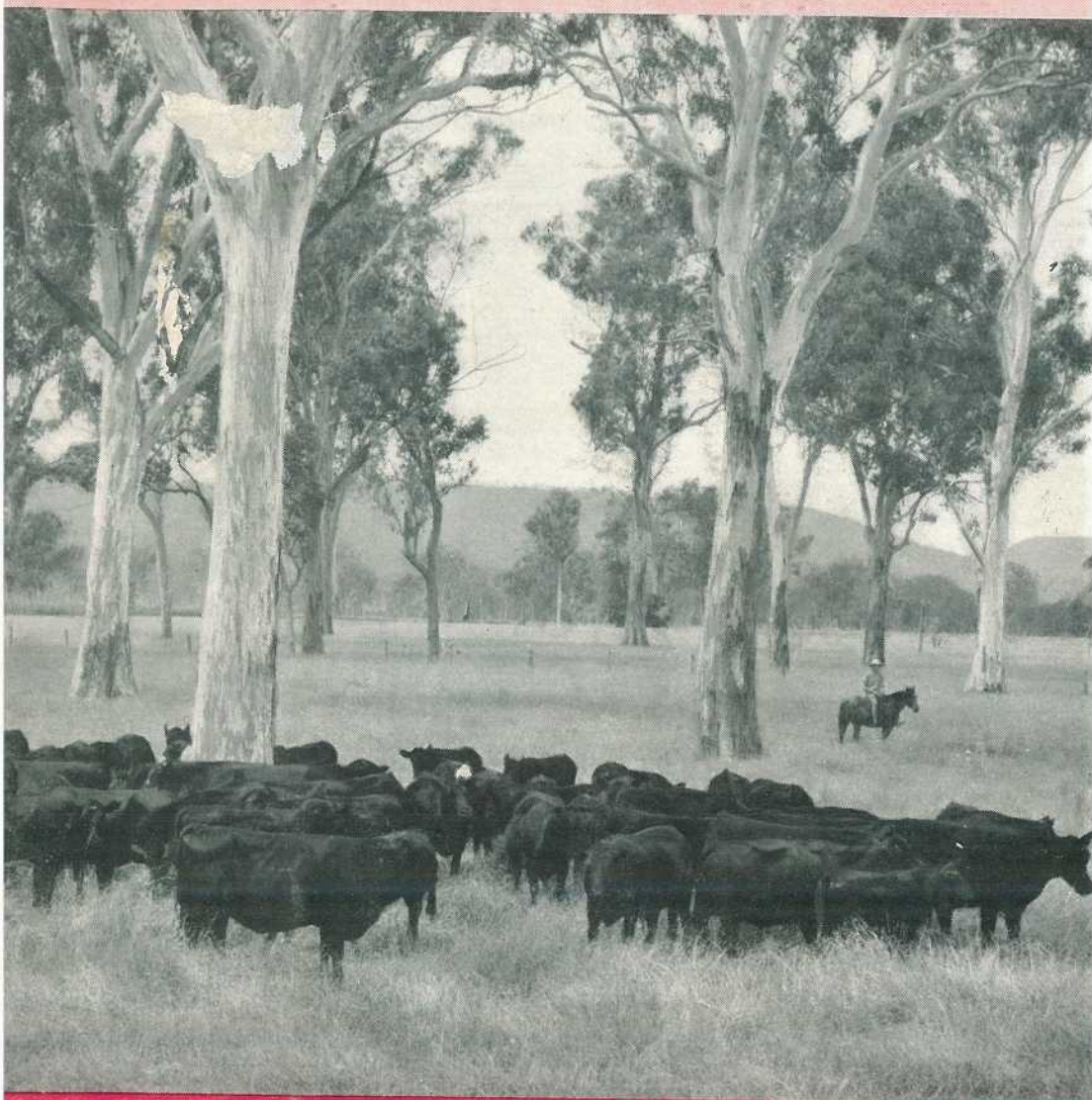


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# Kaban Potato Grower Gets 23 Tons To The Acre

By T. K. KELLY, Senior Adviser in Agriculture  
and J. C. KERR, Field Assistant.

**Mr. Bill Jonsson, a potato grower of Kaban, North Queensland, produced 23 tons of potatoes to the acre from an 8-acre paddock. This is how he did it:**

- (1) Land preparation over two years, involving green manure crops.
- (2) Heavy application of fertilizer; one ton to the acre at planting; one bag to the acre during the growing period.

(3) Using large seed, which required  $1\frac{1}{2}$  tons of seed to the acre.

(4) Efficient watering and pest control.

## Land Preparation

The land preparation phase occupied two years. In December, 1956, a crop of Poona cowpeas was planted and allowed to mature and die. The area was ploughed in October, 1957 and planted to maize in November of that year.



Plate 1

General View of Potato Crop. Variety is Sequoia.



Plate 2

**Digging the Potato Crop.**

This produced a green manure crop of approximately 15 tons to the acre which was turned under in February, 1958. An oat crop followed and was ploughed in as a green manure at the end of May. The potatoes were planted on July 27, 1958.

**Fertilizer**

As a result of trying various mixtures Mr. Jonsson has found a 5-14-5 fertilizer the most suitable for his area. He used 1 ton to the acre before planting. Of this half was broadcasted and the remainder applied in the drill the day before planting.

In the growing period a bag of sulphate of ammonia to the acre was applied through the spray lines. Half a bag was used at flowering and the balance six weeks before harvesting.

It is of interest to note that a correlation exists between fertilizer rates and yields in recent years on this farm. The previous year, Mr. Jonsson obtained 15 tons to the acre when using 15 cwt of fertilizer.

Before this his yields were in the vicinity of 10 tons, using 10 cwt. of fertilizer to the acre.

**Seed and Plant Spacing**

Certified Sequoia seed was used for this area. This variety has given the most consistent yields on the Tableland. A ton and a half of seed to the acre was planted with a spacing of 10-13 in. in the rows according to size of the seed. The seed was a "run of the crop" and varied in size.

The greater part of the area was sown with whole seed of about 6 oz. Where seed exceeded 8 oz. it was cut and planted in a separate section. While the latter area gave a good yield, it was evident that whole seed gave a better result.

Row spacing was 34 in. This width is considered by Mr. Jonsson to be the minimum width to allow enough soil for efficient hilling.

**Watering**

With the use of whole seed, the initial watering is carried out following planting. When cut seed is

used, Mr. Jonsson waters prior to sowing.

The crop was watered at weekly intervals with an application of  $1\frac{1}{2}$  in. each time. It was necessary to omit only one watering because of rain. Consequently the water requirements of this crop were supplied almost entirely by irrigation. The medium pressure system in use gave an application of  $\frac{1}{2}$  in. an hour with nozzles spaced every 36 ft.

### Pest and Disease Control

Spraying was carried out regularly during the growing period from "hilling up to drying off." Five treatments were given in the growing period and three as the bushes died. The late sprayings were aimed at preventing a build up of Tuber Moth before harvesting. Both DDT and Endrin were used for pest control and Zebtox was added on two occasions to prevent blight.

### Inter-row Cultivation

The area was harrowed about three days before the plants



Plate 3  
Picking Up and Bagging Stage.

emerged. The next cultivation was made as soon as the rows could be distinguished. Three more were carried out, of which the last was a hilling.

### Harvesting and Storage

An elevator-type machine was used for digging; manual labour was responsible for picking up and bagging.

To meet market conditions in the north, the potatoes were successfully stored for about two months in a barn with a wooden floor 3 ft. from the ground. Walls were sprayed with Endrin and the potatoes were treated with a 2 per cent. DDT dust. Endrin was sprayed around and under the barn every week.

At the time of sale it was found that there was a shrinkage in weight of approximately 10 per cent. This gave a net yield, after shrinkage, of 20 tons of marketable potatoes to the acre.

### Machinery and Equipment

Mr. Jonsson has efficient equipment for potato growing. A 40 h.p. tractor is used for ploughing and discing operations. For inter-row cultivation, he has a 25 h.p. crawler tractor with 8 inch tracks. The boom spray is carried by a 20 h.p. tractor with 4 inch steel wheels. This spray equipment is worked at 150 lb. pressure, using 100 gal. to the acre.

### Costs

Allowing  $12\frac{1}{2}$  per cent. for depreciation of equipment, Mr. Jonsson found that the cost of producing this crop was £475 an acre.

With an average selling price of £40 a ton, his net return was £325 an acre.

## Pasture and Crop

**Money in Sweet Potatoes.** There is more money in sweet potatoes than most people realize. They are grown as a minor crop in almost every coastal district in Queensland from the southern border to Cooktown.

Sweet potatoes are becoming very popular for human consumption, provided good quality, stringless varieties are grown, such as the variety Abundance.

They are also used as a bulk feed for cattle and pigs. When used in that way there is no risk of poisoning whether the vines or tubers are fed or grazed. The recommended varieties for growing for stock are White Maltese or Porto Rico. A fair average yield of sweet potatoes would be 6 to 8 tons to the acre, but heavy yields up to 15 tons to the acre are not uncommon.

**Irrigated Pastures.** The careful management of newly sown irrigated pastures is very important as the stand and composition of the sward are largely influenced by the care and attention given to the pastures in the critical establishment stage.

Young pastures need an adequate supply of soil moisture but frequent, light irrigations should be avoided. Continued wetting of the surface soil encourages development of the shallower-rooted clovers and annual components, and the competition from these may cause a reduction in the stand of the slower-growing perennial types.

Don't graze the young pastures too early or too heavily. Grazing should be delayed until the plants have made good growth and strong rooting systems. If weeds are troublesome, give a high mowing rather than a grazing and leave the clippings on the soil to provide a protective mulch.

Use light pasture harrows to spread manure. Heavy harrows will tear out the young plants.—

*A. NAGLE, Irrigationist.*

**Healthy Tobacco Seedlings.** Main task of Queensland tobacco growers at present is to raise healthy, vigorous seedlings for transplanting early in summer. Only good quality seedlings will grow into the high-yielding plants that repay the farmer for his work.

This job calls first of all for the use of disease-free seed with good germination. The seed must be sown in properly prepared seedbeds and protected from pests and diseases.

Pure seed, specially treated to free it from diseases and tested for germination, is available from the Department. Main varieties are: Hicks, Hicks (Pioneer selection), Virginia Gold, 402, Gold Dollar and Virginia Bright Leaf. Of these, Hicks is by far the most popular. In ordering your seed, remember a quarter of a teaspoon will plant 50 sq. ft. of seedbed. You can grow sufficient seedlings to plant an acre on 100 sq. ft.—*A. WINTERTON, Agronomist.*

# Dual Purpose Grazing Crops Help Downs Dairymen

By J. HART,  
Senior Adviser in Agriculture.

**On the Darling Downs, summer and winter crops that yield both grain and fodder can play a part in the dairy farmer's programme.**

On the mixed dairy farm such as is found on the Darling Downs, grazing crops generally provide the cheapest fodder. Efficient management of such crops will extend the grazing period obtained from them and in flush seasons, a surplus of feed may result. The farmer is then confronted with the pleasant problem of handling this surplus.

The dairy farmer should always plan with the view to having this grazing surplus. In so doing the aim is to select crops which, if not needed for green feed can be handled without the expense of hired machinery, and either find a place in his own fodder reserve programme, or be harvested and sold as a cash crop. On the Darling Downs, grain harvesting machinery is almost standard equipment. Therefore, in that area, dual purpose grain crops should form the basis of both winter and summer sowings.



Plate 1

Could this be yours? Try Lawrence or Hopps as a dual purpose crop.

As a word of warning though, don't stint your cows because you have the vision of a handy grain return. It is always a temptation. On present day prices, what goes through the cow is more profitable than what goes through the header. If dual purpose crops are treated with this in mind then certain varieties of wheat and oats as well as some of the millets can play a part in the dairy farmer's programme.

### "Steam-up" for Dual Purpose Crops

Dairy farmers are familiar with the "steaming-up" process in relation to their cows. The same principle applies to crops. Land preparation is a form of steaming up for crop production.

If any crop is to provide both grain and grazing it must have an adequate supply of both soil moisture and nitrogen. Moisture can be assured by trapping and storing as much rain as is possible during the land preparation process. This stored moisture is needed to supplement seasonal rainfall.

Nitrogen, in a form available to plants, is released to a growing crop only if all stubble from the previous crop is decomposed before sowing. Land preparation should aim at that end. Better still, let the dual purpose crop follow a leguminous one such as lucerne. This is when dual crops are seen at their best.

If you have no legume land available, and if your cultivation is old and doubtless low in nitrogen of any form, try nitrogenous fertilizers. An application of 1 cwt. of sulphate of ammonia to the acre will often make the difference between a good and a poor dual purpose crop.

But here is another word of warning. Nitrogen alone is not

enough; it can be dangerous. Moisture alone is not enough; it will produce little. But combine the two and then dual purpose crops give outstanding results.

### Grazing and Grain Wheat Varieties

Lawrence and Hopps are the two dual purpose wheat varieties. Lawrence is an old variety, Hopps a recent release. Both are good.

Both varieties are at their best when used as dual purpose crops. They are not recommended for straight grain sowings. After being subjected to as many as three grazings, however, both are still capable of giving grain returns as high as 36 bushels to the acre—provided adequate moisture and nitrogen are available.

March is the suggested sowing month, although in practice Hopps at least has performed well from late January sowings.

### Dual Purpose Oat Varieties

Most oat varieties grown in Queensland are of the dual purpose type. Bovah, because of its tendency to shatter, is not recommended.

Algerian and Klein, because of their slow maturing habits, are the best dual purpose varieties. Clinton, Benton and Lampton, though somewhat faster, are also worthwhile selections.

Oats afford such excellent grazing, however, that it is generally preferable to use them solely for this purpose and to treat the dual purpose wheat as the likely source of a cash crop return.

### Dual Purpose Summer Crops

Dual purpose crops in the summer-growing class are very limited. The Seed Certification Scheme has halted the trade in sudan grass



grain from the dairy farmer's surplus sudan crops.

The only crops worth considering are Japanese millet and white panicum. Of the two, Japanese millet is the superior dual purpose crop. Unfortunately there is a demand for only limited supplies of these seeds. If the grower is able to "catch" the market, however, these grains can

be very profitable sidelines to a dairying venture.

#### Two Reminders

1. On the smaller farms there is more money in dairying than in grain growing.

2. There is no money in dual purpose cropping unless both moisture and nitrogen are readily available.

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### For the Fodder Bank



The Forage Harvester with Pick Up Attachment Chaffs Hay Ready for Storage or Direct Feeding to Stock.

## New Events in Agriculture In North Queensland

**The latest activities of his department in northern Queensland were outlined by the Minister for Agriculture and Stock (Hon. O. O. Madsen, M.L.A.) recently.**

Mr. Madsen said that the Agriculture Department's new tobacco experiment station at Parada, near Mareeba, is rapidly taking shape. It is hoped that the official opening may be possible early next year. Experimental work will include varietal and seedbed trials, blue mould studies and irrigation trials. There will also be investigations to determine the best plant and row spacings.

Pasture investigation and cropping trials have also been planned. The aim of these is to determine the agronomic potential of certain soil types concerned in the development of the Tinaroo Falls Irrigation Scheme.

An Agriculture Department officer at Mareeba is engaged full-time in advisory work and handles the individual problems of the farmers.

Mr. Madsen said tobacco growing is an important industry in north Queensland. In 1958-59, the Mareeba-Dimbulah area grew 4,000 acres of tobacco and the Ayr-Ingham-Woodstock area 1,400 acres.



**Hon. O. O. Madsen, M.L.A.**

At the Mareeba selling centre in 1957-58, more than three million pounds of leaf were sold for a return of more than £1,750,000. The average price was 138.58d. a lb. At the Brandon centre in the same year, more than one million pounds of leaf were sold for £559,000, or 127.43d. a lb.

### **Studies on Blue Mould**

A study of the blue mould position in north Queensland tobacco areas will be repeated this year, Mr. Madsen said. Last year, an extensive six months' survey gave valuable information, but further studies are necessary. Climatic conditions last season were not suitable for a severe blue mould outbreak, but a useful insight into the disease problem was obtained.

Research work designed to develop an efficient spray for controlling blue mould in the field is in progress.

Mr. W. Pont, an Agriculture Department pathologist, now has a formula considerably better than conventional materials. However, a spray that can be relied upon to control an epidemic of the disease such as often occurs late in the season is still a long way off.

### **New Tea Planting**

Mr. Madsen said that a new, small experimental planting of tea is being made in north Queensland. It is being put in at East Palmerston.

For years, the Agriculture Department has grown tea experimentally on the wet lowlands at the Bureau of Tropical Agriculture, South Johnstone. From this plantation, tea equal to world standard commercial grade has been produced. Part of this plantation is being converted into a seed garden so that fair quantities of the seed will be available in the future if required.

Tea is usually grown on the wet highlands, not on coastal lowlands. It is for this reason that the new planting is being made at East Palmerston, which is 500 ft. above sea level. When mature, it can be expected to indicate what effect altitude has on the quality and yield of tea under north Queensland conditions.

The Minister pointed out that the tea plantation at South Johnstone had yielded more than 1,000 lb. of dry leaf to the acre. Tea experts considered this yield well up to world standards. Both Australian and overseas tea tasters had confirmed the good quality of Queensland leaf.

Plucking costs are the main bar to the establishment of a commercial tea growing industry in Queensland. Cost of hand-plucking leaf on the experimental area is in the region of 12s. a lb.

Harvesting with a modified Tarpen hedge trimmer has reduced this cost by about one-third, and given good quality tea. But this cost is still too high and improved methods of mechanical plucking are being sought.

Under present conditions, any establishment of commercial tea growing in Queensland will depend in the first instance on the development of efficient mechanical harvesting.

### **Burdekin Crops Encouraging**

Proof that the soils along the Burdekin can produce high yields in a wide range of crops is piling up at the Millaroo Regional Experiment Station, the Minister said. Early investigations at Millaroo, 40 miles upstream from Ayr, were giving a favourable picture of the district's capabilities.

Full development of the Burdekin River Irrigation Scheme calls for the use of large tracts of country for the production of other crops besides tobacco. Irrigated pastures, for example, could probably make profitable use of land unsuitable for the production of other crops.

On the levee soils at Millaroo, investigations are concerned mainly with tobacco production. But it has been demonstrated that maize and cotton can also be grown profitably. Maize yields have exceeded 100 bushels an acre, and cotton yields have reached 1,400 to 1,500 lb. an acre.

An interesting point about maize and cotton is that they are grown in what would be regarded as the "off" season in other parts of the State. These are summer crops, but on the Burdekin, they are grown in the cooler months of the year—between March and September.

The levee soils have also produced a wide range of horticultural crops.

On the heavier flood plain soils, the merits of irrigated pastures are being examined. A large area of a para grass-centro mixture is now approaching the stage when grazing trials can be commenced.

**It is hoped that the pasture studies will be the means of stepping up beef production on thousands of acres of Burdekin country. The possibility of dairy production, too, cannot be overlooked.**

#### **Buffel Grass for North-west**

Buffel grass, said Mr. Madsen, seems certain to play a key part in increasing animal production in north-western Queensland. He said his Department had recognised the potential for improved pastures in this region and the suitability of buffel grass under the rather harsh conditions. But little was known of the best methods of establishing it and of the soils suitable for buffel grass.

