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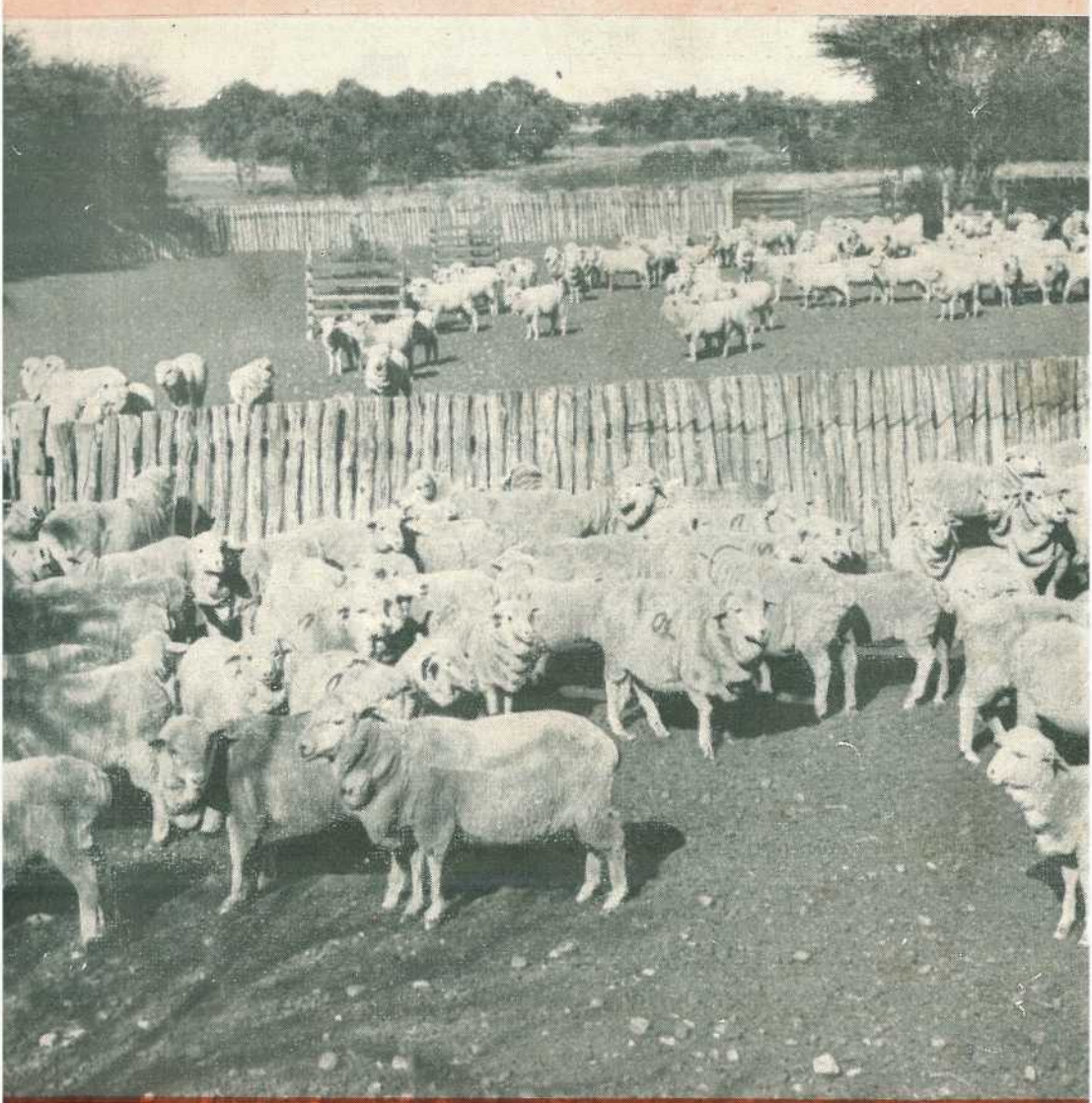

STUD EWES AND WELL-CONDITIONED WEANERS IN CENTRAL-WESTERN QUEENSLAND.

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Big Milk Output From Historic Dairy Farm

By W. D. MITCHELL,
Dairy Technologist.

A property which in 1912 was one of the major suppliers of milk to Brisbane is, today, under new management, still providing milk to this expanding city market. This farm on the banks of the Brisbane River at Wacol, only 12 miles from the city, has a rich historical association with development of the State and the dairying industry of the district.

Under the management of Mr. R. M. Hurley, summer milk production from the 117 acres of the farm has increased from a daily output of 40 gal. in 1956 to a winter production of 80 to 100 gal. daily in June, 1959. Only milk is supplied from this farm, 68 gal. being paid for at ruling market milk prices, the remainder being sold as manufacture milk.

At present, farm income is being supplemented with cash crops of pumpkins and potatoes.

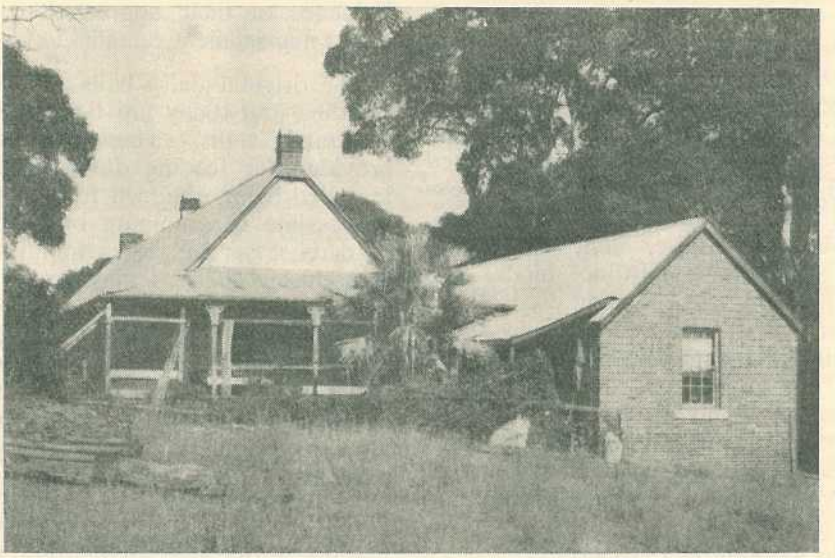


Plate 1

Original Farm Homestead Built in the 1840's on the Banks of the Brisbane River at Wacol, Showing the Hand-Hewn Sandstone Roof Supports. The additional brick wing was added at the turn of the century.

