−2·1 to −2·5 per cent. ..	3	1
−1·6 to −2·0 per cent. ..	9	2
−1·1 to −1·5 per cent. ..	8	1
−0·6 to −1·0 per cent. ..	17	2
−0·1 to −0·5 per cent. ..	18	1
No difference	7	2
+0·1 to +0·5 per cent. ..	16	..
+0·6 to +1·0 per cent. ..	17	2
+1·1 to +1·5 per cent. ..	19	2
+1·6 to +2·0 per cent. ..	7	..
+2·1 to +2·5 per cent. ..	17	4
+2·6 to +3·0 per cent. ..	7	4
+3·1 to +3·5 per cent. ..	8	1
+3·6 to +4·0 per cent. ..	6	2
+4·1 to +4·5 per cent. ..	4	1
+4·6 to +5·0 per cent. ..	3	..
More than +5·0 per cent. ..	9	5

Extreme Variations

Under the Group Scheme the extreme variations were −7·4 per cent to +10·1 per cent. The Pure Bred herd variations ranged from −2·4 per cent. to +22·8 per cent. The farm which showed a +22·8 per cent. was immediately investigated and the causes of this extreme variation corrected. The next highest herd was +9·1 per cent. Had the +22·8 per cent. herd been excluded from the Pure Bred results, the average variation occurring in the remaining 29 herds would have been +1·6 per cent. For all herds the difference would have been reduced from +0·9 to +0·77 per cent.

Not Significant

It is considered that the average difference of +0·9 per cent. does not represent a significant increase in daily yield. A similar result was obtained in a survey made in the Netherlands.

The higher yields in Pure Bred herds are no doubt due to additional feeding and a more complete stripping of the cows on the test day.

Based on the results of this survey it is considered that herd production data obtained during recording is a reliable guide to normal daily production. While cows are recorded only once during a period ranging between 25 and 35 days, the production on this day will indicate the production potential of the cows and differentiate satisfactorily between the ability of these animals.

Black Spear Grass Control In The Central West

by D. L. Purcell, Agrostologist.

Black spear grass (*Heteropogon contortus*) is causing concern to some graziers in the sheep country of central-western Queensland. The seed of this grass infests wool, lowering its price per pound because of the necessity of expensive treatment prior to manufacturing. The seed also penetrates the skin, the flesh, the hooves and even the internal organs of sheep with consequent economic loss to the grazier.

Distribution

Apart from the forest country to the east, which is not considered in this article, the main problem areas in the central-west are: (*a*) the frontage country to rivers and creeks; (*b*) shallower soils on the crest of ridges in downs, especially in areas bordering the forest country; (*c*) brown clay loam parkland, often on ridges, with bauhinia, dead finish, bloodwood and an occasional ironbark; (*d*) sandridge country through the downs, and (*e*) gidyea country on a lighter soil which has been pulled but has not been sown to a vigorous buffel grass variety, and is adjacent to forest country or sand ridges carrying black spear grass.

Observations were made by W. J. Bisset, a Primary Industries Department Agrostologist, on the incidence and increase and decrease of black spear grass on the heavy black soils of Mitchell grass downs country in the Longreach district from 1952 to 1961. He concluded that on the typical heavy downs soils of this area, black spear grass can spread only under exceptionally favourable seasonal conditions, and that it is unable to survive in below average seasons. This means that although odd plants of this grass

may occur on typical Mitchel grass downs country, there is very little danger of a large scale infestation on such soils in this environment.

Spread

Stock routes are usually located on river and creek frontages, where the soil-moisture relations are usually suited to black spear grass establishment and growth. Besides acting as transporting agents for a host of weeds, travelling stock offer added inducement to invasion by foreign species such as black spear grass, by periodically severely overgrazing the vegetation on the route. Once the vigour and reproductive ability of harmless and valuable native plant communities have been impaired, the way is open for infestation and spread of plants like black spear grass.

Heavy wet seasons, with their associated favourable seedling establishment conditions and often reduced grazing pressure, have been one of the main factors associated with black spear grass increase. Below average rainfall years appear to be associated with its decrease, the soil type influencing the degree of recession.

However, the fact is that black spear grass is present in certain areas in sheep country in sufficient quantity to warrant attempts at its eradication.

Control Methods

(1) *Mechanical Removal.* Repeated and efficient grubbing out of any isolated plants will keep black spear in check in areas where only an occasional plant establishes. This method is not possible where large patches or areas are involved. The best time to carry out such an operation is in early summer after most seed has germinated but before new seed is produced.

(2) *Cultivation and Substitution by Introduced Species.* One cultivation will not eradicate black spear. At least two and possibly three cultivations are necessary to clean up an infestation. Even then a vigorous buffel grass should be planted to revegetate the ploughed ground.

A suggested procedure would be:

(*a*) winter burn and discing to at least 4 in.;

(*b*) in early summer after rain, a second discing of sufficient depth to kill any grass roots which survived the first cultivation, and also any seedlings;

(*c*) a shallow cultivation (no more than 2 in. deep) to kill any further seedlings and form a seedbed for buffel grass sowing in late December to early February. Late January appears to be the best sowing time when the average of rainfall and temperature records are considered.

Buffel grass should be sown at 2 lb. or more to the acre, and the seed should not be covered to more than 1 in. depth in sandy soil or ½ in. depth in loamy soil. Tall buffels (Biloela, Boorara, Nunbank) and American buffel are probably the best varieties to sow, with Gayndah next in favour. If seed harvesting ants are likely to be a problem, the seed can be dusted with "Lindane" powder at the rate of 1 lb. powder to 70 or 80 lb. seed.

If the two or three cultivations are not carried out before planting, a mixed black spear-buffel pasture will result. In the central-west, even a vigorous buffel grass in a mixture with black spear will not overrun the spear grass. On the higher phosphate soils suited to buffel it may eventually predominate given some good wet seasons.

A difficulty can often occur using this method of control. Stock will be attracted to the herbage produced on the cultivated area because of the more palatable herbage resulting from the release of available nitrogen for plant growth. If stock are left in the paddock they will overgraze treated areas and so inhibit establishment of the introduced species. If the portion of the paddock infested with black spear is small, spelling the whole paddock to enable grass establishment on a small area could be difficult. However, there is the saving factor that after sowing the grass in late January, the area would not be spelled until germinating rains fell. By that time there should be good pasture growth over the rest of the property which would enable rearrangement of stocking for a month or two.

(3) *Chemical Control.* Because of the impracticability of other methods in many cases, chemical control of black spear grass was attempted at Blackall.