For this reason, Mr. D. I. Sillar, an agronomist, was appointed to Cloncurry two years ago especially to study these problems.

Working in close co-operation with pastoralists and pastoral companies, Mr. Sillar has laid down trials to test methods of establishing buffel grass. He is also paying particular attention to the soil types that will support buffel grass.

Mr. Madsen said Mr. Sillar was measuring the rates of spread that can be expected under various types of property management. He is also investigating a wide range of pasture species including grasses, edible shrubs and legumes. These are being tested on a variety of soil types.

#### **Tropical Legumes Show Promise**

Referring to tropical pasture legumes, Mr. Madsen said these show promise of being as valuable in north-eastern Queensland as subteranean clover is in southern Australia. They are making it possible to establish improved pastures in the wet areas of the northern coast.

These pastures will enable cattlemen to turn off prime quality beef for the chiller trade. Pastures have been guinea grass, molasses grass or para grass in combination with centro or some other tropical legume. At the Bureau of Tropical Agriculture, this feed has carried a beast to 1½ acres and given year-round weight gains of 1½ to 1½ lb. a beast a day.

**Mr. Madsen said the Agriculture Department had pioneered this development of improved pastures on the wet tropical coast. It had tested legumes and pasture mixtures that would thrive on a wide range of soils, including some of rather low fertility.**

The legume centro, first tested at the Bureau of Tropical Agriculture, South Johnstone, is now coming into wide commercial use in North Queensland. More than 1,000 acres have already been sown to this pasture plant and plans are in hand for the production of high quality Queensland grown seed.

Stylo is proving of value in spreading into ridgy country, now dominated by blady grass. The "newer" legume, *Glycine javanica*, has been tested at the Kairi Regional Experiment Station and on East Barron farms. It is showing considerable promise as a grazing legume. Its ability to spread and grow vigorously on old maize cultivations has been demonstrated on Mr. J. Killoran's farm at East Barron.

### New Land Usage

Greater farm productivity is emerging from a new system of land usage being pioneered at the Kairi Regional Experiment Station. It shows promise of giving a better all-round return for farmers on the fertile Atherton Tableland.

For many years it had been the general practice on the Tableland to grow maize continuously. This is an exploitive system of land use. That it has been possible to continue it for so long is proof of the high fertility of Tableland soils.

In recent years, however, the toll of soil erosion, which has been occurring in varying degrees of severity for a lengthy period, has been reducing yields. Farmers are now aware of this threat to their livelihood.

The most effective method of overcoming soil erosion and restoring yields is to use a rotational cropping system. The best restorative crop is pasture.

**At the Kairi Regional Experiment Station, dairying and maize growing are being combined in an eight-year rotation programme. Four years of pasture are followed by four years of other crops before the land is again returned to pasture.**

In the first eight years, soil erosion has been checked. Maize yields are maintained at 60 to 70 bushels an acre, compared with the district average of 20 to 30 bushels. Milk production, too, is well above the district average. In February, the average daily yield per cow under this system on the Station was two and a half gallons of milk.

Side-by-side with this work, Agriculture Department officers at the Station are examining new pasture species. When suitable species are identified and tested, they could

help greatly to improve the quality of Tableland pastures. Already some promising results are being obtained.

### Culinary Dry Beans

Experimental work has begun at the Ayr Regional Experiment Station to determine the potentialities of the district for the production of culinary dry beans. Large quantities of these beans are imported from overseas.

The Burdekin delta has won its spurs as No. 1 production area for the production of French bean seed and it is confidently expected that the production of culinary dry beans should be commercially practicable, the Minister said.

At the present time, Australian imports of culinary dry beans are worth more than £300,000 per annum, and the demand is increasing from year to year. Types of current interest in the North are Cannellini, Saluggia and Barlotti. Seed of these and some other varieties has been obtained for trials in 1959. Others should reach Queensland from overseas during the next few months and will be grown in quarantine before release as a precaution against the possible introduction of disease.

Observations in 1958 indicated that few of the culinary dry bean varieties already grown here are sufficiently uniform in plant type for commercial production. Nevertheless, they include a range of material from which strains suited to Queensland requirements can be selected. The present research programme should enable us to assess the potential of the industry which depends primarily on yield per acre, the quality of the dry beans and the practicability of mechanised production and mechanised harvesting.

Basic data of this kind are fundamental to the development of any primary industry on a sound basis.

**The experimental programme could well lay the foundation of a new industry in the Burdekin delta.**

#### **Certified Tomato Varieties**

**The certified tomato variety, known as Q3, has revolutionized production in north Queensland. It is largely responsible for the excellent quality fruit now grown in the area.**

Less than a decade ago, northern growers were unable to fully exploit market outlets for winter and spring tomatoes. The pink skin varieties grown at that time lacked the quality demanded by consumers. In addition, consignments sent over long distances to southern markets, no matter how carefully graded and packed, opened up in mixed condition. Large quantities were bought at bargain prices and regraded to normal maturity standards before reaching the consumer. Even then, sales were prejudiced by the pink colour of the fruit and its poor internal quality.

When Q3, a certified line bred by the Department of Agriculture and Stock was released, its possibilities were immediately realised by northern growers. This variety offered fruit with good internal quality and an attractive dark-red skin, and a bush with sufficient foliage to protect the fruit from sunburn during hot weather. Even though commercial production of Q3 in the north involved considerable changes in production methods, it is now widely grown along the coast from Mackay to the Atherton Tableland.

At Bowen, Q3 is the main variety planted for the mid-season and late-season crops harvested from August to October. The

quality of tomatoes sold to local markets in north Queensland has never been better and growers in that area can compete with confidence on the more competitive southern markets.

Tomato varieties are very prone to "running-out" in the tropics and certified seed of Q3 is produced at Stanthorpe under the supervision of Departmental officers primarily for use by northern growers. This is a classic example of inter-district co-operation.

#### **Banana Hazard Removed**

Control of leaf spot and speckle in bananas has removed one of the biggest hazards in banana growing in north Queensland, Mr. Madsen said. Efficient control has been made possible by the recent development of a suitable fungicide-oil spray by Mr. W. Pont, an Agriculture Department plant pathologist.

Leaf spot and speckle greatly reduce yields in banana plantations. Both diseases attack the leaves of the plant.

Mr. Pont had been working on the problem in north Queensland for about eight years. He had found that the fungicide-oil mixture, applied as a high volume spray, gave spectacular control. Treatments have to be carried out every month from December to May.

**As a result of this work, Agriculture Department officers are now in a position to give definite recommendations to growers on the use of the new spray.**

So far, Mr. Pont's work has been based mainly on high volume spraying. Work is now proceeding to compare misting and fogging as alternative methods of applying the treatment.

# Growing Wheat For Milling

By W. T. KELSO,  
Senior Cereals Chemist.

**Wheat farmers can help to improve our flour and bread by understanding the meaning of quality in the grain they grow. Information in this article will assist towards such an understanding.**

During recent years interest has been intensified in raising the quality of wheat for milling purposes. Growers, with the knowledge of huge surpluses of wheat in the world, have decided to attack this quality problem and for this purpose they are levying themselves on the number of bushels produced. Such levies are subsidised by the Commonwealth Government. Growers realise that, in the face of strong world competition, the best quality wheat is the one most likely to be sold.

Wheat occupies the most important position among our cereals, because no other cereal contains the properties required for bread making. Disregarding the rice consumption of the Asiatic races, it is the staple food of the world.

Wheat can be grown in almost any soil and in the cool and cool-to-warm temperate climates. Its origin dates back to prehistoric times.

Normal wheat is reasonably uniform in shape and colour and this suggests uniformity of composition. Nothing could be further from the truth. In any one season in Queens-

land, wheat can be obtained ranging in protein content from 8 to 16 per cent., a variation which is unequalled by any other cereal.

For many reasons we accept the quantity and type of protein as being indexes of wheat quality. Starch, which is the largest constituent in wheat grain, is essential for dough formation. Its significance in relation to wheat quality is however, beyond this discussion.

## Harvest Time

Due to the possibility of storms, wheat is usually delivered to the receiving depots with the utmost speed. The larger growers, equipped for bulk handling, deliver in bulk but they may hold some of the harvest in their silos for subsequent delivery. The remaining growers forward their wheat in bags.

The Queensland State Wheat Board carries out a classification on a visual basis at all their depots, and the grades of wheat known as Q1, Q2, Q2A and feed wheat correspond to prime milling wheat, good milling wheat, inferior milling wheat and stock food wheat respectively. Feed wheat is segregated and if possible Q2A also.

**However, it must be borne in mind that although three grades of milling wheat exist by this classification, only one grade of milling wheat (composed of Q1, Q2 and Q2A) is forwarded to the millers.**



Plate 1

A Modern Multiple Bin Silo of the Queensland State Wheat Board.

Segregation of wheat on a quality basis is a complex operation, involving specialist techniques, statistical data and speed of estimation. This latter factor makes it essential for the segregation to be largely carried out before the wheat reaches the depot.

#### Arrival at the Mill

The incoming wheat is first identified for variety and district of origin, and a knowledge of these two factors, when combined with the appearance of the grain, permits an approximation to be made of the quality. According to the manner in which the wheat is received, whether in bags, in bulk of one variety or in bulk of mixed varieties, so does the task of making a classification become increasingly difficult and in the latter case, almost hopeless. Detailed chemical and physical tests are necessary for accurate classification and cereal chemists

are employed at the mills for this purpose.

The principle of milling is based on the marshalling of wheat into its various quality ranges and the good must be used with the bad in such proportions that the specifications of the flour are adhered to within reasonable limits. This goal is not always attainable, particularly in a season when, for climatic reasons, the overall crop has been reduced in both quantity and quality.

#### The Miller's Products

The protein contents of a miller's products in Queensland would approximate to the following values—

1. Ordinary baker's flour—  
11%–11.5%
2. High protein baker's flour—  
13.3% minimum
3. Self raising flour—9%–10%



4. Biscuit flour—7.5%–8.5%
5. Special flour, cake, etc.—  
7.5%–8.5%
6. Bran and pollard—14%–16%

These protein figures would be the average over the year and based on 13.5 per cent. moisture. Depending on the season, these standards may not be attainable and additions of dried protein to the high protein baker's flour may have to be added by the bakers, in order to conform to the requirements of the Act. Queensland does not produce biscuit flour to any extent, due to the harshness of the quality of the protein of the poorer protein wheats, and so importations are made from southern States. Biscuit flours should not have a high protein content.

### Type of Protein

In the various categories listed, protein ranges have been included, but the specifications for these flours are more detailed than protein content. It is important that the correct type of protein is present at any one level of protein quantity. Actually the two requirements are considered simultaneously in order that a balance may be preserved between the type of protein and the protein content. Certain types of protein are often undesirable in some varieties in the high protein range. As protein contents are reduced, the type of protein still remains important, for a correct protein type allows reasonably good bread to be baked at the lower protein levels. This would not be possible if harsher protein types were present.

The type of protein is fundamentally controlled by the variety when all other variable factors are excluded. Wide variations in the

type of protein can be produced, usually for the worst, from the hot and dry climatic conditions usually experienced from flowering time to harvesting time. Variations in soil fertility, while mainly affecting the quantity of protein also affect the type of protein.

The varieties Charter, Festival and Puora, which are usually in the high protein range are inclined towards a very strong type of protein. When they are grown on very fertile soils, the tendency is to produce an undesirable protein type. Climatic conditions also adversely affect these varieties more than others.

When bread is to be made by modern machinery methods, strong, undesirable type protein causes complications in the bakery and does not allow a good quality loaf to be produced.

There are three main types of protein—Weak, medium strong, and strong. In each of these types, the protein can be elastic, strongly resistant to stretching, or have intermediate values. Therefore, we have a considerable number of classes of protein, each in their turn reacting differently in the bakehouse.

An indication of the different qualities of flour can be gained by making a dough and noticing the resistance it offers to kneading, and how much working the dough will withstand before the elastic properties break down.

In bread baking today, we are faced with two different baking processes:

1. The mechanised baker of the city
2. The manual baker of the country.

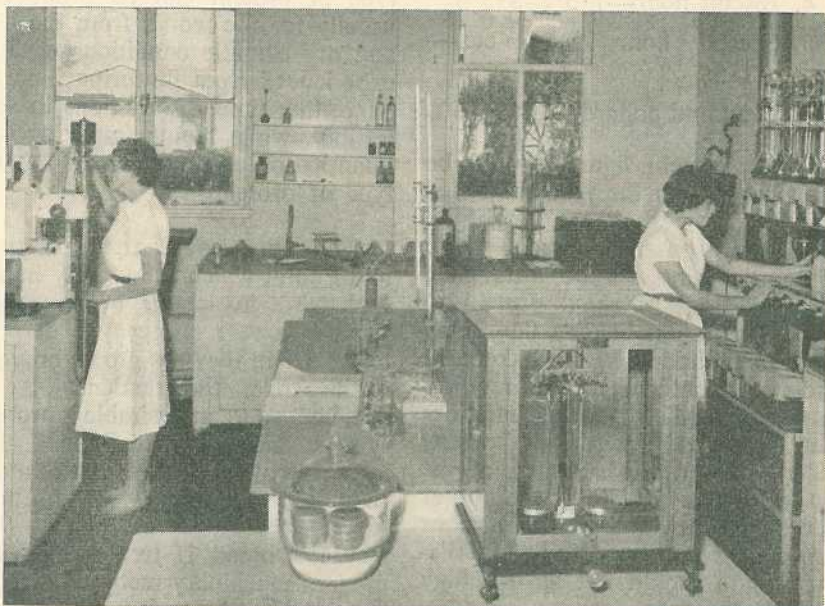


Plate 2

Section of a Mill Laboratory Showing Protein and Physical Testing Apparatus.

For the normal operations of the mechanised bakery, a flour of reasonably-well-defined specifications is desirable. Admittedly, the mechanised baker can handle variations in quality, but he cannot handle them successfully and this militates against the quality of the bread produced. The manual baker is able to modify his baking procedures to suit the flour, and so his demands on quality tolerances are not so exacting.

### The Miller's Problem

The miller's objectives are to maintain the standard of his products at as high a level as possible. He is in business for this very purpose and in a highly competitive industry at that. Having no say in the quality of wheat he is given, he carries out a blending procedure based on a district, varietal, appearance classification together with information from the cereal chemist.

### How Growers Can Help

The first thing growers should realize is that wheat is grown mainly for the production of flour, predominantly for bread-making purposes. If growers supply inferior wheat, the millers still have to use it and hope that it can be blended with superior wheat. The miller is the intermediary between the grower and the baker and through him the primary product is converted to a secondary one. No one has ever baked a good loaf of bread from a poor flour.

Secondly, growers should not be unmindful of the fact that they are selling a product of an indiscriminate nature. While it is essential to harvest a crop with as high a yielding capacity as possible, thought should also be directed towards the manner in which this wheat is to be used. The Royal Agricultural Society in Toowoomba has given

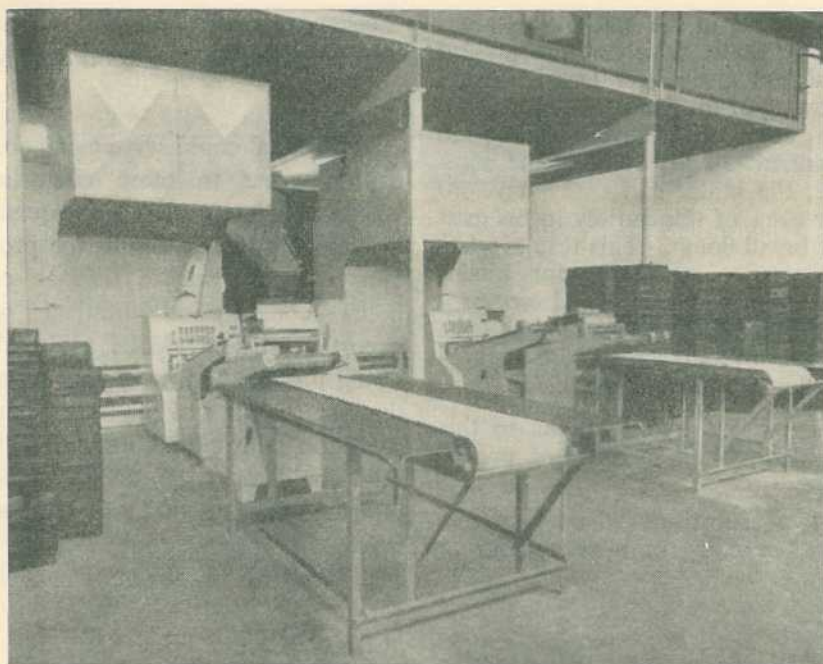


Plate 3

**A Section of a Modern Machine Bakery.**

invaluable publicity to the quality of our Queensland wheat through the medium of its annual competition for the Best Bushel of Wheat.

Growers are advised to study the results of this competition which appeared in the Royal Agricultural Society schedule of entries and the appropriate newspapers, particularly in regard to the variety Festival.

Admittedly, as long as growers receive the same price for quality of an indefinite nature, then it becomes difficult for them to realize the problems of the milling industry. If at any future time, wheat premiums are paid in this State on a bread baking quality basis, then the progressive grower will be more equipped to produce wheat which will attract these premium payments.

Fortunately in Queensland we have had three excellent varieties in Lawrence, Gabo and Spica, and when these varieties are grown in suitable environments, they produce a flour satisfactory to the miller and the baker. Likewise, in a lesser degree, we have had Koda, Charter, Puora and Festival. With these four latter varieties we are representing the high protein, strong to very strong wheats, in which unfavourable environment produces undesirable quality. Although these wheats are necessary in the production of high protein flour, the variety Festival, on account of its inherent inferior type of protein, should have a very small place in the miller's grist, amounting to about 5 per cent.

Emphasis should be placed on growing more of the extensible type of protein wheats, such as Lawrence

and Spica, in the better class areas of the State, which at the present time are given over largely to the growing of Festival. When we take the case of Festival planted to represent 20 per cent. of the acreage, the miller can easily have 40 per cent. of this variety in his grist for bread flours. This results when the wheats unsuitable for bread-making because of their lower protein content, are segregated and the higher protein wheats rise in proportion in the milling blend.

There are two solutions to this problem, listed in order of preference—

1. A substitute wheat is necessary, equalling or approaching the

excellent agronomic features of Festival combined with a good type of protein.

2. Festival could serve as a good export wheat to those countries whose main interest lies in the quantity and not the quality of the protein. In this way a balance of home consumption Festival to export Festival could be achieved. Using this method, it is imperative that the standard of the home consumption wheat does not fall and this could only be achieved by increased sowings of Lawrence and Spica.



## Fertilizer For Tobacco

**F**ARMERS will have decided which portion of their farm they are going to use for next season's tobacco. They have been thinking about the type of fertilizer to use and also the amount per acre.

The wrong type of fertilizer can reduce the yield or the quality of tobacco leaf. It is, therefore, a good idea to discuss this matter with an advisory officer before deciding on the type to use.

The benefits from fertilizer depend upon many factors, all of which work in together to produce the final result. A few points are listed:

1. The soil contains a lot of plant food. Fertilizer helps the plants to overcome some deficiency

or to balance some excess. Do not disregard the plant food already in the soil.

2. Some of this plant food is readily available to the crop. Some of it becomes more slowly available. Quite often, these amounts depend on the previous use which has been made of the field. This must be carefully considered.

