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*100 Years of Queensland Dairying—I.*

## Queensland Had Only 12 Dairy Cows in 1859

By E. B. RICE, Director of Dairying.

**In the closer settlement of Queensland and the establishment and growth of many country towns, the dairying industry has played an influential role.**

In the pioneering stages of Queensland agriculture a farmer could settle on land suitable for dairying with the assurance that almost as soon as he started to develop a farm from the virgin scrub or bush a regular cash income would be received from the produce of a few cows. As additional land was cleared and the dairy herd could be increased, his income would steadily rise.

In contrast with most forms of primary production, where partial or complete failure of a crop through adverse seasonal conditions or other factors may mean the loss of all or most income in a year, dairying has always provided a farmer with a regular monthly cheque from the dairy factory which he supplies.

### **Pioneering Stage to 1900**

The first dairy cattle were brought into Queensland from the Illawarra district in New South Wales in the 1840's and depas-

tured near Ipswich. They were evidently few in number, as there were reported to be not more than 12 dairy cows in Queensland when it was separated from New South Wales in 1859.

As population increased, the numbers of dairy cattle rose steadily to satisfy the demand for milk for household use. Any surplus milk was made into butter on the farm.

Dairying methods in this pioneering stage of the new State were primitive. The milk to be converted into butter was poured into shallow pans or dishes about 18 in. wide by 4 in. deep and the pans were placed in a cupboard for 24 hours or longer. The cream which had risen to the surface of the milk was then ladled or skimmed off. The cream was churned into butter in a small hand-operated churn. The resultant butter was sold to, or bartered with, local storekeepers, who retailed it to their customers.

The locally-produced butter was insufficient for the needs of consumers, and butter was imported into Queensland until 1893. The imported butter was reported to

be of inferior quality, as in those early years there was no refrigerated shipping of butter.

### Travelling Dairy Plant

In 1888 the Government, in its efforts to foster the dairying industry, inaugurated a travelling dairy plant which visited the fast-developing dairy districts for the purpose of demonstrating the use of cream separators and methods of manufacturing butter and cheese.

Mr. Baron Jones was in charge of this travelling dairy.

A second unit was placed in commission in 1889, with Mr. John Mahon (who later became the first principal of the Agricultural College at Gatton) in charge.

The first plant continued until 1892, but the second travelling dairy continued its demonstrations until 1896. The equipment of a travelling dairy consisted of one horse-operated separator, two hand separators, one Lister cream tester, two wooden box churns, one cheese vat, one cheese press, cheese moulds, a curd rack and curd cutter.

There was an almost immediate change effected in dairying through the activities of the travelling dairies, and small factories were built in rapidly increasing numbers.

There are conflicting reports on when the first dairy factory was erected in the State, possibly due to differing opinions as to what would be defined as a factory in those times. Some, perhaps, gave this term to a place where simple mechanical facilities were provided, and where milk was purchased from neighbouring settlers, as distinct from the farm operation of making butter by a hand-churn solely from surplus milk.

However, the first central dairy is claimed to have been established by Mr. C. H. Buzacott at Hampton

on the Crow's Nest branch railway in 1887. This factory is mentioned in a booklet titled "Dairying in Australia", published in 1902 as a reprint of a series of articles by the agricultural editor of *The Queenslander*.

A special committee appointed by the Queensland Council of Agriculture in 1923 stated in its report on "History of Queensland Dairying, together with Investigation of Its Problems of Production and Marketing" that the first cheese factory of any pretension was erected at Yangan in 1893, and the first butter factory at Allora in 1895. Possibly these establishments were more deserving of being described as factories, but the annual reports of the Department of Agriculture mention the numbers of factories from 1890 onwards.

### Brisbane Factory

A central butter factory was erected at South Brisbane in 1890 and by the end of that year there were eight cheese and butter factories and five creameries. The creameries were wooden buildings where a steam-driven cream separator was installed. Nearby farmers took their milk to the creamery, which, after separating the milk, sold the cream to a central butter factory and returned the skim milk to the farmers. This so-called "separator" butter was of better quality than the farm-made or imported butter and attracted a higher price.

The early records show that among those places where the first small factories were established were Lanefield, Brymaroo, Oxenford, Grandchester, Aubigny, Greenmount, Pilton, Quinalow and Toowoomba.

### Farm Separators

About this time, farm separators were first imported into the State

and gave a great stimulus to dairying. By their use, the farmer was relieved of the necessity of taking his produce daily to the factory. As cream has better keeping quality than milk, the farmer was able to forward his cream to the factory several times weekly instead of by the daily delivery necessary for milk. Farms farther away from the factories or creameries then began to be developed for dairying.

In 1895, nearly 200 separators were purchased by factories and farmers. Evidently they increased in numbers very rapidly in the next few years as there is mention in 1900 of their advantages in helping to open up dairy farms further away from factories, and to provide skim milk for calf and pig raising, being offset by neglect of proper cleaning of these machines. It was stated that much of the farm-separated cream was far too advanced in age to permit of it being made into high quality butter, that general failure to keep separators clean was a serious threat to the progress of dairying and some means would have to be devised to check the ill-effects to the industry which were arising from the irrational use of farm separators.

### **Bonus For Export Butter**

To foster expansion of dairying, the government in 1894 offered a bonus of 4d. a lb. for all butter shipped overseas.

The first shipment of butter from Queensland to London was in 1895. A total of 17 tons was exported in that year but by 1898 exports had risen to 436 tons. The advent of refrigerated shipping space stimulated the export trade, but Queensland produce had first to go to Sydney by interstate steamers and was transhipped there on to overseas ships. Ships of the Aberdeen line commenced to call

at Brisbane in 1903 in order to load dairy produce and ship it to the United Kingdom.

By 1895, there were in existence 23 small butter and cheese factories and 27 creameries.

Competition for cream supplies soon after the factory system began was obviously keen. The booklet previously mentioned states that in some instances cream so bad as to be wholly unfit for use was rejected by one or two companies, but was bought by another. Preservatives were added to the butter made from the cream.

It went on further to say that some factories made the worst quality cream into butter, which they did not brand but sold in the name of the carter who conveyed it from the factory. However, it appears that by 1900 some improvement was already taking place, as mention is made of increasing local consumption due to the better quality of the article and its lower cost.

### **Once A Day Milking**

In the pioneering years before 1900, cows were mostly milked once daily and calves were allowed to run with them. The farmers relied on the indigenous grasses for the grazing of their herds. The potentiality of paspalum as a pasture grass appears to have been recognised about the end of the century, as there is reference to its seeming to offer the foundation for enduring success for dairy farmers and graziers.

### **Efforts in Herd Improvement**

Agricultural show societies first stimulated interest in improving the quality of the dairy breeds by providing competitions at which initially the animals were judged on conformation to dairy type. Later, the competitions also included milking contests. The

earliest records of winners at show competitions are for the Brisbane Exhibition in 1885, when the dairy cattle exhibited were of the Jersey and Ayrshire breeds only.

The estimated number of dairy cattle in the State in 1896 was 80,000.

### Milking Competitions

In 1897, a scheme was started for the improvement of dairy cattle by means of milking competitions in different districts. Successful competitors were registered by the Department of Agriculture and permitted to carry a specified brand. In 1905, the scheme was amended to require a cow to be milked, under the supervision of a Departmental Officer, for a test period of two days, and the cow had to have a calculated record of not less than 12 lb. of butter for a week.

The following figures depict the extent of the dairying industry at the close of the last century:

Butter and cheese produced were estimated to be valued at nearly £500,000 and the contingent products of the dairy industry, such as bacon and ham, were valued at £250,000.

In 1899, there were 256 butter and cheese factories and 438 creameries. Altogether 930 establishments were handling cream only, and 4,740 were handling butter and cream. The total quantity of milk dealt with for manufacture into butter on the farms, in factories and in creameries was 22,934,000 gal. This was converted into 5,796,000 lb. of butter in central factories and 2,666,000 lb. on farms, or a gross total of 8,462,000 lb. The appreciable proportion of farm-made butter is obvious.

Two hundred and twenty-one producers of cheese used 1,911,000

gal. of milk in the manufacture of 1,910,000 lb. of cheese.

The exports were 1,159,255 lb. butter valued at £49,517, and 11,358 lb. cheese worth £250.

### Co-operative Factory Movement

The earliest dairy factories were all owned by proprietary companies or private individuals. Although some of the creameries were co-operatively owned by the producing suppliers, they forwarded the cream to proprietary butter companies.

A co-operative factory at Lane-field had 50 suppliers in 1892. In 1894, four factories and one creamery were co-operatives, while the total numbers were 16 factories and 13 creameries.

A co-operative butter and cheese factory was established at Tiaro in 1890 and found a ready market for its products in Gympie, which was then a flourishing gold mining town. However, this factory apparently was short-lived as a co-operative and closed in 1892. It was acquired by, and operated as a branch butter factory of, the Lowood Creamery Co. Ltd., for an advertisement by that company in 1902 included the Tiaro factory among its factories. Its other branch butter factories were at Boonah, Beaudesert and Toowoomba, and it owned a cheese factory at Yangan.

The co-operative movement in the sphere of dairy products manufacturers began to displace proprietary interests in the early 1900's. The Queensland Farmers' Co-operative Association was formed in 1900 and in May, 1901, commenced to manufacture butter at a factory established at Booval. Its production for the year ended

April 30, 1902, was 1,094,906 lb. butter. Thereafter, co-operative dairy associations soon gained ascendancy.

The Maryborough Co-operative Dairy Association's annual reports indicate that it was also in existence in 1901; 33,309 lb. of butter were made for the year ended June 30, 1901.

The Downs Co-operative Dairy Association, Toowoomba, was founded in 1902 and the Port Curtis Co-operative Dairy Association in 1904. This company's annual reports show manufacturing data for the year ended June 30, 1906, when 8,038 lb. of butter were made: There were only 32 suppliers to the Association for that year.

These four pioneer co-operative dairy companies are now the largest dairy companies in the State.

Nowadays, Queensland dairy farmers, through their co-operative factories, largely control the manufacture into butter and cheese of the milk and cream produced by them. In recent years in most parts of the State, the co-operatives have also engaged in the pasteurised milk trade. In 1958, only one of the 48 butter factories, five of the 24 cheese factories, and four of the 18 pasteurised milk factories in the State were not conducted by co-operative associations.

### **The First Legislation**

The Meat and Dairy Produce Encouragement Act of 1894 was the first statute passed with the object of fostering the dairy industry. It provided for loans to be made available by the Department of Agriculture for the building and equipping of dairy factories.

The Dairy Produce Act was originally passed in 1904 and came into effect on April 1, 1905. It was the first Act governing the manufacturing side of the dairy industry in Australia, although a Dairy Supervision Act was passed in New South Wales in 1901 to deal with control of milk and cream production on farms. This Act was repealed by the 1920 Act to which many amendments have been made in the meantime.

A Government Dairy Expert (Mr. G. Sutherland Thomson) was appointed to the Department of Agriculture and Stock in March, 1904, and in that year Queensland was the first State to enforce butter grading. The compulsory grading of cream was introduced on August 1, 1908.

A Margarine Act was passed in 1910.

The Co-operative Agricultural Production and Advances to Farmers Act, 1914-1919, superseded the Meat and Dairy Produce Encouragement Act, but limited loans to co-operative associations. It also assisted farmers to purchase dairy stock. This Act was repealed in 1923, but additional facilities then became available for co-operative dairy companies and dairy farmers under the Agricultural Bank Act of 1923.

### **Subsidy for Bulls**

A scheme for payment of a £ for £ subsidy to purchasers of purebred dairy bulls which were the progeny of a cow entitled to registration in the advanced register of Dairy Cattle Breed Societies was introduced in 1925. This scheme was amended in 1932 by limiting the Government's contribution to a refund of rail freight and in that year the Dairy Cattle Improvement Act was passed.

A main provision of this Act was the registration of dairy bulls, but, due to intense opposition by farmers, the bull registration scheme was never implemented.

The Primary Producers' Organisation and Marketing Act was passed in 1926. It was considered the most progressive legislation of its kind in any country at that time, and provided for the organised control of the marketing of primary products by boards constituted of representatives of the producers of the various commodities. A board was only formed after a poll of producers indicated their wish to engage in such a form of controlled marketing.

### Marketing Boards

The butter and cheese sections of the dairy industry, which had previously set up marketing boards, were among the first to form boards under the new legislation.

Provision was made under an amendment of the Dairy Produce Acts in 1935 for the organised control of the transport of milk and cream to factories by the gazettal of milk and cream routes to factories and the licensing of milk and cream carriers.

Action was first taken to gazette routes in 1937. This amendment was designed to assist in quality improvement by ensuring that milk and cream supplies generally were forwarded to the nearest factory, to avoid uneconomic competition by factories for supplies, and to

prevent undesirable practices, such as improper cream grading and subsidising transport costs.

During the war years of 1939-45, action was taken to eliminate some overlapping which existed in the cream routes originally gazetted to the factories. A committee was appointed in 1940 to examine the practicability of zoning cream supplies for butter factories, but, after submission of its report, no action was taken to implement a factory-supply zoning scheme.

In 1939, the Margarine Act of 1910 was amended. It defined table margarine and provided for quotas to be determined for its manufacture. Quotas aggregating 645 tons yearly were allotted to three firms in 1941. However, due to the difficulty of obtaining raw materials, the quotas were not attained until 1947-48. Subsequent amendments of quotas were 1,600 tons in October, 1951, 6,860 tons in May, 1953, and 4,236 tons in July, 1954.

The Act was repealed in 1958 and a consolidated Act passed. It provided for two specific types of margarine—cooking and table—and the packages containing same to have printed on them the type of margarine within the wrapper.

A Filled Milk Act was also passed in 1958 to prevent the production and sale in Queensland of any imitation milk made from non-fat milk solids and vegetable oils as a replacement of butterfat.

(TO BE CONTINUED)





# Herd Recording as an Investment

By S. W. IVERS,  
Herd Recording Section.

**M**ANY dairy farmers do not realise the financial assistance they are receiving from herd recording. Under the present arrangements, the farmer pays 10s. a cow for each lactation, the State Government contributes a further 10s. and the Commonwealth Government a further subsidy of 6s. 8d. per cow.

In actual fact, every time a cow comes into production and is recorded as A class, the farmer receives the equivalent of about 26s. 8d. for a direct financial outlay of 10s.

There is no other investment on the farm which carries such potentialities. Follow this through to the finish of the lactation and add culling programmes, improved farm practices, production increases and you can appreciate the implications of production recording of herds.

## What Costs are Involved?

It is interesting to know just how this money is spent. There are three main channels of expenditure—

- (i.) The capital cost of equipment.
- (ii.) The necessity for a maintenance reserve of equipment.
- (iii.) Operational costs in the field.

(i.) To commence a group requires a capital outlay for equipment of about £200. A group comprises about 20 herds in a district. The recorder travels from farm to farm testing the cows for two consecutive milkings at approximately monthly intervals.

This expenditure provides for all necessary equipment for normal group operations. A recorder comes to a farm fully equipped and the farmer should not have to provide any equipment. Some of the equipment has been specially designed and improvements are constantly being sought and incorporated.

The basic idea is to improve the utility of the equipment and to streamline operations to reduce costs and improve overall efficiency of herd recording operations.

(ii.) Many items of equipment have to be manufactured from glass and the wastage in some of these items is high. Milk test buckets require retinning about once each year. Babcock testing machines require a complete overhaul every few years as machines deteriorate rapidly with age. Sulphuric acid for the testing of the milk is difficult and dangerous to handle and store under field conditions. It is issued in smaller quantities to the recorder and this stock is replenished on regular schedules. The

aim is to prevent a build up of acid in areas. There are three reasons for this—

- (a) Large quantities of acid can cause storage problems.
- (b) As the acid becomes old, it loses its strength.
- (c) By keeping reserves to a minimum, charges for the hire of jars and crates are kept down.

All of these factors add to a value of over £2,000 which is required for replacements to service the groups throughout the State. To keep costs to a minimum, replacement equipment is purchased in bulk and issued to herd recorders as they require it. A close check is kept on wastage within groups for such things as carelessness or the irregular use of equipment on issue. Equipment is inspected throughout the year as a check of its mechanical condition and to ensure that it is capable of doing the work efficiently.

(iii.) As with many industries, labour costs are the major item of expenditure. Wages have increased steadily since 1948 and have been the major cause of rises in herd recording fees. These, coupled with expenses for the running of vehicles, account for the major proportion of costs.

The proportion of total expenditure necessary to pay labour and mileage costs is listed in Table 1.

TABLE 1.

SUMMARY OF HERD RECORDING COSTS  
(AGGREGATED TOTALS) 1957/1958

	Per cent.
Salaries of Herd Recorders ..	82
Car Mileage Allowances ..	13
Apparatus supplied to Groups	2
Sundries (Tax, Postage, Freights, &c.) ..	3

### What The Farmer Receives

So much for the debit side of recording—what of the credit side? For an outlay of 10s. the farmer is receiving a subsidy which should

induce him to consider the recording of his herd. If he can increase the average production from each cow by a mere 3 lb. of butterfat, he has recouped his outlay and any further increases are his as profit for the year's operations. Many farmers have done this by culling some of their low producers and giving their higher producing cows more to eat. Herd recording provides a check on feeding practices, and improvements in this direction quickly give responses in butterfat production.

Herd recording can be likened to a mechanical auditor. The farmer has no other means available for measuring the actual yield of milk and butterfat of each individual cow. He must be certain that the value of the output of milk and butterfat is greater than the value of the input of feed. He must know how each cow responds to feeding rations or cropping programmes, and how changes of feed are reflected in the milking bucket.

Farmer members of groups also receive value for their money in the information that is passed back to them from the Herd Recording Section. Each month the farmer is provided with a progressive total of each cow's production. At the close of the recording year in September, annual summaries are forwarded with the list of all cows that have completed lactations grouped in their butterfat ranges and age groups.

Allied to this is the sire surveying service which indicates whether the sire is raising herd production. The results of surveys are based on factual information received from group members and form part of routine farm management. An additional feature of this survey is the permanent tattooing of all daughters to ensure accurate identification throughout their milking life.

It is imperative that the work of a sire be assessed as quickly as possible. It is unfortunately true that in Queensland herds, about 20 per cent of the bulls being used are incapable of raising herd production. Accurate assessment can only be based upon a comparison of the daughters with the remainder of the herd. To obtain correct comparisons, all productions are corrected to a "mature equivalent" production based on well-established conversion factors. The effect on production of an unsuitable bull takes years to eliminate and farmers must be on the lookout for such sires in their herds.

#### Useful Surveys

Surveys already carried out or being investigated are—

- (i.) Seasonal calving.
- (ii.) Effect of age at first calving on production.
- (iii.) Effect of length of dry period on production.
- (iv.) Effect of period between calving on production.

Perhaps the most widely accepted of these has been seasonal calving which is practised on many farms today.