In a spot trial in 1961, testing a number of chemicals, 2, 2-DPA (2, 2-Dichloropropionic acid as the sodium salt), often called dalapon, showed promise applied as an overall spray.

At the end of 1963, a trial was laid out at "Woodbine", Blackall, comparing different rates of this chemical. The rates were from 5 lb. to 20 lb. of a commercial preparation of dalapon per acre as a single application and also as split applications with a suitable period between treatments.

The area was burnt in October to be rid of the last season's growth and also to promote germination of the seed of black spear grass. The first spraying was done in early December when there was good growth from the burnt tufts and a good crop of seedlings. The plants were affected slowly and the first effect was a yellowing of the leaves.

In split treatments, the second spraying was carried out when the regowth was 3 in. long.

The chemical was applied as a high volume spray by knapsack sprayer at the rate of about 100 gal. liquid per acre, thoroughly wetting the plants.

The split treatments were very much more effective. Although the split treatment of 5 lb. followed by another 5 lb. per acre resulted in 20 to 30 per cent. of black spear plants shooting again, a better kill was obtained from a single application of 20 lb. per acre. The rate of 10 lb. followed by another 10 lb. gave practically 100 per cent. kill.

Desert blue grass (*Bothriochloa ewartiana*) was more resistant to dalapon, and regrowth was much more vigorous in this attractive native grass species.

The chemical dalapon is expensive, at present being about 80 cents a lb. This price precludes its use over large areas. However, although this treatment has not as yet been tried on an extensive scale, it should find a place in instances such as spot spraying of black spear patches. Both the sides of bore drains flowing from areas infested with black spear and in gullies overrun with this grass would be situations where this treatment could find a place.

The importance of wetting all the foliage must be realised. At the time of the first spraying, a crop of seedlings should also be present, and these must also be sprayed.

If chemical treatment is attempted, it is suggested that the best procedure would be as follows:—

1. If at all possible burn the black spear areas preferably in early spring to make the regrowth readily available for spraying and to promote germination of seed already in the soil.
2. Make the first application at the rate equivalent to 10 lb. per acre, *thoroughly wetting all the foliage* when the spear grass is growing well. The addition of a wetting agent is advantageous. The green shoots should be at least 3 or 4 in. in length and there should be a good crop of seedlings present. When the grass is short, such as after a burn, about 100 gal. of liquid per sprayed acre is required using a knapsack spray. The mixing rate would therefore be 10 lb. dalapon in 100 gal. water.
3. The second application at 10 lb. per acre is made when the regrowth from the sprayed plants is about 3 or 4 in. high and growing vigorously. This could be from 5 to 15 weeks after the first treatment, depending on rainfall.

Although an application at a rate equivalent to 7 lb. followed by 10 lb. per acre was not included in the trial, it is possible that this procedure could be as effective as the 10 lb. plus 10 lb. dalapon treatment described.

It is also worthwhile to throw some seed of a vigorous buffel grass into the treated area, but not sooner than 5 weeks after the last treatment.

Dalapon is toxic to all grasses to different degrees. It is available from a number of firms under assorted labels.

Acknowledgements

Appreciation is expressed to the Shell Company of Australia for providing the chemical used in the trials. The co-operation received from the owners of "Woodbine" and "Forest Park", and the support of the Wool Research Trust Fund are also gratefully acknowledged.

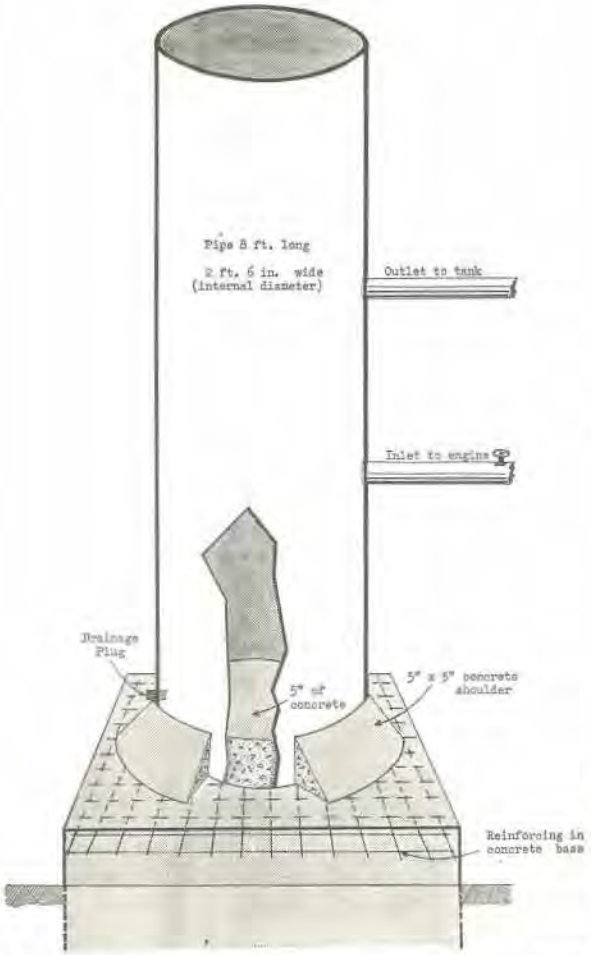


Plate 1: Drawing of the concrete water hopper built by Mr. K. Hinchliffe, of Milman.

Concrete Water Hopper For Dairy Engine

by M. A. T. Paterson, Dairy Adviser.

A suitable and durable water hopper for a water-cooled internal combustion engine often poses a problem for farmers. Mr. K. Hinchliffe, of Milman, via Rockhampton, considers that after a number of years he has found the answer and provided a satisfactory hopper.

After having replaced his engine water hopper a number of times over the years, he felt that a concrete pipe erected on a concrete base outside his dairy would be admirably suited for this purpose. More than anything else, it would resist the action of water upon it and would not develop cracks or leaks.

The materials used in the construction were:

(i) One concrete pipe 8 ft. long with internal diameter of 2 ft. 6 in.

(ii) Sufficient sand and cement for a supporting concrete base and concrete shoulder around the base of the pipe.

(iii) Reinforcing material for the concrete base.

(iv) Two 1 ft. lengths of galvanized water piping (external diameter the same as the inlet and outlet pipes from engine).

(v) A short length of pipe with plug for draining purposes.