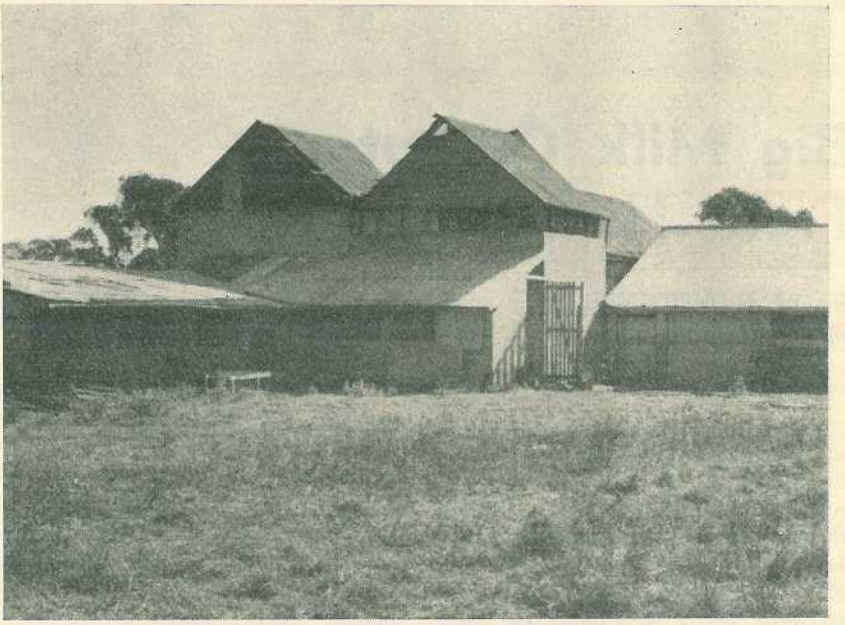


Plate 2

Portion of the Farm Buildings Erected in 1912. The brick pig sties are in the left foreground and the remains of the grain silos in the rear. The right-hand portion shows the present-day feeding stalls.

Dates Back to 1842

The early records of this property date back to 1842 when Dr. Simpson, an early Government official who was to become the first Commissioner for Lands in the Moreton Bay district, was granted 6,000 acres of land from the Government. The original homestead, Wolston House, built by convict labour in sandstone blocks 18 inches square, is being used by the present-day owners. The floor timbers of these original buildings were adzed and the nails handmade. Only in the last year, the men's barracks have been modernised to provide accommodation for Mr. Hurley's son-in-law, who, together with Mr. N. Hurley, assists in working the property.

The major development in dairying took place at the turn of the century when, in 1907, the property was passed to the Grindle family. Evidence of their appreciation of sound management remains today.

The original dairy bails are still standing and today are being used as feeding stalls. These old bails provided for feeding during milking, feed being obtained from three brick silos in adjoining buildings. A derelict set of scales found by Mr. Hurley suggests that feed was being accurately dispensed and the most use made of fodder reserves. This brick and timber building contains four 15,000 gal. underground concrete water storage tanks, no doubt for use for drinking and cleansing purposes. The remaining portion of the buildings comprised holding yards and brick pig sties. The useful portions of these early buildings, including the feeding stalls, are illustrated in Plate 2.

Farm Layout

The total area of the farm comprises 117 acres consisting of 40 acres of rich river flat together with cleared undulating scrub country. At present the area is sub-divided into nine permanent paddocks which provide for cropping with lucerne, oats, potatoes and pumpkins and areas of native grazing pastures. The cultivated area occupies some 36 acres.

To obtain the most favourable feeding value from lucerne and oat crops, the electric fence is extensively used to further sub-divide the river flats during grazing periods.

Herd Management

Since commencing operations in 1956, a gradual alteration in the number and quality of stock has been made. Initially, the herd consisted of 66 Friesian cows which were used primarily to produce vealers for the meat trade, together with small quantities of milk and cream for local sale. To transfer to cream and then milk, Mr. Hurley has gradually changed the composition of the herd through the introduction of a pure bred Jersey bull, several pure bred Jersey and grade A.I.S. cows. A herd of 50-60 cows is now being milked.

To ensure efficient production and to indicate which are the best females from which to breed replacements, the herd is being production recorded under the Grade Herd Recording Scheme of the Department of Agriculture and Stock.

Testing under this scheme was commenced in September, 1958. At the present time, in the initial stages of development, replacement stock have been purchased until sufficient high-producing heifers are bred into the herd.

This practice, however, can be expensive, and with the present high prices obtainable for export beef the owner has found it necessary to buy these cows at abnormally high prices.

This season the first seven heifers mated to the pure bred sire, Trinity Banners Richmond, will come into production. Next season the full programme of providing seven calves each year to ensure five replacements animals will be introduced. To achieve this Mr. Hurley has provided a special bull paddock, and in this manner controls matings.

Feeding

Strict attention is paid to feeding of all milking stock to obtain the best return from the animals.