3. To get the plants to use the fertilizer at the proper time, they need soil moisture. If they are starved for moisture for any length of time the fertilizer can scarcely be blamed for low quality leaf.

Tell an advisory officer all about your field before you ask him which type of fertilizer he would recommend.—*E. J. McDONALD, Adviser in Tobacco Culture.*



Plate 1: Irrigated Pastures at Gatton Regional Experiment Station's Fat Lamb Trials.

## Irrigated Pastures For Fat Lambs

By C. A. SCHRODER,  
Assistant Irrigationist.

*IRRIGATED pastures in the Lockyer Valley last year carried 12 ewes and their lambs to the acre and turned off high quality lambs after four months' grazing at an average 31 lb. This performance, recorded in a trial at the Gatton Regional Experiment Station, shows that fat lamb raising has a future as a worthwhile sideline to Lockyer Valley farming.*

Outstanding features of the trial were:

The very high percentage of lambs delivered for slaughter to ewes mated.

The absence of deaths after the day of birth.

The fast overall growth rate.

The percentage of lambs delivered (at the required slaughtering weight) to the total ewes mated was 148.

Every lamb surviving the day of birth was successfully reared to the required slaughter weight.

Of the lambs slaughtered, 71 per cent. were suckling at the rate of two per ewe.

Lambs by Dorset Horn sires reached the required weight in an average of 93 days, and by the Southdown sires in 97 days. The fastest growing lamb dressed 35 lb. at 56 days.



Plate 2

Ewes With Lambs 7 to 9 Weeks Old, Grazing Irrigated Pastures.

### There is Profit in This

The average gross return from each ewe mated was £5 3s. for the season from lambs. This is apart from wool value.

Irrigated pastures were used only during the period from just prior to lambing until the lambs were delivered for slaughter. This was the four-month-period, August to November. During this period the pastures carried 12 ewes and their lambs to the acre and yielded a calculated gross return from the lambs of £62 per acre.

For the remainder of the year, the irrigated pastures were used for the milking cows. In this period the ewes were grazed chiefly around head ditches, drainage lines and laneways.

Due to the succulent condition of the pastures, a small amount of hay

was provided for the ewes, when suckling lambs.

Allowing a pasture to be down for 4 years as part of the farm rotation programme, the total cost of production for the months August to November is estimated at £5 17s. 8d. per acre annually. This cost includes the preparation of land for surface irrigation, pasture seeding, and the cost of irrigation, including plant, pumping costs and labour.

### The Irrigated Pastures

The irrigated pastures used in the trial were those grown normally on the Station.

They comprised paspalum/white clover; H1 ryegrass/ocksfoot/white clover; H1 rye/*Phalaris arundinacea*/white clover; para grass/strawberry clover; and sub clover/wimmera rye pastures.

These pastures were in very good condition, being vigorous, fast growing and of very high food value. Measured on a dry weight basis, the average protein content was in the vicinity of 20 per cent. The proportion of clover to grass was approximately 65:35.

Pastures of this type maintain an annual production on the Station of approximately 40 tons of green pasture to the acre. They are at their best during mid-August to early December. In this period the average weekly green growth rate exceeds 1 ton to the acre of very succulent and highly nutritious pasture, eagerly grazed by sheep and cattle. The provision of a carbohydrate concentrate, good quality dry hay, or access to an unirrigated pasture, is beneficial, and also makes the area of irrigated pasture "go further".

### Management and Costs

Irrigated pastures of the type and quality outlined are not difficult to produce in the Lockyer Valley. It is imperative, however, that they be properly managed from a grazing angle and that good irrigation practices be maintained.

The necessity to avoid heavy grazing, or over-defoliation, of the pasture, and to maintain satisfactory moisture throughout the root zone can never be over-emphasized. Failure in either point will quickly reduce growth rate and quality, and thus the carrying capacity and food value of the pastures.

Irrigated pastures will persist and give high production for many years. However, on the Station they are grown as part of a rotational cropping programme. In this way the life of a pasture is usually reckoned at 4 years. This length of time allows a good grazing return while the benefit

rendered to the soil results in much improvement in subsequent crops.

All pasture irrigation at the Station is by surface application.

Costs are given very briefly as follows:

#### Pasture Establishment

	An Acre		
	£	s.	d.
Land preparation, including the provision of head ditch	8	0	0
Irrigation outlet boxes ..	2	0	0
Pasture seed ..	3	0	0
Total ..	13	0	0
Cost per year for a 4-year pasture ..	3	5	0

#### Irrigation

The cost of surface irrigation on the Station, including capital cost of plant, pumping and labour costs, is about 8s. an acre-inch. Perennial pastures in the Lockyer Valley normally require approximately 36 in. of irrigation annually in addition to rainfall.

This works out at £14 8s. an acre a year.

#### Annual Costs

It will be seen that the total annual costs, including establishment and irrigation are £3 5s., plus £14 8s., or £17 13s. an acre. These costs cover the full year, whereas in the lamb trial the irrigated pastures were used for four months only.

Thus the total annual costs for the pasture used in the trial was one-third of the costs for a full year (one-third of £17 13s.) or £5 17s. 8d. an acre.

### Spray Irrigation

Some farmers may prefer to spray irrigate rather than use surface methods of application. In some instances, land surfaces or soil type may make spray methods essential.

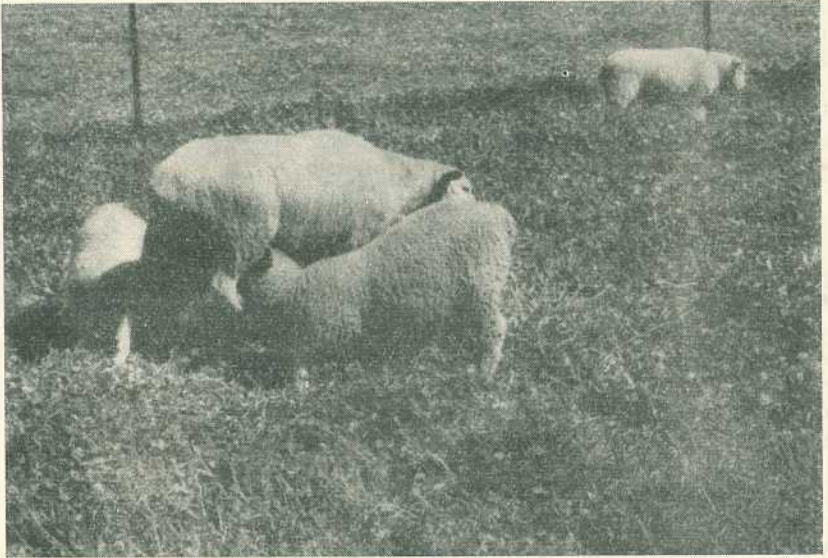


Plate 3

**Multiple Births of Strong Lambs Is the First Step Towards High Profits.**  
These Twin Lambs Are 7 Weeks Old.

Spray irrigation reduces the cost of land preparation. However, it requires a more costly plant, increases power and labour costs and altogether means a slightly higher overall annual cost of producing the pasture.

### Experiments at the College

Fat lamb trials have been in progress for 20 years at the Queensland Agricultural High School and College, Gatton, under the direction of the Principal, Mr. N. W. Briton. The early part of the work comprised breed trials. These were completed in 1948.

Of the various pure breeds and crosses used, Border Leicester x Merino ewes gave the best performance. Dorset Horn and Southdown rams both proved better as sires than the other breeds used.

Southdown sires gave a slightly higher percentage of top quality lambs than Dorsets but on the average they

took some seven to 10 days longer to reach slaughter weight, which was about 63 lb. live paddock weight.

It was very evident in the breed trials that lamb growth and carcass quality were influenced a great deal by the nutritive level of the ration supplied to the ewe flock.

In 1948 the scope of the trials was widened to examine the relationship between the level of nutrition, lamb growth rate, and carcass quality.

These trials are still in progress and the merits of various combinations of pastures, including lucerne, are being determined.

Close relationship has been demonstrated between maturity of the lambs and carcass quality. It is most important that the lamb crop be grown as rapidly as possible to ensure best quality carcasses.



The trials at College are carried out under dry-land farming conditions.

### **Trials at the Experiment Station**

Following the successful development of irrigated pastures at the Gatton Regional Experiment Station (formerly the Bureau of Investigation Irrigation Research Station) and the high returns obtained from them in dairy production trials, it was decided to undertake trials at the Station in fat lamb production. These were commenced on January 1, 1956.

The Gatton Regional Experiment Station occupies land belonging to the Queensland Agricultural College. Valuable assistance in the lamb trials has been received from the College Principal both by way of technical advice and the loan of the breeding stock required.

The following is largely a progress report covering the 1958 crop of lambs:

### **Breeding Stock and Mating**

The ewes used in the trial comprised 87 Border Leicester x Merino which were bought as two-tooths at the commencement of the trial in January 1956 and used in the 1956 and 1957 trials. No culling of ewes was practised at any time other than 5 ewes which failed to breed in 1956 and 1957.

Mating commenced on 10-3-58. At this date the ewes were divided into two groups comprising 29 and 58 respectively. One Southdown ram was joined to the first group and two Dorset Horns to the second.

The two groups were maintained separately until 31-3-58. They were then reunited and run as a single flock. On 10-4-58 a further Southdown ram was added. All rams were removed on 28-4-58.

The mating period was thus 10-3-58 to 28-4-58, a total of 49 days.

March 10th was chosen for mating for several reasons.

In an address to the Queensland Branch of the Australian Society of Animal Production, Mr. Briton showed that in the Lockyer Valley mating must be carried out in late January to April if high lambing percentages are to be obtained.

The mating period used made the period of maximum milk demand coincident with the zenith production period of the pastures used. This fact helps to account for the very heavy carrying capacity obtained. Somewhat reduced carrying rates could be expected in other periods of the year according to the pasture seasonal growth rates.

The supply of lambs available to the market usually drops off about October—many of these are produced on grazing crops such as oats on the Darling Downs. This means a keener market for the August dropped lambs which are normally ready for slaughter in October-November.

### **Grazing**

It is rather paradoxical that the Regional Station does not have available an area of pasture poor enough to meet the requirements of dry ewes. Under existing conditions, ewes rapidly gain weight after weaning their lambs and at subsequent mating carry rather more condition than is desirable.

As the lambs of the 1957 crop were weaned in October-December of that year, the mothers were retained in the yards for a week with restricted diet. They were then grazed around head ditches, laneways, and drainage lines. These

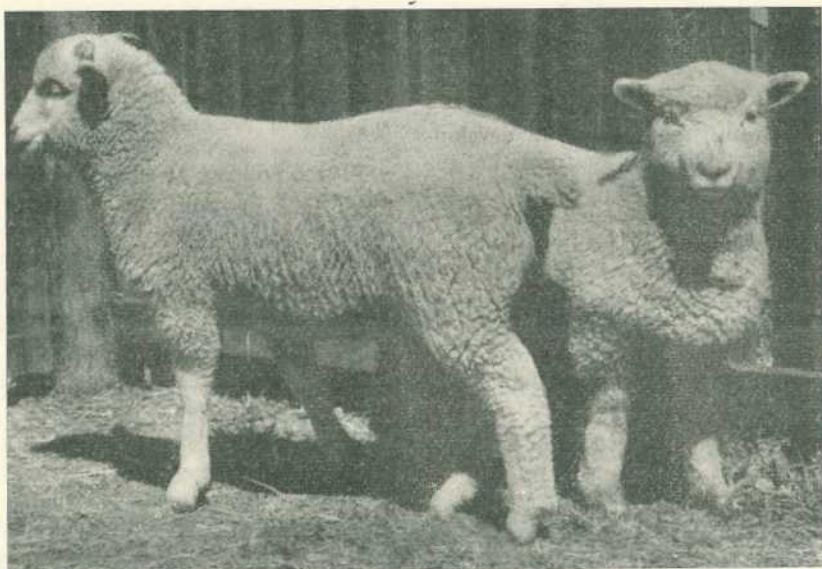


Plate 4

**Prime Suckers On the Day of Delivery for Slaughtering.** Age 63 days, live paddock weight 63 lb., cold dressed weight 32.33 lb.

areas comprise chiefly Rhodes grass with a small amount of white clover; they are less succulent and of lower nutritive value than the irrigated pastures.

Grazing was continued in these areas until just before commencement of lambing, when the ewes were transferred to irrigated pastures and maintained under a system of rotational grazing until the lambs were weaned.

Owing to the succulent condition of the irrigated pastures a small amount of good quality soft hay was provided during the milking period. Irrigated mixed pasture hay, conserved in the previous autumn and summer, proved very acceptable to the ewes. The maximum amount supplied was two bales a day.

### Lambing

Lambing percentage is one of the most important factors influencing the

efficiency of a fat lamb production project. A very good lambing percentage was obtained in the trial.

Small paddocks were used and the ewes inspected twice daily during the lambing period.

No attempt was made to mother lambs that were neglected by their dams or unable to fend for themselves.

Unlambd ewes were removed daily or at suitable short intervals. The ewes and lambs left behind in this way were allowed to remain a day or two before being moved to the main group of ewes with lambs.

The first lamb was born on 2-8-58, 145 days after mating commenced.

### Lamb Losses

Lamb losses from all sources amounted to 11 per cent. of the total number of lambs born.

A very pleasing factor is that all lambs surviving the day of birth were successfully reared to slaughter weight.

### Growth of Lambs

The lambs were delivered for slaughter as they reached paddock live weight of 63 lb. Growth rates were generally very good, quite comparable with trials carried out in southern States with similar breeds on clover/grass pastures. They were particularly good when it is considered that 71.3 per cent. of the lambs slaughtered were suckling at the rate of two to the ewe. Lambs suckling one to the ewe normally make approximately .08 lb. greater daily gain than lambs suckling two to the ewe when grown to 70 lb. live weight.

The first lambs were delivered for slaughter on 7-10-58. They were then 63 days old. Their average cold dressed weight was 31 lb. The fastest growing lamb dressed 35 lb. at 56 days of age. Dorset Horn crosses reached slaughter weight some 5 days earlier than Southdown, which is normal.

All lambs were of very high quality, quite suitable for export.

In the whole three years of the trial, no worm troubles have arisen even though the pastures used are irrigated for maximum production, and though when not suckling lambs the ewes frequently graze wet areas around head ditches and drainage lines.

A regular drenching programme for the ewes is maintained. Worm treatment in lambs has never yet been required.

The ewes were shorn on 4-9-58, when the average fleece weight was 7.4 lb. Previous shearing was carried out on 3-10-57.

### Worms Must Be Controlled

Any scheme to produce first quality sucker lambs on irrigated pastures in the Lockyer Valley would appear to be sound provided that steps are taken to control worms in the parent flock. Satisfactory control would appear to require a routine drenching programme, drenching about eight times per year.

Border Leicester x Merino ewes appear to be very satisfactory for producing the lambs. Not only has the lambing percentage been very satisfactory, the ewes have also shown themselves to be good mothers and good milk producers. Southdown and Dorset Horn have both been satisfactory sires.

High quality irrigated pastures are not necessary throughout the whole year. Such pastures are required only from a couple of weeks before lambing until the lambs are weaned. When mating is commenced in early March it should be sufficient if irrigated pastures are available during the four months August to November.

The irrigated pastures used are the normal type recommended in south-eastern Queensland. In the four months they were used they maintained 12 ewes and their lambs per acre.

The total cost of producing this pasture for four months each year is about £5 17s. 8d. an acre. This includes land preparation for surface irrigation, pasture seed, irrigation plant, power and labour.

On 1958 lamb values, a gross return of £62 an acre was obtained from the sale of lambs.

The average gross return from each ewe mated was £5 3s. for the season, apart from wool value.



Plate 5

Ewes Grazing Subterranean Clover Pastures Just Before Lambing.

### Acknowledgement

Acknowledgement is made both for the assistance rendered by the Principal of the Queensland Agricultural High School and College, Mr. N. W. Briton, in furnishing the details of the fat lamb production work carried out by him at the College, and for

technical advice in the planning of the trials. Very practical assistance has also been received from the College in making available the necessary breeding stock for the trials. The sucker lambs produced were delivered to the College when ready for slaughter.



## Veldt and Mitchell Grasses

*Question:* A Dalby farmer asks about planting methods and rates for Unarlee veldt and Mitchell grasses.

*Answer:* Veldt grass has been used in Western Australia to stabilize poor country. In such regions, the grass receives a winter rainfall which favours its best growth. Heavy grazing is not good for veldt grass as it has the habit of developing its crown well above ground level, making it very liable to damage during grazing. It should be planted in autumn at the rate of 3 lb. to the acre.

Unarlee veldt grass is an improved variety, but results in Queensland have not been highly successful as it seldom persists well.

Mitchell grass produces seed which is liable to clog the tubes on standard drills unless special precautions are taken as with buffel grass, so it is better to broadcast. The rate of planting is about 2 to 3 lb. to the acre, and the best time to plant is early in the wet season.

## Bucket and Bail

**Super for Pastures.** Coastal dairymen, topdress your winter pastures with superphosphate in late autumn or early winter, and you'll increase forage yields in August and September.

Many of the soils in the higher rainfall, coastal dairying districts of south Queensland are known to be lacking in phosphorus. Numerous trials carried out in recent years by Agriculture Department officers have demonstrated the benefits of topdressing such winter pastures with superphosphate.

Superphosphate will stimulate the growth of the perennial legumes such as white clover in your pastures. It will also assist seedling clover development, giving a dense stand.

Buy your superphosphate early and have it on hand to apply immediately after the first good rains in late autumn or early winter. The most economical rate to use superphosphate on winter pastures is 2 to 3 cwt. an acre.

A clover pasture, stimulated with superphosphate in early winter, will give a vigorous response as soon as the coldest weather is over. Plan your spring feeding programme now, by making sure your white clover pastures are kept healthy and productive.

—A. HEGARTY, *Agrostologist*.

### Ropy Cream Can Be Prevented.

Farmers who have to depend on dams or creeks for watering their stock are often troubled with ropy

cream. Cream in this condition is down-graded, reducing the farmer's return.

Ropy cream is caused by water-inhabiting bacteria. These bacteria are enclosed in jelly-like capsules. When they multiply and mass together, the capsules make the cream less fluid. On stirring, the masses of joined bacteria capsules can be seen as fine threads or ropes.

The bacteria that cause ropy cream are most frequently found in dams and stagnant water. When the cows wade into the water to drink, they pack up the bacteria on their udders and flanks. The milk is likely to become contaminated unless their udders are washed with a chlorine solution before milking. Sometimes these troublesome bacteria are also found in the water tank attached to the dairy shed.

If you have trouble with ropy cream, attack the problem first by fencing off from stock all dams and lagoons to prevent the cows wading in them. Equip all surface watering places with a windmill or pump and water trough. If your water supply tank is concreted inside, chlorinate the water by adding 1½ cups of sodium hypochlorite to 1,000 gallons of water.

Always chlorinate the cold water you use in the dairy, and pay strict attention to udder washing, using a chlorine rinse. Ensure that all washing-up water is boiling so that the bacteria will be killed. Because of their jelly-like capsules, these bacteria are more heat-resistant than other types, so you should take care

that the water used for sterilizing is actually boiling. Check that the tubes through which the water circulates in milk or cream coolers are free from water leaks.

If these precautions fail to eradicate the cause of ropy cream, consult your local Dairy Adviser.

—N. E. FOWLER, Dairy Officer.