The first step in the construction of this water hopper is to remove the loose soil from the site selected outside the engine room to a depth where a solid foundation is secured. A reinforced square concrete slab with sufficient surface area to take the vertical concrete pipe and concrete shoulder and an allowance of a few inches each side to ensure stability and solid foundation, is then poured into a wooden form. The depth of the slab should not be less than 1 ft. Bearing in mind that the erected water cooler and contents weigh several hundred pounds, it is essential that attention be paid to the following points—concrete mix, reinforcing, surface area and depth of slab.

When the concrete slab solidifies, the pipe is then placed vertically in a central position on the base. A 5 in. x 5 in. concrete shoulder is next plastered around the base of the pipe and concrete base. Concrete to an equal depth is then poured inside the pipe and levelled out. A satisfactory alternative would be to fit the pipe into the base square to a depth of 5 in. before the base has completely solidified.

Two holes to take the short two lengths of pipe are next bored through the concrete pipe. The pipes are then inserted into these holes and the joint plastered. A drain plug is also inserted in the base of the concrete pipe. Rubber connecting hoses are used to connect to the water cooler and engine inlet and outlet pipes.

The cost of the concrete water trough compares favourably with one constructed from flat sheet metal. With reasonable care during construction, it should last indefinitely.

Shopping For Shoes

Perhaps one of the most important, and often most neglected, item of clothing are your shoes.

Shoes provide protection for your feet and a foundation for all body movements, says Mrs. Sybil Foord, Women's Extension Officer of the New South Wales Department of Agriculture.

A good shoe is soft and pliable but firm enough to retain its shape, and support the foot.

Edges and perforations should be evenly trimmed and clean cut.

Shoe linings should be smooth and soft, with no rough places to irritate the skin.

Buy shoes which permit your feet to support your body naturally and maintain good posture.

Sizes vary from make to make so always fit carefully before buying.

Shop for shoes during but not at the beginning of a normal shopping day.

Be sure the widest part of the shoe does not restrict the area across the ball of the foot where the toes bend naturally.

The shoe should be especially flexible in this area.

You should be able to move your toes freely in new shoes.

Heel fitting is best if it is firm, not loose or tight.

Heel height varies between individuals but should be a comfortable one for your foot.

Most recent fashions are for lower heels and for many of us these provide greater comfort, than very high heels.

High-heeled shoes are often desirable for elegance or special occasions. If they detract from foot comfort wear them as little as possible.

Housework activities perhaps demand the greatest support for your feet so do not wear discarded, ill-fitting shoes around the house.

Those Jobs

It is always interesting to know how other people react to work—what they like doing, what they don't like doing, and why—says Miss Nancy Foskett of the Women's Service, New South Wales Department of Agriculture.

Miss Foskett believes that when we discover why other people like doing a job that WE don't like doing, we can sometimes reduce our dislike by adopting some of their attitude, or the method they use—or both.

To help us do this, Miss Foskett tells us the reasons why one particular group of women liked some jobs.

The reasons ranged from pride in results, satisfaction, adequate equipment, results being appreciated by the family, ample supplies, time well spent, and freedom to set one's own pace, to being able to complete the job as planned.

The first four reasons given by these homemakers were considered the most important.

If pride, satisfaction and appreciation are not as great as we would wish, we may need to know more about how to do that particular job.

Perhaps we only need practice, or to watch someone else do it, or to allow enough time for the job.

It may help to ask someone to explain her way of doing it, or to attend a demonstration, a class, a course or school.

If lack of adequate equipment, or supplies prevents your enjoyment of a job, this can be overcome.

Again, ask others what they use, what they find works best for them, and be ready to try new products with judgment and within reason.

Finally, perhaps all you really need to do is read the label and instruction book and follow recommendations.

Easy Care Clothes

Like ready-mixed foods, easy care clothes are here to stay and have a place in planning the management of home and family.

"We need to know what to look for—what makes clothes easy to care for," says Miss Foskett.

Here are some features to look for in ready-made garments, or to include in the garments we make:

- a simple design with few seams; straight or gored skirts are easier to care for than those that are bias-cut or draped.
- unpressed pleats should be cut on the grain of the fabric rather than on the bias.
- generous seam allowances finished to prevent fraying, and a minimum of inter-linings.
- well finished buttonholes, flat trims rather than frills, and washable trimmings.
- edge stitching on facings, inter-facing attached to facing edges to prevent curling or wrinkling, and bows that untie for flat ironing.
- white or pastel collars should be easily detached for laundering.
- easy care clothes should stay fresh longer, wash and dry quickly, and stay smooth after laundering or dry cleaning.
- they should need little ironing, or only a "touch up" to give a finished look.

Easy care should be thought of as meaning less time or effort required for maintenance.

To get the best in appearance and service from any garment, some care is always necessary.

Planning Meals

One of the everyday concerns of every homemaker is planning. Meal planning can be conscious or unconscious; a pleasure or a chore.

But meal planning is easy and enjoyable when you remember the following points:

- Plan ahead and shop ahead for the family meals.
- Take time to enjoy your recipe books while planning.
- Take time to enjoy your shopping, particularly if you are a bargain hunter, but be sure the bargain you buy is the one on your list.
- Plan quick meals for those especially busy days in the week.
- Make use of ready-made menus suggested in magazines and papers.
- Occasionally try to introduce a new food as well as different dishes to your family.
- Keep your recipe collection properly sorted in a box or file or note book; family favourites can be kept separately, in a special folder.
- Plan each course of each meal to include a variety of colour and texture.
- If possible, have a variation in temperature between courses, one hot, one cold.
- Use garnishes to make the food appear more attractive.
- Combine different flavours to enhance one another; contrast a strong flavoured main dish with a mild dessert.
- Remember the table setting forms a background atmosphere for each meal; plan to vary this quite frequently.
- Meal planning can be a sheer delight especially if you provide yourself with a meal planning centre in or near the kitchen.

Ox Tail With Walnut

Try this old favourite, fortified with gravy beef, now colder weather is here.

Ingredients:

1 ox tail.
½ lb. gravy beef.
Few cloves.
Pepper, salt.
1 tspn. sugar.
1 large onion.
Bouquet garni.
3 cups stock or water.
6 pickled walnuts.
2 tblspns. flour.

Method:

Wash ox tail, trim away fat, cut into joints. Cut gravy beef into cubes. Heat little dripping, cook meat until browned a little, add chopped onion, cook few minutes, then add stock, salt, pepper, bouquet garni. Cover, simmer slowly until tender, 2½ to 3 hr., skimming as necessary. Last ½-hr. add walnuts cut into small pieces, remove bouquet garni. Blend flour with little water, use to thicken gravy.