As the quantity of output receiving the market milk price ("quota" milk) is related to the low production winter months, this attention to high all-the-year production pays dividends. Grain feeding of the herd is provided in the feeding stalls mentioned earlier. The level of feeding is determined on the following basis which has been found to give practical results—

(*a*) *Jersey Cows.* A minimum level of 13-14 lb. of milk a day is set for the introduction of supplementary feeding. Cows achieving this standard are fed at the rate of 2 lb. of crushed grain at each milking, and those below this level are not supplementary fed.

(*b*) *A.I.S. Cows.* With this breed the minimum production level for feeding is 17-18 lb. of milk. Feed with this larger breed is at the rate of 4 lb. of crushed grain to each milking.

The grain used in the last season was crushed milo which was purchased in bulk lots to minimise costs.

The main basis of judging the worth of the milking animals is herd recording information. However, to assist with feeding programmes during the monthly intervals between test periods, a Metrilac Flow Recorder is used to indicate the amount of milk flowing up the milk down-dropper into the sight bowl. Constant reference to the quantities measured on this recorder ensures best use of grain feeding.

Pumpkins have been fed to all milking animals each season. These are sliced and fed in the stalls together with the crushed grain or lucerne hay. An area of 4 acres of Beaudesert Blue variety provided adequate feed during the winter of 1959, a slight surplus being disposed of on the vegetable market. In its role as a bulk crop to back up the supply of dry winter pastures, this carbohydrate food is making a valuable contribution to winter production.

Cropping Programme

To provide ample feed during the milking life of the herd, areas of lucerne and oats have been established. Seventeen acres of lucerne are at present under cultivation on the river flats. This area has been gradually increased from an initial 6 acres in 1957 and present plans are to further increase the acreage to a maximum of 33.

Spray irrigation of lucerne is a regular practice, and during the dry period of May to July each year approximately 280 points are applied every three weeks. Fortunately the salt tolerance of lucerne has meant there is an unlimited supply of water for irrigation.

Being situated on the Brisbane River, water is pumped directly from the river and only in dry times does the salt content cause concern. To date, however, no detrimental effect has been experienced with lucerne.

Power for pumping is supplied by the tractor and a 12,000 gal. an hour pump used to feed the "monsoon" spray lines used for dispersion of the water. Last season, nine cuts and grazing were obtained from the lucerne area. When adequate natural feed is available on the remainder of the farm, the lucerne is cut and converted to hay for feeding out in the stalls during later months.

Bloat from young lucerne growth has not so far been a problem. To overcome this hazard, however, cows are grazed in the following pattern—Grazing for 10 minutes on the lucerne area, then removal to native pastures for 3 to 4 hours; return to the lucerne for a further 15 minutes, and then returned to the native pastures for a second spell; finally the young lucerne is grazed for a further period of 20 minutes.

Oats also provide a useful supplement during the low production winter period and 15 acres are at present available for grazing. The sowing rate was 45 lb. of Benton and Bovah oats to the acre, plus an additional seeding of 9 lb. of tares or Dun field pea to improve the protein content of the feed. In the winter of 1958, the then 10 acres of oats provided 4 grazings for 30 milking cows using the electric fence to ensure most favourable grazing.

Dairy Buildings

Realising that modern facilities are a valuable aid to top quality production, Mr. Hurley erected new dairy buildings in May, 1958, under the supervision of the local Dairy Officer, Mr. J. Jacobsen, to coincide with the change-over to the supply of market milk. The

bails are constructed of tubular steel and the ideal circumstances provided by these buildings are illustrated in Plate 3. Facilities in the milk room include a 10-gal. hot water boiler, an external 10-gal. wood copper and a 10-can cabinet-type dairy refrigerator with an associated tubular cooler for shock cooling during milking.

In-place cleaning of milking machines using an acid-alkali recirculation technique has ensured satisfactory cleanliness of all metal equipment. The results of random examinations for thermoduric type bacteria in milk supplied from this farm to the Brisbane market indicate that satisfactory results are being obtained with the cleaning methods. Excessive numbers of these bacteria show undesirable deposits of milk stone on equipment.

Sample Date	Thermoduric Bacteria
7–5–58 ..	Greater than 100,000/cc.
22–7–58 ..	Less than 30,000/cc.
13–10–58 ..	Less than 10,000/cc.
12–1–59 ..	Less than 10,000/cc.

(A bacterial count of 30,000/cc. is accepted as a satisfactory standard.)

Measures adopted to control mastitis in the herd have much to recommend them. All udders are washed with a chlorine solution before the machines are attached. The milk from each quarter is checked for visible signs of mastitis, using the strip-cup. Before the cows leave the bails the udder is again washed with a chlorine solution. This is claimed to seal the teat orifice with a chlorine solution to minimise after-infection. When cows dry off, it is the practice to insert a penicillin stick into each teat before putting the cows into the dry paddock.

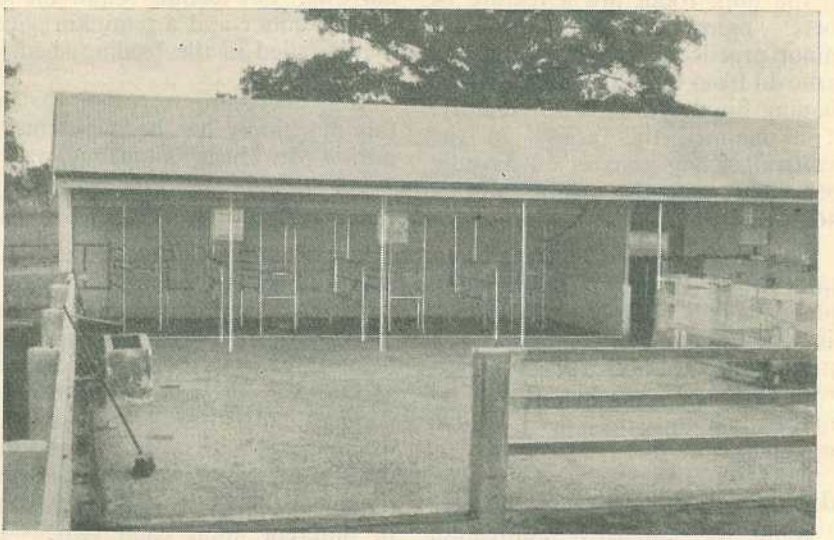


Plate 3

New Dairy Buildings Erected in 1958. Note the ideal appointments of tubular bails, concreted holding yards, provision of a water trough, and easy access to the milk room.