## Plan Now For September

Join a Herd Recording Group to find out which cows are profitable.

Construct a bull paddock to enable controlled mating.

Check the operation of the separator to ensure accurate skimming.

Adopt machine stripping of cows to save time without milk losses.

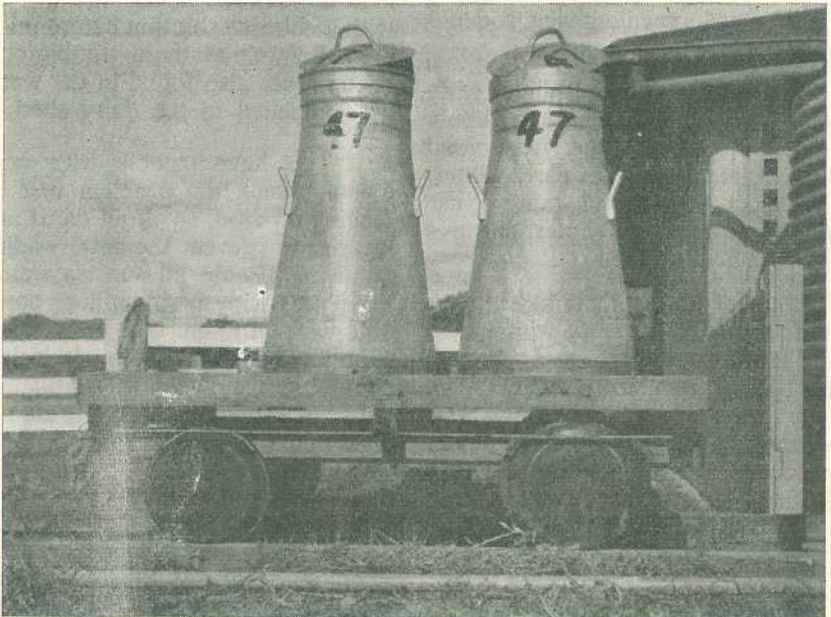
Paint dairy premises.

Prepare land for summer crops.

Top-dress pastures.



## This Shows Ingenuity



Mr. J. Tramacchi, of Cedar Pocket, Gympie District, Built This Very Efficient Milk Trolley, Using Old Brake Drums (From a Car) For Wheels. These drums run very well on wooden rails, carrying the cans that convey milk for Nestles Milk Factory.

# Infertility Causes Heavy Dairy Herd Wastage

By A. R. McTACKETT,  
Cattle Husbandry Branch.

**A** SURVEY of the breeding performances of Queensland dairy cattle has revealed a high rate of infertility. It has also drawn attention to the heavy herd wastage that infertility causes.

*In a two-year study of nearly 10,000 cows in 127 herds, it was found that 30 per cent. showed some form of infertility. Over the period, 40 per cent. of the cows culled and 28½ per cent. of those retained in the herds had infertility troubles.*

The survey was commenced five years ago by the Department. One of its aims is to determine the amount of infertility in dairy cattle. But what exactly is infertility? Many people working in the dairy industry think of infertility simply as cows returning to service or being difficult to get into calf. Returns to service are the most important cause of infertility but other disorders also prevent the regular calving of cows.

High fertility means the ability of the species to reproduce itself regularly. For dairy cattle, regular calving at the most suitable period of the year is desirable for both economic production and high yields throughout the life of the cow. The right time to calve the herd, as dairymen well know, depends on whether the farm is devoted to butter or wholemilk production.

## Calving Not Regular

Infertility, therefore, occurs when cows do not calve regularly each year according to the needs of the particular farm. A number of cows in the herd calve late or are carried over till the following season not in calf. The result is that these cows spend excessively long periods in the "dry" paddock.

The effect of infertility on farm returns depends upon the proportion of the herd which fails to calve annually. It is considered that cows with intervals between calvings of over 390 days have shown evidence of some form of infertility. Exceptions occur where cows are deliberately withheld from service in order to have them calve at a more suitable period of the year for the type of dairy production (milk or cream) that is being catered for on the particular farm.

The selection of calving intervals of over 390 days as evidence of infertility is based on expected annual calving. Cows that require over 390 days in which to calve again lose one month or more of their potential productivity for that year. The longer the interval the more production is lost.

A calving interval of 390 days allows a period of two to three months for conception. In cows that are functioning normally, at least two services could take place during this period which is critical for regular calving.

To assess the incidence of infertility, the records of the cows in the survey have been studied and those with calving intervals of over 390 days have been selected and the reason for the long interval determined. This method was also chosen in assessing infertility among cows that were mated and later culled except that, naturally, the predicted calving date was used to determine "expected" calving interval.

### Four Reasons

There are four reasons why cows fail to calve regularly every year:

1. They need more services to get in calf than should be necessary—Service Return.

2. They do not return to service at normal 3-weekly intervals when not in calf, the periods between heats being long or irregular—Long Cycles.

3. They do not show heat soon enough after calving to get in calf and calve again within a reasonable time—Anoestrus.

4. They abort and subsequently do not produce to their full capacity—Abortion.

Intervals between calvings may, of course, be prolonged when cows are withheld from service in order to calve them down at more desirable times of the year. In the herds surveyed 6½ per cent. of the cows that were kept had long intervals between calvings due to such management practices only and showed no evidence of any infertility problems.

### 30 Per Cent.

Altogether there were 8,284 cows retained and 1,276 cows sold or died after mating in the 127 herds surveyed. Of the retained cows, 2,489 or 30 per cent. required periods of over 390 days to calve normally again. A further 429 or just over 5 per cent. aborted. When long intervals due to management alone are not counted,

2,374 or 28½ per cent. of retained cows showed some form of infertility.

Using estimates for cows that were mated and later sold, the amount of infertility in the 1,276 cows involved was determined. Not counting those that were held back from service with no evidence of infertility, 508 or 40 per cent. of the wastage cows showed some form of infertility. This is much higher than in the case of retained cows and clearly reveals the importance of infertility in herd culling programmes.

In addition to the high incidence of infertility in mated cows, quite a number that are sold or die before service also show signs of disorders of reproduction. Cows are often sold following abortion or failure to clean up after calving. Occasional deaths occur due to difficult parturition. Some cows may dry off before coming in season and are sold to avoid keeping such dry cows for long periods before they come into production again. These cows have not been included.

The proportion of infertility of the four major types is given in Table 1 both for retained cows and for cull cows. The figures add up to over 100 per cent. because in some instances more than one factor has been involved, for example, service return followed by abortion or failure to show heat within a reasonable time after calving followed by service return.

TABLE 1

THE MAIN REASONS FOR PROLONGED CALVING INTERVALS IN 2374 RETAINED COWS AND 508 CULL COWS.

Reason	Retained Cows	Cull Cows
	Per cent.	Per cent.
Service Return..	41.2	67.5
Long Cycles ..	14.7	17.9
Anoestrus ..	39.2	30.5
Abortion ..	18.4	..



Service return was the most important reason for long intervals between calvings and was especially important in culled cows. Delays in the onset of heat after calving were common in some areas and were responsible for a high proportion of long calving intervals. Abortion accounted for over 18 per cent. of the long intervals. These cows would have to get into calf and calve again before returning to normal production levels.

Of all the retained cows nearly 5½ per cent. aborted. A further 1 per cent. of cows had dead calves. These losses represent a depression of fertility and lead to reduced production. At the same time there are fewer calves from which to make selection of replacements.

Long cycles between heats were responsible for the least number of prolonged calving intervals. But these cycles cause considerable upsets in breeding programmes. Cows are thought to be in calf and unexpectedly return to service. Some may even be dried off and fail to calve when they are due. Instead of calving they may come in season.

No doubt in some instances an abortion has been missed but in far more cases there is no evidence of abortion. When service return and long cycles occur together a heavy strain is thrown on the patience of the dairyman with this particular herd problem.

### Diseases

A considerable amount of the infertility occurring in dairy cattle can be attributed to infectious diseases of the reproductive organs. These diseases lead to service return, irregular cycles between heats following service, abortion, and secondary infection of the breeding organs after abortion or retained membranes.

The main infectious diseases occurring in Queensland dairy herds are:—

1. *Brucellosis* (*Contagious abortion*): The chief symptoms of brucellosis are abortion, especially from 6 to 8 months, the birth of dead calves at full term, retained membranes and secondary infection of the breeding organs causing discharges that are foul smelling. Service return may follow particularly after an abortion "storm" in recently infected cattle. In herds that have been infected for some time, abortion may not be prevalent in older cows but young stock are especially prone to abort. Older infected cows will continue to spread infection even at a normal calving.

There are no effective methods of treatment for brucellosis once it is established. Most efficient control can be achieved by the use of Strain 19 vaccination of heifer calves preferably at from six to eight months. While a protected herd of vaccinated stock is being built up attention should be given to hygiene to reduce the spread of infection within the herd, for example aborted calves and cleanings should be burnt or buried in lime, and affected cows isolated.

In cases where an abortion "storm" due to brucellosis occurs, vaccination of adult cattle with Strain 19 may be adopted under the supervision of a veterinary surgeon.

2. *Leptospirosis*: Abortion "storms" over a period of six to eight weeks may be due to infection with leptospirosis. There are usually no other symptoms of infertility associated with the abortion. Cows clean up without any trouble and no difficulties occur in getting them back in calf.

At the moment there does not appear to be any particularly effective way of dealing with an outbreak

of leptospirosis. The aim should be to blood test affected cattle to find out the actual cause of the abortions so that appropriate steps can be taken to control it.

3. *Vibriosis*: Unlike brucellosis, which is contracted by cows grazing over contaminated pasture, vibriosis is spread at service. This disease is widespread in the State and leads to serious service return problems.

The most important symptom is service return with cycles between heats of irregular length. Early abortion at from three to five months occurs but later abortion may also occur. Discharges may be noted within 48 hours after service. Following abortion a discharge of thick yellowish pus may be passed but there is usually no bad smell nor retained membranes associated with it.

Methods of control and treatment of infected bulls and cows with antibiotics have given some encouraging results. Difficulties with the control of bulls through lack of bull paddocks and with straying stock often hamper the operation of effective control measures.

4. *Trichomoniasis*: Although trichomoniasis has been diagnosed in Queensland, it does not appear to be prevalent. Symptoms of service return with irregular, often long cycles between heats and occasional abortion are the main features when trichomoniasis enters the herd. This disease also is spread through the herd at service.

5. *Vaginitis*: Vaginitis is not now considered to be as important a cause of service return as it once was, but this disease can lead to upsets in the breeding programme. The infection is spread at service and will cause inflammation of the breeding organs of both bulls and cows. Service return and discharges, often matting the hair of the tail, occur. In the acute stages,

the lips of the vulva often swell and the tail is carried to one side. At this time the passage will also show inflammation with a dense crop of small granular elevations running together along the sides of the passage.

Various treatments are available, including douching with zinc sulphate. When treatment is undertaken the bull should also be treated.

Pamphlets giving more details of these diseases are available free from the Department of Agriculture and Stock, Brisbane, or from veterinary officers in rural areas.

Other than the diseases mentioned, dairymen should be on the lookout for sterile bulls. The majority of service returns following the use of a sterile bull are at more regular intervals (that is, intervals of 18-24 days) than returns following service during an outbreak of vibriosis or trichomoniasis. The results of the survey indicate that totally sterile bulls are not very common. They are fairly easily detected if proper attention is given to herd breeding records.

### Season and Nutrition

Seasonal factors in relation to service return occur but these are usually not sufficient to cause the severe interference with planned breeding programmes that any of the diseases mentioned will cause. Analysis of herd breeding records supplied by dairy farmers has shown that fertility is slightly depressed during the summer from December until April and that fertility then improves during the winter and spring.

Differences may occur between districts but these differences are insufficient to affect the general trend for the State.

The part played by nutrition in fertility is being studied. Indications from investigations to date are that the incidence of long delays in the onset

of heat after calving is more closely associated with the general level of nutrition than with specific deficiencies of minerals or other nutrients.

The highest incidence occurs in cows that calve in the winter months when there is a shortage of palatable feed.

As a result of inadequate nutrition at the period of maximum milk production following calving, appearance of heat is often delayed until feed supply becomes adequate after summer rains. Supplementary feeding to provide a ration adequate in all nutrients is the only way to overcome this condition of winter anoestrus. Treatment to bring affected cows in season has proved disappointing, especially in the absence of some supplementation.

### How Is It Recognised?

There are several useful aids in the recognition of the presence of infertility disorders in a herd. The first essential, however, is to keep adequate breeding records. All calvings and abortions and service dates should be accurately noted in a book or on a chart. Whichever is used, consideration must be given to the use of something that is substantial enough to stand up to the vagaries of the weather. Provide some kind of protection for the records, too.

It is of great advantage to keep a full record of all heats following calving whether service has occurred or not. When service occurs the bull used should be noted against the date of service. If a stray bull serves a cow or if the herd sire serves a neighbouring cow these facts should be recorded. Such records often indicate how and when an infection has entered the herd.

With the help of these records, quick checks can be made of herd breeding performance at any particular time. Cows that have failed to come in season within 60 days after calving can be identified. The number of abortions occurring during various months can

be determined. The number of cows returning to service, the number of services required for conception and the intervals between heats are easily determined.

By making use of such records it is a fairly simple matter to decide whether there is an infertility problem in the herd or not. Often by examining the records a good indication of the likely nature and cause of the trouble can be obtained.

Early detection of infertility in the herd will assist greatly to minimise its effects. The simplest way to recognise trouble with service return is to consider the results of the first 10 services. If five or more of these cows return to service then some effort should be made at once to find out the reason and an infertility investigation should be carried out by a qualified veterinary surgeon. If two or three of these cows return six weeks or more after service it is advisable to have some examination of the herd made.

Particular care is necessary when a new bull or replacement cows are introduced. A close watch of mated cows for at least 48 hours following service to discover evidence of discharges often reveals early signs of the introduction of infection.

### Steps In Control

1. Keep accurate breeding records.
2. Feed dry cows adequately. Don't leave them out in a poor quality, dry paddock and forget them.
3. Bring dry cows in handy to the dairy about a month before they are due to calve, and watch for signs of calving.
4. Keep bulls in bull paddocks and hand mate.
5. Keep cows and bulls away from wandering cattle.
6. Carefully watch cows after service for signs of discharges.

7. Recognise the presence of trouble and get advice early. Don't wait until the end of the mating season, when it is too late.

8. Don't run the risk of introducing diseases of the reproductive organs with purchased bulls. Before they are used in the herd, it is advisable to have bulls treated by douching the sheath with antibiotics. If possible, they

should also be test mated with three or four virgin heifers in order to detect whether they are carriers of diseases such as vibriosis and trichomoniasis. These precautions will greatly reduce the risk of infecting the herd. It is far easier to take steps to prevent the entry of these diseases into the herd than it is to cope with them once they become established.

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## Longer Life For Dairy Rubber

Absorption of butterfat by dairy farm rubberware is a major cause of inefficient milking and contamination of milk and cream by bacteria. Only constant care will improve the efficiency and extend the life of dairy rubberware.

Most types of rubber used in dairy equipment readily absorb fat. This causes the rubber to swell and accelerates the damaging effect of sunlight. Cracking and ageing of rubber lead to inefficient milking and form ideal sites for the growth of bacteria.

The rubber flaps on the releaser spit chamber are often swollen from fat absorption. This may allow air to be drawn into the releaser, causing frothing and carry-over to the vacuum tank. In bad cases, the releaser may flood.

The combined action of fat and sunlight on milk tubes and claw rubbers can cause them to crack and swell until they slip off during use. Similar cracking also occurs at the mouths of the teat cup infla-

tions. When cracks form on the inside surfaces or penetrate from the outside, it's time to replace the worn rubber with a sound piece.

No cleaner can prevent completely this absorption of fat by rubberware. But caustic soda will remove a great deal of the fat, especially when the rubberware is boiled in a caustic solution for 10 minutes. This treatment should be carried out at least once a week, using one tablespoon of caustic soda to four gallons of water. Regular care of this kind will pay off in lengthening the life of the rubber and improving the quality of milk and cream.

Another approach in reducing the fat absorption of rubber lies in the use of the new synthetic rubbers. These do not absorb fat so readily as natural rubbers. For this reason, milking rubberware made of synthetic rubber can be expected to have a longer life than that made from natural rubber.

—R. T. WESTON,  
*Dairy Adviser.*

# Why We Should Look After The Dry Cow

By W. F. MAWSON,  
Senior Adviser, Cattle Husbandry.

Short lactations and low yields may well be the twin products of a neglected dry cow.

Perhaps you tend to regard the dry cow as something of a burden. She is often put away in a rather poor, distant paddock and then forgotten. She is an illustration of the saying, "Out of sight—out of mind." Yet the care she gets when dry—and especially the feed supply available to her—has a big influence on her production during the next lactation. And her level of production affects your pocket.

The level of production during a lactation depends on several factors. An animal's production is limited by its breeding make-up, and, of course, the quality and quantity of feed obtained during lactation also plays a big part. A third factor is that of the body weight, or condition of a cow at the beginning of a lactation. This is a matter which is often overlooked. It's also one which can be improved without a lot of trouble once it receives thought and attention.

When speaking of cattle, lactation refers to the time over which a cow produces milk after calving and until she is dry again. Studies of production figures and lengths of lactation have shown that a yearly lactation length of 300 days—that is, 10 months—followed by a dry period of about 60 days—two months or so—is

the most economical for well-fed cows. That figure of a 10 months' lactation could be regarded as an aim. The present Queensland figure is a good deal shorter than this.

It has been shown that the condition of the cow at calving has a strong influence on the length of lactation. As you can well imagine, there is a similar effect on production. Short lactations and low yield may well be the twin products of a neglected dry cow.

You may ask what are the characteristics of a profitable lactation?

Following calving, your cow should settle down in a week or so and be in comparatively high production. But she won't reach her peak until the fourth to sixth week. At that time you can expect her to be right at her top. She won't hold that level for a long time. In fact, you can expect a steady decline at the rate of about 10 per cent. each month. This typical pattern is referred to as a normal lactation curve. It is expected that the cow will be in calf again after being in milk for about three months.

It would be interesting to check the members of your herd to see how they measure up.

The reaching of a peak of production within six weeks of calving appears to be necessary if satisfactory production is to be obtained. That peak is the door to longer lactations and more economical production. The key to the door is in the care of the cow before calving.