Farm visits to each member are paid by officers throughout the year where results are discussed and programmes laid down for future activity designed to increase production and reduce costs.

Many farms have been recording for a long period now and have sufficient figures for a constructive

plan for "grading-up" the herd. This requires that the herd be divided into three groups according to their production. The progeny from the top-producing group is used to replace cows in the lower bracket and so gradually the "tail" drops off as the herd average rises.

It is certain many producers could utilize the benefits of herd recording to advantage. Briefly these benefits are provided in—

- (i.) Monthly recording of each cow's production.
- (ii.) Progressive totals each month which give production in milk and butterfat for each cow and the number of days she has milked.
- (iii.) Annual herd summaries each year indicating the production and length of lactation of each cow.
- (iv.) Assistance and advice from departmental officers on farm planning, setting up feeding, breeding and culling programmes.
- (v.) The identification of female calves by tattooing.
- (vi.) The compilation of sire surveys when sufficient data is available.
- (vii.) Recommendations arising from surveys which are being regularly conducted.
- (viii.) Guidance with the selection of replacement stock.
- (ix.) Guidance in designing and keeping systems of dairy records.



## Tuberculosis-Free Cattle Herds (As at 1st September, 1959)

### Aberdeen Angus

Crothers, G. H. & H. J. "Moorenbah", Dirranbandi  
 Elliott, A. G., "Ooraine", Dirranbandi  
 Mayne, W. H. C., "Gibraltar", Texas

### A.I.S.

Cox, T. L. & L. M. J., Seafeld Farm, Wallumbilla  
 Crooke, J., Arolla A.I.S. Stud, Fairview, Allora  
 Davis, W. D. "Wamba", Chinchilla  
 Dennis, L. R., Diamondvale, A.I.S. Stud, Mundubbera  
 Edwards Bros. "Spring Valley", A.I.S. Stud, Kingaroy  
 Evans, E. G., Lauraven A.I.S. Stud, Maleny  
 Green, D. B., Deloraine, A.I.S. Stud, Fairdale  
 Heading, C. A., "Wilga Plains", Maleny  
 Henry, Mrs. K., Greenmount  
 Henschell, W., "Yarranvale", Yarranlea  
 H. M. State Farm, Numinbah  
 Littleton, H. V., "Wongalea", Hillview, Crow's Nest  
 Marquardt, A. C. & C. R., "Cedar Valley", Wondai  
 Mears, G. S. & E., M. S. 755, Toogoolawah  
 Moore, S. R., "Sunnyside", West Wooolin  
 Neale, D. G., "Groveley", Greenmount  
 O'Sullivan, Con., "Navillus", Greenmount  
 Phillips J. & Sons, "Sunny View", Benair, Kingaroy  
 Power, M. F., "Barfield", Kapaldo  
 Queensland Agricultural High School & College, Lawes  
 Radel, R. R. & Sons, "Happy Valley", Coalstoun Lakes  
 Roche, C. K., Freestone, Warwick  
 Sanderson, W. H., "Sunlit Farm", Mulgildie  
 Schloss, C. J., "Shady Glen", Rocky Ck., Yarraman  
 Scott, M. E. & E., "Wattlebrae", A.I.S., Stud, Kingaroy  
 Scott, W. & A. G., "Walena", A.I.S. Stud, Blackbutt  
 Shelton, R. A. & N. K., "Vuegon" A.I.S. Stud, Hivesville, Murgon  
 Sokoll, A. H., "Sunny Crest", Wondai  
 Sperling, G., "Kooravale", Kooralgin, Cooyar  
 Sullivan Bros. "Valera", Pittsworth  
 Sullivan, D. "Bantry", Pittsworth  
 Sullivan, F. B., "Fermanagh", Pittsworth  
 Thompson, W. H. "Alfavale", Nanango  
 Webster, A. H., "Millievale", Sabine, via Oakey  
 Wieland, A. W., "Milhaven", A.I.S. Stud, Milford, via Boonah

### Ayrshire

Dudgeon, C. E. R., Marionville Ayrshire Stud, Landsborough  
 Dunn, T. F., "Alanbank", Gleneagle  
 Goddard, B., Inverell, Mt. Tyson, via Oakey  
 Holmes, L., "Benbecula", Yarranlea  
 Mathie, E. & Son, "Ainslie", Maleny  
 Scott, J. N. "Auchen Eden", Camp Mountain  
 Zerner, G. F. H., "Pineville", Pie Creek, Box 5, Post Office, Gympie

### Friesian

Behrendorff, E. C., Inavale Friesian Stud, M.S. 786, Boonah  
 Macdonald, S. E. G., "Freshfields", Marburg  
 Naumann, C. H., "Yarrabine", Yarraman  
 Pender, D. J., Lytton Road, Lindum  
 Stumer, A. O., Brigalow, Boonah

### Guernsey

Doss, W. H., Degilbo, via Biggenden  
 Fletcher, A. B. "Cossart Vale", Boonah  
 Holmes, C. D. (owner Holmes L. L.) "Springview", Yarraman  
 Johnson, G. L. "Old Cannindah", Monto  
 Miller, G. "Armagh Guernsey Stud", Armagh, M.S. 428, Grantham  
 Ruge, A. & Sons, "Woowoonga", via Biggenden  
 Sanderson, N. H. "Glen Valley", Monto  
 Scott, C., "Coralgrae", Din Din Rd., Nanango  
 Swendson, A. C., Coolabunia, Box 26, Kingaroy  
 Wissemann, R. J., "Robnea", Headington Hill, Clifton

### Jersey

Beckingham, C. Trout's Rd., Everton Park  
 Birt, W. C. M., Pine Hill Jersey Stud, Gundiah  
 Borchert, Mrs. I. L. M., "Willowbank" Jersey Stud, Kingaroy  
 Burrows, R. N., Wondai, Box 23  
 Bygrave, P. J. L., The Craigan Farm, Aspley  
 Carpenter, J. W., Flagstone Ck., Helidon  
 Conochie, W. S. & Sons, "Brookland", Sherwood Rd., Sherwood  
 Cramb, S. A., Bridge St., Wilsonton, via Toowoomba  
 Crawford, R. J., Inverlaw, Kingaroy  
 Farm Home For Boys, "Westbrook"  
 Fowler, P. & Sons, "Northlea", Coalstoun Lakes  
 Gregory, P. H. F., "Carlton", Rosevale, via Rosewood  
 Harley, G., "Hopewell", M.S. 189, Kingaroy  
 H. M. State Farm, Palen Creek  
 Hutton, D. R., "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  
 Noone, A. M. & L. J., "Winbirra", Mt. Esk Pocket  
 Porter, F., Conondale  
 Queensland Agricultural High School & College, Lawes  
 Ralph, G. H. "Ryecome", Ravensbourne  
 Scott, Est. J. A., "Kiaora", Manumbar Rd., Nanango  
 Semgreen, A. L., "Tecoma", Coolabunia  
 Seymour, B. T., "Upwell", Jersey Stud, Mulgildie  
 Smith, J. A. & E. E., "Heatherlea", Jersey Stud, Chinchilla  
 Tatnell, W. T., Cedar Pocket, via Gympie  
 Toowoomba Mental Hospital, Willowburn  
 Verrall, F. W., "Coleburn", Walloon  
 Weldon Brothers, "Gleneden", Jersey Stud, Upper Yarraman

### Poll Hereford

Anderson, J. H. & Sons, "Inverary", Yandilla  
 Hutton, D. R. & M. E., "Bellgrath", Cunningham, via Warwick  
 McCamley, E. W. G., "Eulogie Park", Dululu  
 Maller, W., "Bore View", Pickanjinie  
 Wilson & McDouall, Calliope Station, Calliope

### Poll Shorthorn

Leonard, W. & Sons, Welltown, Goondiwindi

## Bucket and Bail

### Have Your Calves Identified.—

The identification of calves was initiated in 1955, when Herd Recorders commenced tattooing heifer calves in both ears. Symbols were placed in each calf's right ear to represent the recording group and herd number. A letter indicating the year of birth was placed in the left ear together with the number of the calf.

This procedure has been continued each year and in 1958 and 1959 the positive identification of calves has played a big part in the breeding and improvement plans of recording members.

Any breeding plan must be based on the positive identification of calves and their parents.

Sire Surveys may be made as early as possible if daughters of bulls are identified when they come into production. A private survey is made when at least six daughters have each completed a lactation, and a preliminary survey (which is more accurate) is made when 10 daughters have each completed a lactation. This means that by tattooing calves and keeping records of them the worth of your bull may be gauged, in many cases, while he is still on the farm.

On the female side, the production records of identified animals will direct attention to superior or inferior cow families.

In 1958, calves were tattooed with D in their left ears. It is noted that 6,988 calves were marked in 683 herds. This means that only about two thirds of recording members are making use of this service. If you are one of the members whose calves have not been marked, have them ready for the Herd Recorder when he visits you next time.

### Keeping Milk Free from Weed Taints.—

Methods of controlling weed taints in dairy produce will be demonstrated to Queensland farmers by the Agriculture Department this year. These methods have proved successful overseas.

Last year was one of the worst on record for weed taints in Queensland dairy produce. Because of their serious incidence, a great deal of butter was downgraded and some milk supplies were rejected by the factories.

Weed taints in dairy produce are common in winter and spring. Taints are most troublesome after a wet winter when there has been profuse weed growth. Most winter weeds are palatable to stock and quite nutritious, but they cause unpleasant taints in milk. Heat treatment only intensifies some of these off-flavours.

Controlled grazing and spraying pastures with hormone weedkillers will be demonstrated as methods of preventing, or at least reducing, weed taints.

Two Ipswich district farms have been selected for field trials on the control measures this weed season. On one, oats will be grazed after having been sprayed with a hormone weedkiller to destroy the troublesome weeds.

On the other farm, the merits of controlled grazing will be studied. Cows will be grazed on a weed-infested lucerne crop and removed two, four and six hours before milking. Aim of this is to find out what interval is needed for the chemical causing the taint to pass out of a cow's bloodstream.

It is believed, however, that these measures are successful only against certain types of weeds. The problem

is made more difficult in Queensland, where lesser swine cress is a widespread weed that does not readily lend itself to these methods. As a long-range remedy, the provision of good quality improved pas-

tures giving proper ground coverage should eliminate these problem weeds.

—F. C. COLEMAN,

*Director of Dairy Field Services.*

### Plans for October

Join a herd recording group to find out which cows are profitable.

Construct a bull paddock to enable controlled mating.

Mate cows now to ensure seasonal calving.

Cool milk and cream to preserve quality.

With warm weather approaching, carefully check cleansing methods.



## The Growing of Lupins

J.L., of Capella, seeks information on the use of lupins in his district.

*Answer:* The most frequently grown lupin is the Blue lupin which is an autumn to winter growing legume. It is grown in the Granite Belt, usually on stored soil moisture accumulated during the summer months.

In the Granite Belt, the soils on which the crop is grown are much more sandy than those around Capella. This difference in soil type may prove a difficulty in the successful culture of the lupin.

A trial planting of lupins on the sandy soils at Coolool on the near north coast did not perform well the first year. However, the second year the lupins showed much more satisfactory growth. Whether or not this was due to soil fertility or inoculation disturbances is not known.

Generally it is considered desirable to inoculate all legumes with the appropriate inoculum prior to planting in order to ensure better germination and plant growth. Appropriate inoculums for most legumes are available from the Department.

As there are other legumes which may suit the purpose of improving soil fertility in the Central Highlands, a consultation with the local Adviser in Agriculture is suggested, who will be able to make recommendations and give advice based on local knowledge.

# Irrigated Pasture For Dairy Herd At 2d. A Head

By L. E. BRANDS,  
Adviser in Agriculture.

A cost of 2d. per cow per day gives this dairyman financial security and mental peace, even in times of drought.

**T**HE story is about a dairy farmer in the Toowoomba agricultural district who had realized for a long time the hazards of our climate and its allied variations in production. Some customary methods of fodder production and conservation had been practised, but did not prove fully satisfactory. For this reason, irrigation was looked upon as a way out, and in March 1958, a bore was sunk. At a depth of less than

100 ft. a supply of 10,000 gallons an hour was struck.

## Flood Irrigation

The same month, Agriculture Department officers finished a flood irrigation layout for 4 acres of lucerne and 6 acres of a pasture-clover mixture, consisting of *Phalaris tuberosa*, H.I. rye, ladino white clover and montgomery red clover.



Plate 1

A Close-Up of the Flood-Irrigated Clover Pasture of 6 Acres That Helped to Feed a Herd of 33 Dairy Cows.

Grazing of the pastures commenced in July and continued right through the summer to this day (April 29). Each day, an average of 33 cows (26 milkers and 7 forward and backward springers) fed on the mixture and at night were put on sudan grass and sweet sorghum. Naturally, during wet weather the herd was kept off the irrigated pastures and grazed the native grasses.

Of this property of just over 400 acres, 300 are under cultivation (including the irrigation paddock). Before irrigation was practised, 100 acres of cultivation were utilized to provide fodder for the cows. It has proved possible to bring this acreage down to 45 acres. In other words, an extra 55 acres could be used for grain production. The soil, formerly timbered with box, is capable of producing a 15 bag to the acre barley crop, which means a gain of some £800. Let us remember this figure.

How did the lucerne do? So far, the 4 acres produced 630 bales in 5 cuttings and another cutting is due shortly.

### These Were The Costs.

To gain an insight into the costs of this irrigation project, the following figures are given:

	£	s.	d.
Costs of establishing water supply, (bore, casing, etc., including turbine pump) .. .. .	1,250	0	0
Survey and supervision of layout .. .. .		nil	
21 timber inlet-boxes at 11s. .. .. .	11	11	0
Steel and timber posts and insulators to divide the 6 acres into 9 paddocks	25	15	0
Implements used for layout (leveller, crowder and delver) .. .. .	27	18	3
<b>Total .. .. .</b>	<b>£1,315</b>	<b>4</b>	<b>3</b>

If the depreciation is stretched over 10 years, depreciation costs amount to some £130 a year or £13 an acre. In a normal year, eight 3-acre/inch waterings are to be given. Fuel costs to drive the pump amount to £1 for one 3-acre inch watering or £8 per acre per year.

The total costs per acre per year (labour costs not calculated) are thus £21.



Plate 2.

**Cows in Good Condition Strip Graze the Pasture That was Provided for Them at a Cost of 2d. a Head a Day.**



Annual cost of maintaining the 6-acre pasture area is £126. This area has been divided into 9 paddocks. Two at a time provide grazing for a fortnight. The same area is grazed once every two months. This amounts to 2d. for each cow for a full grazing day.

### Cheap Lucerne

It is interesting to see how the lucerne worked out. The price is based on contracting:

Baling (a bale) .. ..	2s. 0d.
To mow one acre .. ..	10s. 0d.
Hire of rake (an acre) ..	2s. 6d.
Cart in and stack (a bale) ..	1s. 0d.

With an average yield of 31 bales, contracting costs amounted to £5 5s. 6d. per acre per cutting.

The lucerne was given a total of 7 waterings, which adds another £1 8s. Depreciation costs amount to £2 12s. Total costs for 1 ton of prime lucerne-hay £9 5s. 6d.

To conclude this story it should be added that, a few weeks ago, the area under pastures was increased to 13 acres. Moreover, the tractor to drive the pump was permanently displaced by a diesel engine (value £400) with a direct universal drive coupling to the pump. The general costs picture, however, will be influenced only favourably by these measures. And remember the saving in cultivation. Also the average monthly cream cheque of £145. And who could calculate the value of mental peace?

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## Certified Sweet Sudan Grass

**F**OR those farmers who wish to plant a quick-growing summer fodder crop for their dairy herds and at the same time be sure that they are not introducing Johnson grass to their farms, there is now available a substantial quantity of certified sweet sudan grass seed.

This seed, produced under the Department of Agriculture and Stock's certification scheme, was grown during the current year and has only recently been certified. Its desirable features are its trueness to type, very high germination, freedom from weed seeds, including complete freedom from Johnson grass seed, and a very small percentage of inert matter.

Quite a great deal of the uncertified sweet sudan grass seed available for sale contains a proportion of seed with either black or dark glumes. The sweet sudan grass seed produced under the Queensland certification scheme, although not being completely free of dark glumed seed, has only a very small proportion of seeds which do not have the true sienna colour which is a distinct characteristic.

To ensure its trueness to type is maintained, sweet sudan grass crops grown for certification purposes must have an isolation distance of 40 chains from all other sorghum and sudan grass crops. Inspections made of the land before planting and of the crop during its growth ensure that the crop is grown in accordance with certification requirements. In addition every precaution is made during seed cleaning to prevent contamination of the seed.

Farmers can, therefore, confidently purchase Queensland certified sweet sudan grass seed knowing that the seed they are buying is true to label.

—N. V. HIBBERD, *Standards Branch.*

# Improved Pastures Will Fatten Cattle In Far North

By S. R. WALSH.  
Adviser in Agriculture.

The tropical coastal district of the far north offers an opportunity for the establishment of a sound cattle-fattening industry based on improved pastures.

The far northern area, which embraces portions of the Cardwell, Johnstone, Mulgrave and Douglas Shires, is unique in having extensive areas of suitable soil for pastures with an assured rainfall and ample water supply.

The closeness of the breeding areas in Cape York Peninsula and the Gulf regions assures a supply of store cattle, most of which are sold through the Mareeba sales yard.

It has been demonstrated at the Bureau of Tropical Agriculture, South Johnstone, that store cattle can be fattened quickly on tropical pastures in the far north.

The location of the fattening areas together with the principal towns in relation to the breeding areas are shown in Plate 1.

## Fattening in the Thirties

The use of this coastal area for fattening dates back to the early period

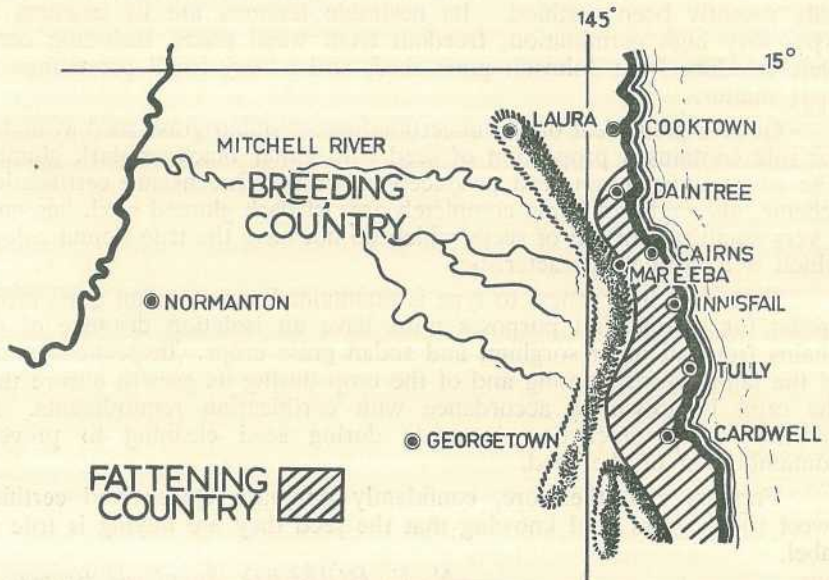


Plate 1

in the 1930's when store cattle were brought from the inland area and fattened under intensive grazing conditions on the Daintree river flats.