Liverburgers Are Tasty

Team nourishing liver with minced steak and tasty seasoning in these crisp fried meat cakes.

Ingredients

1 lb. steak minced.
½ lb. liver.
¾ cup dried breadcrumbs.
1 egg.
1 tspn. salt.
Small ½ tspn. hot pepper sauce.
1 large onion.
1 tspn. Worcest. sauce.
2 tblspns. milk.
Seasoned flour.
Bacon fat or oil for frying.
Sauce to taste.

Method

Pour hot water over liver, leave ½ hr., drain and pat dry. Mince, using a coarse cutter. Also mince peeled onion. Mix both with meat, breadcrumbs. Beat egg, salt, sauces, milk, add to meat, mix well. Form into cakes, using seasoned flour. Refrigerate about 1 hr. if possible until they firm. Cook in bacon fat or heated oil until cooked. Last 5 min. put a small spoonful of selected sauce on each one.

Cheese Whirl Scones

The olives inside give them flavour and make them look good.

Ingredients

2½ cups S.R. flour.
1 tspn. salt.
2 tblspn. butter.
Scant cup milk.
1 cup well flavoured grated cheese.
Paprika.
Little cayenne.
Stuffed olives (optional).

Method

Sift flour and salt, rub in butter lightly. Mix to medium soft dough with milk. Turn on to floured board, knead a little until smooth. Roll out gently to a little less than ½in. thickness. Grate cheese over, sprinkle with paprika and a little cayenne. If using olives, put a row down the long side. Roll up, enclosing the olives. Cut to about ¾in. thickness. Put fairly close together in greased lamington tin. Lightly glaze with milk. Bake in very hot oven until cooked and golden brown, about 12 to 15 min.

• If liked, arrange in 2 greased 7in. sandwich tins, then serve without breaking up with butter.

Country Hour Broadcasts In May

3-5-66	A. J. Hegarty, Chief Development Planning Officer	"Development Planning in Queensland".
10-5-66	V. J. Wagner, Chief Agronomist	"Field Crops in Queensland".

For Country Cooks

Pineapple and Apricot Loaf.

Afternoon Tea Suggestions

If you are looking for something a little different try these recipes; and you will be voted the hostess with a flair for choosing just the right thing to eat.

Pineapple and Apricot Loaf

Standard 8oz. measuring cup is used.

All spoon measurements are level.

3oz. (¾ cup) dried apricots.
¾ cup milk.
½ cup canned pineapple juice.
2 oz. (1 cup) bran.
4 oz. (1 cup) plain flour.
4 oz. (1 cup) self-raising flour.
½ teaspoon salt.
2 oz. (¼ cup) castor sugar.
2 oz. (¼ cup) butter.
2 tablespoons honey or golden syrup.
1 teaspoon bi-carbonate of soda.

Pre-heat oven to moderate (gas 350 deg., electric 375 deg.). Grease an oblong loaf tin 9 x 3 x 3 in. with butter. Cut apricots in small pieces and cover with the milk and pineapple juice, this will curdle. Sift flours and salt into a basin—add bran and sugar. Melt butter in a saucepan with the honey. Add bi-carbonate of soda and stir until it foams. Pour onto dry ingredients and add apricot mixture. Beat until well mixed then pour into prepared tin. Bake 40-45 min. Yields 24 half slices.

Golden Cherry Nut Twirl

Standard 8 oz. measuring cup is used.

All spoon measurements are level.

8 oz. (2 cups) self-raising flour.
Pinch of salt.
1 tablespoon castor sugar.
1 tablespoon butter.
1 egg, beaten.
½ cup (approximately) milk.

Topping:

2 oz. butter.
2 oz. castor sugar.
1 tablespoon golden syrup.
2 oz. chopped glace cherries.
2 oz. blanched, roughly chopped almonds.

Pre-heat oven to moderately hot (gas 375 deg., electric 400 deg.). Sift flour, salt and sugar into a bowl. Rub in butter. Beat egg lightly with the milk and mix into flour to make a moist dough. Knead and roll out into long sausage shape. Starting from the outside, coil into a buttered 7 in. cake tin. Place all ingredients for topping in a saucepan and melt. Pour over scone coil and bake in oven 35-40 min. Serve warm or cold spread with butter. Yields 12 slices.

Quick Mix Passionfruit Cake

Standard 8 oz. measuring cup is used.

All spoon measurements are level.

3 oz. butter.
6 oz. (1½ cups) self-raising flour.
Pinch of salt.
5 oz. castor sugar.
2 eggs.
4 tablespoons milk.
Pulp of 2 passionfruit.

Pre-heat oven to moderate (gas 350 deg., electric 375 deg.). Grease a 7 in. round deep cake tin with butter and line the bottom with paper. Sift flour, sugar and salt into a basin. Soften butter (do not melt) and chop or beat into sifted ingredients. Add unbeaten eggs, milk and passionfruit pulp. Beat for 2 min. Turn into prepared tin and bake 40-45 min. When cold, ice with passionfruit butter icing. Yields 16 slices.

Passionfruit Butter Icing:

1 oz. (1 tablespoon) butter.
5 oz. (1 cup) icing sugar.
Pulp of 1 passionfruit.

Soften butter, beat in sifted icing sugar and passionfruit.

Orange Macaroon Cake

Standard 8 oz. measuring cup is used.

All spoon measurements are level.

3 oz. butter.
4 oz. (½ cup) castor sugar.
Grated rind of ½ orange.
2 egg-yolks.
6 oz. self-raising flour.
Pinch of salt.
4-5 tablespoons milk.

Macaroon Topping:

2 egg-whites.
4 oz. castor sugar.
½ cup coconut.

Pre-heat oven to moderate (gas 325 deg., electric 350 deg.). Cream butter and sugar, add orange rind and beat in the egg-yolks. Mix in sifted flour and salt alternately with the milk. Place in a 7 x 5 in. loaf tin greased with butter and lined with paper. Prepare topping by beating egg-whites till stiff. Add sugar and beat till dissolved, then fold in the coconut. Spread on top of cake. Bake in oven 50-60 min. Yields 20 slices.