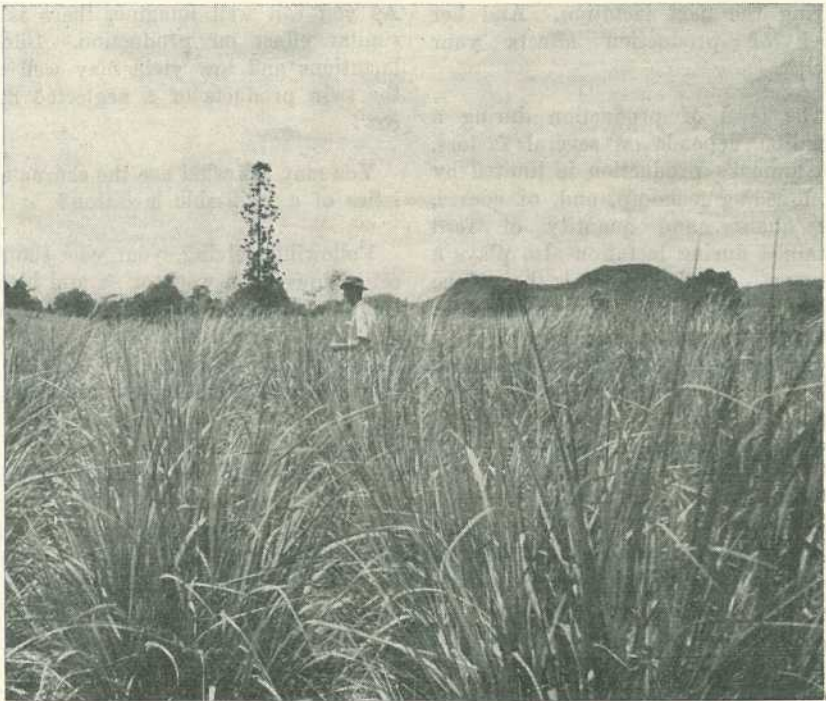
During the time she is dry a well-bred dairy cow will be busy building up stores of fat and minerals in her body. That is, of course, if she gets the opportunity. So we expect her to put on weight and get into a fat, sleek condition. This is a desirable state for a dry cow. After the calf is born and your cow gets down to the business of producing milk she will soon

reward you for good care. Surplus weight is converted into milk, so, in effect, she has been storing milk while she has been dry. What's more, she's been storing it cheaply.

Cows which are in poor condition at calving don't climb to a production peak, and there is consequent low production for the whole lactation. The care given a cow for two months before calving has a far-reaching effect. Perhaps it's the most important time of the whole year. If you would like help in planning to provide for the simple needs of your cows at that time you should contact your Cattle Husbandry Adviser.

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## Cow Cane as Fodder Reserve



Cow Cane Provides a Valuable Reserve of Standing Feed.

# Drawing Up A Dairy Herd Culling Programme

By S. W. IVERS, Adviser, Herd Recording Section.

It appears that many members of herd recording groups have culling programmes in mind but have no concrete ideas on how to go about setting up and carrying out their plans. Here are a few hints that may assist—

(1) Collect all the Annual Herd Summaries of the herd, dissect the production ranges and decide the divisions for three groups. Work around the herd average as a basis for dividing the herd into the three groups, each about the same size. For the top-producing section, select a figure just above the average and for the lower portion a figure just below the herd average. The remainder will form the middle group and will consist of cows producing about the herd average. Make the production margins wide enough to give three sections of about the same number of cows.

(2) You now have a foundation upon which to build your programme. Go through the summaries and put the herd into its categories. Use more than one year's results to give a comparison and more accurate results—it may be dangerous to cull on one lactation only. Don't be hasty—there are so many things that can affect production that a comparison of two or three lactations gives a better and sounder basis for deciding whether to breed from a certain cow or remove it from the herd. Remember that a heifer may be slow maturing and may improve in production

in the second lactation. Variable rainfall under Queensland conditions causes fluctuations in the amount of feed available and you must make allowances for this in your comparison.

(3) You may be surprised at the manner in which the herd has been divided. Possibly some of your favourite cows now appear in the lowest bracket and cows you intend to cull are amongst your top producers. So far the planning of your programme has been mechanical. From now on, you must plan with care as a mistake at this stage could mean the loss of a high-producing cow.

(4) Check to see where each cow in the top bracket falls. Is the production consistent and in the same category for each year for which you have figures. If there is a variation and one year's production shows a drop sufficient to change a cow from one group to another, have a look at the other cows in the herd for similar variations. If there is a regular pattern, it could be that there was a drought in that year. Maybe there was a dry spring, or abnormal rainfall affected pasture growth. If it is found that the pattern of production is fairly uniform then the individual cow's decline may be due to a difficult parturition, mastitis, footrot, or milk fever. It is at this part of the planning that the farmer, and he alone, can make a decision regarding the cow. He must be prepared to make allowances for cows affected by conditions which





lower production. If he feels that the cows had everything in their favour, and, on a herd basis, should have done as well as the others but have not reached the production standard, he must cull them progressively from the herd. Watch also the month of calving—an analysis of herd recording information indicates that cows calving in the third quarter of the year are generally in the highest production ranges. The worst production period for most of the State is the first quarter.

You cannot afford to cull for culling's sake. By having a planned approach, as a cow is culled her place in the herd is taken by a selected replacement of a higher production potential. If a farm is overstocked, this would not apply because simply by culling the low

31, 47, 54, 59, and 61 appear to be worthy of consideration for breeding replacement stock. Cows 19, 43, 68, and 85 could also be eligible for inclusion in this group. Cows numbered 22, 26, 27, 46, 74, 81, 82, and 88 appear to be ready for culling from the herd and replaced by the progeny of higher producing cows. Cows numbered 1 and 2 are an illustration of the need for cation. It could be that they had a difficult time at calving or could have been affected with mastitis at some stage of their lactation. These facts should be noted and allowances made when deciding whether to retain or dispose of cows.

In the final analysis your herd may look something like the example in Table 2.

TABLE 2  
RANKING OF COWS

Top Bracket		Middle Bracket		Low Bracket	
Cow No.	Cow No.	Cow No.	Cow No.	Cow No.	Cow No.
5		1		22	
8	89	2		26	
13		3		27	
15		14		46	
17		41		74	
19		47		81	
29		50		82	
31		51		84	
47		55		88	
54		66			
59		73			
61		83			
68					

Remarks:—Cow No. 1. Decline in production—difficult calving.  
Cow No. 2. Decline in production—effect of mastitis.  
Cow No. 83. Replacement.

producers and giving the high producers more to eat, there is an increase in production.

To see what a culling programme would look like refer to Table 1.

In this example, all things being equal, cows numbered 5, 8, 13, 17, 29,

You are now in a position to retain progeny from your top-producing cows and gradually eliminate cows in the low production range. When this step has been completed, a fresh culling programme is drawn up but with higher butterfat levels.

## Sheep On

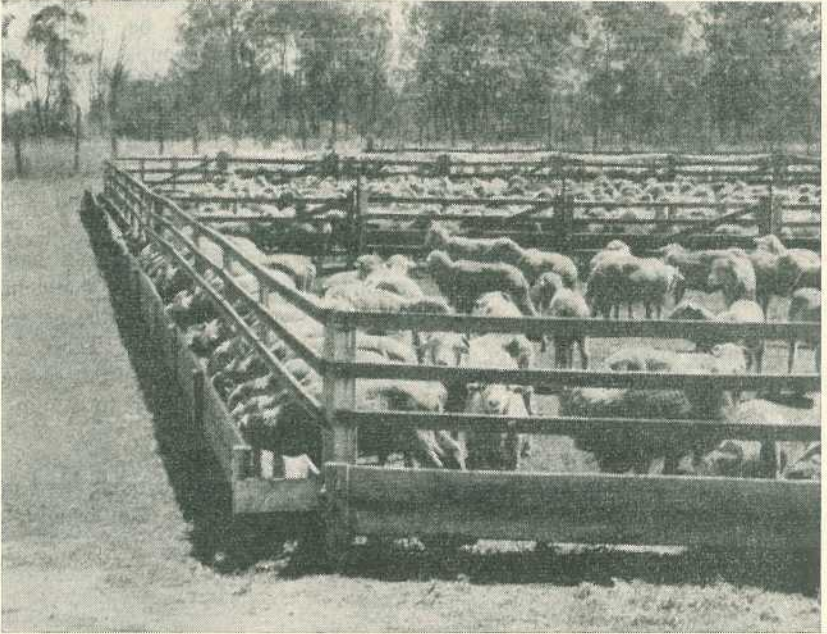


Plate 1 : Intensive yard-feeding of wethers on a property near Bundaberg.  
Note the feed troughs outside the yard to prevent feed contamination.



Plate 2 : Another more extensive view of the feeding yards.

## The Coast

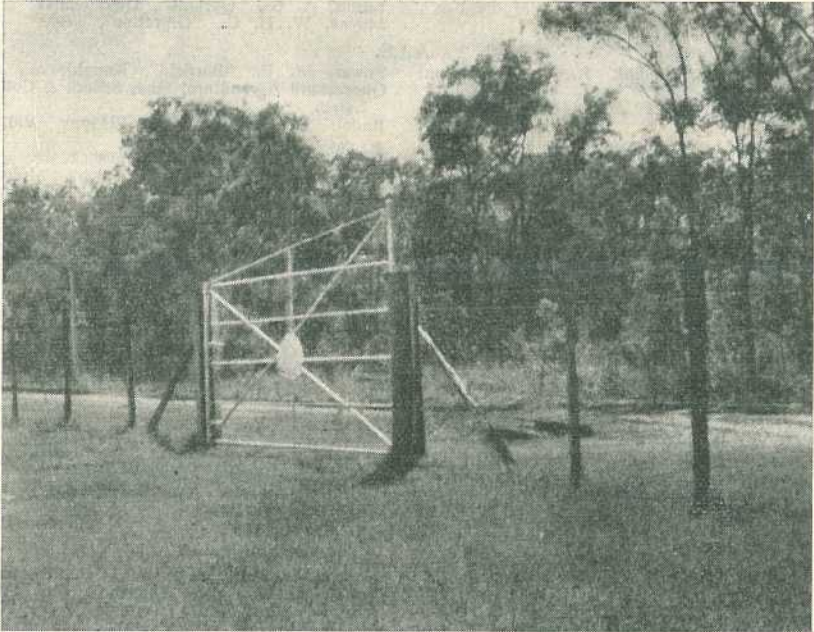


Plate 3: A good dog-netting gate and fence on the property. The gate is locked at top and bottom. Wild and stray dogs are one of the main problems in coastal sheep areas.

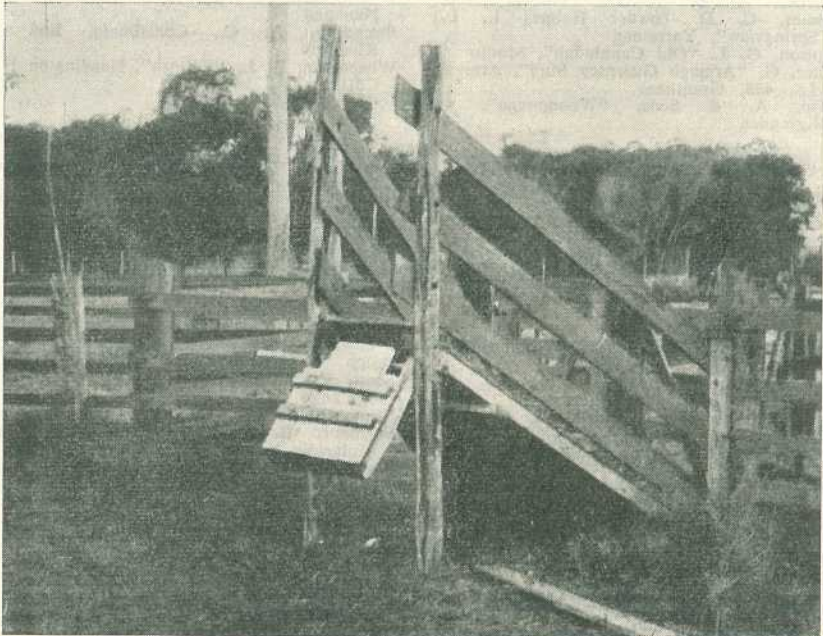


Plate 4: Loading ramp at sheep yards. Note adjustable apron to suit motor trucks of varying height.

**Tuberculosis-Free Cattle Herds**

(As at 1st August, 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., Laurauen A.I.S. Stud, Maleny  
 Green, D. B., Deloraine, A.I.S. Stud, Durong, Proston  
 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 Wooroolin  
 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., "Wenlena", 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", Rossvale, via Pittsworth  
 Sullivan, F. B., "Fermanagh", Pittsworth  
 Thompson, W. H. "Alfavale", Nanango  
 Webster, A. H., "Millievale", Derrymore, Helidon  
 Wieland, A. W., "Millhaven", A.I.S. Stud, Milford, via Boonah

**Ayrshire**

Dungeon, C. E. R., Marionville Ayrshire Stud, Landsborough  
 Dunn, T. F., "Alanbank", Gleneagle  
 Goodard, 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**

Macdonald, S. E. G., "Freshfields", Marburg  
 Naumann, C. H., "Yarrabine", Yarraman  
 Pender, D. J., Lytton Road, Lindum

**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, "Woonoonga", via Biggenden  
 Sanderson, N. H. "Glen Valley", Monto  
 Scott, C., "Coralgrae", Din Din Rd., Nanango  
 Swendson, A. C., Coolabunia, Box 26, Kingaroy  
 Wisemann, 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. M., 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., Wiltonton, 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., "Ardash Stud", Boonah  
 Noone, A. M. & L. J., "Winbirra", Mt. Esk Pocket  
 Porter, F., Conondale  
 Queensland Agricultural High School & College, Lawes  
 Ralph, G. H. "Ryecombe", 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

# Judging the Ages of Cattle By Their Teeth—New Data

By M. A. BURNS,  
Senior Adviser in Cattle Husbandry.

**Examination of the incisor teeth is the method commonly used for assessing the age of cattle up to four years. While it is shown to be a fairly reliable guide to the average age of large groups of cattle, it may be misleading when used as a guide to the age of individual animals.**

Observations on the time of eruption of permanent incisor teeth of both male and female beef cattle have been carried out at the "Brian Pastures" Research Station \*over a period of 3½ years from November, 1954 to May, 1958.

In the case of about 70 per cent. of the animals, variation in the age at which eruption of a pair of incisor teeth occurred was less than three months. Some animals had four teeth before others had two, and this overlapping happened at other ages also.

For females, 79 per cent. of the group erupted the first pair of permanent incisor teeth between the ages of 24 and 26 months. The second pair of teeth erupted between 31 and 34 months of age—again for 79 per cent. of the group. The third pair erupted between 39 and 42 months of age for 57 per cent. of the group. Eruption of the third pair had not occurred at

42 months for 36 per cent. of the group.

For males, 71 per cent. of the group erupted the first pair between 24 and 26 months of age but the average was 1.1 months less than for females. The second pair of teeth in males erupted between 29 and 31 months in 67 per cent. of the group. For the third pair, 71 per cent. of the group erupted teeth between the ages of 36 and 40 months.

The average interval between eruption of successive pairs ranges from 5.6 to 7.4 months.

## Management of Animals

All animals were the progeny of grade Hereford cows and stud Poll Hereford bulls. Birth dates of the observed animals were in the months of November and December, 1954. Weaning took place in August, 1955. Males were castrated at four to six

\* This station was purchased as a research station in 1952 by the Australian Meat Board. Observations on the eruption of incisor teeth were carried out at the request of the United Graziers' Association of Queensland to provide evidence on the reliability of dentition of beef cattle as an indication of age.

months. Females were mated about 27 months and calved accordingly at three years.

### Nutrition

During the course of this study the stock were run under open grazing conditions on native pastures growing on the basaltic and granitic soils of the Central Burnett district. Blue grass (species of *Dichanthium* and *Bothriochloa*) and spear grasses (species of *Stipa Heteropogon* and *Aristida*) dominated the pasture. They produce a heavy growth of material during the first quarter of the year and dry off rapidly following seeding. Such

pastures are inadequate to maintain continuous growth rates throughout the year.

During August and September, 1957, the pregnant females in the observed group received a supplement of blood meal and molasses. With this exception there was no feeding of mineral supplements or concentrates. The weight gains followed the typical growth pattern for the district, namely, high gains during late summer followed by loss of weight in winter and steady weight gain during spring and early summer. The rate of growth during spring and early summer in 1957 was depressed by drought.

TABLE 1  
AGES AND RANGE AT TIME OF ERUPTION OF PERMANENT INCISORS

	Average Age in Months	Range in Month
(a) Males—		
1st pair (21 head) ..	24.9	22-27
2nd pair (21 head) ..	30.5	27-34
3rd pair (20 head) ..	37.9	33-41
4th pair .. .. .	one animal only at 41 months	(one not erupted.)
(b) Females—		
1st pair (14 head) ..	26.0	22-34
2nd pair .. .. .	33.4	29-41
3rd pair .. .. .	..	35-42
4th pair .. .. .	One animal only at 41 months.	(+ five not erupted)

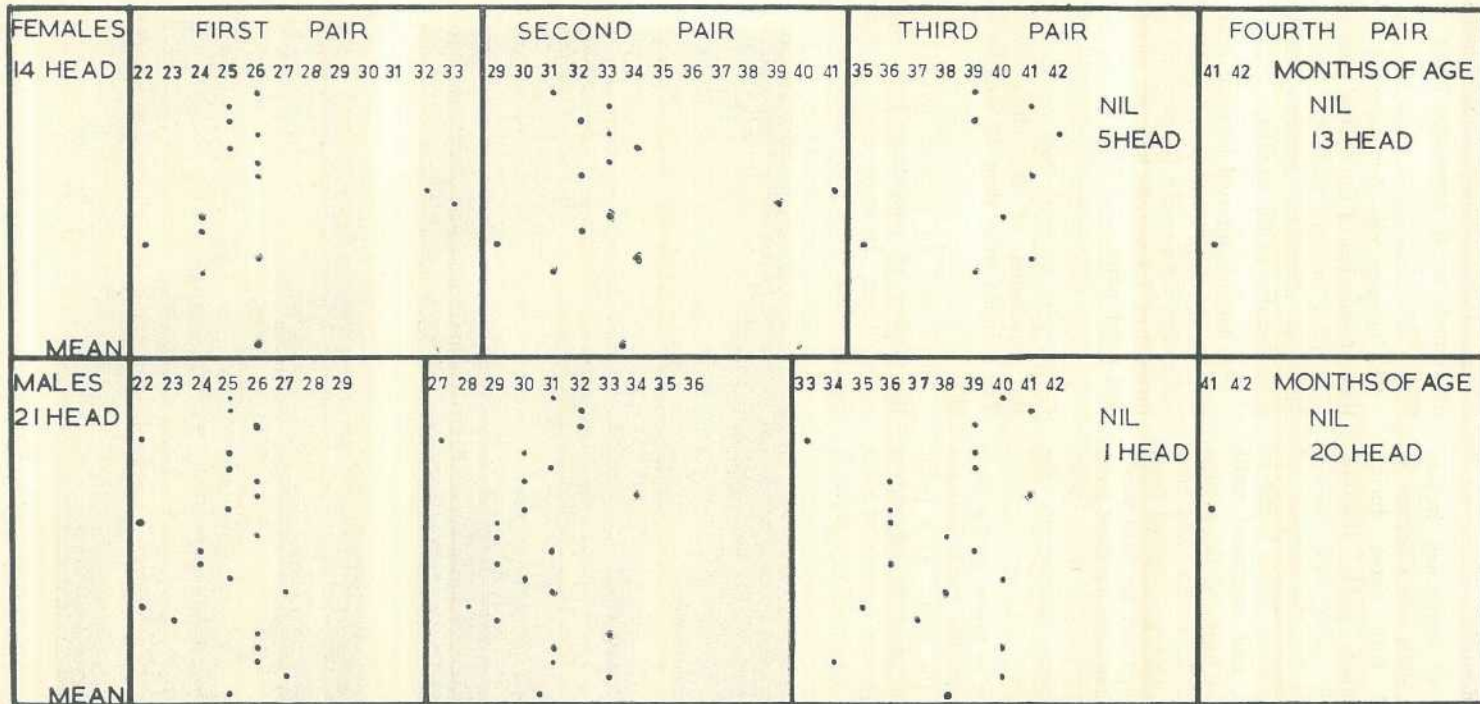
TABLE 2  
AVERAGE INTERVAL BETWEEN ERUPTION OF PAIRS OF TEETH

	1st-2nd Pairs	2nd-3rd Pairs
Males .. .. .	5.6 months	7.4 months
Females .. .. .	7.4 months	(one animal excluded)

TABLE 3  
AVERAGE BODYWEIGHTS OF ANIMALS AT TIMES OF ERUPTION

(a) Males ..	1st pair (Jan., 1957) 709 lb.	2nd pair (July, 1957) 691 lb.	3rd pair (March, 1958) 859 lb.
(b) Females ..	1st pair (Feb., 1957) 687 lb.	2nd pair (Sept., 1957) 700 lb.	