Plate 4

Grade A.I.S. and Jersey Herd Grazing a Regrowth of Irrigated Oats Crop.
Feeding is controlled with an electric fence.

Every effort to reduce contamination of milk to a minimum has been made. Concrete holding yards and stock-free areas adjacent to the milk room are a feature of these premises. An additional minor practice is to stir all milk on removal from the refrigerator before loading for despatch to the factory. It is claimed this assists in the removal of any gaseous off-flavours generated in the milk during storage.

The benefits of these precautions have been realised in the fine quality milk supplied by Mr. Hurley since he commenced market milk production in May, 1958. Apart from an initial few cans affected by mastitis, all milk has been graded top quality at the factory.

Machinery

With the intensive cultivation practised on this property, a full range of farm machinery is necessary with, of course, the tractor the first and foremost item. Additional equipment includes a chisel plough, a disc plough, a bush and bog, a spring tooth cultivator, a power mower and diamond harrows. For feeding requirements, a chaff cutter and a pumpkin slicer are installed in the feeding shed.

It is interesting to realise that all this machinery has been purchased during Mr. Hurley's tenancy.

Other Income

Potatoes have proved a valuable supplement to the main income from dairy produce. Two crops are grown each year, Sebago and Sequoia varieties being planted, the second variety being used for the summer crop. Last year an area of 2½ acres was cropped and production averaging 6 tons to the acre obtained. Care is taken to plant in different areas each year. To assist with harvesting, a home-designed potato digger suitable for drawing behind the tractor has been made.

Future Plans

The three years of progress achieved on this farm have been in the form of development and consolidation in an attempt to provide sufficient income from dairy produce to support three families. Major expenditure in developmental work has been completed and the owners anticipate a financial profit in the coming season.

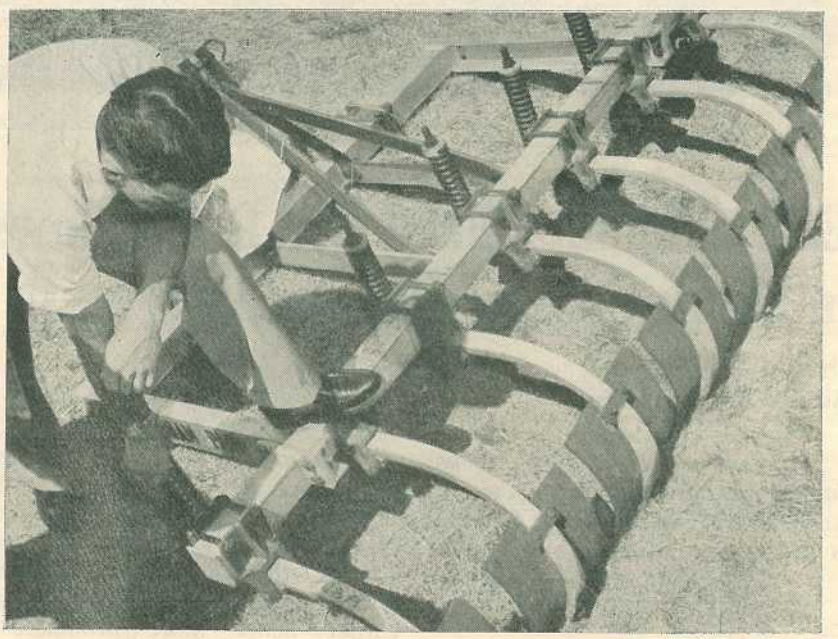
It is the aim of all market milk producers to possess large milk quotas and in this regard Mr. Hurley will endeavour to maintain the daily winter milk production in the vicinity of 100 gal. He considers this can be achieved by having each cow average a production of 2½ gal. daily. With this guarantee of a consistently large volume of good quality milk, quota supplies have been increased from 20 gal. in 1958 to 68 gal. in October, 1959.

As from this year, all herd replacements will be bred on the farm to eliminate the guesswork in purchasing replacements where no production records are available.

The planned increase in the acreage of lucerne should make it possible to provide all stock with home-grown feed and thus minimise the expenditure necessary to purchase supplementary feed to ensure top production.

This farmer's progress and his confidence in the future of the dairying industry deserve success. If the next three years' operations on this property meet with the same results as the developments which have occurred since 1956, the plans of the owner should be achieved.

To Rake Sticks



Plough Used As Stick Rake. This gadget, made by Mr. R. Eley, of The Gums, attracted a lot of attention at the Toowoomba Farmers' Festival. It consists of steel plates curved to fit the shanks of a chisel plough. The spring release safeguards against damage by rocks and stumps when the implement is used to rake sticks into windrows and heaps.

Plate 1: **A Crop of Poona Cowpea and White Panicum being Grazed**

Early Summer Feed For Dairy Cows in South Coastal Queensland

By N. J. DOUGLAS,
Adviser in Agriculture.