Later, portions of the Tully district were developed and grassed and cattle fattening extended to this region.

With the potential of this industry becoming evident, preliminary investigations into suitable grass and legume pastures were commenced in 1939. In 1946, more detailed investigations were started and many earlier problems associated with coastal pastures particularly in relation to pasture legumes were solved at the Bureau of Tropical Agriculture.

## Climate

In an area covering such a wide expanse of the tropical coast some variation in rainfall is expected.

A comparison of the average rainfall for various districts from 1948-57 is shown in Table 1.

In spite of a variation of some 100 inches in annual rainfall the distribution of the rain in all centres follows a similar clearly defined pattern of heavy falls in the January to March period, and a dry period in the spring months.

This seasonal variation influences planting times and subsequent pasture

TABLE 1  
RAINFALL [INCHES]

—	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Tully ..	35.7	26.6	32.8	21.9	16.5	9.1	8.9	5.3	4.8	4.9	7.4	11.5	185.4
Innisfail	21.9	21.8	24.0	13.5	7.2	5.0	3.9	3.0	3.6	3.6	5.0	7.6	120.1
Babinda	33.8	21.3	30.7	21.0	9.2	7.5	6.1	8.3	12.6	4.9	12.3	10.0	177.7
Cairns ..	20.7	15.2	17.9	8.5	3.4	2.8	1.5	1.7	2.0	1.6	4.7	6.4	86.4

During the past five years a considerable increase in development has taken place. Higher prices and a more settled market have greatly assisted this development.

## Present development

The main areas being developed at present comprise the better class country such as the scrub lands, the lighter scrub adjacent to the river banks, the palm swamp country and the plains.

During 1957-58 an area of some 1,500-2,000 acres of scrub land alone was developed.

The open forest regions are being used for rough grazing during the wet season and provide quite useful feed after the first storms.

Most of these classes of country require their own individual methods of development and pasture mixtures.

growth. An unusual feature of the "wet season" is the extremely hot, dry period of six to seven days, frequently longer, which is often experienced in late January or February.

This dry period with its very high temperatures has an adverse effect on newly planted grasses and has, at times, caused considerable loss.

From the graph in Plate 2, the rainfall distribution can be clearly seen.

At the Bureau of Tropical Agriculture near Innisfail, temperatures vary from the summer average maximum of 86 deg. F. to the winter average of 58 deg. F. with summer and winter extremes of 100 deg. F. and 42 deg. F. respectively.

An indication of the climate throughout the year is gained from

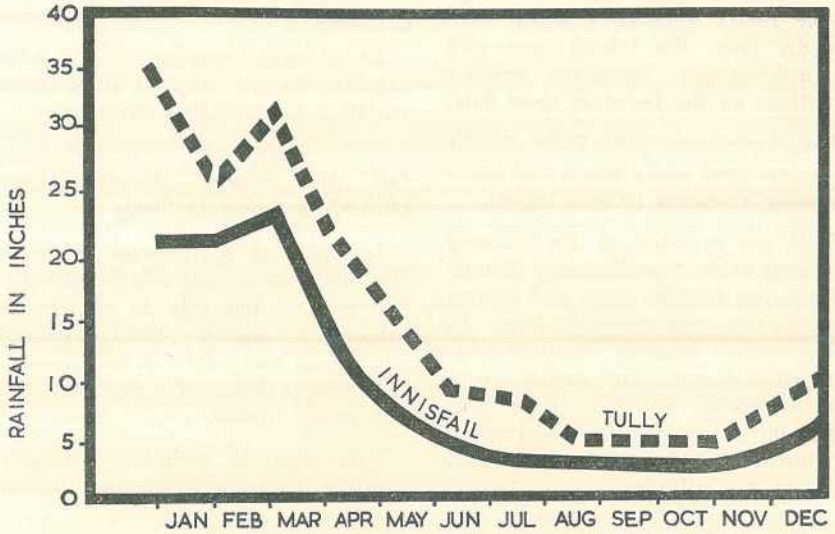


Plate 2

Table 2, which is based on recordings from the Bureau of Tropical Agriculture.

Those areas adjacent to the coast are mainly low-lying, subject to flooding and swampy.

### Topography

In portion of this region, pasture is secondary to sugar cane and consequently the grazing areas are on unassigned land and the steeper hillsides in the cane zones. Outside those zones there is some level and plain country being developed under pasture.

The hillsides are, firstly, the foothills with the more gentle slopes and, secondly, the steeper areas of rain forest, which if previously cleared now carry secondary growth and weeds.

### Native Vegetation

The native vegetation follows rather definite soil types and topographical zones.

*Rain Forest or "Scrub".* The Basaltic soils are invariably covered with thick rain forest or "scrub" as it is referred to, typical of so much of the wet belt of the far northern tropical coast.

In addition, a lighter rain forest is also found in narrow strips along many of the rivers and creek banks. These belts vary in width from 2 to 10 chains.

TABLE 2

CLIMATOLOGICAL DATA FROM THE BUREAU OF TROPICAL AGRICULTURE (1958)

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Average Maximum Temperature °F .. .. .	87°	86°	85°	80°	78°	75°	74°	76°	79°	83°	86°	87°
Average Minimum Temperature °F .. .. .	71°	72°	70°	66°	62°	58°	58°	58°	60°	64°	67°	68°
Average Evaporation (daily)	·15in	·13in	·14in	·12in	·10in	·09in	·11in	·11in	·15in	·16in	·17in	·18in
Average Humidity (1958) ..	78%	86%	85%	90%	91%	89%	88%	84%	77%	95%	66%	78%

Soil in these areas is usually a dark grey clay loam (Plate 3).

Cost of clearing of this class of country is high but is somewhat offset by the sale of millable timber. Better pasture stands are usually obtained on this scrub land.

*Palm Tree.* The Piccabin Palm tree (*Archontophoenix alexandreae*) country is mainly confined to swampy and low-lying areas. It may also be found in conjunction with a light rain forest on some of the lower areas.

In many instances these areas are naturally drained and flooding is usually by "back water" from adjacent rivers or creeks.

Clearing costs are relatively low due to the easy manner in which the palms are pushed over. Costs vary somewhat, depending on the amount of scrub timber and vine which may be mingled with the palm.

This class of country provides good conditions for some species of grass and legumes (Plate 4).

*Open Forest.* The open forest of the eucalypts, bloodwood, ironbark, and messmate, and similar species is confined to the sandier regions and is typical of many large areas of undeveloped country in the north.

The open forest also varies somewhat in density. It may carry a certain amount of shrub and a vine undergrowth on the better soils with more open timber on the lighter soils (Plate 5).

Clearing costs are comparatively high due to the large trees which have to be dug out and there is usually insufficient material for a satisfactory burn.

*Tea-Tree.* The tea-tree areas may be broadly divided into two classes. *Firstly*, the better class, which is



Plate 3

Light Scrub Cleared by Bulldozer in the Tully Area

usually found adjacent to scrub fringes on the low-lying areas of the river banks; *secondly*, the poorer group of broad-leaf, stunted tea-tree which is found on the very heavy, white clay soils of the wallum type.

Cost of clearing the better class is fairly low as it is rather open and the trees invariably snap off at ground level when pushed with a bulldozer. However, suckering and seedling growth may be heavy.

grass and various carpet grass species. These all invade neglected areas and pastures.

### Establishing Pastures

Sown pastures on the northern tropical coast are usually established on newly cleared scrub or forest areas, or on cleared land which had reverted to weed growth.



Plate 4

Palm Tree and Light Vine Scrub on the Banks of the Tully River.

*Native Grasses.* Native grasses are found only in the open country, such as the open forest and tea-tree and wattle areas. Species comprise kangaroo grass, a small amount of black spear, giant spear and various *Aristida* and wire grass species. Several small native species of *Brachiaria* are also found on the wetter soils.

In addition to these native species, several other second grade introduced grasses are found in all districts, these being Russell River grass, sour

*Land Preparation.* Land preparation methods vary greatly depending on whether virgin scrub lands or old cultivations are being developed.

*Scrub Lands.* Clearing of this country is done either by hand or by machines. In either case small trees and vines are brushed prior to the clearing of the main bulk of the timber.

*Hand Clearing.* This method involves the chopping and burning of the scrub trees. The tree stumps are

left intact and cultivation is impossible for many years unless a bulldozer is used for further clearing.

The average rate of tree-falling by this method, after preliminary brushing has been carried out is approximately 1 acre a day, depending on the thickness of the scrub. Labour for this work is scarce and the cost at present (autumn 1959) varies from £14 to £16 per acre.

are later burned. This leaves bare strips which are treated as cultivated land on which machinery may be used. Care on the part of the operator is necessary to avoid pushing the top soil with the timber.

With this method, the ash from the burnt trees is concentrated along the wind-rows and the benefit from the plant foods in the ash is lost to most of the area.

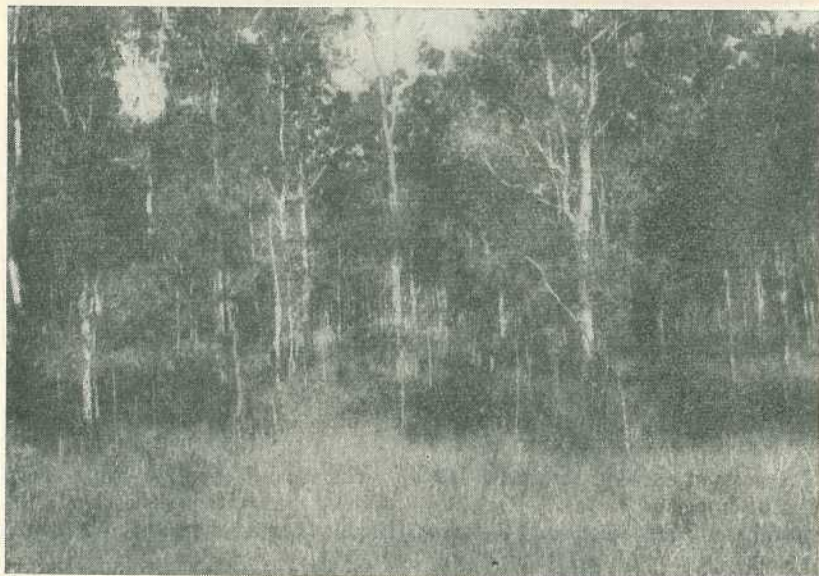


Plate 5

Open Eucalypt Forest on Sandy Loam Soil. Carrying kangaroo and black spear grass.

*Mechanical Clearing.* The use of the bulldozer for clearing land for pasture is a rather recent development in north Queensland, which, providing the heavier type of machine is used, is proving satisfactory. The method is becoming increasingly popular each year particularly on palm and light scrub country where up to an acre an hour may be cleared.

Two methods are commonly used. In one method the trees may be pushed out of the ground and swept into wind-rows about 3 chains apart where they

With the second method the timber is pushed on a face and the machine is run over the fallen material. After a period of some weeks the whole area is then burned (Plate 6.)

In all cases, clearing should commence early enough to allow the trees and branches to dry sufficiently to be burnt in December.

If commenced too early in the year, sucker regrowth may occur, also the leaves drop and a poor burn results.



Plate 6.

**A Good Scrub Burn, 3 Months After Falling.** (Note logs and stumps remaining.)

The times of clearing vary from late August-September to early October, depending on the methods and the area involved.

*Old Cultivation Land.* When bringing old land back into production, it is best to plough early in order to get good control of weeds, particularly if it is an old blady grass paddock. The best kill is gained with most weeds by cultivation during the drier part of the year.

The growing of a leguminous cover crop or forage crop such as cowpeas or velvet beans in the first summer prior to sowing the pasture will help in the control of weeds and provide better soil conditions for the young pasture. This crop is ploughed under in early winter and the weeds kept under control by discing ready for the next December-January planting season.

The plain country being mainly covered with rather dense blady grass should be treated in a similar manner.

Another factor which must be borne in mind is that grass seed is small and unless the soil has been worked into a well firmed seed bed of comparatively fine tilth much seed will be wasted due to its falling on hard lumps, old grass stools, or being locked in large air pockets under the large clods. This frequently occurs in a roughly prepared seed bed.

Treat the grass as a crop and no difficulty will be experienced in obtaining a good stand.

### Planting Methods

On uncultivated land the ground conditions such as the presence of logs, stumps and the terrain, limit the use of machinery. Hand broadcasting is chiefly in use.



This may appear to many people to be a rather slow method but after some experience an even spread is quickly obtained.

On cultivated land, seeding may be done by machinery, but to date this has only been carried out in North Queensland by a few farmers.

With very fine small seed, such as molasses grass, the use of sawdust or some other such type of spreader is necessary.

When mixing seed and sawdust the proportions of each must be carefully checked so that an even rate of seed per acre is maintained. A proportion of 2 bags of sawdust to 1 bag of molasses grass has been found satisfactory.

Guinea grass may be sown without sawdust.

When sowing mixed grass-legume seed without sawdust, particularly guinea and centro, the mixture should be kept well stirred, otherwise the centro seed filters to the bottom of the tin and will not be spread evenly throughout the paddock.

### When to Plant

It is preferable to sow as soon as fairly continuous rain is assured. This means a December-early-January planting.

Better results are obtained with an early planting, but a risk is attached to very early planting as a hot, dry spell in November may kill young plants and germinating seed.

When planting after a burn, do so as soon as possible, to gain the benefit of the fine seedbed provided by ashes. By burning one day and sowing the next, the seed goes into the ashes and rains ensure that it is covered.

If rain falls between burning and planting, the ash usually cakes. Then the seed is left lying on the surface and germination is often poorer.

On cultivated land, sow when the soil moisture is adequate and follow up rains are assured. Rolling after sowing gives a better germination and more even growth. This is shown by the way the seed germinates better in the wheel tracks left by the tractor.

Some special points to observe when sowing tropical pastures may be summarised as follows:

- (1) Order your seed early in the year and have it on hand as you commence to fall.
- (2) Buy the seed from reliable sources and avoid introducing weeds.
- (3) Plant sufficient seed—a poor stand results in weeds and higher maintenance costs.
- (4) If only burning once, plant a legume with your grass to maintain soil fertility.

### What Species?

Fortunately the species of grass and legumes do not vary to the same extent as the soil types. The most useful species are described briefly:

*Guinea grass* (*Panicum maximum* var. *typica*). This grass is widely known throughout the North and is adaptable to a wide range of both climatic and soil conditions. Many strains are found in the guinea species. These range from the very coarse, vigorous giant guinea to the fine, softer green panic.

Common guinea grass is a tall stooling type which if ungrazed may grow up to 8 ft.

Under good management, guinea grass provides a highly nutritious feed practically throughout the whole year. During the wet season, this grass does tend to become high and coarse.

The tropical legume centro combines readily with this grass and forms a very satisfactorily mixed



Plate 7

#### A Guinea Grass-Centro Pasture Which is 8 Years Old

pasture with the protein averaging about 14 per cent.

A planting rate of 4 to 5 lb. to the acre is recommended (Plate 7).

*Green panic* (*Panicum maximum* var. *trichoglume*). This strain of guinea is a soft, leafy, fine-stemmed type with a yellowish-green colour. It is not suited to the wet coastal conditions as it has not the ability to recover rapidly after grazing.

During the autumn and winter it is overrun by weeds and poorer grass species. The planting rate is 3 to 4 lb.

*Hamil grass*. This species is a very vigorous robust strain of guinea grass with a blue-green colour.

From the history available it appears that it was introduced to the Daintree area some 25-30 years ago and has been confined mainly to that district.

Being vigorous, it grows to 12 to 14 ft. and consequently requires additional mowing to control this growth.

It is adaptable to the weedy hill-sides and better results are achieved if it is sown in conjunction with the common guinea grass.

When sown as a pure stand, stock frequently have difficulty in making tracks through it and this often results in many areas not being grazed.

A mixture at the rate of 1 lb.-2 lb. of Hamil grass with 3 lb.-4 lb. of common guinea grass to the acre is satisfactory.

*Molasses grass (Melinis minutiflora)*. This is a fast-growing species and is particularly suitable for planting in new burns for smothering weed growth.

It will establish itself in soils of lower fertility and is suitable for large areas of the tropical coast. The species is essentially a summer grower and seeds during the autumn. Molasses, in addition to being a valuable pioneer grass, has a place in a tropical pasture programme.

With this grass, however, careless management may reduce its effective value by 90 per cent. It requires careful grazing and will not stand burning.

It is very palatable to stock in the period from the first storms to seeding, at the beginning of May. After it seeds it becomes unpalatable and of only slight value as a pasture grass during the winter and early spring.

Molasses grass combines well with centro for six to seven years but is gradually dominated by it. It is quickly smothered out by the more vigorous puero.

It is sown in early summer—December–January at the rate of 2 to 3 lb. of seed to the acre.

When sown in conjunction with guinea grass, the rate of 1 to 1½ lb. is then used. This combination is useful for sowing in a new burn, the molasses grass being quickly replaced by the guinea after a second burn.

*Para grass (Brachiaria mutica)*. This species is ideally suited for the lower flats, wetter areas and the swamp regions of the whole of the coastal belt.

It combines well with centro and will also grow in association with guinea grass. Para, or panicum as it is often called, has a high nutritive value and will stand moderately heavy grazing.

This grass can be either mown or disced, for weed control, without danger to the stand of grass.

When cuttings or runners are planted in rows 3 to 4 ft. apart and 2 to 3 ft. between plants, a quick cover is soon obtained during the wet season.

This species is rapidly overrun with weeds and other grasses if planted on the hillsides, and to a lesser extent on the red soils. Except under very wet conditions, puero will also smother out para grass.

*Rhodes grass (Chloris gayana)*. This species also is not suitable for the wetter regions of the coast. The grass rapidly runs to seed and the leaf becomes wiry and unpalatable.

Some stands have been established but usually last one to two years before being overrun with weeds. The planting rate is 8 to 10 lb. to the acre.

*Brachiaria decumbens*. This grass, which has no recognised common name, is a very vigorous type, dark-green in colour with a rather short leaf. It produces a large amount of bulk with a somewhat coarse, hard and unpalatable stem.

Unfortunately the grass itself is rather low in protein and with a high fibre content. It combines with centro satisfactorily and this helps to raise the protein level. An undesirable feature is that it will invade existing stands of pasture and smother them out.

It will stand heavy stocking and heavy trampling and is an ideal grass to smother weeds.