Brucellosis-Tested Swine Herds (As at April 14, 1966)

BERKSHIRE

Binstead, D., Cooringa, via Biggenden
Bishop, N. H., Monto
Clarke, E. J., "Kaloon", Mt. Alford, via Boonah
Cochrane, S., "Stanroy", Felton
Coleman, N. L. & K. L., "Riverside", Tara
Crawley, R. A., Rockthorpe, Linthorpe
Edwards, C. E., "Spring Valley" Stud, Kingaroy
Farm Home for Boys, Westbrook
Fletcher, A. C., "Myola" Stud, Jimbour
French, A., "Wilston Park", Pittsworth
H. M. State Farm, Numinbah
H. M. State Farm, Palen Creek
Handley, J. L., "Meadow Vale", Lockyer
Handley, G. R., "Locklyn" Stud, Lockyer
Hutton Bros., "Denrock" Stud, M.S. 182, Laidley
James, I. M. (Mrs.), "Kenmore" Stud, Cambooya
Jubilee Hospital Board, Dalby
Kimber, E. R., Block 11, Mundubbera
Law, D. T. & Son, "Rossvill" Stud, Aspley
Ludwig & Sons, A. R., "Beau View" Stud, Beaudesert
Peters, C. E., P.S. 1974, Bongeen
Queensland Agricultural College, Lawes
Research Station, Hermitage
Rosenblatt, G., "Rosevilla", Biloela
Schellback, B. A., "Redvilla" Stud, Kingaroy
Sperling, C. N., "Sunraye Inn", Albert St., Crow's Nest
Traves, G., "Wynwood" Stud, Oakey
Young, (Jnr.), W., Kybong, via Gympie

LARGE WHITE

Antcliff, R. E. & C. M., Beaudesert
Ashwell, J. & B., "Green Hill", M.S. 465, via Cambooya
Assenbruck, C., Mundubbera
Barron Bros., "Chiltern Hill", Cooyar
Becker, D. V., P.O. Box 169, Dalby
Behm, A. M., "Aleum", Wondai
Beutel, G. R. and Son, M.S. 786, Boonah
Brook, R. A., Woowoonga, Biggenden
Coleman, N. L. & K. L., "Riverside", Tara
Coller, R. H., "Relloc", Flagstone Creek, Helidon
Crombie, M. A. & R., Picnic Hill, Junabee, via Warwick
Duncan, C. P., "Colley", Flagstone Creek
Ethell, Dr. G. S., Mundi Pastures, Mundubbera
Evans, J. W. & I. W., Tanside, Wondai
Fowler, K. J. "Kenstan", M.S. 195, Pittsworth
Franke, H. J. and Son, "Delvue" Stud, Cawdor
Freeman, W. A., "Trevlac", Rosewood
Garrawin Stud Farm Pty. Ltd., Samford
Gibson, H. R. "Thistleton", Wootha Rd., Maleny
H. M. State Farm, Numinbah
Hall, M., "Milena" Stud, D'Aguilar
Herbener, K., "Kevlan" Stud, Monto
Horton, O. J., "Manneum Brae" Stud, Manneum, Kingaroy
Hudson, R. F. & V. D., "Rondel," Hogg St., Wilsonton, Toowoomba
Hutton, G., "Grajea" Stud, Laidley
Jeffries, S. G., "Vale Glen", Boundary St., Toowoomba
Jones, K. B., "Cefn" Stud, Clifton
Kahler, J. & S., "Karajoy", East Nanango
Kanowski, A., "Exton", Pechey
Kruger, V. F. & B. L., "Greyhurst", Goombungee
Law, D. T. & Son, "Rossvill" Stud, Aspley
Lobegeiger, L. C., "Bremer Valley" Stud, Rosevale, via Rosewood
McInnis, D., M.S. 441, Monto
Parker, L., "Ban-Nookoo", Mulgowie, via Laidley
Postle, R., "Yarallaside" Stud, Pittsworth
Powell, R. S., "Kybong", Gympie
Purcell, J., "Scoria", Thangool
Queensland Agricultural College, Lawes
Radel, V. V., "Braedella" Stud, Gooroolba, Gayndah Line
Research Station, Biloela
Rosenblatt, G., "Rosevilla", Biloela
Salvation Army Training Farm, Riverview
Scantlebury, J. A., Mundubbera
Sedgwick, F. G. & J. E., Mundubbera
Smyth, R., Barambah Rd., Goomeri
Stephen, T. A. & K. A., "Withcott", Rowbotham St., Toowoomba
Stumer, K. F., French's Creek, Boonah
Thomas & Sons, "Rosevale", Laravale
Thomson, J. & R., "Dewrang", Natural Bridge, via Nerang
Tierney, M. J., Flagstone Creek, Helidon
Trim, R. A. & R. J., Mutdapilly, via Harrisville
Windeknicht, H. E., Gooroolba, Gayndah Line
Zahnow, W., Rosevale, via Rosewood

TAMWORTH

Armstrong, H. J., "Alhambra", Crownthorpe, Murgon
Fletcher, A. C., "Myola" Stud, Jimbour
Herbst, L., "Hillbanside", Bahr Scrub, Beenleigh
Kanowski, S. E., "Miecho", Pinelands

WESSEX SADDLEBACK

Cotter, N. J., "Olaroy", Goomeri
Douglas, Mrs. W. S. & Son, "Greylight" Stud, Goombungee
Grimes, C. W., "Laurel Lyn", M.S. 74, Clifton
Jurgensen, B. H. & R. R., Wyaralong, via Boonah
Lau, D. E., "Homevale", Goombungee
Law, D. T. & Son, "Rossvill" Stud, Aspley
Mengel, N. D., Douglas Park, Nobby
Morrish, G. P. & N. A., "Gaville", M.S. 21, Kalbar
Sander, I. F. & C. L., "Redgates", Murgon
Scott, A., "Wanstead", Grantham
Smith, C. R., "Belton Park", Goombungee