Here are some suggested crops that should provide early summer feed in the coastal dairy districts of south Queensland:

Each year in the coastal dairying districts of south-eastern Queensland, there is a demand for summer-growing annual crops which can be grazed to provide supplementary feed during the late spring and early summer months. Usually these crops are grown under rainfall conditions but, earlier—hence more profitable—grazing is obtained if these crops

can be started under irrigation. It may take only one 2-in. application of water to keep the crop growing from one storm to the next. If continuous growth can be maintained, high quality grazing is available when it is most needed.

A wide range of soil types is represented in the districts under discussion. Most will grow a good grazing crop, providing land preparation is adequate and fertilizer is applied at planting time. With the exception of alluvial country, a nitrogen-phosphate fertilizer in the ratio of 1:2 applied at the rate of 2 cwt. to the acre will result in greatly increased yields.

Cowpea-White Panicum Mixture

A mixture of Poona cowpea and white panicum has been the most popular of all the summer grazing crops. In recent years, Poona cowpea has become susceptible to a stem rot disease. However, new strains of cowpeas with specific resistance to the disease should be available shortly. A sowing mixture of 25 lb. of cowpea and 10 lb. of white panicum to the acre can be broadcast and harrowed in after the first good storm rains.

In all instances, it is advisable to treat the cowpea seed with inoculum which can be obtained

Plate 2

A Close Up of a Well-Grown Crop of White Panicum and Poona Cowpea that is Ready for Grazing.

free of cost from the Department of Agriculture and Stock at Brisbane, Cooroy and Gympie.

This mixture is an excellent crop to condition ground before planting clover/ryegrass pastures, particularly in areas where mat grass and/or couch grass are a problem.

White Panicum and Japanese Millet

Areas of straight white panicum or Japanese millet make very useful grazing. The broadcast sowing rate is 20 lb. to the acre. A nitrogen-phosphate fertilizer markedly increases the amount of grazing. Growth of these crops is rapid, particularly Japanese millet, which can often be grazed 4 to 6 weeks after planting when weather conditions are favourable for growth.

General observations taken in the field indicate that the cowpea/white panicum mixture is a better overall proposition than the straight millet crops. This is because the cowpeas help to maintain or increase soil fertility. The residual effect of the legume is often reflected in a succeeding crop of oats. The extra vigour and colour of oats sown on land which has been precropped with cowpeas are usually quite discernible.

Sudan Grass

Sudan grass is widely grown throughout the coastal district for grazing purposes. It is a robust grower, resistant to dry conditions. It may be planted as a straight crop but a mixture of cowpea and sudan grass is preferable.

The sweet sudan variety has been selected for its free-stooling habit, leafiness and palatability and has largely replaced the old strains of sudan grass. It is usually sown broadcast at the rate of 14-15 lb. to the acre. A nitrogen-phosphate fertilizer will increase the yields obtained from this crop. The grass makes rapid recovery after grazing, and several grazings may be obtained during the season.

While the grass is commonly grazed at all stages of growth, occasionally stock losses are experienced. Once the plant has reached the flowering stage, all danger of poisoning is past. It is recommended that even with sweet sudan, all customary precautions should be taken to prevent prussic acid poisoning.

Velvet Bean

Since the appearance of stem rot disease in cowpeas, velvet beans have been grown as a grazing crop in areas where this disease was prevalent. Velvet beans are primarily a green manure crop. It is 4 to 6 months before the pods commence to ripen, whereas, the cowpeas reach this stage within three months.

As a grazing crop, velvet bean will easily outyield any cowpea and its long growing period will allow it to carry well into the cooler months. Therefore it will provide valuable grazing during the period when, normally, the quality of the pastures is declining.

Velvet beans are broadcast at the rate of at least 30 lb. of seed to the acre. If planted in drills, 4 to 5 ft. apart, approximately 10 lb. of seed to the acre is sufficient. They should be planted with the first spring rains.

Maize may also be sown with velvet beans. If this is done, the usual method adopted is to sow two rows of maize 3 ft. apart, to one row of velvet bean sown at the same time or up to six weeks later than the maize.

Plate 3

A Close Up of a Sweet Sudan/Poona Cowpea Mixture that is Ready for Grazing

Again, it is recommended that the legume seed be inoculated before planting. For maximum yield, early, light and intermittent grazing should be practised.

When to graze

Grazing of annual crops such as white panicum and Japanese millet should not be delayed until seed heads are formed, as much of the regrowth potential of the crops is lost. The aim therefore, is to commence grazing when the height of the crop is 12 to 15 in.

Strip grazing should be practised when possible. This system of grazing enables fullest utilization of the crop. It is particularly suited to small areas where available feed has to be rationed.

Often, at the first grazing of a mixture containing these legumes, dairy stock tend to ignore the legume. However, they soon develop a taste for cowpea or velvet bean and will eat these crops readily.

Hay and Silage

The crops mentioned are suitable for both hay and silage. Provided hay-making can be carried out before the wet season, a valuable reserve of good quality hay may be stored for future dry springs and droughts.

"See How It Works?"

At the Toowoomba Farmers' Festival, Mesdames A. B. and B. J. Behrendorff, of Bonjeen, inspect Mr. K. M. Trease's entry in the farm gadget competition. It is a tractor-driven grain crusher which bags the crushed grain and also chaffs hay. It has a capacity of ½ ton of grain an hour.

Bucket And Bail

Save Money on Cream Cans.— Careful handling, right from the time they come brand new from the store, will prolong the useful life of milk and cream cans. Neglected or roughly treated, they will quickly deteriorate and become unsuitable for carrying dairy produce.

Whether your replacement costs are heavy or light lies largely in your own hands.