TABLE 3

Plant	Description of Sample	Analysis of Water-free Material		
		Per cent. Crude Protein	Per cent. Phosphate	Per cent. Crude Fibre
Guinea grass .. .. Figures from Utehee Creek analysis 1956- 1958 average all seasons	Young and leafy .. ..	13.1	.75	25.8
	Old stemmy .. ..	4.5	.14	39.7
	Grown with Centro ..	12.6	.43	..
	Grown without Centro	9.5	.48	..
Molasses grass .. .. Figures from Utehee Creek analysis average all seasons 1956-1958	Very young growth ..	11.9	.23	27.4
	After seeding .. ..	3.3	.17	40.8
	Grown with Centro ..	9.1	.39	..
	Grown without Centro	7.1	.45	..
Elephant grass .. ..	Young growth .. ..	21.0	.42	23.2
	Shoots from old growth	7.0	.08	44.1
<i>Brachiaria decumbens</i>	Cut each 90 days .. ..	4.9	..	..
	Young growth .. ..	12.0	.64	27.5
Green panic .. ..	Old growth .. ..	3.4	.63	..
	Young and leafy .. ..	24.8	.67	23.2
Para grass .. ..	Mature growth .. ..	5.8	.20	38.0

It would prove useful in areas around dairy buildings and yards as it would help to reduce muddy conditions but its tendency to spread from such positions render it a potential weed.

Planting is by rooted cuttings similar to para grass.

*Elephant grass* (*Pennisetum purpureum*). This species is most useful as a fodder reserve. It will provide a bulk of leaf and stem fairly high in nutritive value.

If ungrazed for long it develops a very hard stalky cane which is unpalatable to stock.

Grazed when it has a good leaf growth, about 2 ft. to 2 ft. 6in. in height, it provides excellent fodder high in protein. Cutting at ground level greatly improves the stand.

This grass is a heavy feeder and requires applications of either farm-yard manure or fertilizers for best results.

An ideal position for this grass is immediately below dairy buildings

where the washings from the floor and yard manure can be spread over it.

The grass is planted by "sets" in rows 2 ft. 6 in. to 3 ft. 6 in. apart and will grow on quite a variety of soil types.

It also combines well with centro.

*Pangola* (*Digitaria decumbens*). This strain is not yet in general use, but indications are that it may become a useful species for the wet belt.

The grass spreads by runners and roots from the nodes, similar to para grass.

Present trials show it to be palatable and able to stand fairly heavy stocking. Weed growth is also suppressed.

The results of chemical analysis of some of the grasses are shown in Table 3. The analysis of the grass when grown with a legume clearly shows the increase in protein.

### Pasture Mixtures

(a) *Red Basaltic Soils*. The red soils dry out very quickly and many

grasses are not suited to these conditions.

A mixture of guinea grass and centro is recommended for most of the red soil regions. On the steeper areas, molasses grass may also be included in the mixture with stylo as the legume in place of centro.

Elephant grass in small areas is suitable as a fodder reserve.

Most of the soils on the steep hill-sides in the wet belt are low in fertility and are covered with blady grass. A mixture of molasses grass and stylo is recommended for these areas and control of the blady grass is achieved in a few years.

Although para grass grows in some favoured isolated areas, it is not generally recommended for these soils.

(b) *Palm Swamps*. Para grass and centro is the most suitable mixture for these areas. It is advisable in the initial planting to oversow with guinea grass at the rate of about 2-3 lb. to the acre. This is a form of insurance to control weed growth until the para grass is firmly established.

In areas subject to inundation, some guinea may die out. On much of the

country however, the guinea will continue to grow on the small high mounds and a combination of the two grasses and the legume is soon established.

Centro, although it may be killed by some flooding, can withstand these conditions better than other legumes.

(c) *Open forest*. There is a fairly wide range in the class of country under this heading and difficulty is often experienced in establishing grasses. One reason is the high cost of clearing and the difficulty of preparing a seed bed.

The legumes centro and stylo will grow readily, and in combination with native grasses, particularly kangaroo grass, they form quite a good mixture for the wetter months of the year.

However, once the ground has been cleared and prepared, guinea and molasses grass with centro and stylo will grow well on the sandier and lighter ridges. Para grass and centro are suitable for the isolated patches on the lower areas and the heavier soils which may be subject to flooding.

(A summary of the planting rates of desirable mixtures is given in Table 4.)

TABLE 4

—	Planting Rate	Desirable Mixtures
Guinea grass .. ..	4-5 lb./acre .. ..	Combines well with centro at 2-3 lb./acre
Green panic .. ..	3-4 lb./acre .. ..	Not recommended for wetter areas
Hamil grass .. ..	1-2 lb./acre .. ..	Sow with guinea grass at 3-4 lb./acre
Molasses grass .. ..	2-3 lb./acre .. ..	Sow with centro at 2-3 lb./acre
	1 to 1½ lb./acre .. ..	When sown with guinea grass at 3-4 lb./acre
Rhodes grass .. ..	8-10 lb./acre .. ..	Not suitable for wetter areas and not generally recommended for the region
Para grass .. ..	Cuttings planted at 2-3 ft. in rows 3-4 ft. apart	Sow with centro at 2-3 lb./acre
<i>Brachiaria decumbens</i> ..	As for para grass .. ..	
Elephant grass .. ..	As for para grass .. ..	
Pangola grass .. ..	As for para grass .. ..	

(d) *Tea-tree*. Molasses grass and para grass, with the legumes centro and stylo will all grow satisfactorily on those areas adjacent to the scrub fringes of the rivers.

Some land preparation prior to sowing is necessary, otherwise the native species are too vigorous and smother out young seedlings before they can become well established.

The stunted broadleaf tea-tree grows on country with a very heavy, white clay soil which is difficult to develop. Heavy applications of fertilizer would be required before a suitable pasture could be established.

### Management

Management of pastures in the wet tropics is similar, in the main, to that for other areas. It must be remembered, however, that while pasture growth in the wet tropical regions is very rapid during and immediately after the rainy season, weed growth is equally vigorous.

It is important therefore to allow a new pasture to become well established before grazing so that it may compete with the weeds. Usually the guinea grass will seed in May of the first year of sowing, so do not graze until after this seeding period.

This practice of deferring the grazing improves the stand and may add years to its ultimate life.

Although there is no actual dormant period there is a slowing down of growth during the winter, but with reasonable rains in late Autumn and early Spring growth continues throughout the whole year.

Without a cold winter to check weed growth, winter species such as blue top (*Ageratum* sp.) become quite a problem in many pastures, particularly in molasses grass and in over-grazed areas.

If, however, the pastures are efficiently managed and kept in a

vigorous condition, weed growth may be reduced very considerably with little extra expenditure.

Constant overgrazing not only reduces the plant foods stored in the grass roots, but prevents the replacement of those plant foods because insufficient leaves are left on the plants to assist in the manufacture of the important sugars and starches which are essential for further growth.

The height to which pasture plants can be grazed without unduly slowing down their rate of growth depends on the way in which their leaves are produced and carried.

Grass leaves are carried at the nodes or joints on the stems. Where the stems are long and the joints are far apart, as in guinea grass and similar tall, tussocky grasses with rather narrow leaves, there is a relatively small amount of leaf in relation to the height of the plant. This type of grass cannot be grazed too close to the ground without reducing the rate of recovery.

Para grass, on the other hand, has comparatively short internode spaces, and although it has shorter leaves it produces a much greater leaf area in relation to its size. This species, and other grasses of similar growth habit, may be grazed more closely than the stooling types.

Also in a pasture of erect, tussocky grasses, there is a considerable area of bare ground between the stools. If the pasture is overgrazed, competition for light is reduced and weeds soon fill in these bare patches. Species with a prostrate habit and the ability to root from the nodes, form a thicker and denser mat with a more even ground cover.

In the tropics, it is preferable not to graze pastures, particularly guinea grass pastures, below 12 to 15 in. In order to keep pastures to this height, the stocking rate must always be within the safety limits (Plate 8).

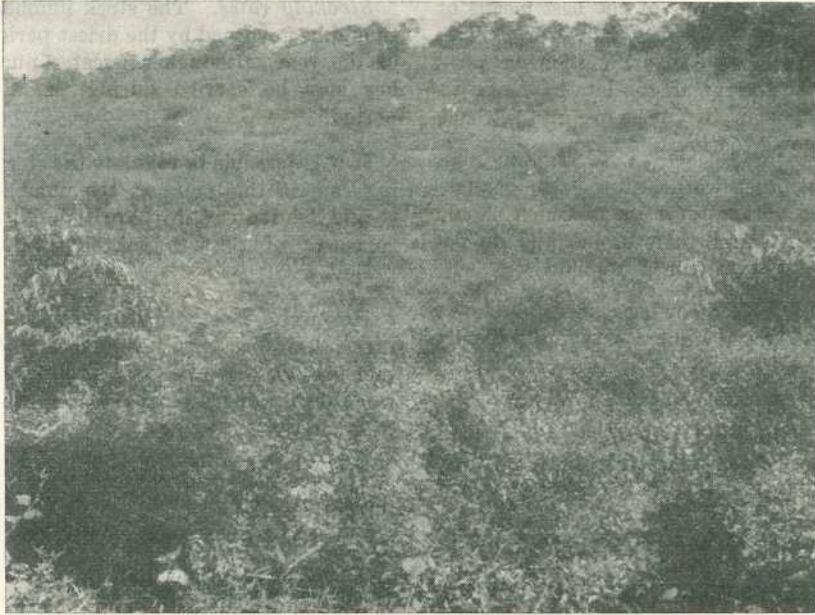


Plate 8.

**Heavy Weed Growth Resulting from Overgrazing and No Maintenance Work.**

*Rotational grazing.* This form of management is preferable to continuous stocking as it gives the grass an opportunity to recover and stock access to fresh feed at all times.

Where stock are grazed continuously in a larger paddock of mixed pasture, it is quite possible to overgraze the more palatable species while second grade grasses and weeds will take their place. Rotational grazing is specially important when only limited areas of good pasture are available and also to help in the control of ticks.

Rotational grazing, correctly managed, prevents overgrazing and if the stock are moved frequently before the grass is eaten down too low, regrowth is rapid. It is better to graze small areas quickly rather than to prolong grazing on large areas.

Take the cattle from a paddock three days too early rather than one day too late.

Subdivision should be into areas small enough to conform to the herd size and to allow the economic working of the property. Too frequent moving of cattle is not always a practical form of management for beef cattle, and this may occur with very small paddocks.

*Mowing.* Mowing is a practical means of controlling weeds and pasture growth. However, excessive use of the mower may be as detrimental as overgrazing.

In the early stages of growth, the protein level is high and the fibre content low. As the grass flowers and seeds, growth slows down and the protein level of the leaves falls and the fibre content rises; consequently the grass has inferior quality to when it is growing vigorously.

In order to prolong the growing period, it is necessary to control growth during the flush period and to remove old seed heads and dry stalks.

Mowing is one of the best means of achieving this. However, with vigorous weed growth, mowing must not be too low or too late in the growing season. Legumes are also set back if mown too low.

In other words, mow high, particularly with guinea grass which should not be lower than 15 in., and do not mow after April if possible.

A late mowing means slower regrowth, a lighter carrying capacity and the possibility of increased winter weeds.

*Strip Grazing and Electric Fences.* The growth habit of tropical pastures limits the use of the electric fence. In addition, the increased stock handling and fence erection limits its use in the grazing areas.

For a satisfactory performance, frequent mowing under the fence line would be necessary to prevent the earthing of the wire.

*Stocking rates.* The stock numbers should be governed by the driest period of the year, although a greater number may be carried during the wet period.

If it is possible to regulate the stocking rate in this manner, the numbers should be reduced by April to allow regrowth of pasture for the winter period.

However, few graziers or dairy farmers are in a position to vary stock numbers at will and a safe figure to work on for the year round is 1 beast to 3 acres.

The stocking rates vary also with the class of country. Many areas cannot be grazed during the wet season, as trampling damages pastures growing in boggy ground.

The combination of swamps and open forest provides a good association.

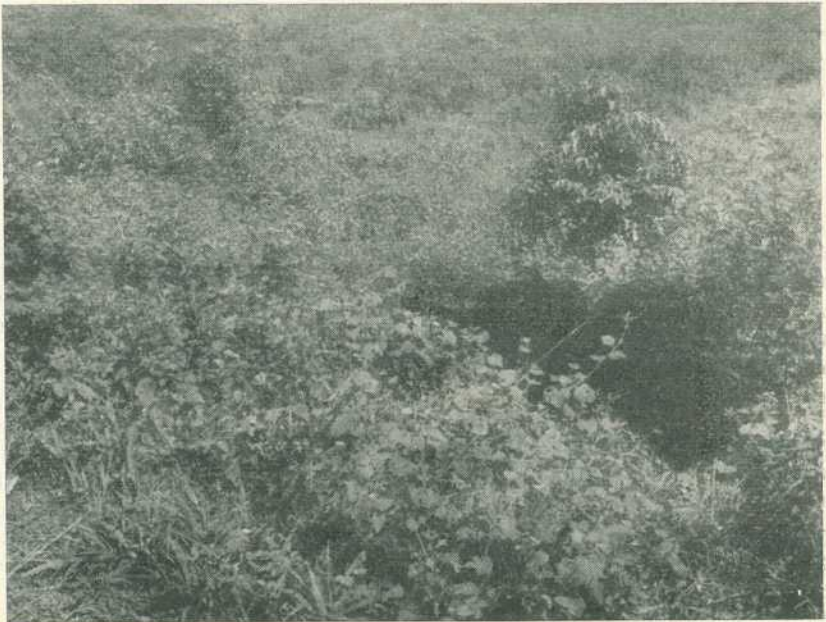


Plate 9.

**Guinea Grass on Scrub Land being Invaded by Tobacco Bush.**



During the wet season the native grass species in the forest provide a fodder of a fairly high nutritional level while grazing is restricted on the wetter areas. This restriction is a form of fodder conservation.

Grazing of the low-lying and swamp areas may be commenced by May, at which period the native pastures are reaching a low point of productivity.

With this combination, stocking may be slightly heavier, even to 1 head to 2 acres when rotational grazing is practiced.

The red basaltic soils do not have the carrying capacity of the heavier regions and the decline of pasture production is most pronounced in May. This lower production is apparent until the storm period of October-November.

If it is considered that a pasture will carry 1 beast to 2½ acres it is better to stock at the rate of 1 beast to 3 acres for safety during the dry months.

Restoration of an overstocked pasture is both slow and costly.

Where fattening rather than breeding is being carried out, it is often practicable to vary the stocking rate in accordance with the seasonal conditions of the pasture.

## Weed Control

With a growing season of practically 12 months of the year, weeds become a major problem. Strict control measures are necessary and good management practices required, otherwise weeds very quickly overrun pastures and in some instances may cause stock losses (Plate 9).

The main weeds affecting pasture in the wet tropics are lantana, wild tobacco-tree, devil's fig, knob weed, *sida* species and in some instances

guava trees. Blue top is a problem during the winter period.

*Agronomic Control.* Prevention of weed invasion is far less costly than control once weeds are established. Most of them can be fairly satisfactorily controlled by maintaining a good ground cover throughout the year.

A straight grass pasture is always more susceptible and more open to weed infestation than a mixed pasture. The extra fertility made available to the grass by the legume ensures a good vigorous growth resulting in the exclusion of many weeds.

*Chemical Control.* Most weeds are susceptible to the hormone sprays, so, for a comparatively low cost, pasture can be kept free from weeds providing they are sprayed as soon as they appear in a paddock (Plate 10).

The main points in maintaining a weed-free pasture may be summarised as follows:

- (1) Spray before seeding, when the weeds are young and growing vigorously, and before they are firmly established in a paddock. This means lighter spray applications and greater efficiency in control.
- (2) Use the hormone spray at the rate recommended by the manufacturer.
- (3) Spray thoroughly.
- (4) Remember, legumes are also susceptible to the hormone sprays, so care is necessary when spraying in a mixed pasture.

*Mowing or brushing.* As mentioned under the paragraph on mowing, good results may be achieved by the judicious use of the mower prior to weed seeding, but follow up sprays are essential. Brushing may be necessary on rough country or where weed size has become excessive.

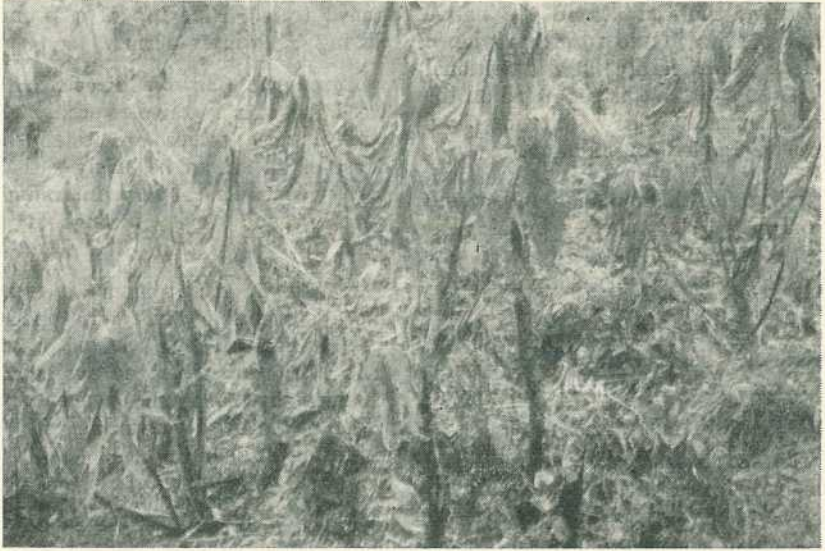


Plate 10

Tobacco Bush Sprayed with 0.2 Per Cent. Hormone Solution.

### Uses for Tropical Pastures

It is considered that cattle fattening offers an effective method of utilizing improved pastures in the wet tropics.

It has been shown over a period of 10 years at the Bureau of Tropical Agriculture that it is possible to fatten 18-month-old steers into high quality fat bullocks in approximately 10 months.

Land clearing, grassing and maintenance costs are high, but well-managed pastures will persist for at least 10 years in a state of high productivity.

There are several methods of utilizing these sown pastures:

Graziers in the breeding country of the Gulf region or the Peninsula could

develop their own fattening properties on the coast.

An alternative procedure is for unassigned canelands or other country to be developed by the existing landholders who would buy their store cattle for fattening either from the breeding stations or at central sale-yards as at Mareeba. This type of enterprise would be very vulnerable to market fluctuations especially in relation to prices for store cattle.

Group buying by smaller fatteners would help to stabilize the industry and place it on a sound and more profitable basis.

In the localised areas where dairying is carried out on the wet tropical coast, these pastures offer scope for increasing production and prolonging the lactation period.

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### CHECK YOUR WATERWAYS BEFORE THE SUMMER STORMS

Grassed waterways are important units in the farm soil conservation programme. They are carefully designed to carry excess runoff but to do this effectively they must have a near perfect ground cover and a minimum of top growth. Ensure that these conditions exist at the time the summer storms arrive. Mow in early spring to remove surplus top growth. Apply urea or sulphate of ammonia to ensure a rapid spread of grass in the warmer months and so provide the desired ground cover.