LANDRACE

Adams, L. & O., "Wamilora", Eumundi
Antcliff, R. E. & C. M., Beaudesert
Ashwell, J. & B., "Green Hill", M.S. 465, Cambooya
Behm, A. M., "Aleum", Wondai
Bertolotti, F. E. J. & N. I., "Mascotte", Wallumbilla
Bishop, N. H., Monto
Brook, R. A., Woowoonga, via Biggenden
Brosnan, D. J., "Bettafield", Mt. Murchison, via Biloela
Burnett, E. V., "Kentwood", 445 Priestdale Rd., Rochedale
Champney Bros. and Trout, "Avon View", Wooroolin, Kingaroy Line
Coulson, E. R. C., Wondai
Crawford, G. L., "Glenvillan", M.S. 90, Manneum
Dower, R. J. & E. A., "Dowlea", Tingoora
Ehrlich, J. W., "Bunya Vale", M.S. 222, Oakey
Fowler, K. J., "Kenstan", M.S. 195, Pittsworth
Fowler, K. P., "Northlea", Hogg St., Wilsonton, Toowoomba
Fowler, N. E. P. & M. P., "Northdown Stud", Coalstoun Lakes
Garrawin Stud Farm Pty. Ltd., Samford
Geddes, F. C., "Iona Valley", Hodgson Vale
Grayson, D. G., "Wodalla", Killarney
Guy, K. R. & R. O., "Terenga", Buderim
Herbener, K., "Kevlan" Stud, Monto
Hinchcliffe, D. F. & R. K., "Oakview", Milman, via Rockhampton
Horton, O. J., "Manneum Brae" Stud, Manneum, Kingaroy
Hudson, R. F. & V. D., "Rondel", Hogg St., Wilsonton, Toowoomba
Itzstein, R. A., "Hyde Park", Gooroolba, Gayndah Line
Jones, K. B., "Cefn", Clifton
Kajewski, W. F., "Glenroy", Glencoe, via Gowrie
Kimber, C. C., Gooroolba
Law, D. T. & Son, "Rossvill" Stud, Aspley
McIver, S. S. & M. F., "Cooinda", M.S. 360, Bell
Mitchell, J. J., "Weylands", Bruce H'way, Landsborough
Neilsen, L. R., "Sunny Hill", Ascot, via Greenmount
Nielsen, K. & D., "Tellerton", M.S. 544, Clifton
Peters, C. E., P.S. 1974, Bongeen
Peters, L. A., "Moonlight", Bongeen
Phillips, D. G. & D. M. & Son, "Dorley", Murgon
Powell, N. J. & H. A., Coalstoun Lakes Rd., Biggenden
Powell, R. S., "Kybong", Gympie
Purcell, J., "Scovia", Thangool
Prygoda, B. W., Binjour, "Bonnie Plains", Gayndah
Radel, R. M., "Turua", Coalstoun Lakes
Research Station, Kairi
Rosenblatt, G., "Rosevilla", Biloela
Semgreen, A. L. & D. J., "Tecoma", Kingaroy
Shellback, B. A., "Redvilla" Stud, Kingaroy
Shultz, H. & Sons, M.S. 599B, Jandowae
Smith, E. J., "Ayrvale" Stud, Borallon, via Ipswich
Story, K., "Daandean", Rangers Bridge, via Dalby
Stumer, K. F., French's Creek, Boonah
Williams, N., Dalwogan, Miles
Williams, W. L. & M. E., "Jindabyne", Miles
Young, R. & C., "Dudley Park", Biggenden

Home Savings Grant Scheme

The Commonwealth Government is offering married persons aged less than 36 years a grant of £1 for every £3 saved for the first home they own. The savings must be made over a period, and held in an approved form. The maximum grant to a married couple, or a husband or wife if only one is eligible, is £250 on savings of £750 or more. Smaller grants, however, are payable on lesser amounts saved.

The grant is a tax-free gift; it is not a loan.

The aim of the scheme is to encourage young people to save, both before and after they are married, for the first home they own after marriage. The grant is a reward for this saving, and will assist young people to own and establish a home.

Potential applicants, especially sons and daughters of farmers, pastoralists and landholders generally, who intend building their future home on land owned or leased by their parents or other member of the family, are advised that the Home Savings Grant Act requires, as an item of eligibility, that an "Approved Interest" be held in the name of the applicant husband and/or wife, or that action to acquire this "interest" be taken within 1 year of the date of contract to buy or build/commencement of construction. "Approved Interest" simply means adequate tenure of the specific piece of freehold or leasehold land on which the subject home is being or is to be built.

It is also emphasised that only certain specified forms of savings will qualify for this grant. To enable your entire savings to be recognised, it is essential that they be deposited and maintained in a "Home Savings Account" and designated as such in the respective bank records. This account may be in the name of the husband or wife or in joint names.

Cheque/current accounts are not an acceptable form of saving and all moneys held in these accounts will *not* be considered for this *tax-free gift.*

Moneys expended on purchase of your land, improvements thereon, legal and architectural fees, deposits to purchase or build homes, outlaid prior to date of contract or commencement of construction, are savings in an acceptable form.

All young persons contemplating marriage and also those who may not have given thought to this prospect, should obtain a copy of the booklet "A Grant for your Home" available at all banks and post offices.

All inquiries by mail, telephone or personal call should be made to: Regional Director, Department of Housing, P. & O. Building, 113 Eagle Street (Box 83B, G.P.O.), Brisbane. Telephone—31 0251.

your health

Rheumatic Fever And Its Effects On The Heart

Acute Rheumatic Fever in Childhood

Acute rheumatic fever mostly affects children and adolescents. As its name suggests, it is primarily a disease of joints. One or two joints are usually swollen and painful, and as these settle down others may become affected. The child is sick, miserable, off his food, and has a high temperature. Often the condition occurs in a less severe form which may not be recognised as a definite illness, and the child may merely appear pale, lacking in energy, or have frequent nose bleeds or persistent limb pains. The latter occur particularly at night, disturbing sleep. The symptoms improve dramatically with aspirin, which is the well-tried and standard treatment.

In the majority of patients the attack is limited to this general fever and inflammation of the joints, known as arthritis, and the child recovers fully. In perhaps a quarter of all attacks, however, the heart tissues become inflamed as well. No symptoms occur, but the doctor's stethoscope detects the faint murmurs that develop because the heart valves become swollen and inflamed. Most cases of rheumatic carditis, as it is called, also recover. The significant thing is that in a few, permanent damage to heart valves occurs and is manifest years later as chronic rheumatic mitral or aortic valve disease.

One of the greatest advances in medicine in the last forty years has been the discovery that rheumatic fever always follows an infection, usually of the throat, by a particular germ, the streptococcus. If the infection with such organisms is treated promptly and effectively with penicillin, rheumatic fever does not occur.

Acute rheumatic fever seldom occurs under the age of three years. The earlier in life the attack occurs, the more likely it is that the heart may be affected. Attacks in adults, however, seldom cause serious heart trouble. Repeated attacks in childhood are particularly likely to cause damage to the heart valves. Recurrent attacks of rheumatic fever can now be prevented almost entirely by giving penicillin tablets regularly, twice or three times a day from the time of the original attack up to the age of 15 or 20 years. **This form of prevention, which is harmless, is of the utmost importance in preventing serious rheumatic heart trouble later in life, and should be given to every child who is known to have had rheumatic fever, or even where a strong suspicion exists.**

As a result of this simple measure, the frequency of rheumatic fever in Australia has been strikingly reduced.