From the time you start using them, the cans are exposed to attacks by acid milk and cream and by washing solutions. The action of these substances gradually destroys the thin layer of tin on the cans. The steel is then exposed and rusting will commence. Unchecked, rust will quickly eat right through a can, making the re-tinning more expensive.

Exposed steel in a can imparts a tallowy and oxidised flavour to milk and cream. This flavour cannot be removed during butter-making, and the cream has to be down-graded.

To prolong the life of cans, these precautions are suggested:

1. Wash your cans thoroughly and sterilize them with boiling water or steam. Stand them upright until the steam has escaped and the can has dried; then turn them upside-down on a dust-free storage rack. If possible, always wash up in rain water.

2. Use cleansers at the correct strength, and use stiff bristle brushes. Never use steel wool or metal fabric, as these quickly cut off the tinning.

3. Rinse the cans with the chlorine solution (at the correct strength) only a few minutes before use. Never rinse with a chlorine solution after washing up.

4. Inspect the cream stirrer for sharp edges. Use the stirrer by plunging it up and down in the can; don't roll it around the sides of the can.

5. If cans are not being used for long periods, wipe them over with an oily rag and store in a clean, dry place. Wash thoroughly and air before use.

—N. E. FOWLER,
Dairy Officer.

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 vaccum 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 inflations. 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.

A Culling Necessity.—The present high price of cattle for tinning offers dairy farmers a profitable avenue for the disposal of culls. Most farmers are taking advantage of the high price and are getting rid of their unwanted cows. But there is one thing which is causing concern to the dairying industry—are farmers sure that they are not selling their profitable cows?

If a man is production-recording his herd he knows which cows to sell. But what of the farmers who are not recording? They could be selling their highest producing animals.

What a tragedy it would be if a farmer culled his herd without production records, and later on found that he is left with cows of below average production.

Why run this risk when for a small outlay you can record your cows and be sure that you are disposing of the unprofitable ones.

—S. E. PEGG,
Chief Adviser, Herd Recording Section.

Plan Now For November

Mate cows now to ensure seasonal calving.

Milk and cream should be cooled to preserve quality.

Change the separator oil.

Check your milking machines for milkstone.

Plant summer crops.

100 Years of Queensland Dairying—II.

Progress With Breeds And Production

By E. B. RICE,
Director of Dairying.

The system of herd-book registration of dairy cattle began in this State with the foundation of the Queensland Dairy Herd Book Society, the first such society in Australia, in 1900. It catered for all dairy breeds and in its first volume issued in 1900 there were registered 34 bulls and 69 cows of the Jersey breed, 12 bulls and 49 cows of the Ayrshire breed, 1 bull and 1 cow of the Guernsey breed, 1 bull and 1 cow of the Holstein breed.

A Jersey Cattle Society was formed in Queensland in November, 1906, and issued its first herd book in 1907 in which were also included all Jersey cattle previously recorded in the Jersey section of the Queensland Dairy Herd Book. The total Jersey registrations then were 157 bulls and 378 cows. A reference to an advanced register of dairy stock is found in volume 8 of the Society's herd book issued in 1918. Testing of cows for entry to this register commenced in 1916. The requirements for entry were for cows under 3 years to produce in 48 hours at least 2 lb. commercial butter, cows under 4 years 2½ lb. and cows over 4 years 3 lb. A bull was eligible for A.R. rating if four of his daughters had so qualified. The cows were tested by officers of the Department of Agriculture and Stock.

The Ayrshire Cattle Society of Queensland, which was founded in 1912, issued its first herd book in 1915. There were 321 bulls and 758 cows in this first volume. This Society believed it was the first Australian herd book to contain an advanced register, provision for which was made in August, 1914. For entry to this register a cow had to produce 2 lb. butter in 2 days if under four years of age and 2½ lb. if over four. A bull which had sired four A.R. cows qualified for the register.

The Holstein-Friesian Cattle Club of Australia, which was formed at a meeting held in Toowoomba in April, 1914, published its first herd book in 1917. The Society's name was changed in August, 1918, to the Friesian Cattle Club of Australia. The first herd book contained 28 bulls, 23 of which were in Queensland, and five in New South Wales. There were 143 cows, of which 94 were in New South Wales, 48 in Queensland and one in South Australia. This herd book also contained four appendices (which were closed on 30th April, 1919) in which were 34 cows. Female progeny of these cows if sired by a registered bull were subsequently entered in the herd book, the number of upgradings by a purebred sire depending

on the section of the appendix in which the cow was entered.

The advanced register is referred to in Volumes 1 and 2 of this Society's herd book published in 1920. The minimum yield to entitle a cow to advanced register entry was 3½ lb. commercial butter in 48 hours for a cow five years or older, an allowance of .01 lb. being made for every 7 days under 5 years, with a minimum yield of 2 lb. for the 48 hours.

The foundation volume of the Illawarra Dairy Cattle Association of Queensland was published in 1918. There were 29 bulls and 559 cows entered in this volume. A condition of entry in this Society's herd book was that a cow must pass a butterfat test on the following standards:—

2 permanent teeth, 2 to 2½ years, 7 lb. a week.

2 to 4 permanent teeth, 2½ to 3 years, 8 lb. week.

4 to 6 permanent teeth, 3 to 4 years, 9 lb. week.

Full mouth, over 4 years, 10 lb. week.

The weekly yield was calculated on a 48 hours' test by an officer of the Department of Agriculture and Stock.

A bull was eligible for registration if four of his daughters had qualified for registration.

An Advanced Register was begun in January, 1918. The qualification for entry of cows was that they had been tested twice (48 hours' test) during a lactation period and had produced the following calculated yields of commercial butter in 7 days:—

Age	After Freshening	Not less than Six months after Calving in the Same Lactation Period
	lb.	lb.
2 to 2½ years ..	11	6
2½ to 3 years ..	12	7
3 to 4 years ..	13	8
Over 4 years ..	14	9

If four of his daughters had qualified for the Advanced Register, a bull was also eligible for this rating.