\* This weight was influenced by advancing pregnancy and supplementary feeding.



AGE OF ANIMALS AT ERUPTION OF PERMANENT INCISOR TEETH

GRADE HEREFORDS "BRIAN-PASTURES" GAYNDAH 1958

Plate 1

Age of Grade Herefords at Eruption of Permanent Incisor Teeth.

### Method and Results

The number of temporary incisor teeth visible at birth was observed in 136 calves of both sexes during November-December, 1954. Random groups of both males and females were then taken for the purpose of monthly observations. These began in February, 1955, and continued until the sale of the majority of the groups when an age of 42 months had been reached. Some wastage occurred from the original groups and the data which are presented have been obtained from 21 males and 14 females which were under observation throughout the whole period.

Eruption time is taken as the time when the edge of the tooth becomes visible through the gum. As a point of interest the majority of calves showed six temporary incisors at birth with a range of from two to eight.

Plate 1 shows the age distribution of animals as at successive times of eruption.

The average age for males at the time of eruption of the central pair of permanent incisors was 24.9 months. This was about one month younger than females at 26 months.

The average interval between eruption of the first and second pairs in males was 5.6 months followed by an interval of 7.4 months between second and third pairs.

In only two of the 35 animals the fourth pair of teeth had erupted at the conclusion of the observations. The animals were then 42 months of age.

There was no general pattern in the number of temporary teeth shed at one time. In some cases all temporary teeth were shed prior to the

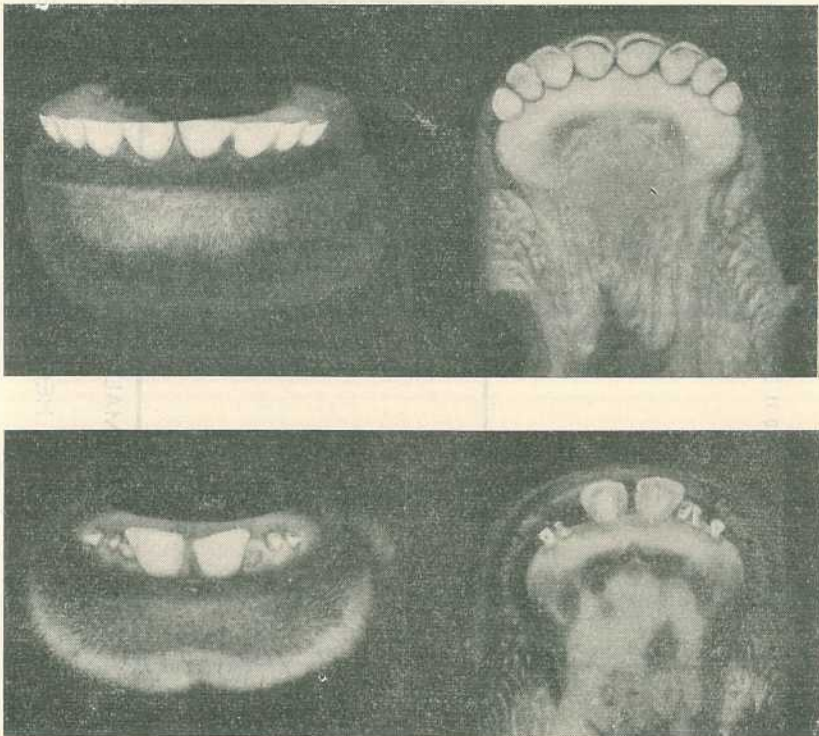


Plate 2

**Incisor Teeth of Cattle, Showing Front and Inside Views.** Top Row : Full set of temporary teeth. Second Row : First pair of permanents, also showing stubs of remaining temporaries.



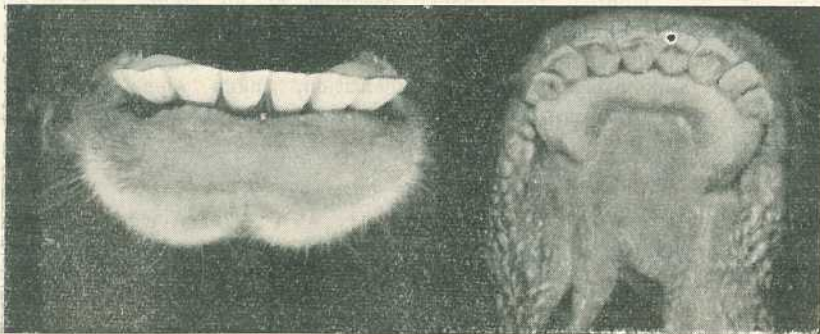
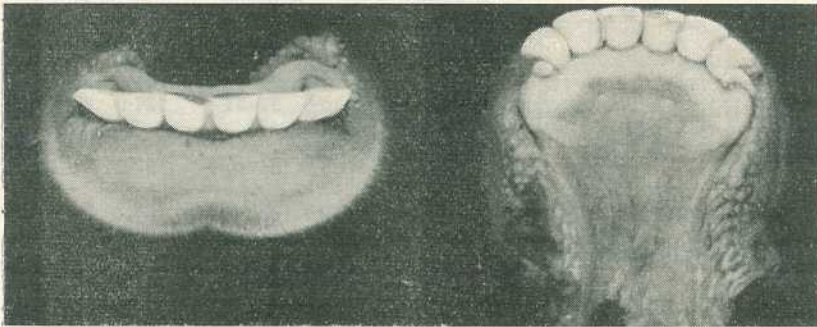
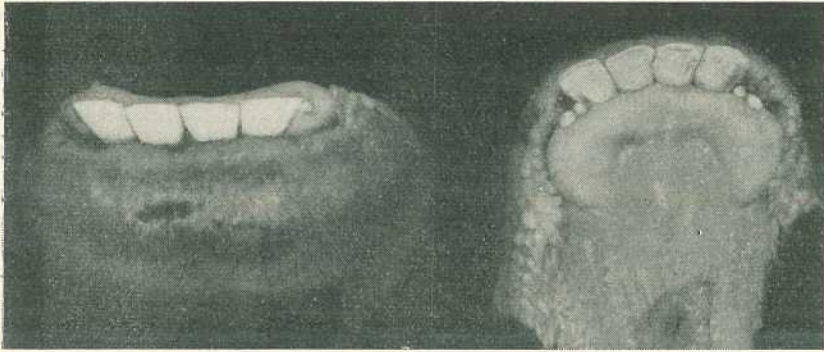


Plate 2 (continued)

Third Row : Second pair of permanents. Fourth Row : Third pair of permanents.  
Fifth Row : Full set of permanents.

appearance of any permanent teeth, but other animals retained some temporary teeth even when two pairs of permanent teeth were fully out of the gum. Shielding of the temporary

teeth always began with the central pair.

Data were not obtained on the eruption times of molar teeth owing

to the difficulties encountered in making accurate observations.

The fluctuating plane of nutrition probably delayed eruption time, particularly as the animals became older (D. M. Joubert).

The results obtained are comparable with reports from overseas as shown in Table.

	1st-2nd Pair	2nd-3rd Pair
	Months	Months
"Brian Pastures"—		
Females .. ..	7.4	7.6
Males .. ..	5.6	7.4
Joubert—Females ..	6.3	6.5
Wiener and Donald—		
Females .. ..	6.4	5.5
Bonsma and Nesor (mixed sexes) ..	7	6

TABLE 4

Females	1st Pair		2nd Pair		3rd Pair	
	Average and Range in Months		Average and Range in Months		Average and Range in Months	
"Brian Pastures"—						
Females .. ..	26	22-34	33.4	29-41	41 } 35-42 }	
Males .. ..	24.9	22-7	30.5	27-34	37.9	33-41
South Africa—						
Females .. ..	24.4	19-32.6	30.7	24-40.7	37.2	32-42.2
Scotland—Females .. ..	23	18-30	29.5	25.4-33.8	35	24.8-43.6
South Africa—(mixed sexes of animals) .. ..	27	24-29	34	28-39	40	34-45

The time of eruption of permanent incisor teeth falls within a range of 2-3 months for about 70 per cent. of animals. However, an extreme range of up to 12 months is reported and overlapping (for example, the appearance of four

teeth in one animal before another in the same group has two) has occurred at all stages within comparative groups of animals. It is thus concluded that the state of dentition, taken alone, is not a reliable guide to the age of cattle.



## Keep Piglets Warm

Young pigs should be protected from cold, westerly winds and not be forced to lie on cold, damp floors. Cold, damp conditions frequently bring on a number of diseases which can result in slow growth or even death—*T. ABELL, Senior Adviser, Pig Branch.*

## Stock and Station

**Blowfly And Worm.** Field officers who noted the considerable blowfly activity in sheep areas this season stress that, provided special care has been used in its application, the insecticide, diazinon, has given favourable results.

To quote one field officer, "Diazinon is only giving good results where applied strong, at 0.04 per cent. concentration, and at  $\frac{1}{2}$  gal. per sheep, jetted to the skin, for body and crutch strike, especially with half-woolled sheep."

This season has also favoured worm increases. The Sheep and Wool Branch recommends the practice of drawing ration sheep direct from paddock flocks. This enables worm post mortem examinations on ration sheep to be used to indicate the severity of worm burdens in paddock flocks. If action is delayed until outward symptoms of worms are obviously visible in flock sheep, the position becomes one (as it too often does) of "panic drenching" instead of wise preventive control.—*R. B. YOUNG, Senior Adviser, Sheep and Wool.*

**Phosphorus Deficiency in Cattle.** Give your cattle a phosphorus-rich supplement this winter and avoid loss of production and unthriftiness through phosphorus deficiency.

Phosphorus deficiency causes a great deal of wastage in both the beef and dairy industries. Reports of the condition are received every winter.

Phosphorus-rich supplements in the ration will correct the deficiency or, if fed now, will prevent it during the winter. Phosphorus supplements can be supplied either as licks or

as concentrate added to the drinking water. Licks can be used everywhere, but they're rather wasteful and not all stock will take to them. However, bonemeal can be given successfully to dairy cows fed in the bails. Where cattle water at troughs, phosphate can be supplied in the drinking water by means of an automatic dispenser.—*K. M. GRANT, Assistant Director of Veterinary Services.*

**Best Cattle for Tropics.** Breeding cattle that will be better adapted to our conditions is one of the most important avenues for the improvement of the cattle industry in Queensland.

Considerable experimental data have already been accumulated in Queensland and in other countries which indicate that crossbreeds between Brahman and British cattle will gain faster than British breeds under range conditions in tropical and subtropical climates. Furthermore the greater growth rate is reflected in greater carcass weight at a given age.

There are three possible methods of approaching the problem of breeding cattle that may be more suitable to our particular climate:

1. Intensive selection within the British breeds for those animals that are best adapted to our environment;
2. Crossbreeding between Brahman and British breeds and the interbreeding of selected crossbreeds to develop new breeds; and
3. Continued crossbreeding without endeavouring to form new breeds.

Steady progress in breeding better cattle for our conditions can be expected by any of the three methods, provided sound methods of selection are used.—*J. G. YOUNG, Senior Husbandry Officer.*

**Antibiotics for Pigs.** Incorrect use of antibiotics in rations for pigs can be both disappointing and expensive. Antibiotics are fed to pigs to control diseases and to speed up growth.

Best time to start growth stimulation is when you commence creep feeding. Piglets are susceptible to digestive disorders and some of the antibiotics are very useful in preventing scours. There's evidence to show that once you've started pigs on a growth stimulant, you should keep them on it or the growth rate may slow down when the antibiotic is left out of the feed. If the amount of antibiotic is reduced after the pigs reach 100 lb., the pronounced reduction in growth does not occur.

Antibiotics can be valuable allies in your attempts to increase financial

returns, but they can never be substitutes for good housing, feeding and management.—*T. ABELL, Senior Adviser, Pig Branch.*

**Damp Meal for Sows.** A recent Agriculture Department trial has shown that it is worthwhile feeding damp meal to sows. These animals are usually hand-fed, not self-fed. The feeding test indicated that wet feeding reduces food wastage.

In feeding the sows, water was first poured into a trough and meal was dropped in on top of it. The sows quickly mixed the two while feeding. It was found that half a pint of water to a pound of dry meal gave a satisfactory damp mixture.

Damp feeding not only reduced wastage. It was also found that sows fed damp meal were willing to eat more food, and this is an important point when sows are sucklings litters or when pigs have poor appetities.—*J. A. CHRISTENSEN, Adviser, Pig Branch.*

## Timely Tips for September

It's not too late yet to get some benefit from "strategic" dipping for ticks if you start straight away—and do it right.

On the subject of dipping, make yourself a promise (and keep it) to look after the dip well this year. Keep a dip book, make periodic checks on the strength of the fluid (the Department will do this free of charge) and charge it carefully according to the dip manufacturer's instructions. You'll get a better "kill" if you look after your dip well.

September may see the beginning of spring. Blight may come with it, to affect cattle, sheep or horses. Watch for tears, red lids, blinking, painful eyes (especially when the sun shines in them). Treatment at

this stage with modern drugs give really good results. Your vet. will give you details of what gives best results in your district.

Don't let those eyes go beyond that early stage. If you do you'll see the clear part of the eye go cloudy, blood vessels grow into it and fleshy inflammation develop. The eyes may point and even burst. *Don't let it get to this stage.* Blindness may result, and treatment is not nearly so efficient then.

Tick fever may crop up at this time of the year. Generally it follows the "spring rise" of ticks. Remember it can be cured by an injection, but that there are a lot of other points to be considered. Talk it over with your Veterinary Officer.

# Capon Heads Upset Growing Pigs

By P. D. RANBY, Veterinary Officer.

**Young pigs fed capon heads that carried the remains of hormone pellets were found to be unthrifty and very uneven in size.**

With the expansion of the table poultry trade, large numbers of "chemical" capons have been coming onto the market. To produce the chemical capon, a hormone pellet is implanted under the skin of the top part of the bird's neck sometime before slaughter. The hormone is an oestrogen which has

the effect of "effeminizing" the cockerels and improving the quality of their flesh. At slaughter, the remains of the hormone pellet are discarded with the head and neck.

When such capon heads together with other poultry offal are fed to pigs as a "soup", boiling does not

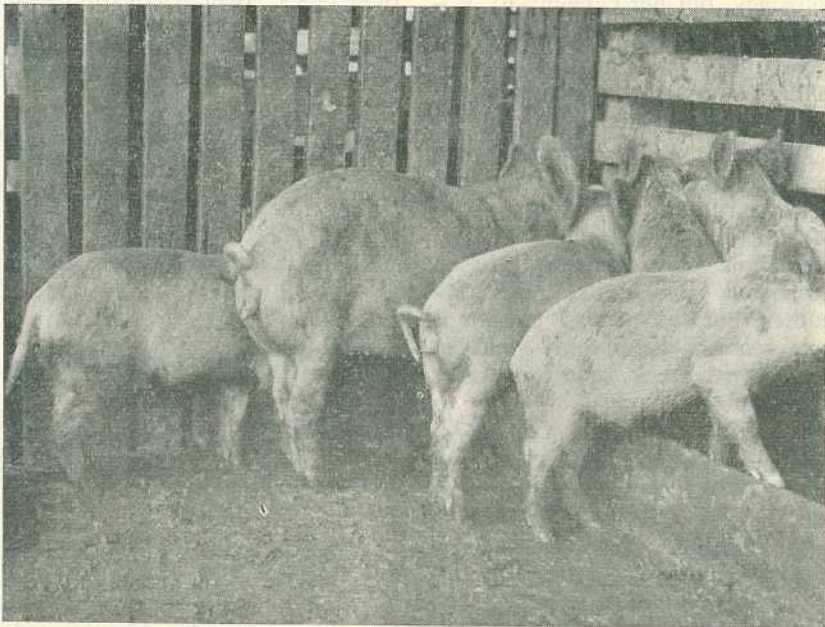


Plate 1

**These 2-2½ Months Old Pigs were being Fed Capon heads as a "Soup". They were showing various signs of poisoning from the hormone residues. Note the unevenness in size.**

destroy the hormone residue from the remains of the pellets.

On one piggery in the Brisbane area, 30 growing pigs were fed soup prepared from capon heads and offal with adverse effects. Adult pigs on the same property which were not fed the soup were found to be thriving.

### Oestrogen Poisoning

The growing pigs were generally unthrifty and very uneven in size although about the same age (See Plate 1). Various signs of oestrogen poisoning were present. The young female pigs were showing intense

signs of heat and other sexual activity long before their due time.

The young pigs had been fed capon heads in soup over six weeks. On checking on the poultry abattoir, it was found that the hormone implants were used at the rate of 15 milligrams per capon.

On withdrawing the capon heads from the pigs' diet, symptoms practically disappeared in a week while growth and general condition improved.

In the case of feeding capon heads to pregnant sows, there would be a danger of abortion and prolapse.

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## Milking Capacity of Sows

When farmers select a breeding sow they usually consider type and prolificacy, but her capacity to produce milk is often overlooked.

Fast litter growth is dependent on the sow's milk production in the first few weeks after farrowing.

The actual amount of milk produced by sows in a lactation has been measured, and varies from 300 to 650 lb. in the 8 weeks. Production varies from day to day, and from one milk gland to another, but the general pattern is an increase in the weekly yield up to the fourth week, then a decrease until weaning.

Piglets are only able to take from one-third to one-half of the milk in a sow's milk glands each time they suckle. If their dam is a poor milker then they cannot grow rapidly because they get insufficient food. This is one reason why you should try to select breeding sows from strains known to be good milkers, measured by the production of heavy 3-weeks-old piglets.

The quantity and quality of the food you give a sow affect her milk

yield. To get maximum production you must feed her enough of the right types. Insufficient food means lowered milk yield and loss of body weight. Sow's milk goes through two major changes in composition. The first is a rapid change from colostrum to normal milk in the first week after farrowing. Then a gradual change takes place in the percentage of the various constituents, and the critical period is about the third week of lactation, just before the maximum yield is reached.

Creep feeding of the litter should be established by this time, because from this stage on you will get more weight increase in the piglets per pound of food if it is fed directly to them rather than to the sow, which has first to convert the food to milk.

If you want fast growing litters you now know why you must select sows which can milk well, feed them properly, and have the litters eating a good creep feed mixture before they are 3 weeks old.  
—T. ABELL, Senior Adviser, Pig Branch.

# Lindane For Sheep Nasal Bot

By C. R. SMITH and R. B. YOUNG,  
Senior Advisers, Sheep and Wool.

Experiments have shown that lindane is effective in destroying sheep nasal fly larvae in the heads of sheep.