—J. E. LADEWIG, Chief Soil Conservationist.

# Getting The Best From Irrigated Paspalum—White Clover Pastures

By A. NAGLE,  
Irrigationist.

Irrigated pastures, composed of paspalum and white clover, are more often tolerated than appreciated by dairymen on the coastal areas of South Queensland.

This is due to the tendency for these pastures to become paspalum dominant during midsummer, with rank unpalatable growth often ergot-infected, while winter production is limited to the white clover component.

With good management practices, the productivity of the pasture and the grass-clover balance can be maintained at a high level, and further, the seasonal productivity can be prolonged well into winter.

The measures suggested for management of irrigated paspalum-white clover pastures are:

(1) *Mowing.* Mowing or "topping" of the dominant paspalum during summer is necessary to improve palatability of the grass, and prevent reduction of the clover stand by excess shading. However, the regrowth is often so rapid that the paspalum is again rank and unpalatable before the next grazing and it is recommended that midsummer mowing be made 6-10 days before the stock are turned in to the pastures.

Mowing before grazing induces a soft nutritious growth of the paspalum, which is then readily acceptable to stock. Therefore, the stock do not concentrate on, and overgraze, the clover as so often happens when the grass is in a rank condition.

Mowing or topping by a rotary-type slasher or mower is quite effective and the clippings can be left on the pastures to form an effective insulation of the clover against midsummer heat. Reduction of soil temperatures in summer is important for vigorous clover growth.

(2) *Deferred Grazing or "Autumn-Saved Pasture."* This involves mowing of a portion of the pasture in early April, allowing the regrowth to stand over until July and August, when a shortage of fresh, nutritious pasture usually occurs. This practice will substantially increase winter production of paspalum-white clover pastures.

This has been proved at the Regional Experiment Station, Gatton, and in New Zealand, where the provision of autumn-saved pasture is widely accepted as a means of extending seasonal production of pastures.

(3) *Renovation.* Renovation with tine or disc implements is required periodically. Renovation reduces the often-sod-bound paspalum stand, allows the introduction of other pasture components rye grass and clover, and improves water penetration and aeration of the soil. It is evident that a thorough renovation every 4 or 5 years will improve production of the pastures. Autumn is the best time for renovation as this allows the oversown rye grass and clover to become established.

### Sod Seeding

The autumn introduction of white clover and rye grass into paspalum pastures with a sod seeder also can

boost winter production. Close mowing is required before seeding.

### Fertilizer Application

On most coastal soils, an annual application of a bag of superphosphate to the acre is necessary to build up the clover stand. It is possible also that moderate applications of nitrogen to the pasture in early autumn and early spring will increase grass production during these critical growth periods.

Poor results from paspalum-white clover are often due to poor management practices. Treat the pastures as a perennial crop rather than a weed-infested field. The productivity and usefulness of the pasture will then be increased tremendously.



## Anticipate Summer Irrigation Requirements of Pastures

**T**OTAL water requirements of irrigated pastures are greatly increased during spring and summer, when more frequent applications of irrigation water are required.

Maintenance of high pasture productivity and persistence of the temperate climate pasture species are dependent on an adequate supply of moisture in the main root zone which extends to a depth of 12 to 15 in.

It is essential that any impending soil moisture shortage should be anticipated and irrigation applied before the occurrence of any check to the pasture growth.

Do not depend on the appearance of the pastures as an indication of irrigation need. Plants showing obvious water shortage indicate that watering has been withheld unduly.

Use an earth auger regularly to check the moisture at various soil depths. Irrigate before the moisture in the root zone is depleted.

—A. NAGLE, *Irrigationist.*

## Pasture and Crop

### Livestock and Soil Fertility.—

There is a tradition that keeping of livestock improves the fertility of the land.

Farm fertility can be built up with livestock, for it has been estimated that threequarters of what livestock consume can be returned to the soil in the form of manure.

Though animal droppings are our cheapest form of grass fertilizer, the collection and use of surplus farm-yard manure will not always be practicable on every dairy farm.

However, manure harrowing and spreading in the field continues to be an important pasture management practice, which can be readily carried out in conjunction with rotational grazing practices.

—A. HEGARTY, *Agrostologist*.

**Don't Delay Irrigation.**—Young pastures require sufficient soil moisture to establish a deep root system. Light applications of water either naturally or artificially will cause the pasture components to establish mainly a surface root system.

If natural rainfall has not been sufficient to provide ample soil moisture, action should be taken to provide this moisture artificially. Don't delay irrigation hoping for rain. The shortage of moisture during this period will adversely affect the pasture.

The safest method of establishing whether or not a pasture requires watering is to use a soil auger in the field concerned. If the soil

crumbles in the hand, water is required. If the soil forms a ball in the hand sufficient moisture is available.

—I. N. McCLEMENT, *Assistant Adviser in Agriculture*.

### Preparing Tobacco Seed-beds.—

Soil for tobacco seed-beds should be worked into a fine tilth and then sterilized. After ploughing and cross-ploughing, the land should be cultivated several times before the beds are marked out.

The next stage is sterilization. This is done to kill any harmful organisms that may cause disease and to destroy insect pests, nematodes and weed seeds that may be present in the top soil. Seed-beds may be sterilized to a depth of 4 in. by burning either a layer of wood 1 ft. deep, a 4-in. layer of antbed or a 9-in. layer of sawdust. For best results, the soil should be moist but not saturated at the time of burning. After burning, any unburnt material should be raked off and the ashes worked into the soil. The beds should not be dug over again.

—E. J. McDONALD,  
*Tobacco Adviser*.

**Blue Mould in Tobacco.**—Volunteer plants, old stalks, root suckers and old seedbeds are a major disease hazard in all tobacco districts. This growth acts as a reservoir of blue mould infection, and from this source the disease can sweep through the new season's planting.

*The Fight Against Disease—1*

## The Stockowner and the "Micro. Lab."

By G. C. SIMMONS, Senior Bacteriologist

**The microbiological laboratory helps the stockowner and the whole community in a number of important ways, which are outlined here:**

Australia is fortunate in that it is an island continent, and introduction of disease from abroad can be readily prevented. However, there is no room for complacency, for experience with bovine contagious pleuropneumonia has shown that once a disease is established, eradication may be expensive and time consuming. The quarantine authorities should therefore be given every assistance in applying methods to prevent introduction of diseases.

Our more immediate concern is to determine the causes of ill health in stock within our own country, for it is only when the cause of a disease is known that methods of prevention, control and treatment can be formulated on a sound, scientific basis.

Newspaper and radio publicity given to scientific progress might possibly lead one to believe that all diseases affecting livestock are known. Of course this is not so; in fact, it is only since the Second World War that many of the major diseases have been recognised and their causes determined.

### Where Research Begins

Before considering the role of the veterinary microbiological laboratories in this State, a brief summary on how diseases become defined and reported may be of interest. Each disease has its own symptoms and signs but often these characteristics may be very similar in two or more diseases.

An individual stockowner may have a sick animal, or one may die. If he is wise he will call in a veterinarian. Specimens from this animal will then be sent to a diagnostic laboratory if the cause cannot be determined from the post-mortem

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(Continued from page 595)

Destroy these unwanted plants and you'll help safeguard your own and your neighbours' crops.

Spores of blue mould are like tiny seeds. They can be carried long distances by the wind. In Queensland, blue mould is by far the most serious disease of tobacco in the field. But co-operation of all farmers in

destroying unwanted tobacco plants will greatly reduce the infection. Efficient fumigation of seedbeds is of little value if infected root suckers, volunteer plants and other growth are constantly showering your young plants with fresh spores.

—A. WINTERTON,  
*Agonomist.*

examination. Usually a diagnosis can be made when laboratory and field reports are correlated. Occasionally, however, no reason for the ill health can be found.

If a number of such cases occur, then obviously there is a disease of unknown cause which warrants

**eradicated, there must be a well-equipped laboratory as part of the industry.**

Each country or State must have its own laboratory with staff having knowledge of diseases present in the particular area, for just as animal breeds vary in different parts of the

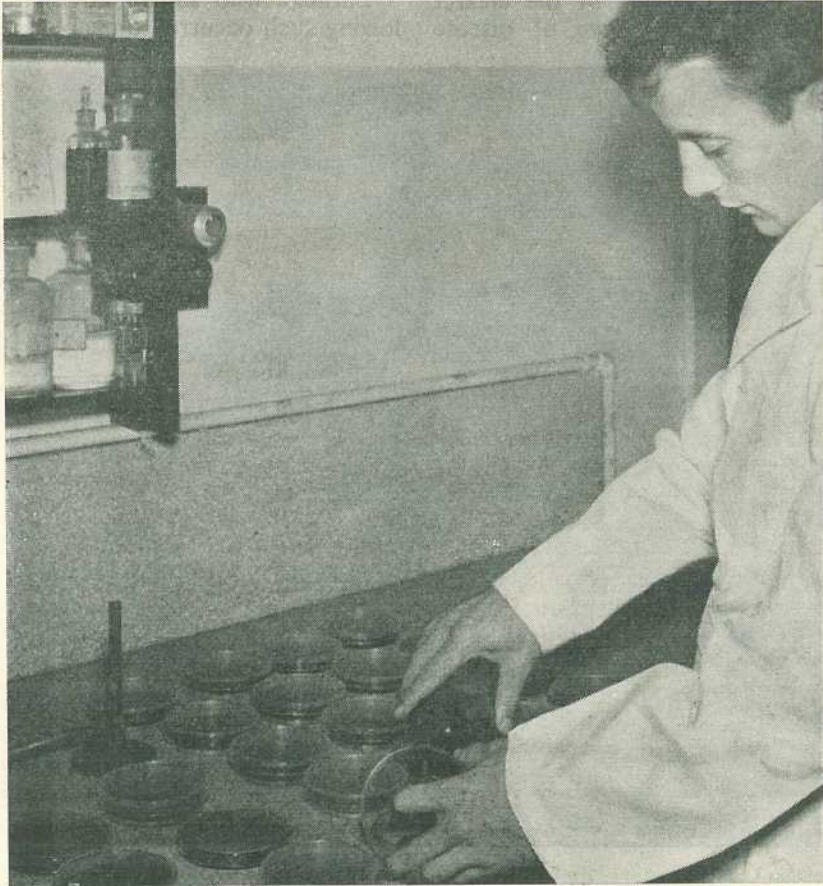


Plate 1

**Preparing Media on which Bacteria are Grown.**

investigation. Within the limits of staff and equipment, special attention is given to it until the cause is determined. The essential points are (1) the disease is reported, (2) field and laboratory investigation reveal an unknown condition, (3) research is carried out on the disease.

**It is obvious that if the livestock industry is to know what diseases must be controlled and**

country so often do the diseases affecting those animals. The Queensland laboratories situated at Oonoonba and Yeerongpilly therefore play an important part in determining the diseases present in this State and their relative importance in different regions.

In Queensland, expansion of laboratory facilities and staffing

since the last war has paid dividends, for many diseases previously of unknown cause are known now to be due to specific micro-organisms. Consequently the appropriate control measures or treatment can be taken to prevent further loss.

### Strain 19 Vaccine

A good example of the clearer picture we now have of disease

In most herds which have practised Strain 19 vaccination, this has proved the case, but some of the progressive farmers who used the vaccine as soon as it became available found that abortions still occurred in their herds and that infertility was still a problem.

Farmers who sought advice following such occurrence enabled the



Plate 2

### Preserving Bacterial Strains by Drying.

problems in Queensland is the situation in regard to infertility in dairy cattle. Infertility has always been a problem in the economic production of dairy and beef products. Vaccination against brucellosis with Strain 19 vaccine has meant that farmers should have only memories, not experiences of contagious abortion storms.

laboratory to prove that bovine vibriosis was present in Queensland.

The laboratory studied this disease, and with information from other scientific sources, was able to devise a satisfactory test to diagnose its presence in a herd.

Treatment and control methods for this disease are proving increasingly satisfactory and so farmers



who now avoid loss from vibriosis should remember those who first asked for assistance and so gave the laboratory the chance to discover the disease.

A similar story may be described for bovine trichomoniasis.

Laboratory workers are always on the lookout for those diseases known to occur in other States or countries.

known to be caused by the horses eating a poisonous plant, Gomphrena, although not before a great deal of microbiological examination had been done.

#### Queensland Discovery

In other instances, microbiological research has revealed an organism not previously described elsewhere. An example we can give is

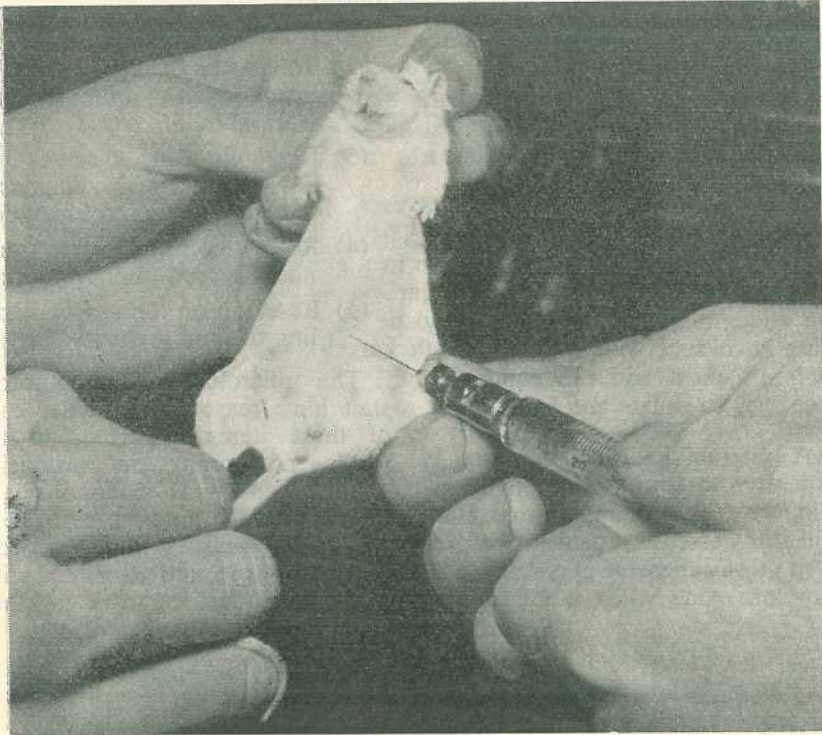


Plate 3

**Mouse Inoculation is Frequently Used in Diagnosis of Animal Diseases.**

Occasionally they are confronted with a disease in which the cause cannot be surmised just on examination of carcasses or sick animals. Material from such disease is subjected to all the skill and technique possible by the microbiologists.

Sometimes research only serves to eliminate a micro-organism as the possible cause. An example is coastal staggers of horses, now

the recognition of *Brucella ovis* as the cause of a genital disease affecting rams. The Queensland work led to the knowledge that this disease was not only important in Queensland but throughout Australia and New Zealand. It is now known to be present in the United States.

Louis Pasteur, who has been called the "Father of Bacteriology," once said that chance only favoured

the prepared. There is no doubt this applies to the prevention of loss from disease. If animals or birds die, future losses may rarely be prevented if the cause is not known. If we neglect to obtain an accurate diagnosis, losses will occur in future years, for few infectious diseases die out of their own accord once they become established in a herd or flock.

The diagnosis of disease caused by infectious agents may often be made at least tentatively by examination of the carcass, but usually laboratory examination must be done to confirm or establish a diagnosis. As these infectious agents include many different types of micro-organisms, each having adapted itself to live in a particular host or to a particular mode of life, the modern diagnostic laboratory must have staff with knowledge of each organism and the equipment necessary to isolate and study them.

A microbiological laboratory is expensive to equip, staff and maintain. Newer techniques to isolate and study disease organisms call for even more expensive apparatus. The days are gone when a microscope

and test tube were all the equipment needed. Even the microscope required is much more expensive.

#### Where is the Gain?

Quite rightly then the question may be asked, "What does the stock-owner and the general public gain from having such laboratories?"

Out of the numerous answers that can be given, we may list the following—

- (1) Diagnosis of disease.
- (2) Diagnostic facilities in case of introduction of diseases from abroad.
- (3) Research on diseases to devise vaccines, diagnostic methods and control methods.
- (4) Recognition of diseases transmissible from animal to man.
- (5) Research on the proper handling of food products.

The microbiological laboratory staff have reason to consider each of these items important to the whole community in producing animal products as economically as possible. Also, that the best use of laboratory facilities will only occur if all persons in, and associated with, the stock industries work together.



## Stock and Station

**Feeding the Pig.**—The overfat pig can be avoided! The bacon pig with the heavy, soft backline, rolls of fat along the ribs and flanks, and the deep, barrel-shaped underline, dresses into a carcass which is difficult to sell because of its excessive proportion of fat to lean. This undesirable carcass can be avoided by regulating the food intake. When pigs reach porker weight, restrict the intake of grain and allow the animals to satisfy their appetites with bulky foods like pasture or hay. Feed a nutritious ration while the pigs are growing to porker weight so that the muscle or lean can develop fully. Such feeding practices lead to the production of prime grade carcasses.

It must be realized that, irrespective of the pig's shape, it is in the farmer's feeding methods that prime carcasses are produced.

—G. W. OSBALDISTON,  
*Pig Branch.*

**Fatten Lambs Quickly.**—On fat lamb farms, it is very desirable to fatten lambs for market as quickly as possible. Generally, under most favourable feed conditions for the ewe, and crop conditions for the lamb if lambs have to be weaned, the time period for the lamb to reach a good market weight will be 3 to 4½ months. Such lambs should have received no setback to their growth in this time. By marketing time, they should be well rounded off, with a short dumpy body, thick shoulders, broad back, and with wethers, a good cod. Many Downs farmers include portable weighing scales of the clockface type in their farm equipment. These are useful for determining lamb weights in yards. It is necessary to have a

reasonably close knowledge of the range of weights required in market lambs, and to check weights of lines of lambs as they progress to see if they have attained those weights. The greater proportion of desirable export prime lamb in Australia lies in a range of weights around 28 to 36 lb.

Queensland's lamb kill is all used for home consumption. As lambs around that range of weights appear to receive the best prices at Queensland sales, it is reasonable to assume that that is the type required by butchers and housewives. To secure carcass weights ranging from 28 to 36 lb., paddock lambs would need to be within a range of approximately 55 to 75 lb. when fresh in from the paddock.

Buyers bidding for fat lamb on the hoof do not weigh the lambs, but assess the carcass weight from general experience. They value the line of lamb according to primeness, evenness of line, and make an allowance for bruising and transport stress. They go by visual appraisal, touch, long experience, and knowledge of current market values.

Early maturing is the main factor to aim for in fat lamb preparation for market. Breeding and feeding both go towards such results. Breeding lays down the foundation or potential for optimum development. Good feeding of the ewe during late pregnancy and during lactation is equally essential if the potential of the lamb to grow into a quickly matured and high-market-value lamb is to be realised. Care should be taken during the growth of the lamb to see that neither the mother nor the lamb is handicapped by worms.