There were at least two purebred Guernsey cattle in Queensland in 1900, as Volume 1 of the Queensland Herd Book Society contains the names of one bull and one cow of this breed, both being owned by the Agricultural College at Gatton. A Queensland branch of the Guernsey Cattle Society was not formed until 1928. However, in Volume 5 of the Herd Book of the Australian Society, issued in 1923, there were the names of three Queensland breeders who owned three bulls and 28 cows which were in the register.

Table 1 gives the membership of Dairy Cattle Breed Societies in May, 1959, and the herds recorded under the Purebred Recording Scheme. It will be seen that only 10 per cent. of registered stud breeders have their herd production recorded.

Progress in Farm Practices

The standards of dairy buildings and of hygiene were causing concern at the beginning of the present century. There was stated to be a need for instruction and legislation

TABLE 1

MEMBERSHIP OF BREED SOCIETIES
MAY, 1959

Herd Book Society	Membership	Herds Tested	Percentage
A.I.S. ..	390	48	12
Ayrshire ..	46	5	11
Friesian ..	60	12	20
Guernsey	86	12	14
Jersey ..	580	43	7
Total	1,162	120	10

to overcome the ignorance and carelessness which were evident in production methods on dairy farms.

What appear to have been the first model dairy farms in the State were at Talgai West. The Scottish Investment Company had five dairy farms on its property, four of which were occupied by tenants on a share-farming system. There was a total of 410 cows on the farms. The farming practices there in 1901 were in strong contrast with the general methods of the times. The cowsheds had concrete floors and were effectively drained, milk was cooled and strained, the dairy utensils were steamed and there was an adequate supply of water, pumped from a windmill, at the shed. Fodder crops were grown for the herd to supplement the paddock grazing of the indigenous grasses and silage was made from maize. These farms would almost certainly have been the first in Queensland on which systematic records of production of cows were kept. Daily milk yields were recorded of all cows and butterfat tests were also made at intervals. The production records were used for breeding and culling.

The invention of the milking machine and its possibilities were mentioned in 1904, but it was only in the 1920's that real headway was made in installation on farms. Machine-milking made rapid progress after 1945, and in 1957 there were 16,482 milking units (sets of teatcups), installed on Queensland farms. In some of the major dairying districts, 98 per cent. of the cows are now milked by machine.

The inadequacy of fodder reserves on dairy farms and the desirability for more attention to fodder conservation has been pointed out from time to time in various reports right from the latter years of the last century. This has often been highlighted by quoting the ravages of the periodically recurring droughts. It was estimated that the 1915 drought caused losses of £2,316,000, of which £1,356,000 was due to decreased quantities of dairy products and £960,000 was through stock losses. Butter production in 1927-28 was 19 per cent. below that of the preceding year, and in 1936-37 it was also 25 per cent. lower than in 1935-36. In the 1946-47 drought, the estimated losses were £2,500,000 for dairy products and £1,000,000 for stock and in 1951-52 they were £10,G00,000 and £5,000,000, respectively.

Grade herd recording began in Queensland in 1910, but for some years farmers' herds were only recorded when an officer was in their particular district. Many herds in these years would have been recorded only once during a lactation. The system was known as the farmer's-sample system, whereby the farmer weighed and sampled the milk from each cow in his herd during the four milkings in two days and took the samples of milk to an officer who visited the district to carry out the butterfat tests. In 1925, the rules governing herd recording were altered to require a

farmer to have at least four tests made at approximately two-monthly intervals during a lactation period. He weighed and sampled the milk of each cow during the 24 hours' test periods, and the fat tests were done in the Brisbane testing room or at factories. All records were compiled for the farmer by the Department.

The group herd recording scheme under which a herd tester is appointed to visit each farm in a group of 20 once monthly to weigh, sample and test the fat content of each cow in the herd was inaugurated in 1948. From eight groups in 1948, the numbers were extended to 83 groups in 1958.

Testing of purebred dairy cattle for a 273 days' lactation period was commenced in Queensland in 1921, but owners then entered only selected cows. Five tests, each over a 24 hours' period, were made in a lactation, the animal being stripped out under the supervision of the Departmental testing officer at the milking preceding each test.

From 1st July, 1923, the official Registered Purebred Dairy Cattle Production Recording Scheme commenced. In a stud herd entered under this scheme, at least 25 per cent. of the registered purebred cows were required to be submitted for testing. The prescribed production standards for entry to the advanced register of Dairy Cattle Breed Societies ranged from 200 lb. for junior two-year-olds to 350 lb. for mature cows, the increments being of 25 lb. for each increase of six months of age. From 1st July, 1930, the junior two-year-old standard was lifted to 230 lb., and the other age standards remained as before, but the increments then became 20 lb. for each successive age group.

In 1948, the rules of the Department of Agriculture and Stock were amended to require not less than one-third of the registered purebred cows in a herd, including all cows during their first lactation, to be recorded. This was to enable sire surveys to be made. From 1st July, 1958, all registered cows were required to be recorded in every herd entered under this scheme.

The appointment of a Pasture Improvement Committee in 1930 was indicative of an awakening of interest in the need for improved pasture management in dairying districts.

Refrigeration for cooling and holding cream on farms was pioneered in the Roma district in 1936 due to the initiative of Mr. R. S. Beresford, Manager of the Roma Co-operative Dairy Association. By 1941, there were about 100 refrigerators in dairy sheds in various parts of South Queensland, mainly in the Roma district. The Queensland Butter Marketing Board commenced to make farm refrigerators in 1946 and due to an arrangement with the Agricultural Bank for their purchase by farmers on a low deposit and monthly instalments deductable from the farmer's pay cheque from the factory he supplied, farm refrigeration then made steady progress. This year there were 2,500 farm refrigerators in the State.