Rheumatic Valve Trouble in Later Life

In those patients in which it occurs, rheumatic valve trouble is slow to develop and usually does not cause serious symptoms until adult life. Many such patients do not remember having had an attack of rheumatic fever, and it is probable that in these a mild attack early in childhood went unrecognised.

The commonest type of rheumatic valve trouble in adults is mitral stenosis, in which there is a narrowing of the mitral valve through which blood from the lungs enters the left ventricle, the main pumping chamber of the heart. This obstructs the flow of blood from the lungs, leading to progressive shortness of breath on exertion. Other common symptoms are attacks of breathlessness at night, spitting of blood and repeated attacks of bronchitis. In the early stages treatment with drugs is effective,

but in more severe cases surgical treatment will eventually be necessary when the condition is causing definite disability and interference with the patient's normal way of life. Surgical treatment today is safe and satisfactory, often giving complete relief from symptoms.

Aortic valve disease is another common type of rheumatic valve trouble in which either obstruction or leakage at the valve may occur. Forceful beating and considerable enlargement of the heart occur, and this may be detected for the first time on routine X-ray examination of the chest. Shortness of breath and pain in the chest are the commonest symptoms. The condition responds well to treatment with drugs and restricted activities when necessary. In severe cases surgical treatment may be considered. Operations for this condition are more serious, and may involve replacement of the valve, using a heart-lung machine.

Many rheumatic valve conditions are more complicated, and special tests such as cardiac catheterisation are often necessary to decide whether an operation should be advised or not. All patients with rheumatic valve trouble should have such advice from a recognised cardiologist or cardiac clinic, particularly if symptoms or disability are present.

—National Heart News.

New Ways With Peanuts

Good cooks are always keen on new ways of preparing high-energy, economical and flavour-rich food. Now that hot-weather meals, picnics and barbecues are coming round again, here is a selection of new and different sandwich fillings:

Elegantly Thin. Mix ½ cup each peanut butter and orange marmalade or honey. Spread on brown bread. Spread other slice of bread with cream cheese, softened a little with milk. Put together, cut in half.

Dairy Delight. Mix ½ cup each peanut butter, chopped raisins and ½ cup cottage cheese.

Sandwich Bun. Mix 1 cup grated quality cheese, 1 tablespoon chili sauce and ¼ cup crunchy peanut butter. Use between sandwich bun.

Rebel Ham. Combine ½ cup each peanut butter with devilled ham and 2 tablespoons pickle relish.

Protein Poor Boy. Slice a frankfurter bun in half. Spread one half with a thick layer of peanut butter. On the other half arrange slices of ham, Swiss cheese, onion, salami and lettuce. Press halves together firmly.

Cole Slaw. To add a new note to an old favourite, try this Dixie Cold Slaw: toss together 2 cups firmly chopped cabbage, ½ cup chopped celery, ½ cup salted peanut halves or chopped peanuts, ¼ cup chopped green pepper, 2 tablespoons sugar, 2 tablespoons minced onion, ¼ cup peanut oil, ¼ cup vinegar, ½ teaspoon paprika, and ½ teaspoon salt. Chill at least 1 hr. before serving. Serves 4 to 6.

Cream Sauce. For something really different that will put a new taste on your favourite creamed potatoes, make this cream sauce. Blend together 2 tablespoons peanut oil, 2 tablespoons flour, 1 tablespoon peanut butter, ½ teaspoon salt and a dash of pepper. Gradually stir in 1 cup milk. Stir over low heat until thick and smooth. Stir in ½ cup peanuts. Pour over 3 cups diced cooked potatoes while they are still hot. Makes four servings.

Candy Crunch. And for an unusual dessert or just a treat between meals, this Candy Crunch Ice Cream is hard to beat. Stir 1 quart vanilla ice cream just to soften. Gently fold in two finely chopped 1 oz. chocolate peanut candy bars (½ cup). Repack and freeze until firm.

Tuberculosis-Free Cattle Herds (As at April 14, 1966)

Angus

Bridle, W. N., Cabulcha Pty. Ltd., Caloola, Leyburn
Crothers, H. J., "Moorebah", Dirranbandi
Elliott, A. G., "Ooraine", Dirranbandi

Mayne, W. H. C. & Sons, "Gibraltar", Texas
Smith, D. S., "Wyntoon", Springsure

A.I.S.

Cox, T. L. & L. M. J., Seafield Farm, Wallumbilla
Crookey, J., Arolla A.I.S. Stud, Fairview, Allora
Dart, J. L., Springbrook Rd., Mudgeeraba
Davis, W. D., "Wamba", Chinchilla
Embrey, R. J. & D. M., Warrill View
Evans, E. G., Lauraven A.I.S. Stud, Maleny
Fowler, K. J. & B. D., Kenstan A.I.S. Stud, M.S. 195, Pittsworth
Green, D. B., Deloraine A.I.S. Stud, Fairdale, via Wondai
Heading, C. A., "Wilga Plains", Maleny
Henry, Mrs. K. & Sons, "Tara", P.O. Box 4, Cambooya
Henschell, W., "Yarranvale", Yarranlea
H. M. State Prison Farm, Numinbah
Holmes, G. I. and A. M., "Branch View" A.I.S. Stud, M.S. 1444, Yarranlea
Klein Bros., Kapleton A.I.S. Stud, Ma Ma Creek, via Grantham
Littleton, H. V., "Wongalea", Bowenville
Marquardt, A. C. & C. R., "Cedar Valley", Wondai
Martin, J. P. & R. J., Kentville, via Forest Hill
McInnes, M., "Leawarra", Boondooma, Proston
McShane, A. H., Handford Road, Zillmere

Mayne, W. H. C. & Sons, "Gibraltar", Texas
Smith, D. S., "Wyntoon", Springsure

A.I.S.