Lambs marketed early make the least demands on the available pasture, crops, and stored fodder on the property; and permit early release of the mothers to allow for preparation for the ensuing season's mating and pregnancy.

—R. B. YOUNG,  
*Senior Adviser in Sheep and Wool.*

**Pink-eye in Horses.**—If neglected, pink-eye can cause complete or partial blindness in horses. Pink-eye is an infectious inflammatory disease that may affect one or both eyes.

Affected horses should be stabled in a dark stall, as their eyes become very sensitive to light. Their eyes should then be treated several times a day with an antibiotic ointment. Early treatment gives the best results.

If the disease has developed to a more serious stage, it's best to call in a veterinary surgeon. But if this can't be arranged, use eyedrops with some cutting action, such as 2 per cent. zinc sulphate or three to five drops of 5 per cent. silver nitrate solution. Alternate with this treatment an antibiotic or antiseptic preparation, preferably one containing cortisone.

—S. KNOTT,  
*Divisional Veterinary Officer*

**Keep Pleuro in Check.**—Queensland cattlemen are getting on top of pleuro, but only regular inoculation will keep the disease down.

Extensive inoculation programmes have sharply reduced the number of pleuro cases reported. In fact, fewer than 1 per cent. of slaughter cattle from most properties have shown evidence of pleuro in the last year or two. Five or six years ago, meatworks' reports often indicated that up to 15 per cent. of cattle slaughtered showed evidence of pleuro.

Although the position is encouraging, pleuro is still present. Any relaxation in herd vaccination is merely inviting trouble. Don't miss vaccinating your young stock every year. Combined with the vaccination of all older cattle every two or three years, this is a good insurance against future outbreaks.

—K. M. GRANT,  
*Assistant Director of Veterinary Services.*

**Poultry Beginners Need More Than Luck.**—Lately, the Poultry Section of the Department of Agriculture and Stock has had a large number of inquiries from people wishing to start poultry farming. In many cases, people have been under the impression that only a limited amount of capital is needed to start a poultry farm, and that a good living can be made from a flock of 1,000 layers. This may have been true 10 years ago, but it isn't the case today. Poultry farming is becoming a specialized business and the income which the farmer earns depends largely on his efficiency and management.

If you intend making poultry farming your business, you will need a flock of at least 2,000 layers to provide you with a good income by present day standards. To establish a farm of this size from scratch, you will need at least £5,000 of available capital. In addition you will be paying out for feed, without any return, during the five months needed to rear your pullets. Then, for the next two months, farm costs may exceed egg returns because the pullets are still coming into lay and egg size is small. This means that you may need a further £1,000 working capital to tide you over this seven-month period.

—R. V. BYRNES, *Poultry Branch.*

**Best Prices for Eggs.**—It is essential that a commercial egg producer understands and tries to operate the law of supply and demand to his best advantage. Naturally the demand, or consumption, of eggs tends to remain at a fixed level throughout the year, but the supply varies according to the seasons and consequently so does the price. When the supply of eggs is greatest the prices are low and when the supply is poor, then egg prices are high.

From our Egg Marketing Board figures, we find that production is greatest from September to January inclusive and prices are relatively low. While from February to June inclusive, production or supply is lowest and egg prices are highest. February to June then is the period to concentrate on and is the time when we want the pullets to be laying most heavily.

In order to have pullets laying well during this period, it is necessary to purchase chickens in late July or during August. These chickens will come into lay in late January or early February and continue to lay right through the year till the following February–March when they will go into the moult. In other words, they dodge the first moult.

The late July–August chickens may not lay more eggs over the laying year than, say, May hatched chickens, but they produce at the right time and are therefore more profitable.

—K. D. PUGH,  
*Poultry Officer.*

### Timely Tips For October

October can be a month of dry weather and storms. Given dry weather and scanty pasture, animals may eat plants which they would not otherwise touch. Also, storms may bring on a flush of plants which might be relished by hungry stock. Plant poisonings are likely under both these conditions. Generally, treatment for plant poisoning in stock is symptomatic. If you suspect trouble from this source, contact your nearest veterinary officer. He will advise on treatment and determine what plant is involved, so that you may be able to eradicate the plant.

Warts in young stock may be seen this month. They can be treated by surgery or a drug injection. The same drug is used in the treatment of “lumpy jaw.”

Remember that “lumpy jaw” is infectious. An animal with an open “lump” is a danger to the rest of the herd.

You may see vaginitis in your herd this month. If it is “simple” vaginitis, douches with  $\frac{1}{2}$  per cent. zinc sulphate or powders with zinc sulphate as a base may be worthwhile. If the vaginitis is “secondary” and the main site of infection is in the breeding bag, it is a good idea to have the herd investigated to find out what the real cause is. Then it can be treated.

Don't let mange keep your pigs back. Departmental trials have shown that mangy pigs eat well but don't grow so well as mange-free pigs. (In fact, mangy pigs hardly grow at all.) Thorough treatment of all pigs on the farm with BHC twice within 10 days will prevent trouble from this source.



● Prepare your land for early summer crops.

**Brucellosis-Tested Swine Herds** (As at 1st September, 1959)**Berkshire**

- Astbury, "Rangvilla", Pechey  
 Clarke, E. J., Mt. Alford, via Boonah  
 Cochrane, S., "Stanroy", Felton  
 Cook, F. R. J., Middle Creek, Pomona  
 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., "Wilson Park", Pittsworth  
 Grayson, D. G., Killarney  
 H. M. State Farm, Numinbah  
 H. M. State Farm, "Palen" Stud, Palen Creek  
 Handley, J. L., "Meadow Vale", Lockyer  
 James, I. M. (Mrs.) "Kenmore" Stud, Cambooya  
 Kimber, E. R., Block 11, Mundubbera  
 Law, D. T., "Rossvill" Stud, Aspley  
 Lees, J. C., "Bridge View" Stud, Yandina  
 Ludwig & Sons, A. R., "Beau View" Stud, Beaudesert
- McLennan, G. J., "Murcott" Stud, Willowvale  
 O'Brien & Hickey, J., "Kildurham" Stud, Jandowae East  
 Orange, L. P., "Hillview", Flagstone Creek  
 Pfrunder, P. L., Pozieres  
 Pick, L., Mulgildie  
 Potter, A. J., "Woodlands", Inglewood  
 Puschmann, L., "Tayfield" Stud, Taylor  
 Q.A.H.S. & College, Lawes  
 Regional Experiment Station, Hermitage  
 Rosenberger, N., "Nevrose", Wyreema  
 Schellback, B. A., "Redvilla" Stud, Kingaroy  
 Smythe, E. F., "Grandmere" Stud, Manyung, Murgon  
 Stark, H. L., "Florinda" Stud, Kalbar  
 Thomas & Sons, F., "Rosevale" Stud, Laravale  
 Traves, G., "Wynwood" Stud, Oakey  
 Weier, V. F., "La Crescent", Clifton  
 Wolski, A., "Carramana", Warra  
 Young (Jnr.), W., Kybong, via Gympie

**Large White**

- Assenbruck, C., Mundubbera  
 Barron Bros., "Chiltern Hill", Cooyar  
 Bell & Son, E. J., "Dorne", Chinchilla  
 Butcher, Dr. B. J. & Parnwell (Mrs.), Plunkett, via Tamborine  
 Clark, L. D., Greens Creek, Gympie  
 Duncan, C. P., "Hillview", Flagstone Creek  
 Fowler, S., "Kenstan", Pittsworth  
 Franke, H. J., "Delvue" Stud, Cawdor  
 Garrawin Stud Farm Pty. Ltd., 657 Sandgate Rd., Clayfield  
 Gibbons, A. E. H., Mt. Glorious  
 Gibson, H., "Thistleton" Stud, Maleny  
 H. M. State Farm, Numinbah  
 Hall, M., "Milena" Stud, D'Aguilar  
 Heading, J. A., "Highfields", Murgon  
 Horton, C. J., "Mannum Brae" Stud, Mannum, Kingaroy  
 Hutton, G., "Grajea" Stud, Cabarlah  
 Jensen, S., Rosevale, via Rosewood  
 Jones, K. B., "Cefn" Stud, Clifton  
 Kahler, J. & S., East Nanango  
 Kanowski, A., "Exton", Pechey  
 Kennard, R. B., "Collar" Stud, Warwick
- Larsen, H. L., "Oakway" Stud, Kingaroy  
 Law, D. T., "Rossvill" Stud, Aspley  
 Lees, J. C., "Bridge View", Yandina  
 Lobegeiger, L. C., "Bremer Valley" Stud, Moorang, via Rosewood  
 Mack, A. J., Mundubbera  
 Palmer, A., "Remlap", Greenmount  
 Pampling, G., Watch Box Road, Goomeri  
 Postle, R., "Yaralla" Stud, Pittsworth  
 Powell, R. S., "Kybong", Gympie  
 Q.A.H.S. & College, Lawes  
 Radel, V. V., Coalstoun Lakes  
 Regional Experiment Station, Biloela  
 Robinson, O. R., & O. J., "Linvale", Argoon, Biloela  
 Skyring, G. I., "Bellwood" Stud, via Goomeri  
 Stanton, H. R., "Tansey" Stud, via Goomeri  
 Stewart, L., Mulgowie, via Laidley  
 Stumer, K. F., French's Creek, Boonah  
 Wharton, C. A., "Central Burnett" Stud, Gayndah  
 Wieland, L. C. & E., Lower Cressbrook, Toogoolawah  
 Zahnaw, W., Rosevale, via Rosewood

**Tamworth**

- Armstrong, H. J., "Alhambra", Crownthorpe, Murgon  
 Booth, J. D., Swan Creek, Warwick  
 Campbell, P. V., "Lawnhill" Stud, Lamington  
 Coller, R. H., Tallegalla, via Rosewood  
 Fletcher, A. C., "Myola" Stud, Jimbour  
 Herbst, L., "Hillbanside", Bahr Scrub, Beenleigh  
 Kajewski, W., "Glenroy" Stud, Glencoe  
 Kanowski, S. E., "Miecho", Pinelands
- Potter, N. R., "Actonvale" Stud, Willcamp  
 Regional Experiment Station, Kairi  
 Salvation Army Training Home For Boys, "Canaan" Stud, Riverview  
 Skerman, D. F. L., "Waverley", Kaimkillenbun  
 Stephens, T., "Withcott" Stud, Helidon  
 Thomas & Sons, F., "Rosevale" Stud, Laravale  
 Wieland, L. C. & E., Lower Cressbrook, Toogoolawah

**Wessex Saddleback**

- Ashwell, J., "Green Hill", Felton South  
 Burnett, G. C., "Rathburnie" Stud, Linville  
 Cooper, G. J., Neungua  
 Douglas, W., "Greylight" Stud, Goombungee  
 Dunlop, J. B., "Kunawyn", Acacia Road, Kuraby  
 Kruger & Sons, "Greyhurst" Stud, Goombungee
- Law, D. T., "Rossvill" Stud, Aspley  
 Mack, A. J., Mundubbera  
 Scott, A., Wanstead Stud, Grantham  
 Smith, C. R., "Belton Park", Nara  
 "Wattledale" Stud, 432 Beenleigh Road, Sunnybank

**Large Black**

Pointon E., Goomburra

# So You Want To Go Poultry Farming?

By C. W. TUTT.  
Poultry Adviser.

There always are some questions the newcomer to any business wants answered. Apart from technical ones, there are the ones relating to **COSTS and PROFITS.**

Poultry farming is no exception. Attracted by high prices for eggs, people at present outside the industry are showing renewed interest in poultry farming as a business.

## Capital Resources

The person concerned knows how much capital he has available to "put into" or "buy into" a poultry farm. If he is going to "put into" a poultry farm, and plans to build it up from a largely undeveloped piece of land over a period of time, he should know to within a very near figure, the amount it is going to cost him—and the profits he can expect.

If he buys a poultry farm as a going concern it is of value to him to know the capital he would require if he built, equipped and stocked a new poultry farm.

To the prospective poultry farmer in both of these categories therefore, the following figures based on present day costs will be of interest:

1. Satisfactory housing and equipment can be expected to cost £1 8s. for each layer.

2. Capital required to house 1,000 layers satisfactorily is £1,400.

3. Stock can be reared to the point of lay for 12s. each.

4. Capital required to rear 1,000 pullets is £600.

5. £2,000 is therefore required for a farm unit of 1,000 layers.

6. Working capital to the extent of £1,000 would be desirable to tide the new farmer over the period when the farm is being developed and therefore unproductive.

## Earning Power

Pullets can be expected to earn more than hens for they generally lay at a greater intensity than hens.

"Pullets" can be defined as adult female fowls which have not completed a year's lay. Hens, or second year hens as they are called in the industry, are those which have completed a year's lay, and have moulted. Pullets in present Queensland flocks can be expected to lay an average 168 to 180 eggs a year. Second year hens can be expected to lay between 120 and 132 eggs each in a year.

Thus it can readily be seen that pullets are more profitable than hens. On comparable rations second year hens eat at least 2 lb. more feed for every dozen eggs produced than pullets.

Besides the marked difference of overall earning power between the second year hens and pullets, as

shown by their production figures, profitability of either is considerably affected by the time of the year when much of the production takes place. It is more profitable to produce eggs when egg prices are higher. On the basis of average annual production and average annual net return for eggs, it is expected that a pullet will earn £1 4s. 9½d. at the present time.

### Egg Price Is Not All Profit

With "hen" eggs retailing at 6s. 6d. a dozen in southern Queensland (4-6-59), poultry farming may appeal as an easy-money field to the newcomer entering the industry.

But there are expenses! A breakdown of the selling price reveals:—

8d. a dozen goes in the retailers' margin.

1s. 0½d. a dozen goes in deductions made by the Egg Marketing Board.

2s. 8½d. a dozen is devoured by the costs of production.

A total of 4s. 5d. that is *NOT* profit.

The profit margin is 2s. 1d. a dozen. It should be appreciated the average profit per dozen eggs throughout a year is not so much. The average price paid for first quality hen eggs through 1958 was 60.26d. a dozen. The average deduction was 6.51d. a dozen. The average payment to producers was 4s. 5¾d. a dozen. The cost of production was 2s. 8½d. a dozen. The average net profit was 1s. 9¼d. a dozen.

### The Cost

Feed accounts for 75 to 80 per cent. of the total costs of producing eggs. The amount of feed required by pullets to produce a dozen eggs on an average ration is 7 lb. Through 1958, layers' mash cost 3¾d. a pound and so represented



Plate 1

These Young People are Looking at an Intensive Laying Shed, the Type Required for Successful Intensive Poultry Farming.



2s 2½d. in the cost of a dozen eggs. Any upward or downward movement in the price of poultry feed is quite important to the poultry farmer, as each ½d. a lb. represents 3½d. on a dozen eggs, equal to 4s. 1d. a layer a year.

substitute for good husbandry. There is no short cut, nor cheap way of building up a sound poultry farming business.

Good buildings and equipment and adequate accommodation make

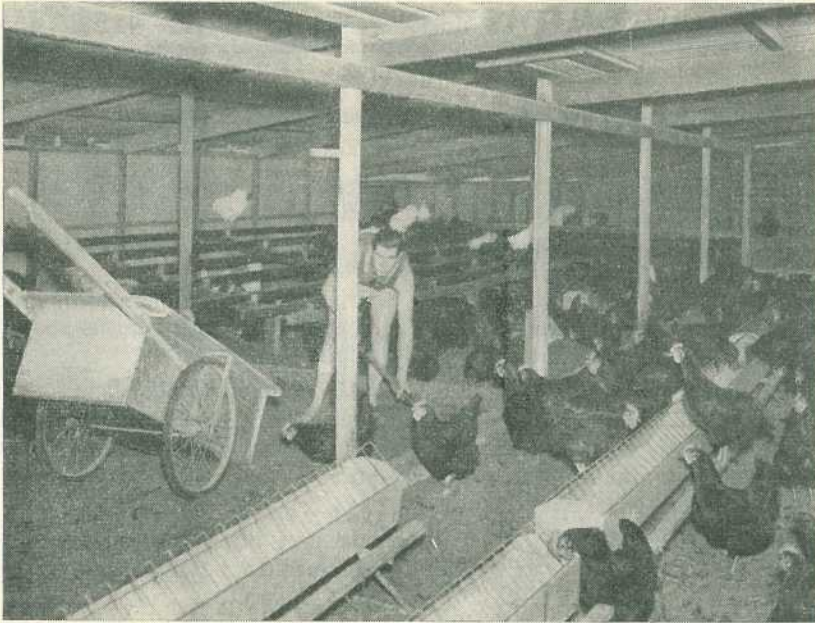


Plate 2

**On the Inside of this Intensive Laying Shed are Feeding Hoppers which Prevent Feed Wastage.** There is plenty of perching space and four inches of loose, dry litter. Also in use is a handy, multi-purpose farm cart.

Other costs besides feed are freight, depreciation on housing and equipment, stock replacement loss, labour, and interest on capital. These, excluding labour, total 6½d. a dozen.

This cost is very variable, depending on the efficiency of the farm, and no attempt to assess its value in the cost of production is made here. The newcomer to poultry farming may like to regard payment for his labour as part of the profit of poultry farming.

#### **Good Husbandry is Essential**

Experiments and experience have both shown there is no satisfactory

for convenience of working, and these are a necessity to enable the would be poultry farmer to care for a sufficiently large flock to return him a good living.

#### **Flock Size**

“How many layers do I require to make a good living?”, the newcomer invariably asks. “About 1,500”, is the round figure answer at the present time. An **ALL PULLET** flock of this number, properly looked after, should return you about £1,860 profit.

Egg prices vary from year to year, depending on the demand of available markets and the supplies


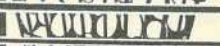

		PRICE PER DOZ.		
1958		PROFITS	39.5%	1s. 9¼d.
		OTHER COSTS	11.6%	6¼d.
		FEED COSTS	48.9%	2s. 2¼d.
	1st QUALITY EGGS		TOTAL	4s. 5¾d.

Plate 3

Showing the Return from First Quality Eggs in 1958.

of eggs available to meet it. In addition, seasonal variations influence the supply of grains and meat-meals available which have a very important influence on the cost of production. Both of these largely determine the profit margin.

In south-eastern Queensland and central Queensland, all producers keeping 50 or more fowls are required to market their eggs through the Egg Marketing Board. Approved producers are granted permits by the Egg Marketing Board to sell eggs direct to customers. Every holder of a permit is required to furnish monthly returns of all eggs sold to the Egg Marketing Board and pay such levies as the Board may require. At present (4-6-59) these levies amount to 7½d. a dozen.

#### Farm Site and Buildings

A large proportion of Queensland poultry farms are situated in and near the Greater Brisbane area. An advantage these farms enjoy is their proximity to the main Queensland market for poultry products.