**A**LTHOUGH the sheep nasal fly is common in sheep areas of Australia, it is not a major economic pest. Its activities cause loss of condition in some flocks. It can be a cause of concern to studmasters who obviously would not want to present sheep at shows or offer rams for sale showing nasal discharge caused by bot infestation.

The sheep nasal bot is the larval form of the sheep nasal fly (*Oestrus ovis*).

Sheep with running noses (so called "snotty nose") in the flock are often the first intimation the sheepman has that the nasal fly has been at work. The background experience of the sheepman is able to tell him that "snotty nose" is caused by the presence of maggots, sometimes as big as an inch in length, hidden deep in the nasal clefts and sinuses of his sheep.

He has occasionally seen these white-bodied, black-banded grubs



Plate 1

Sheep on the Darling Downs Suffering from Nasal Bot.

in cavities of the skulls of ration sheep that have been split open to obtain the brains.

But very few sheepmen have seen the nasal fly that commences the circle of activity which results in the presence of these large white grubs in the sheep's skull. This is probably because the flies are small and quick flying, and not at all an obvious pest.

However, the sheep are well aware of their presence long before the sheepman, for once flies of this type are about during spring and summer, sheep show very obvious irritation. They become restless, rush about, mob together, and endeavour to hide their noses from the attack of the flies by periodically shaking their heads, or thrusting their noses into the wool of other sheep or into the dust beneath them.

If the sheepman chances to be in the paddock at a time when such restlessness is evident, careful observation may help him to observe the flies themselves.

### **Flies Hatch in Warm Months**

The sheep nasal fly is a "nuggety", dark-grey fly slightly smaller than a blowfly. It is profusely spotted with small black spots in the thoracic region.

These flies hatch from below soil level in spring and summer and mate soon after hatching.

In early morning and evening they remain resting in warm sunny spots on various objects such as trees, timber, and tall grass in the vicinity of sheep camps. As the day becomes hotter they commence flight in search of sheep.

**They become intensely active, flying and hovering amongst the sheep, and pounce swiftly to lay tiny larvae or maggots on the nostrils of the sheep. During the life of about**

**four weeks, the female fly can infest many sheep with these minute larvae.**

Soon after being deposited near or on the sheep's nostrils, the larvae crawl upwards into the passages and sinuses of the nose and skull.

In lambs, growth of the larvae may be complete within a month; in older sheep this may take nine or 10 weeks.

By this time the larvae are of considerable size, and may be over an inch long. They are white and plump, with a black-banded back, and on the lower surface of the body are rows of small spines.

### **Larvae may be Sneezed Out**

At maturity the larvae leave the nostrils, often being sneezed out, and, once on the ground, burrow into the soil.

In instances where the larvae have originally entered through very small openings, they outgrow the dimensions of the entrance, and being unable to emerge, they die in the skull cavities in which they developed.

### **Pupae Live Underground**

Those larvae that managed to emerge or were forcibly expelled by sneezing of the sheep soon burrow underground. They shrink, harden, and pupate.

Pupation may last one to three months.

Following pupation the adult fly emerges, dries its wings, and flies in search of a mate.

### **Effect on Sheep**

The harmful effect of the nasal fly on the sheep is twofold. The flies attacking the sheep interfere with grazing and resting, and cause unthriftiness. The larvae in the



nasal cavities irritate the delicate mucous membranes which become swollen and inflamed. A copious nasal discharge of foul mucus passes down the nostrils, hindering breathing. Irritation causing hindrance to feeding and resting occurs, and sheep lose condition. There is much sneezing and snuffling.

**Because of the damage to the mucous membranes, secondary bacterial invasions can result, in rare instances sufficient to cause death.**

### Control With Lindane

Until recently, control measures seldom showed satisfactory results. These methods included smearing the nostrils with pine tar, providing salt lick troughs with the margins copiously smeared with tar, and applications through the nostrils of carbon bisulphide and paraffin, or tetrachlorethylene and paraffin.

Then South African scientists at Onderstepoort Laboratory explored

a new method of treatment with nasal injections of chlorinated hydrocarbons. In field observations they had observed that mature larvae of nasal bot could exist in lambs only a month old. This indicated that infestation could occur shortly after birth, and larval development could be completed within a month.

Their experiments showed that lindane was effective in destroying the larvae in the heads of sheep. They investigated concentrations of lindane that could be tolerated.

In addition they sought to discover a form in which the insecticide could be introduced in order to ensure maximum penetration into the almost inaccessible situations into which the larvae find their way.

It was necessary for the emulsions to be able to side-pass the almost solid mucoid accumulations with which the sinuses are often clogged.



Plate 2

**Nasal Bot Larvae Taken from the Sinuses of an Affected Sheep's Skull.**  
A match box is shown for size comparison.



Plate 3

Using Lindane Treatment for Nasal Bot. Note that the sheep's head is held at an angle of 45 degrees with the ground.

The formula arrived at was—

	Parts by Volume.
<b>SOLVENTS</b>	
Benzol .. . . .	12.5
Acetone .. . . .	12.5
Kerosene (lighting) .. . . .	10.0
<b>EMULSIFICANTS</b>	
Sulphonated castor oil .. . . .	57.0
A wetting agent .. . . .	2.0
<b>ACCESSORY SOLVENT</b>	
Oleic acid (technical) .. . . .	6.0
	100.0
<b>LINDANE — 4 gm. per 100 c.c.</b>	

Four c.c. of this mixture were injected into each nostril of a sheep lying on its back, with head held at an angle of 45 degrees with the ground. The sheep was held 10 seconds after injection to assist penetration. In the experiments a dosage in excess of 20 mg. of the

formula per kg. of body weight was found to cause some loss in lambs, and mismothering. It was, therefore, recommended that lambs under 20 lb. live weight should not be treated.

Dose rates of the formula recommended are:—

<b>Lamb</b>	20 lb.— $\frac{1}{2}$ c.c. each nostril.
<b>Weaner</b>	30 lb.—1 c.c. each nostril.
<b>Weaner</b>	40 lb.— $1\frac{1}{2}$ c.c. each nostril.
<b>Sheep</b>	50 lb.— $1\frac{1}{2}$ c.c. each nostril.
<b>Sheep</b>	60 lb. to 100 lb.—2 c.c. each nostril.
<b>Sheep</b>	100 lb. and over—4 c.c. each nostril.

The South African scientists recommended that the treatments be repeated at three weekly intervals.

### Queensland Field Trial

The South African formula was used in treatment of a number of sheep affected in the early part of 1958 in the Darling Downs area of Queensland. Nasal fly was very prevalent in some flocks in that area in January, 1958. A state of semi-drought made paddocks and cultivation areas almost devoid of pasture and gave sheep little protection from attacks by nasal fly. British breed and crossbred sheep and lambs lost condition because of the running around and the clogging of their nasal passages.

Two hundred and seventy-seven affected sheep from five properties were treated, there being 72 Dorset Horn rams, 135 Dorset Horn ewes, 50 Crossbred ewes, and 20 Crossbred lambs.

### Method of Administration

Four c.c. of the formula were squirted into each nostril by means of an automatic syringe with the

needle removed. The sheep were held for 10 seconds after treatment. The first sheep were treated by holding them on their backs. Later a Reid South Australian Mulesing cradle was used. With the cradle there was less struggling, and less contamination of the operator with mucus expelled by the sheep.

**The sheep's head was held at an angle of 45 degrees from horizontal.**

There was little untoward reaction. A few sheep held their heads high on being released, and tended to walk backwards for a few steps. There was some dizziness, but recovery was rapid.

**With the majority, only one treatment was found to be necessary. Three weeks after treatment, 75 per cent. were reported to have shown a remarkable recovery; 24 per cent. were considerably eased in their breathing, and 1 per cent. was drafted off for re-treatment.**

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## The Paralysis Tick

August usually sees the scrub tick or paralysis tick on the increase all along the eastern Australian coast.

Right up till March this deadly parasite is capable of causing paralysis and death in any of the mammalian species. Dogs are most commonly affected.

Early signs seen are, refusal to eat, vomiting, and a swaying motion in the hind limbs which soon progresses to complete paralysis. The dog goes down and death

rapidly follows from respiratory failure due to the tick's poison.

Treatment is effective if the dog is given anti-tick serum by a veterinary surgeon as soon as the swaying in the hind limbs is seen. Speed here is essential—2 or 3 hours' delay can be fatal.

Control of the paralysis tick is best attained by use of a BHC wash or powder every 7 days. In bad areas, the only safe method is a thorough daily search of your dog.—*E. R. JOHNSON, Veterinary Officer.*

**Brucellosis-Tested Swine Herds**

(As at 1st August, 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  
 Zahnov, 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

## Orchard and Garden

### Guard Against Soil Acidity.

Farmers who grow fruit or small crops on Queensland's coastal soils can be reasonably sure that their soil is acid. If they use fertilizers or irrigate their crops, they can be quite certain that their soil is becoming more acid.

Acidity is caused mainly by loss of calcium from the soil. If you've applied fertilizers to your crops and haven't had the expected crop response, then consider excessive acidity as a possible cause. A pH test, which is a measure of the soil's acidity, will show you whether your soil needs lime.

Most horticultural crops grow best in a soil with a pH of 5.5 to 6.0, or a little higher. Initially, a soil may need lime at two tons or more to the acre to bring its acidity into the desired range. After that, a regular check on soil acidity will show you when further liming is necessary.—*D. DOWDLES, Adviser in Horticulture.*

**Unprofitable Bananas.** Bananas that have ceased to be commercially profitable should be eradicated during the winter months. They're a potential menace to healthy plants.

Weak, unprofitable areas exist in most banana plantations. These areas, which seldom justify the expense of weed control, desuckering and fertilizing, soon become neglected. They are then a very real disease risk in districts where bunchy top has been recorded.

The most economical method of eradication is to inject a hormone preparation like 2,4-D or MCPA into the plant. The hormone is applied through a special injector, the point of which is inserted into the pseudostem, just above the corm. Your local Horticulture Branch officer will supply details of the equipment and its use.—*J. M. WILLS, Senior Adviser in Horticulture.*

**Quality in Cauliflowers.** A firm, white cauliflower head is an attractive product, and an attractive product commands the top market returns.

When marketing cauliflowers, undoubtedly the major essential is to cut as soon as the curd reaches prime condition. You may get a bigger product if they are left a little longer in the field—but size is of little value when quality has dropped.

And, in this specialized crop, it is quality that counts.

Look at the results of delayed harvesting—

Exposure to wind, sun, rain, insects, and disease, and a corresponding risk of serious curd blemish and loss of buyer appeal.

Leave them too long and they become over-mature, with long stalks and loose, open curds which tend to wilt quickly after cutting.

Cut when the curd is white and firm. Try tagging your plants according to development—these will be ready this week, others for next, and so on.

There is no substitute for quality in cauliflowers. Only an attractive head is a good head.—*R. L. PREST, Senior Adviser in Horticulture.*

**Seedbeds.** That sad story of the seedbed—the whole basis of a new crop lost in drowned, weakened, or diseased seedlings—don't let it happen to you!

Young seedlings just won't tolerate bad soil drainage.

The seedbed should be well-drained and constructed about 9 in. above ground level. If possible, make a foundation of sand or rubble. Allow for side gutters.

Get rid of that excess water. It may cause water-logging, injure

roots, and it certainly favours diseases such as damping off.

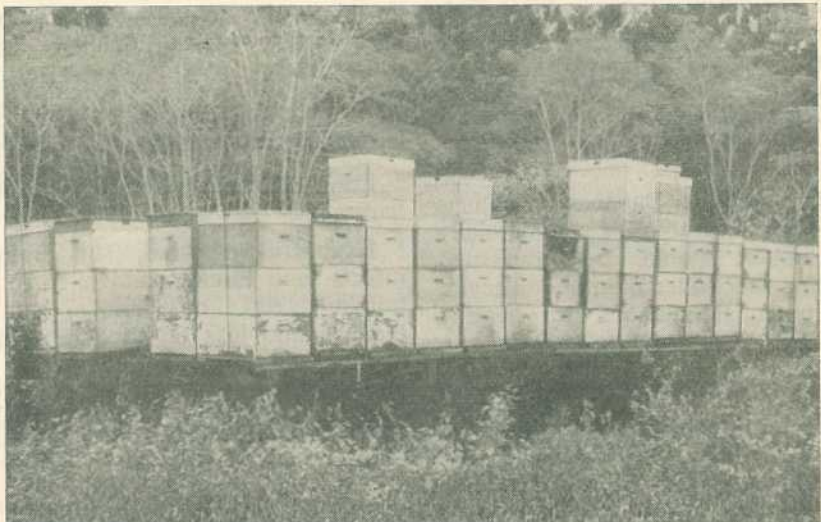
Give the bed overhead protection during the "wet" by erecting a movable framework. Over this place hessian or other material, and so protect the tender plants and divert the heavy rains. The covers can be removed in fine weather.

Don't overcrowd the plants. They need air and room to develop. Sow them in rows about 4 inches apart, and thin out to reasonable spacings.

Drainage, protection, aeration, living space—provide these in the seedbed, and you will have a stock of healthy seedlings.—*D. DOWDLES, Adviser in Horticulture.*

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## Hives of Industry



In This Jungle Setting, Mr. W. Weare, of Upper Barron, Works His Beehives From the Top of a Trailer. A space for this purpose is left up the centre of the trailer, which is simply towed into a suitable location.

# Salt Damage to Citrus

By W. V. MUNGOMERY, Horticulturist.

**The first precaution to take against salt damage in citrus is to check the quality of the irrigation water. There are a number of remedies to use where salt damage exists.**

Trees vary greatly in their tolerance of high salt concentrations in the soil. The date palm is very tolerant, figs and grapes are less so, while in the low tolerance group are citrus together with the pome and stone fruits and the avocado.

Plants react differently to given concentrations of salts, and also to the various elements which occur commonly in saline waters. With citrus, it is the sodium chloride (common salt) in the water which is most commonly harmful.

In most citrus-growing countries of the world, damage due to excess salt has been a problem for many years. In most cases, the damage occurs when the water table rises into the root zone of the plants, bringing with it abnormally high concentrations of salt. This kind of trouble is usually due to over-irrigation of crops grown on shallow soils.

In Queensland, however, salt problems in citrus are mainly the result of under-irrigation, with water of marginal quality. In the Central Burnett district during the 1957 drought, trees irrigated by the permanent overhead sprinkler system suffered very severely.

## What To Look Out For.

The first symptoms of salt damage occur in the leaves. These

acquire a dull appearance, curl and turn yellowish. Later the margins of the leaves die and turn brown, particularly near the tips. Later again, these leaves fall, the older ones being shed first.

Fruit drop also tends to be abnormally high and the fruits which do develop are smaller than normal and may ripen somewhat prematurely. Very often there is a fair amount of twig die-back.

## How Is It Caused?

As mentioned before, salt damage in citrus is usually due to higher than normal concentrations of sodium chloride in the soil or irrigation water. In some cases, the carbonates and sulphates of sodium, magnesium or calcium may be troublesome but this is relatively uncommon in Queensland.

In western districts, bore waters are sometimes high in sodium carbonate, and these tend to make the soil too alkaline for satisfactory plant growth.

In Queensland, most citrus are grown on deep, well-drained soils and salt damage, when it occurs, is due mainly to the use of marginal or poor-quality irrigation water.

Experience in the Central Burnett has shown that toxic quantities of salt can enter the tree in

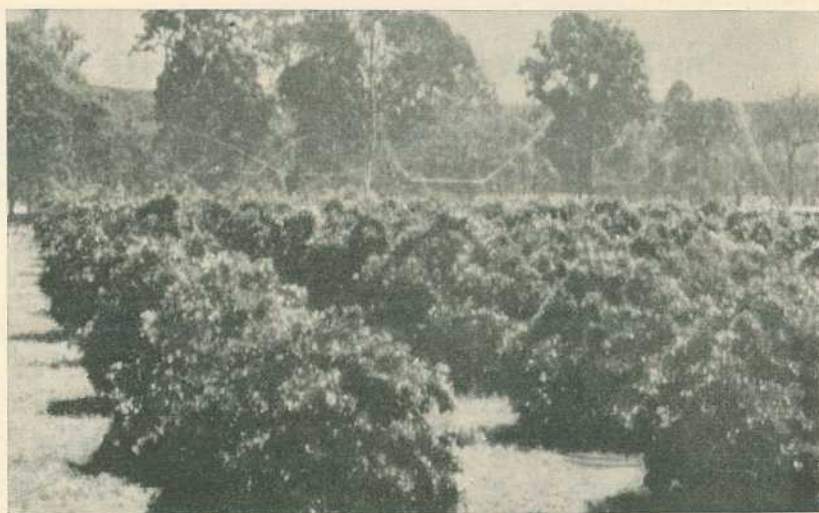


Plate 1

**Overhead Irrigation in Citrus.** In prolonged hot weather, overhead irrigation can be dangerous when the salt content of the water is above normal. Salt deposits remaining on the leaves between successive rotations of the spray nozzle are harmful. Watering at night and heavy rates of application are remedies.

two ways, namely, through the leaves or through the roots.

Damage was first observed on orchards where the permanent overhead system of irrigation was used. This system normally has a relatively low application rate; not more than  $\frac{1}{4}$  in. an hour. The weather was hot and dry. Under these circumstances much of the water which fell on the leaves of the trees had time to evaporate between each rotation of the sprinklers. As a result, the salt concentration on the leaves became very high even though the quality of the water was reasonably satisfactory.

Trees were also affected because of the build-up of salt in the soil. Normal irrigation practice aims at applying just enough water to wet the root zone of the plant and no more. However, under drought

conditions, there is no leaching of the salts dissolved in the irrigation water into the deeper layers of the soil. The result is that each successive irrigation increases the amount of salt in the root zone. It is easy to see how the continual use of water which would normally be considered quite safe, can eventually lead to the accumulation of injurious amounts of salt in the root zone.

Also, we must not overlook the indirect effects which excessive salt may have on tree growth. When there is an unfavourable ratio of sodium to calcium and magnesium in the irrigation water, the sodium will displace the calcium and magnesium in the soil. This may lead to a deficiency of these last two elements and adversely affect the physical condition of the soil, making it more difficult to irrigate.



### How To Remedy

The obvious remedy for salt damage is to change to a better source of water. However, in most instances this is impossible, and the best use has to be made of the water available. Sometimes the salt content of the water may be so high that its use should be discontinued. The salt in the water could do more harm to the tree than the drought, and the grower can only wait for a heavy fall of rain to wash the salt out of the soil.

Next, we come to the case where the water quality is marginal and the use of the permanent overhead system of irrigation has caused damage from the absorption of salt through the leaves. Under these circumstances, the best thing to do is water in the early morning, late afternoon or, preferably, at night. Evaporation will be lower at these times. It will also help if the output of the individual irrigation sprinklers is increased.

When the damage is due to the accumulation of salt in the root zone as a result of the repeated use of marginal water, heavy irrigation is necessary. This will wash the salts through into the deeper layers of the soil out of range of the root system of the trees. The amount to apply should be at least twice that which would be needed to wet the root-zone only. Two or three heavy irrigations will usually bring the salt content of the soil back to a reasonable level.

The ratio of heavy to normal irrigations subsequently will depend on the amount of salt in the irrigation water. If this quantity is approaching the permissible maximum, then a heavy irrigation will be needed every time. However, if the salt content of the water is relatively low, a heavy irrigation may be needed only after

perhaps five or six normal waterings.