Mears, G., S., & E., "Morden", M.S. 755, Toogoolawah
Messrs. Mitchell and Mulcahy, "Rosenthal", Rosenthal
Neale, D. G., "Groveley", Greenmount
O'Sullivan, P. W., "Navleigh", M.S. 371, Greenmount
Phillips, J. & Sons, "Sunny View" A.I.S. Stud, Kingaroy
Queensland Agricultural College, Lawes
Radel, R. R. & Sons, "Happy Valley", Coalstoun Lakes
Ross, W. & Co., M.S. 23, Rosewood
Sanderson, W. H. "Sunlit Farm", Mulgildie
Schelbach, N. N., Allanview Stud, Warwick
Schloss, C. J., "Shady Glen", Rocky Creek, Yarraman
Scott, W. & A. G., "Walena" A.I.S. Stud, Blackbutt
Shelton, R. A. & N. K., "Vuegon" A.I.S. Stud, Hivesville, Murgon
Sullivan Bros., "Valera", Pittsworth
Sullivan, D. & T. "Bantry", Pittsworth
Sullivan, F. B., "Fermanagh", Pittsworth
Thompson, W. H., "Alfa Vale", Nanango
Wieland, A. W. & T. G., "Milhaven" A.I.S. Stud, M.S. 786, Milford, via Boonah

Ayrshire

Ferguson, J. A., "Doralla", Cedar Ck., via Beenleigh
Goddard, B., Inverell, Mt. Tyson, via Oakey
Holmes, J. L., Charlton, via Toowoomba
Mann, N. J., Crescent Farm, Pittsworth

Mathie, J. E. and M. D., "Ainslie", Maleny
Scott, J. N., "Auchen Eden", Camp Mountain
Smith, E. J., "Hillcrest", Borallon
Zerner, G. F. H., "Pineville", Pie Creek, Gympie

Friesian

Behrendorff, E. C., Inavale Friesian Stud, M.S. 786, Boonah
Dart, Dr. J. L., Springbrook Rd., Mudgeeraba
Evans, P. J., M.S. 28, Dragon St., Warwick
Goodwin, A. T. & P. M., Winabee Stud, Killarney
Hickey, K. A., Clumber, via Kalbar
Lobley, N. E., "Neloby", Mumford Rd., Narangba
Macdonald, S. E. G., "Freshfields", Conondale Rd., Maleny

Morrison, E. J., Cedar Creek, via Closeburn
Pender, D. J., Lytton Road, Lindum
Pomerenke, P., Kentville, via Forest Hill
Queensland Agricultural College, Lawes
Stumer, A. O., Brigalow, Boonah
Superintendent, Marsden Home for Boys, Station Rd., Nth. Booval

Guernsey

Doss, W. H., Emu Creek, Biggenden
Holmes, C. D. (owner Holmes, L. L.), "Springview", Yarraman
Johnson, G. L., "Old Cammindah", Monto
Johnston, N. B. & J. M., Don River, via Wowan
Kerr, A. S., Ferndale Stud, Thangool
Robinson, O. J. & C. M., "Callide Valley", Koonkool, Callide Valley Line

Ruge, A. & Sons, "Woowoonga", via Biggenden
Scott, Cecil & C. A., "Coralgrae", Din Din Rd., Nanango
Swendson, A. C., Coolabunia, Box 26, Kingaroy
Wissemann, R. J. & D. W., Top Camp, Middle Ridge, Toowoomba
Wilson, J. R., "Okeden", Proston

Jersey

Beckingham, C., Trouts Rd., Everton Park
Birt, W. C. M., Pine Hill Jersey Stud, Gundiah
Borchert, Mrs. I. L. M., "Willowbank" Jersey Stud, Kingaroy
Burrows, R. N., "Heather Doon", Box 23, Wondai
Conochie Bros., Brookland Jersey Stud, Manumbar Rd., Nanango
Crawford, R. J. and Sons, Inverlaw, M.S. 90, Kingaroy
Dicker, E. T. & I. L., and McLellan, I. K., Chalincrest Jersey Stud, Coochin, via Boonah
Evans, W. F. & Co., "Morago", Boonah
Farm Home for Boys, Westbrook
Ferguson, J. A., "Doralla", Cedar Creek, via Beenleigh
Fowler, P. & Sons, "Northlea", Coalstoun Lakes
French, R. N., Chancelea Jersey Stud, Natural Bridge, via Nerang
Gotke, B. W., "Reynold Valley Stud", Charlwood, Kalbar
Harley, G. W. & P., "Hopewell", East Nanango
Herbener, K. E., P.O. Box 172, Monto
H. M. State Farm, Palen Creek
Hutton, D. R. & M. E., "Bellgrath", Cunningham, via Warwick
Johnson, H. G., Windsor Jersey Stud, Beaudesert
Lau, J. F., "Rosallen", Goombungee, Toowoomba

Matthews, E. A., "Yarradale", Yarraman
McCarthy, J. S., "Glen Erin", Greenmount, Toowoomba
Meier, L. E., "Ardath Stud", Boonah
Miles, J. R., "Kapricorn Farm", Kalapa
Newton, J. & E. C., Merryvale, Upper Caboolture
Patrick Bros., Craigan Jersey Stud, Aspley, Brisbane
Porter, F. & Sons, Conondale
Postle, R. S. & G. C., "Yarallaside", Pittsworth
Queensland Agricultural College, Lawes
Ralph, G. H., "Ryecome", Ravensbourne
Scott, Est. J. A., "Kiaora", Manumbar Rd., Nanango
Semgreen, A. L., "Tecoma", Coolabunia
Smith, J. A. & E. E., "Heatherlea" Jersey Stud, Chinchilla
Thomson, J. R. H. & R. V. A., "Dewrang" Jersey Stud, Natural Bridge, via Nerang
Toowoomba Special Hospital, Willowburn
Verrall, F. W., "Coleburn", Walloon
Waite, H. M., M.S. 182, Laidley
Weldon Brothers, "Gleneden" Jersey Stud, Upper Yarraman

Poll Hereford

Anderson, J. H. & Sons, "Inverary", Yandilla
Christensen, B. L. & M. O., "Elavesor", Rosevale
Hill, W. W. & R. C., Mathalla
Hutton, D. R. & M. E., "Bellgrath", Cunningham, via Warwick

Kirby, A. E. & J. M., Lochington, Bogantungan
Maller, W., "Bore View", Pickanjinnie
Maller, W., "Tantivy", Birnam, via Toowoomba
Stiller, N. L., "Vine Veil", Guluguba

Hereford

Angel, W. D., "Summerhill", Murgon

Poll Shorthorn

Leonard, W. & Sons, Welltown, Goondiwindi
Pointon, R. B. & S. C., M.S. 780, Kingaroy

Queensland Agricultural College, Lawes

Brahman

Queensland Agricultural College, Lawes

Droughtmaster

Ferguson, G. A. E. & H. R., "Charraboon" Droughtmaster Stud, Toogoolawah