Future expansion may well be mainly outside this area owing to the "building in" of many suitable areas by residential expansion. This factor should be evaluated by those

contemplating the establishment of a new poultry farm.

#### Brisbane Area

Brisbane City Council ordinances in respect to poultry farms require the following:

(1) Plans and specifications of all structures to be submitted to, and approved by the Building Surveyor.

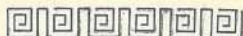
(2) The site upon which poultry sheds and other buildings are to be erected to be approved by the Health Inspector.

(3) The poultry sheds and/or any concrete floor or floors of like material to be made rat-proof.

(4) All poultry to be kept at least 200 ft. from any dwelling or habitable building.

(5) All poultry to be kept at least 100 ft. from any natural water-course or roadway.

Poultry farming is a job requiring attention seven days a week. It has its disappointments and its rewards. It's up to you to make your appraisal, of the *costs* and *profits*. If you want to go poultry farming make sure that you have taken a close look at those figures which mean success or failure in any venture—*costs!*



# Pigs Poisoned By White Cedar Berries

By S. G. KNOTT and P. D. RANBY,  
Veterinary Officers.

If you have white cedar trees in your pig or poultry pens, either destroy the trees or remove the pens to another site. The berries from these trees often cause losses of pigs and sometimes of poultry too.

Loss of pigs from eating white cedar berries was seen recently. One morning in June, a farmer at Camp Mountain found sickness and deaths (see Plate 2) amongst a litter of nine piglets. The piglets were one month old and had been thriving. Post mortem examination of the four dead piglets revealed large numbers of yellow, egg-shaped berries in their stomachs. The three sick piglets showed a wobbly gait when walking but preferred to lie down. Two of these died several days later.

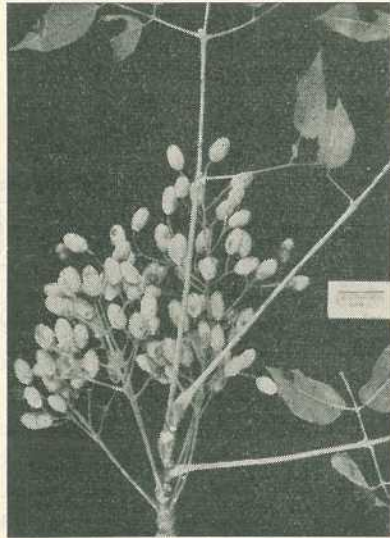


Plate 1

A Typical Cluster of White Cedar Berries.

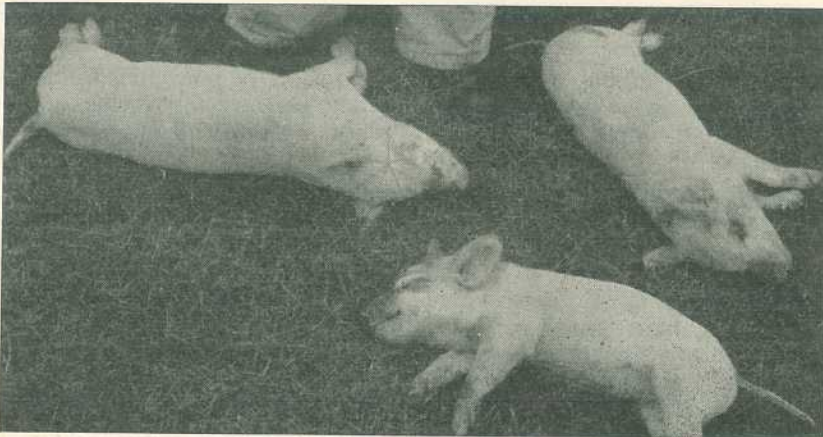
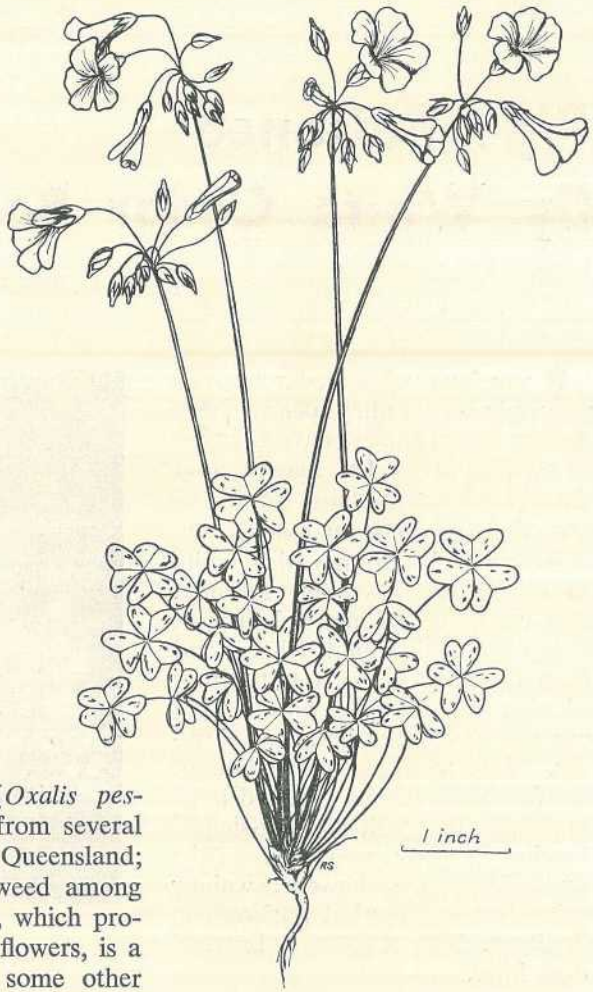


Plate 2

These Suckling Pigs Died From Eating the Berries of the White Cedar.

# Soursob Declared Noxious Weed

By S. L. EVERIST,  
Government  
Botanist.



Recently, soursob (*Oxalis pes-caprae*) was reported from several localities in southern Queensland; in one instance as a weed among pineapples. The plant, which produces attractive yellow flowers, is a very serious weed in some other

(Continued from page 609)

The young pigs but not the sow were able to leave and enter the sty through a small opening. A white cedar tree loaded with berries was found 50 yards away and many berries had fallen to the ground.

Over the years, losses have been reported from most areas where white cedar trees grow. Young suckling pigs that have escaped from their pens and gone searching for extra food, have been reported to be killed by white cedar berries.

Outbreaks are more likely in pigs than other domestic animals.

In cases of poisoning from white cedar berries, the farmer usually reports sudden deaths and illness in pigs that have been thriving. Sick pigs stagger about and show signs of abdominal pain and prostration. In addition, they may also pant and show bluish gums—both signs of interference with blood oxygenation. The berries may also cause patchy bowel inflammation and lung congestion although these changes are not always present.

There is no specific antidote for the poison but it is wise to give affected pigs a purge as soon as possible.

States, particularly South Australia. Although there is no certainty that it will become so aggressive here, recently it was declared noxious under the Stock Routes and Rural Lands Protection Acts as a precautionary measure.

The plant has a perennial rootstock, swollen here and there into white, fleshy tubers, and producing numerous bulbs and bulbils. There is no stem above ground, numerous leaves arising directly from the crown of the rootstock.

The leaf consists of a long, yellowish green, fleshy stalk, and three clover-like, wedged-shaped leaflets, notched at the tip and resembling the traditional shamrock; each leaflet is usually marked with purple spots and all have the power of folding up or "going to sleep".

Stems and leaves have a sharp, acid flavour.

The flowers are on slender stalks in clusters of about 16 at the top of upright stalks longer than the leaves; the 5 petals are bright yellow and about 1 in. long.

Ripe seeds are rarely produced in Australia, and the plant spreads by means of the bulbils, which are easily detached from the parent and are carried about on implements, boots or the feet of animals.

In Queensland, soursob has been found growing wild in a few places on the Darling Downs, West Moreton and the near North Coast. Occasionally it is grown in gardens.

The plant contains oxalates in fair quantity, and has killed numbers of sheep in other States, mostly when the animals were hungry and low in condition.

### How to Get Rid of It

Those who have it, should get rid of it before it spreads. This can be done by mixing sodium chlorate with water at the rate of 1 lb. to 4 gal., and spraying the plants until they are wet. At this low concentration, there is not much residual effect on the soil, and most grasses will recover.

Solutions of ordinary sodium chlorate should be used with care because if these solutions are allowed to dry out on boots or clothing, they can take fire if rubbed or struck. Proprietary preparations are available which contain extra chemicals to reduce this fire risk. These are mostly only half the strength of powdered sodium chlorate and should be mixed accordingly.

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### *Book on South-Eastern Queensland Flora*

Although compiled in the first place for beekeepers, *The Honey Flora of South-Eastern Queensland* has a use for farmers and others interested in botany. It contains illustrations and descriptions of the important ironbarks, gums, bloodwoods, boxes, stringybarks, wattles, tea-trees, and cultivated plants such as lucerne, pumpkins, oranges and clover.

*The Honey Flora of South-Eastern Queensland* contains 199 pages and 178 illustrations. Prices are: In Queensland 15s. a copy, with a 3s. discount to registered apiarists, University botany students and book-sellers; elsewhere £1 a copy.

# The Way To Grow Parsnips

By C. N. MORGAN,

Senior Adviser in Horticulture.

**Successful growers of parsnips are specialists, who use methods as recommended here.**

The parsnip (*Pastinaca sativa*) is a native of the Mediterranean region. It has never become an important commercial crop in Queensland, possibly because the demand is restricted to consumers who appreciate the rather distinctive flavour of the roots. The plant is somewhat fragile in the early stages of growth and production is more or less confined to specialist growers who are not deterred from planting by the need for thorough land preparation and careful attention to details.

## Land Preparation

Any well-drained soil of reasonable depth can be used for parsnips but growers show a preference for the light sandy loams. On the heavier soils, the preparation of a fine seedbed involves the use of rippers, chisel ploughs or deep cultivators before the soil can be brought to a fine tilth.

Thorough pre-planting tillage is essential. The soil must be free from lumps, stones and trash, all of which interfere with the downward penetration of the developing root. Such mechanical obstacles are responsible not only for uneven germination but also for much of the rough skin and forking characteristics which sometimes show up in roots at harvesting.

On the lighter types of soil, single row plantings on the "flat" are normal. In many vegetable-growing

areas, however, the soil type is a friable clay-loam, sometimes of shallow depth. On such soils, the crop is planted on beds raised some 6 in. above the general ground level, and the required surface tilth is obtained with a scraper board which breaks up clods liable to interfere with planting operations. The beds are usually about 3 ft. centre to centre, and about 2 ft. wide, which is sufficient to carry two rows of parsnips.



Plate 1

**Young Parsnip Crop in the Sunnybank District.** The soil is a deep, sandy loam and the crop has been established on the "flat" in single rows.

### Soil Fumigation

Parsnips are very susceptible to attacks by root-knot nematodes, which cause unsightly lumps on the roots and reduce keeping quality after harvesting.

In areas where nematode damage has been experienced the soil should be fumigated with DD or EDB (12½ or 15 per cent. v/v) at least two weeks before planting. These liquid fumigants are injected into the soil through flexible hoses attached to tine implements in rows one foot apart at a depth of 6 to 8 in. The rate of application is ¼ pint per chain of row (20 gal. to the acre). For good results the soil must be in seed-bed condition and should be compacted with a medium-weight roller immediately afterwards. Watering to wet the surface inch of soil after treatment helps to increase control in the surface layer of the soil.

### Nutrition

Most of the coastal soils in Queensland are moderately to highly acid. The parsnip has a high lime requirement and marked responses to applied lime have been recorded on a number of occasions. A soil pH of not less than 6.0 is considered desirable for the crop. In most vegetable growing areas, it is difficult to maintain a pH of this order, particularly in the heavier rainfall areas. An application of lime or dolomite to land which is to be used for parsnip growing is therefore generally desirable.

Rates of application will vary with the acidity and texture of the soil. On the heavier soils, they may range from 1–2 tons to the acre and on the lighter soils, from ½–1½ tons to the acre. Either lime or dolomite may be used but the latter should be applied if magnesium deficiency symptoms have been recorded previously in crops grown in the area.

Both may be broadcast over the surface of the ground in the final stages of land preparation and then cultivated in.

The parsnip crop makes heavy demands on the nutrients of the soil. Manures are sometimes applied before planting, but they must be thoroughly decomposed as raw organic matter in the soil tends to induce malformation of the roots. Rates of application vary from 5 to 10 tons to the acre. Supplies of manure are, however, limited and most parsnip growers rely entirely on artificial fertilizers to produce the crop.

The standard fertilizer is a 5/13/5 mixture. It is available in two forms, one of which contains a considerable proportion of blood and bone while the other is wholly water-soluble. The first of these is used in the basal dressing at the rate of 8–10 cwt. to the acre. It may be broadcast over the land in the later stages of land preparation or, alternatively, distributed along the bottom and sides of furrows in the row positions when the land is almost ready for planting. The former practice is generally preferable as high concentrations of fertilizer near the developing root of the young plant increase the risk of forking, especially if rainfall is sub-normal and water supplies for irrigation are limited.

Where the previous crop in the rotation has been heavily fertilized, and the residual nutrients are in good supply, rates of application for the basal fertilizer can be substantially reduced.

Side dressing fertilizers are normally required shortly after thinning and again four weeks later. In this case, a soluble 5/13/5 mixture is used at a rate of 1½–2 cwt. to the acre. The fertilizer is banded along both sides of the parsnip row and chipped in. Times of applica-

tion and rate of application may, of course, be varied according to the growth behaviour of the crop.

### Planting

Only one parsnip variety—Hollow Crown—is grown commercially in Queensland. The roots are large and well-shaped and yields are high.

With plantings on the flat, row spacings vary from 15 to 18 in., depending on the implements used for cultivation. On raised beds, however, the two rows are 12 to 15 in. apart.

The seed is sown at a rate of 4–6 lb. to the acre or approximately  $\frac{1}{4}$  oz. to 100 ft. of row. The normal depth of sowing is from  $\frac{1}{2}$  to  $\frac{3}{4}$  in., and precision planting is necessary to ensure even germination. The best results are obtained when a mechanical planter is used on a firm seed-bed. Such planters are usually fitted with a roller which packs the soil after the seed is sown. When the seed is hand planted, the seed-bed should be immediately rolled and irrigated.

On some soil types, the surface tends to cake when irrigated and the crust interferes with germination. Any such crust which appears on the ground between sowing and germination should be broken up with a fork hoe or by running a small spiked roller over the rows.

Only new seed should be used for planting. Parsnip seed loses its viability very quickly; old seed invariably germinates irregularly and gives an uneven stand, both of which create difficulties in handling the crop later on.

The parsnip is a long-season crop and takes from 5 to 6 months to mature. In coastal areas, successional plantings are made from late February to May. In the cooler upland districts, earlier planting is permissible. Late plantings are rarely successful; root quality is

inferior and, in any case, the consumer demand for parsnips declines rapidly in the warmer months of the year.

### Weedicides

In parsnips, as in carrot crops, weeds can be controlled with white spirit and power kerosene, both of which are selective weedicides.

The normal practice is to spray the parsnip row about 10 days after planting and before germination takes place. Usually a heavy crop of weeds develops before the germinating parsnips appear above ground. The pre-emergence spray destroys these weeds and ensures that young seedlings do not encounter excessive competition. The second spray is usually applied about three weeks later, when the plants are in the fern-leaf stage.

With this schedule, little or no hand weeding is necessary. Weeds developing between the rows are, of course, controlled with tillage implements.

Certain precautions are necessary when weedicides are used after the parsnips have germinated. The spray should be applied as a fine mist in sufficient quantity to wet the weeds without excess run-off onto the soil. In addition, applications should be restricted to the late afternoon when temperatures are falling and the leaves are dry; morning applications involve a risk of injury to the plant.

### Thinning

Given a reasonably good germination, the seedlings will be packed close together in the row and, if unthinned, the roots develop slowly and a considerable proportion may be small and possibly malformed. In commercial practice, thinning is essential.

This operation is usually carried out by hand some three to four weeks after germination, when the



seedlings are just large enough to handle. The job is done by hand and the best of the young plants are retained to give an average spacing between the plants of approximately 3 in. Thinning operations are simplified if a scuffler with specially adjusted tines is run alongside each row to leave the young plants on a ridge about 2 in. thick.

After thinning, the soil should be compacted by irrigation.

### Harvesting and Marketing

Parsnips are harvested when the roots are  $1\frac{1}{2}$  to 2 in. in diameter at the crown. There is a limited trade for bunch roots, each bunch comprising 12 roots with the tops on. The bulk of the crop is, however, marketed in bags containing topped roots which are graded for size. The normal grade standards are—  
No. 1 grade: sound, well-shaped roots not less than 2 in. in diameter and 6 in. in length; No. 2 grade: sound, well-shaped roots not excessively shrivelled and not less than  $1\frac{1}{2}$  in. in diameter and not less than 4 in. in length. Deformed, cracked or diseased roots should never be consigned to market.

The roots may be pulled in light-textured soils but it is more usual to dig them carefully with a fork in order to avoid damage. Pulling is more or less restricted to the lighter soil types. A plough furrow may be opened-up alongside the row to make pulling easier. After pulling, the roots are topped about  $\frac{1}{2}$  in. above the crown, washed and bagged.

Men engaged in harvesting parsnips sometimes suffer from skin complaints characterised by painful

blisters on the neck and arms. Individuals differ in their susceptibility to the complaint, and there is some evidence that the trouble is more pronounced when the crop is harvested wet than when harvested dry.

### Points to Remember

1. Prepare the seed-bed at least 12 in. deep.
2. Fumigate before planting in land with a nematode history.
3. Lime the soil when necessary, and fertilize heavily except in the more fertile soils.
4. Use new seed and sow it in firm ground.
5. Control weeds early in the life of the crop.



Plate 2

**Parsnips Bagged for Market.** The roots must be graded for size and quality.



## Orchard and Garden

**Kelthane Controls Red Spiders on Strawberries.**—Red spiders are troublesome on strawberries during each spring in Queensland and control of these pests has been a particular worry to growers because of the limited range of suitable miticides available for use. Entomologists in this State have, over a number of years, conducted extensive investigations with likely materials in an endeavour to obtain one or more showing a high degree of control combined with a low health hazard. Kelthane, a new organic miticide has these features and is recommended especially for use on strawberries. It should be used at a strength of 0.05 per cent. active ingredient at intervals of two weeks during periods of attacks. As with any material of this kind, it is necessary to give a thorough cover to the under leaf surface, and applications should be spaced a few days before fruit picking.

—A. R. BRIMBLECOMBE,  
*Senior Entomologist.*

**Market Only Top Quality Beans.**—Only high quality beans, picked at the right stage of maturity, will secure top market prices. But they should also be well packed, as bad handling and packing can easily reduce your returns.

The best stage for picking beans is when the pods have ceased to grow any longer. The seeds will then be about a quarter of an inch long. If beans are left on the plant for too long, the seeds continue to grow after picking and the pods become stringy. If they're picked too young, they will wilt quickly.