Even if water for irrigation is in short supply, it is false economy to irrigate lightly when salting is a problem. Of course, these practices are of value only in a soil with free drainage. If drainage is impeded in any way, some positive steps must be taken to improve it.

Where the soil structure has deteriorated from the use of water with an unfavourable ratio of sodium to calcium and magnesium, the addition of gypsum is the remedy normally used. The calcium in the gypsum will replace the sodium in the soil. Rates of application varying from 2 to 20 cwt. to the acre may be used, depending on the nature of the soil and the amounts of sodium to be replaced.

In very acid soils (below about pH 5), agricultural limestone or dolomite can be used in place of gypsum. On the other hand, if the soil is very alkaline (above pH 8.5) an application of sulphur may be effective.

### Precautions To Take

The first precaution to take against salt damage is, naturally enough, to check on the quality of the irrigation water being used. Horticulture Branch officers will advise on the procedure for taking samples. Analyses of these samples will then show whether the water is suitable and how it should be used.

Also, in areas where water quality may be doubtful, some attention should be given to the selection of varieties and rootstocks. Lemons are very sensitive to salt. Oranges are more tolerant, and grapefruit are the most tolerant of the commonly grown citrus varieties. No positive information is available on mandarins, though field observations suggest that they

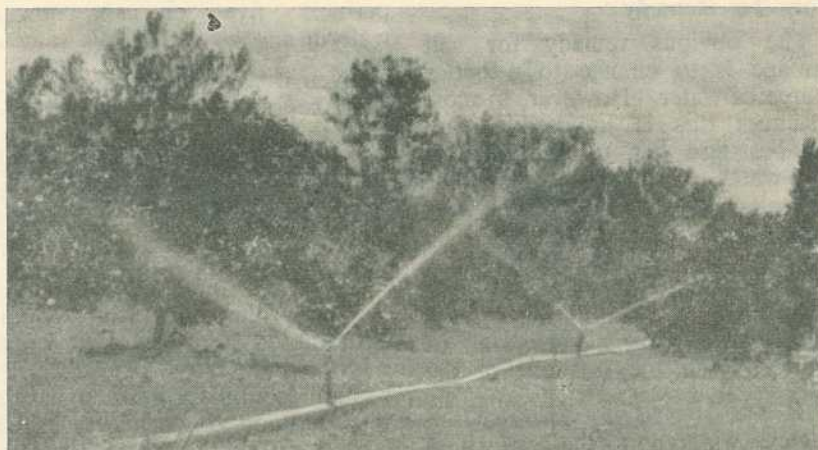


Plate 2

**Portable Irrigation Lines in the Orchard.** With this system of irrigation, salt damage with waters of marginal quality is mostly due to build-up of salt in the surface layers of the soil. Heavy irrigation to leach excessive salt below the root zone is an insurance against further trouble.

are more tolerant than oranges but less tolerant than grapefruit. This also applies to these varieties when used as rootstocks.

If salt damage is anticipated, sweet orange or Emperor mandarin would definitely be better than rough lemon. *Trifoliata* is the least

satisfactory rootstock. It is even more sensitive to salt than rough lemon.

Fortunately, salt damage does not occur very frequently in Queensland. However, the recommendations given will be found of value when it does.

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### Warning to Beekeepers

Recent experience with the introduction of queen bees into Queensland from overseas has shown that the examination of these consignments is of great value in protecting the Queensland beekeeping industry from the introduction of pests and diseases.

All consignments introduced are examined by the Beekeeping Section of the Queensland Department on behalf of Quarantine Authorities and during the last year three consignments have been found to be infested with diseases or pests. Accordingly, these consignments were destroyed in quarantine.

During the last few weeks, one consignment from the United States

of America was found to be infested with small mites which invade the breathing tubes of the adult bee. This trouble known as "Acarine Disease" does not occur in Australia, although it is caused by one of the most serious parasites affecting honeybees in other parts of the world, particularly Great Britain and Europe.

Fortunately most Queensland beekeepers are aware of the value of the quarantine examinations, and knowledgeable beekeepers, realising the possibility of introducing disease, are now avoiding importations.—C. ROFF, *Adviser in Apiculture.*

# Teamwork Markets High Quality Eggs

By K. C. GUYATT, Division of Marketing.

**H**OUSEWIVES have long been more suspicious of the humble egg than of most other foods. But lately egg quality has improved, and for this we can thank organised marketing and teamwork between producers, retailers, and the egg marketing boards. All now recognise the perishable nature of eggs and the need to place them fresh into the housewife's hands.

In order to sell a guaranteed product, the egg marketing boards must see that egg quality is kept up. This job is doubly important because it means keeping local customers happy so that they will buy more eggs, and so that this, in turn, will reduce the surplus on the lower-paying, well-supplied export market.

What do the egg marketing boards do? What is their obligation to the farmers who have set them up? And to their customers? What does the farmer owe to his board? We might add something on how the consumers and retailers contribute in maintaining quality of this perishable product. It will be seen that all parties must pull together so that each may benefit.

## The Farmer's Part

In the marketing chain, the first link plays a very important part. The good farmer aims to produce a good-sized egg with sound shell texture. When it comes to marketing, however, other things are also important—the internal quality of the egg—and these

things are not always so apparent. These matters will be briefly mentioned here but information is always readily available from Agriculture Department poultry advisers. Defects include unsatisfactory yolk colour, enlarged air cells (stale eggs), blood and liver spots, watery whites, and fertile eggs.

Generally, farmers aim to produce an egg of good size and quality. To retain quality, the eggs should be collected regularly from the nest, and to prevent infection of eggs with mould they should be dry-cleaned when necessary rather than washed. Until their dispatch to the board, the eggs should be kept in a cool place and for this purpose, charcoal coolers are now coming into use. Such coolers also help to maintain correct humidity, which prevents evaporation of moisture, and staleness.

Deliveries to the board should be made at least twice a week.

## What the Board Does

When the board receives the eggs, an inspector examines them over a bright light. This is called candling, a word which has persisted since eggs were examined over a flame from a candle. Stale eggs, shown by the size of the air cell, and eggs with undesirable internal quality, such as addled eggs, small bloodspots and so on are down-graded for pulping. Cracks in the shell and poor quality shell texture, which is usually shell that is



Plate 1

Operators Feed Eggs to Six of the 20 Vacuum Pulp Extractors at the South Queensland Egg Marketing Board.

fragile and liable to be easily broken, are also detected, and these are the main eggs going into pulp.

After candling, each egg is weighed automatically and stamped to indicate the grade and quality.

The Queensland egg marketing boards fix three quality standards (first and second quality and useless) and three weight determinations. Only first quality "hen" eggs and first quality "small hen" eggs are sold as eggs in shell. Second quality eggs are pulped for pastrycook purposes. First quality hen eggs are  $1\frac{1}{2}$  oz. and over, whilst first quality small hen are  $1\frac{1}{2}$  oz. to  $1\frac{1}{8}$  oz. The following table shows the grading outturn in 1957-58 of eggs received by The South Queensland Egg Marketing Board.

Eggs are pulped by a vacuum extraction method and the pulp then

TABLE I  
GRADING OF EGGS RECEIVED BY THE SOUTH QUEENSLAND EGG MARKETING BOARD (1957-58).

—	Dozens	Per cent.
First Quality—Hen	4,770,853	72.06
First Quality— Small Hen	1,160,770	17.53
Second Grade ..	680,268	10.28
Third Grade* ..	876	.01
Duck .. ..	496	.01
Useless .. ..	7,070	.11
	6,620,333	100.00

\* Discontinued from November 24, 1958

pasteurised by a process similar to that used in milk factories but of course at more critical temperatures to avoid cooking. The pulped egg is rapidly hard-frozen in blast freezing tunnels and held under refrigeration pending local sale or shipment overseas.

### Service to the Consumer

Local shopkeepers receive board eggs within 24 hours of receipt from growers. The board packs in attractive cartons to facilitate handling by the retailer, and to meet the requirements of the modern super-market shopper. The board guarantees all eggs marketed by it and employs service officers who investigate all marketing or quality complaints.

To ensure that supplies are available throughout the year, the best high quality eggs are chosen in the months of high production and dipped in high grade mineral oil. This seals the egg pores and prevents staleness. The eggs are then held in chilled rooms until the low production winter months. Although not of the same high quality as new laid eggs, these eggs nevertheless are of sound quality. This is ensured by candling the eggs before they are placed on the market.

### How the Retailer Can Help.

It is agreed that no egg is as good as a new laid egg. All new laid eggs of course are not of top quality but a top quality egg can soon deteriorate if not correctly handled on the farm and in the marketing process. It is unfortunate that many retailers do not buy more regularly—at least twice a week—and often fail to store at cool temperatures to avoid staleness.

How often are eggs found displayed in a hot shop window or in some hot storeroom with other general produce?

How often is it found that newly purchased eggs are sold without regard to disposing of the earlier purchases first?

How often do we see eggs picked up from the wholesale floor and transported in an open truck exposed to the blazing summer sun?

These factors militate against egg quality which the egg marketing board, through its service officer, is attempting to rectify. A road distribution service may be necessary to overcome unsatisfactory transport conditions.

### And the Housewife

Today, very few Queensland homes are without the benefit of refrigerator or ice box. This is the place for eggs along with dairy produce and other perishables. If a refrigerator is not available, a cool place out of a draught is the next best thing. In the refrigerator the least cold spot will be sufficient; 55–60 deg. is most suitable. Remember, take from cold storage only those eggs for immediate use. Transferring eggs from low to high temperatures can have a harmful effect on egg quality as failing to keep them under refrigeration.

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## The Piglet at Birth

Pigs are born in a rather advanced stage of development: they can see, walk, are covered with hair, and within minutes of birth will find their mother's udder, and settle down to suck the teat of their choice. At birth, more than 80 per cent. of the pig's body is composed of water, but as the pig grows older the composition changes very quickly indeed.

Pigs appear to suckle little and often, and following birth will do so approximately once every hour, day and night. At each suckling, the milk flow lasts only 10–20 sec., the piglets obtaining 10 to 70 ml. milk. Up to 48 hours after birth, the pigs receive colostrum. Thereafter, it is gradually replaced by milk. The main value of colostrum is to provide antibodies which protect the baby pigs against various infections.

## THE FARM FAMILY

# The Danger of Tetanus

Tetanus in humans is easy to prevent, but difficult, and often impossible, to cure. About 50 per cent. of notified cases who develop symptoms die from the disease, in spite of medical treatment.

Tetanus is an acute fever, caused by the tetanus bacillus, a tiny but very dangerous germ which produces a deadly nerve toxin when it grows in deep wounds, away from sun and air. Tetanus is often called "Lockjaw" because one of the commonest symptoms of the disease is a painful spasm of the jaw muscles.

### How It Is Contracted

The germ which causes tetanus lives in the intestines of grass-eating animals, particularly horses, and is most likely to be found in and around farmyards, stables and gardens where the soil is treated with animal manure. The germ is extremely hardy, and can live for years in the dust. There is a risk from tetanus in almost any paddock, garden, footpath or road. Tetanus can be picked up nearly anywhere, particularly by children who play barefooted.

### How It Develops

The tetanus germ prefers a deep, punctured wound with a small opening. Such a punctured wound shuts out oxygen and enables the tetanus germs to thrive and increase in their dark, moist hiding place. A deep cut or puncture caused by stepping on a nail or the prong of a fork is much more likely to be followed by tetanus than a surface abrasion.

Gunshot and fireworks accidents are especially dangerous, because the force of the explosion can carry the infected material deep into the tissues.

### Symptoms

When a wound is neglected, tetanus takes anything from 4 to 21 days to develop. Stiffness of the neck muscles, and painful spasms of the jaw muscles, causing difficulty in swallowing, are often the earliest symptoms. Later on, spasms of the other muscles of the body occur. Often the slightest noise or jarring is sufficient to throw the patient into violent and agonising convulsions. The quicker the symptoms occur, the greater the danger.

### The Danger Is Very Real

Once the symptoms of tetanus have developed, it becomes a very serious disease. In Queensland, between 1945 and 1949, there were notified 160 cases of tetanus with a death total of 89—slightly over half. Probably the figures would be much higher but for the fact that most doctors take the precaution of giving an anti-tetanus injection to all accident victims, if there is any risk that dirt may have entered the wound.

### Danger to Children

Children are in the danger group. Queensland statistics over the past five years reveal that 36 per cent. of all deaths from tetanus occurred in children under the age of 15 years. This age group comprises only 28 per cent. of the population.

### Immunisation

There need be no deaths from tetanus. Anti-tetanus immunisation will safeguard you against this killer. Two or three injections of anti-tetanus toxoid, followed by another dose one year later, and repeated single doses about every five years, are all that is required.

Anti-tetanus immunisation is particularly important for people living in rural areas, or engaged in occupations where there is a special risk of tetanus. Children can—and should—be immunised at 18 months of age.

**Save your children and yourself from the death that lurks in dirt. See your doctor or Local Council to-day about Anti-Tetanus Immunisation.**

### Precautions

If you have not protected yourself by anti-tetanus immunisation, observe these precautions:—

1.—Do not try to close a deep, punctured wound, or think it is

unimportant because it is small and appears healthy. Punctured or torn wounds, especially those which are dirty, or have bits of contaminated matter forced into them, require immediate medical attention.

2.—If there is even a remote possibility that you could have been infected by the tetanus germ, make it your business to get an injection of anti-tetanus serum. This should be done as a precautionary measure even when immunisation has been given previously. Most probably your doctor will suggest it; if he does not, be sure to ask whether or not he thinks it necessary.

3.—If any of the symptoms of tetanus develop, do not waste a moment in getting medical attention. Large doses of anti-tetanus serum may save your life. Even a few hours delay can make all the difference.—*Queensland Health Education Council.*

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## Best Recipe of the Month

### MELON CHUTNEY

5 pounds of melon	3 pounds of onions	1 pint of vinegar
2 tablespoons of salt	1 pound of light brown sugar	
1 pound of raisins	1 bag of spice	
1 level tablespoon tumeric	1 tablespoon of curry	
1 tablespoon of flour	1 teaspoon of pepper	

Prepare the melon and pass it through a mincer together with the onions. Place the melon, onions, vinegar, salt, sugar, raisins and spices in a pan, bring to the boil and boil slowly for two hours. Then mix the dry ingredients to a thin paste with a little extra vinegar, add this to the contents of the pan, bring to the boil, stirring all the time. Simmer for half an hour. Bottle and seal while hot.

# The Things That Make A Leader

By J. PARK,  
State Organiser,  
Junior Farmers.

**I**N military organisations, where a good deal of research into the subject of leadership was carried out during the last war, great importance is necessarily attached to the selection of leaders. This should be, but is not always, the same in civil life. In times of peace, many good projects fail because they do not have the right kind of leaders to see them through.

There is a great need today for what might be called minor leaders, men and women who can organise and administer activities in a local or community sphere. Indeed, it might not be incorrect to say that the whole structure of modern life depends upon the ability of certain types of men and women to organise, inspire and lead the great mass of people who are waiting to be led.

Leadership is a problem deriving from social psychology and is a product of the behaviour of groups. The first studies in this field were made with animal groups. It is well known that the leadership tendencies of certain animals are clearly demonstrated. With animals the leader is generally the most massive, the toughest and the most aggressive in the herd. (Exceptions to this rule can, of course, always be found.)

To maintain his position as leader he must constantly do battle with the youngsters of the herd who, from time to time, challenge his place in the leadership hierarchy.

The same sort of thing occurs in human groups, particularly among primitive peoples, where the young challenge the old to do battle. In the more civilized communities the clash frequently occurs between the personalities of the young and the old.

The reason why the young so often break away from and trample down tradition is that they react against the impositions of older leaders, and they reject the rules which have been laid down by the elders for the social conduct of the whole group.

Various classifications of leadership have been made; the one given here is made by Bartlett in his book "Psychology and the Soldier". In it he distinguishes three main types of leaders:

## 1. The Institutional Leader—

This type has authority because of the tradition and prestige which a certain institutional type of organisation gives him. An example would be the cartoon character, "Colonel Blimp," who was created as a caricature of the military leader



who, through seniority, attained a high rank, and who was able to wield authority because of the prestige of his rank and the discipline of the military organisation behind him.

His type can usually attain a certain measure of success because of these things alone, apart from any claim to leadership which his personality might give him. This type could of course be a "born" leader, but in the example given and in most other cases he is a product of a particular type of training.

Such a leader will tend to hold himself aloof from his subordinates, needs to be punctilious about details of procedure, somewhat severe in discipline, and to hold rather rigidly to the traditional orders of his organisation.

Today such leaders are probably difficult to find in our military forces, and in voluntary organisations it would be rare to find one such as he attaining any real measure of success. He should not exist in a true democracy, but unfortunately his type may still be found in some of our communities where, through lack of interest, apathy or forbearance on the part of other members he is allowed to carry on.

In youth organisations or youth movements he should certainly not exist.

**2. The Born Leader or Dominant Type**—He is the one whose self-assertion is primarily responsible for bringing him to the fore. But self-assertion alone does not make a leader. We all know the objectionable type of person who wants to "run" everything and everybody despite the opposition of members of the group. The difference between such a person and the "dominant" type of leader is that

the latter combines with his assertiveness such qualities as a capacity for swift action and a willingness to do what he expects others to do.

Such a leader is usually eager to bring about radical changes and to initiate new movements. Often he will blunder in his decisions and he needs the intelligence to profit by and rectify his mistakes. He needs to have complete knowledge of his subject and skill in its performance.

There is a real danger that leaders of this type will become domineering and tend to override others unthinkingly. As a rule leaders of this type have great natural gifts, and they tend to specialise and become expert in some particular field.

**3. The Persuasive Type**—This leader is very often "behind the scenes" as it were, and is responsible for the smooth running and administration of the organisation with which he is associated. He is a far more complex and subtle person than the "dominant" type, and possesses to a greater degree the capacity for knowing or predicting what people will think, feel or do under certain circumstances.

He is thus able to keep ahead of the group, and formulate for them lines of action which will be in accordance with their own desires.

Such a leader will make full use of the quality of "suggestibility" and can take his group where he wants. He possesses a deep understanding of human nature rather than of his particular subject. Note that in this, too, he differs from the "dominant" type.

But to utilize his natural capacity for handling people, to be truly successful, he needs to be alert,

intellectual, and must be able to mix with those he wishes to influence. It should be realised that this leader's power of interpretation, that is, his ability to know and predict the thoughts, feelings and actions of others, improves by the exercising of it in practical situations.

Despite this attempt at classification, it should not be expected that any person will fit neatly into one of the groups. There will be a considerable amount of overlapping. A person who by force of personality comes to the fore in a social group may hold his place by possessing some of the characteristics attributed to the third type. For instance he might have a very good understanding of his fellow creatures.

Summing up, it can be said that if a leader has a well-developed personality, is enthusiastic, competent, interested in those he is leading, able to be one of them, yet retain dignity, and is absolutely impartial, he or she has a very good chance of handling successfully the group which requires to be led.

### Hints for Club Members

Has your club planned its Field Day for this year? If not, it is suggested that a sub-committee be appointed to go into the matter at once. Confer with your local Agriculture and Stock office and find out how your club might best assist Departmental officers in their job of bringing recommended practices before the notice of farmers.

*A few shillings may save you pounds*

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