Beans should be picked every three or four days. After picking, cases or bags should be held in a

cool place. Cases must be stacked on their sides to allow for the bulge of the lids. To prevent the lower layers being crushed, bagged beans should not be stacked too high.

—K. KING,  
*Senior Adviser in Horticulture.*

**Avocados Are Touchy.**—So you're thinking of planting avocados? Yes! The trees are attractive, and the fruit has a glamour all its own.

Assuming that you have the warm, frost-free area which is preferable for these trees—there are yet two major limiting factors which you must consider and investigate.

These are the depth and drainage of your soil. I don't know of any other fruit tree that is more easily damaged or killed by excessive soil water, which causes root rots and leads to disease attacks.

Most fruits will tolerate fairly wet conditions for a week or more. Three days of waterlogging, however, and avocados will give up the ghost!

The soil must be deep and friable—well-drained to a depth of 4 or 5 ft., or more if possible. Don't take chances; be certain!

Get a soil auger and sample the area deeply in a number of places. Watch out for changes in colour and texture. Colour changes in the profile often indicate drainage trouble; mottling with blue and white streaks are a sure indication. A clay subsoil or hardpan, of course, rules out the soil type immediately.

You can't afford not to be certain; the avocado is definitely one tree that just won't stand wet-feet!

—D. DOWDLES,  
*Horticulture Branch.*

# The job of guiding a club

By J. PARK, State Organiser,  
Junior Farmers' Organisation.

**J**UNIOR farmers' clubs, like all voluntary youth organisations, need competent guidance. At the club or "grass roots" level this can best be given by members of the advisory committee. These committee members must understand the club and know how to help it without taking initiative and authority away from the members. The advisers should be experienced people to whom the club members can turn for help and advice. Because they are experienced, the advisers have something valuable to offer: advice. But giving advice is a delicate matter. It is easy to offer too much, and equally easy to offer it the wrong way.

## Composition of Committee

It is not possible to lay down rules for the composition of the club advisory committee. The needs of individual clubs in this regard differ widely, and the availability of suitable advisers is equally variable.

It is generally accepted, however, that the members of the committee should be mature persons older in years than the club members. It should contain people of different vocations and from different walks of life. In the interests of the girls in the club, women should be represented as well as men. If representatives of local organisations are on the committee, the club can be linked to these in ways helpful to both.

The number of advisers will not be the same in all clubs but will vary according to the size of the club and to the frequency of its meetings. A large club with a varied programme and a number of active groups which meet often will make greater demands upon its advisory committee than a smaller one or one which meets less often.

The size of the committee is, however, a less important consideration than the personalities of its members.

## Election

In a club's first year, the advisory committee is often the small group of people who sponsored the club. Thereafter, the advisory committee is elected annually by the club members. Before a nomination is made, the person concerned must be asked and must agree to stand for election. Naturally the voting will be by secret ballot and not a show of hands. Retiring members are eligible for re-election but this does not mean that the committee shall be elected en bloc as an easy way of disposing of the business. The election of advisers should be taken seriously both by those who have been nominated and by those who will cast the votes.

It is not unusual to find that an advisory committee member may seldom attend meetings and may take little real interest in the club. Where politeness discourages the club members from "dropping" such a person from their list of nominees, a hint from his fellow advisers that he might consider not standing for election again would not be out of place.

### Meetings

As well as attending club gatherings, the advisory committee may find it desirable, if not necessary, to meet informally to discuss club affairs. It is advisable also that occasional meetings between the advisers and the club executive be held. All meetings of the advisory committee should have some specific purpose, for example, to consider the progress being made by the club, or to discuss the suggestions which are to be made to the club by the committee concerning its programme. While all such meetings of the advisory committee will be informal, it is essential that a record of all the meetings should be kept. For this reason, if for no other, it may be advisable for the committee to have a chairman and a secretary.

### Duties of Committee

The first duty of every adviser is to know what a junior farmers' club is for, and how it can help the young people of the community. This knowledge comes from living in the locality and being in close touch with its people; from learning what

other clubs are doing; and from a study of the *Junior Farmers' Handbook*, which may be obtained free of cost upon application. The committee must understand particularly well the organisation of the club itself and appreciate its relationship with the zone council and the State council. Unless they do this, they cannot set an example—as they should—of willingness to co-operate with the zone and State bodies. This information can be gained not only from the official *Handbook* but also from such people as the organising staff members and the local State councillors.

(TO BE CONTINUED)

### HINTS FOR CLUB MEMBERS

Don't try to push inexperienced members into a debating team. To debate well requires self-confidence as well as skill. Make a start with discussion groups using familiar topics; conduct mock meetings with all members speaking to motions which lend themselves to friendly argument. Finally, encourage members to give short talks.

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## Standardised Bale Markings

**J**ULY to September is the greatest peak period for Queensland sheep shearings. About 40 per cent. of Queensland's sheep are shorn in these months.

The Australian Wool Bureau scheme for standardised bale markings is becoming increasingly used by sheepmen in all States. Wool clips branded with standard bale markings define the *standards* of wool for each particular property; not the *qualities*. If bales are branded with standard markings the broker knows easily which is the best wool of any particular clip. Similarly, the buyer knows which wool to turn to immediately, when he is looking for the top line. Where standardised markings are not used it is often the case that each bale has to be opened up and examined on the broker's floor.

Brochures relative to implementing standardised bale marking are obtainable from your local Sheep and Wool Officer.

—R. B. YOUNG, Senior Adviser, Sheep and Wool Branch.

## Try These Tomato Recipes . .

As a vitamin C rich food, tomatoes are among the best. One good-sized, vine-ripened tomato will give you about half your day's quota of vitamin C, as well as a generous amount of vitamin A.



To get most good from tomatoes, eat them raw and fresh. But remember they hold a large share of their vitamins even when cooked or canned.

### Tomato Tips

- Sort and use ripest tomatoes first. Keep the rest spread out where it's cool . . . the refrigerator is a good place.

- Peel and cut tomatoes quickly, just before you are ready to cook them or serve raw in salad. If you must prepare tomatoes ahead of time, be sure to keep them covered in a cold place until you use them.

- To peel tomatoes.

Stroke the skin with the back of a knife until loosened, or

Dip in hot water 1 to 2 min., then quickly into cold-water, or

Run tip of fork into tomato and rotate over a flame until the skin wrinkles slightly.

Green tomatoes, caught by the first light frost, can be brought indoors. "Mature greens"—those about to turn colour and often with a white spot around the blossom end—will ripen at cool room temperatures (55 to 70 deg. F.) in either sunlight or shade. Spread them out.

Immature green tomatoes won't ripen and are likely to rot if kept too long. It's best to pickle or cook them soon after picking.

### Fried Tomatoes

Slice 6 medium-sized ripe or green tomatoes about  $\frac{1}{2}$  in. thick. Dip in mixture of  $\frac{1}{2}$  cup fine, dry bread crumbs or flour,  $\frac{1}{2}$  teaspoon salt, and a little pepper. Cook in a small amount of fat until brown on both sides. If desired, dip tomatoes in beaten egg, then in flour or bread crumbs before cooking. Six servings.

### Scalloped Tomatoes

3½ cups sliced tomatoes

$\frac{1}{2}$  cup minced onion

2 tablespoons minced green pepper, if desired

1 teaspoon salt

Pepper

Sugar, if desired— $\frac{1}{2}$  teaspoon for ripe tomatoes, 1 tablespoon for green

2 cups soft bread crumbs

2 tablespoons fat

Combine tomatoes (ripe or green), onion, green pepper, salt, pepper, and sugar if used. Place in a baking dish alternate layers of tomato mixture and bread crumbs, ending with bread crumbs. (For a thinner mixture, omit 1 cup of the crumbs). Dot with fat.

Bake in a moderately hot oven (375 deg. F.) 20 to 30 min. for ripe tomatoes, about 45 for green.

If desired, sprinkle  $\frac{1}{2}$  cup grated cheese over the top for the last 10 to 15 min. of baking. Six servings.

### Baked Tomatoes

Wash and remove stem ends of 6 medium-sized tomatoes, ripe or green. Place in a baking dish, brush with melted fat, and sprinkle with salt and pepper. Add just enough hot water to cover bottom of dish. Bake in a moderately hot oven (375 deg. F.) until tender—about 30 minutes for ripe tomatoes, about 45 for green. If desired, sprinkle with bread crumbs before baking.

*On the half shell.*—Cut tomatoes in two, place cut side up in a baking dish, brush with melted fat, and season with salt and pepper. Bake in a moderately hot oven (375 deg. F.) until tender—about 30 min.

*Stuffed.*—Scoop out centre of ripe tomatoes, leaving a shell about  $\frac{1}{4}$  in. thick. Chop pulp and drain off juice (use juice in cocktails, soups, sauces). Mix pulp with an equal amount of soft bread crumbs. Add 2 tablespoons minced onion cooked in 1 tablespoon fat until lightly browned. Season with salt and pepper. Stuff tomatoes, and place in a greased baking dish; add just enough water to cover bottom of dish. Bake in a moderately hot oven (375 deg. F.) until tender—25 to 30 min.

### Beef, Tomato, & Cabbage Scallop

1 pound ground beef or other lean meat  
2 tablespoons fat  
 $\frac{1}{2}$  cup chopped onion  
1 cup chopped celery  
2½ cups tomatoes  
2 teaspoons salt  
Pepper  
4 cups chopped or coarsely shredded cabbage  
1 cup soft bread crumbs

Brown the meat in fat. Add onion and celery; cook 5 min. Add tomatoes, salt, and pepper; bring to boiling. Place alternate layers of cabbage and meat mixture in a baking dish. Top with bread crumbs. Bake in a moderately hot oven (375 deg. F.) 40 to 45 min. Six servings.

### Fish-Tomato Stew

Cook 3 cups cubed potatoes in 3 tablespoons fat until lightly browned. Add  $\frac{1}{2}$  cup chopped onion,  $\frac{1}{4}$  cup chopped green pepper, 3½ cups tomatoes. Cover and cook until potatoes are tender. Add 1 pound cooked fish, cut in about 2-in. pieces. Season with 1 teaspoon salt, and pepper. Cook about 5 min. longer. Six servings.

### Chicken Creole

4- to 5-pound chicken  
 $\frac{1}{2}$  cup flour  
1 teaspoon salt  
Pepper  
 $\frac{1}{2}$  teaspoon paprika  
 $\frac{1}{2}$  cup fat (chicken fat may be used)  
 $\frac{1}{2}$  cup chopped onion  
 $\frac{1}{2}$  cup water  
 $\frac{1}{2}$  cup chopped green pepper  
2½ cups fresh tomatoes

Cut chicken into serving pieces. Roll in mixture of the flour, salt, pepper, and paprika. Brown in melted fat. Add onion; cook 2 to 3 min. Add the water, cover, and simmer about 1 hour or until almost tender, adding more water if necessary. Stir occasionally to keep from sticking. Add green pepper and tomatoes. Simmer about 30 min. longer. Serve on seasoned hot noodles or rice. Six servings.

### Savory Rice With Tomatoes

Cook  $\frac{1}{4}$  pound diced bacon until crisp, remove from fat, and drain. Combine 2 tablespoons of the bacon drippings with 3½ cups tomatoes,  $\frac{1}{4}$  cup each of chopped green pepper

and onion. Bring to boiling, add about 3 cups cooked rice, cook 10 to 20 min. Or add 1 cup uncooked rice and 2 cups water, and cook gently 40 to 45 min. or until rice is tender. Add more water if mixture becomes dry. Season with salt and pepper. Add bacon. Six servings.

### Clear Tomato Soup

1½ quarts tomatoes  
 ½ bay leaf  
 ¼ cup chopped onion  
 4 cloves  
 1 tablespoon fat, melted  
 1 tablespoon flour  
 1 teaspoon sugar, if desired  
 1 teaspoon salt  
 Pepper

Cook together the tomatoes, bay leaf, onion, and cloves—about 20 min. Press through a sieve. Blend

the fat, flour, and sugar (if used); gradually add the cooled, sieved tomatoes. Cook over low heat, stirring constantly for about 5 min. Season with salt and pepper. If desired, sprinkle with finely chopped parsley and serve with toasted bread cubes. Six servings.

### Spanish Sauce

Cook 2 tablespoons chopped onion in 2 tablespoons fat until lightly browned. Blend in 1 tablespoon flour. Add 2½ cups tomatoes, ½ cup each of chopped celery and green pepper, 1 tablespoon chopped parsley, 1 teaspoon salt, and a little pepper. Cook 15 to 20 min., stirring frequently. Serve over meat loaf, cooked spaghetti, fried or baked fish, cooked cabbage, or omelette.

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## V-Belt Care Reduces Wear

Designers of modern farm machinery are turning more and more to V-belt drives in preference to chain and sprocket and flat belt drives. While it is true that V-belts provide a comparatively slip-free and shock-absorbing drive, it is nevertheless essential that they should be used under conditions recommended by the manufacturers, and given adequate maintenance so that they do not fail prematurely.

As most of the stretch in V-belts occurs within the first few hours of operation, the tension should be checked two or three times after short periods of running. The degree of tension needed will depend upon a number of factors such as the section, the size of the pulleys, the speed and the load. An approximate check can be made by measuring the deflection of the belt midway between the shaft centres. This should be about ¼ in. on an average drive.

If a belt which has seen some service requires frequent tensioning, it is a sure sign that its useful life is coming to an end, so keep a replacement ready.

If one belt of a multiple drive fails, the whole set should be renewed. It is a great mistake to use belts of different ages and makes in a multiple drive. Store the serviceable belts carefully against the time when a used set can be matched and put into use together. Belts are best stored away from direct sunlight in a cool place. They should be hung in single or triple coils and not too tightly wound. Tying them tightly with thin string or wire should be avoided.

Never use belt dressing on V-belts—if you do, slipping is bound to occur. Also do not allow oil or solvents to come into contact with them as these attack the rubber.

Last and by no means least, never fit a new belt by forcing it over the pulley with a lever—always slacken off the adjustment fully and fit the belt by hand.

—C. G. WRAGGE, *Agricultural Engineer.*

## Science tells us why and how to use valuable milk food

**A**T one time milk was regarded as necessary for only babies and young children. Today's scientific knowledge shows it to be a food of such exceptional value that no diet, at any age level, is complete without it.

Why so important?

Milk supplies more of our needs than any other one food. It is an energy food, a body-building food and a protective food.

Though a liquid, milk has more solid matter than apples, turnips and other fruits and vegetables.

### Milk contains these food elements:

**Proteins**—(For growth and tissue repair).—Casein, Lactalbumin, Lactoglobulin.

**Fats and Carbohydrates**—(For energy and warmth).—Butterfat, Milk sugar or lactose.

**Minerals**—(For building bones and teeth).—Calcium Phosphorus.

**Vitamins**—(For normal body function).—A, B1, B2, C, D, and nicotine acid.

### Children Must Have Milk

A building is only as good as the materials that go into it. The same applies to the human body. And the building time is the growing time. Bones are lengthening and calcifying; teeth are developing; young

muscles are developing to meet the demands made on them. Milk's first-class proteins and minerals provide the ideal answer to these needs. As a "grow-food", milk is a "must" in every child's diet.

### Milk for Adults

Without milk the average adult diet would seriously lack calcium. That is why milk is essential, as the most practical and pleasant way of getting the calcium the body needs.

Adults need at least half a pint of milk a day, as a drink or in cooked foods.

### Milk and Weight

Milk can help both to reduce and to gain weight. A glass of milk taken about 20 minutes before a meal will dull the appetite for the more fattening foods at the table. When an increase in weight is desired, doctors prescribe milk sipped slowly with or just after a meal.

### Mother Needs Milk

Milk is especially important in the diet of both expectant and nursing mothers. The mother must nourish her baby both before and after birth. She needs an extra supply of body-building elements and minerals for the bones and teeth of the developing baby. Otherwise nature will rob the mother's body for the



sake of the child. The nursing mother has equal need of at least a pint of milk a day.

### Milk Must Be Safe

Disease germs can thrive and multiply in raw milk for long periods. So pasteurised milk should be used where possible. The modern process of pasteurisation destroys bacteria, but does not alter the quality and flavour of the milk. If only raw milk is available, or if it is preferred, boil it before use. Both raw and pasteurised milk should be boiled before being given to baby.

### Care of Milk at Home

Pasteurised milk is delivered to your door safely sealed in sterile bottles. From then on, the safety and quality of the milk are in your hands. Exposure to sun is bad for milk, as it destroys some of the vitamin content. Arrange for the bottles to be left in a shaded spot, and then, as soon as possible after delivery, put the bottles in ice

chest or refrigerator. Use the milk from its own bottle and cover with its own cap.

### Some Ways of Serving Milk

As a drink, coloured and flavoured. As a drink with coffee, chocolate and other beverages.

With eggs in custards, baked or boiled.

As blanc mange, flavoured and coloured.

As junket or milk jelly.

In souffles, flummeries and other cooked milk dishes.

Creamed with vegetables.

Served with porridge and cereals.

### How Much Milk You Need

Children—not less than one pint daily.

Adults—not less than half pint daily.

Expectant and Nursing Mothers—certainly not less than one pint, and, if possible one quart daily.—*Queensland Health Education Council.*

## Solving The Underweight Problem

**W**HEREAS overweight is more dangerous in people of middle age and older, underweight is more a matter for concern in people under thirty. Underweight is more often a symptom of disease than is overweight, but of itself is a far less dangerous and distressing condition.

### What Causes Underweight ?

It may be a sign of disease, especially if the loss of weight is sudden. More often, underweight is caused through habitually eating too little food or the wrong kind of food; by fatigue or over-activity; or by psychological factors such as worry and mental strain,

There is quite a large class of apparently normal persons who seem unable to gain weight. However, careful examination of their mode of living usually shows that one or more of the above named factors are involved. Many teenagers, keen to remain slender, allow their weight to reach a dangerously low level, at an age when underweight is especially hazardous.

### Plan for the Underweight

1. Have a thorough medical examination to decide whether or not the underweight is caused by disease.
2. Get plenty of rest at night and during the day when possible, so

that fatigue will not interfere with appetite or the body's ability to use food to build body weight. Underweights should try to get 9 or 10 hours' sleep a night. If it is at all possible, a short rest should be taken after each meal.

3. Do all you can to avoid hurried eating and stress and strain during meals. An ample, unhurried breakfast is particularly important in overcoming underweight.

4. Eat well-balanced meals at regular times. Ask your doctor during the initial examination if he suggests any extras in the way of

diet. Milk, sipped slowly with or after meals, can be helpful in gaining weight.

5. Take moderate, regular exercise, suited to your individual needs, but don't continue to the point of undue fatigue.

6. Above all, try not to be a worrier. Do your best to cultivate a calmer and more relaxed attitude towards life. Try to build up a hobby and other interests to keep your thoughts pleasantly occupied.—  
*Queensland Health Education Council.*



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