In 1939, steam sterilization for milking machines and farm dairy utensils was introduced, the initial installations of low-pressure steam sterilizers being made on a number of farms on the Darling Downs. However, as electricity began to be reticulated rather extensively in rural areas after 1945, farmers generally preferred to install electric

hot water boilers, which were more convenient than the steam sterilizers which depended on wood or kerosene fuel.

A dairy shed, known as the combined dairy building, was designed in 1939 to enable all milking shed operations and storage of milk and cream to be done in a single building. Previously, the milk and cream were required to be stored and the utensils washed and kept between milkings in a dairy at least 30 ft. away from the milking shed. The extension of machine-milking, and refrigeration, necessitated all operations being centralised in one dairy building.

The Queensland Dairymen's Organisation, which was formed as an organisation to represent the views of Queensland dairy farmers before Governments and so on, started as a voluntary organisation in April, 1940, and in 1946 was given statutory authority under the Primary Producers' Organisation and Marketing Acts.

Some important developments in dairy farming in Queensland took place in the years after the 1939-45 war. The reticulation of electricity to rural areas led to its rapid use in dairy sheds for motive power and heating water supplies; there are now 5,635 electric water heaters in dairy sheds, whereas their numbers were negligible in 1939. Machine-stripping of cows began to displace hand-stripping, about 30 per cent. of farmers having ceased to hand-strip by 1958. Interest in dryland pasture improvement and management has now become widespread through the dairying districts, and irrigated pastures, which scarcely existed in dairying districts in 1945, are being established at a rapidly increasing rate on farms where irrigation is practicable.

The buckrake and forage harvester are leading to a growing adoption of silage-making, and the chisel plough is assisting in the establishment of improved pastures. Advances in earth-moving machinery are creating interest in water-harvesting, although only a few farms have so far adopted this method of conserving water for irrigation of pastures or fodder crops. Artificial breeding schemes are in operation in the Nambour and Atherton Tableland districts.

Progress and Statistics

The statistics in Table 2 show the development of the Queensland dairy industry since the beginning of this century:—

TABLE 2

Year	Dairy Cattle	Total Milk Production (000 gals.)	Butter (000 lb.)	Cheese (000 lb.)	Condensed Milk (000 lb.)
1900–01	136,000	23,825*	9,742	2,437	..
1910–11	357,095	71,770	27,859	3,718	6,228
1920–21	554,208	151,081	60,923	15,201	15,169
1930–31	775,301	224,085	95,719	13,648	..
1940–41	1,446,731	279,267	119,940	11,733	..
1950–51	1,440,198	278,111	106,281	19,430	..
1957–58	1,269,969	207,753	72,308	11,590	(drought year)

* Milk used in butter and cheese only.

In 1902, the investment in dairy factories was stated to be £51,000 on machinery and plant and £48,000 on land and premises. In 1905, the dairying industry was making the most progress of all sections of Queensland agriculture. By 1920 the capitalised value of dairy products produced in Queensland was estimated to be between £7,000,000 and £8,000,000. The peak values were recorded in 1952-53, when the estimated total value of milk for consumption (ex farm), milk products (ex factory), and by-products (for animal feeding) was £36,000,000.

Capital investment in the dairy industry was estimated to be £35,000,000 in 1930.

A rapid expansion phase of dairying in Queensland was between 1927 and 1937, when the total number of dairy cattle rose by nearly 50 per cent. Several new areas which had been opened for dairying just before, and during, this decade, and the collapse of prices for other primary products, which was even more severe than for dairy products during the depression years of the 1930's were responsible for this expansion.

The record year for total milk production and butter was 1938-39, when 347,000,000 gal. of milk and 154,378,000 lb. of butter were produced. The average milk yield of 361 gal. per cow was also the highest ever attained. However, the record year for the dairy cattle population was not until 1943, when 1,574,000 dairy cattle were in Queensland. Cheese production reached its highest level of 28,501,000 lb. in 1942-43. The special request of the British Government during wartime resulted in a temporary changeover to supplying milk for cheese factories by many former cream suppliers whose farms were conveniently situated for assisting to expand cheese production.

In 1952-53, butter production (ex factory) reached the highest monetary value recorded of £23,672,000 of which £4,166,000 was Commonwealth Government subsidy.

Cheese production also attained its record monetary value of £2,378,000, including £269,000 as subsidy, in 1952-53. Capital investment in the industry in 1958 was estimated to be £200,000,000.

[TO BE CONTINUED]

Spear Grass For Hay

"R.B.", of Bowen, has inquired about the suitability of spear grass for hay production.

Answer: It is generally considered that pure stands of spear grass are not particularly good for hay production. In a native pasture mixture, however, a small percentage of spear grass is permissible. This will not spoil the quality of hay produced, provided the mixture is cut in the very early flowering stage of the spear grass. Spear grass loses protein content rapidly after flowering and at the same time there is a considerable increase in the crude fibre percentage.

A Maternity Paddock For The Calving Cow

By S. G. KNOTT,
Divisional Veterinary Officer.

GOOD dairy cattle have regularly been bringing high prices and you can't afford to be careless with cattle, especially when they are worth so much.

Yet some people are unwittingly careless with their cows at calving time, even allowing them to calve in a dry paddock.

It is suggested that you might have a special maternity paddock near the house, where you and your family can keep constant supervision over the cows just before and immediately after calving.

In this way you can quickly tell if your cow is developing trouble at calving, and before she becomes

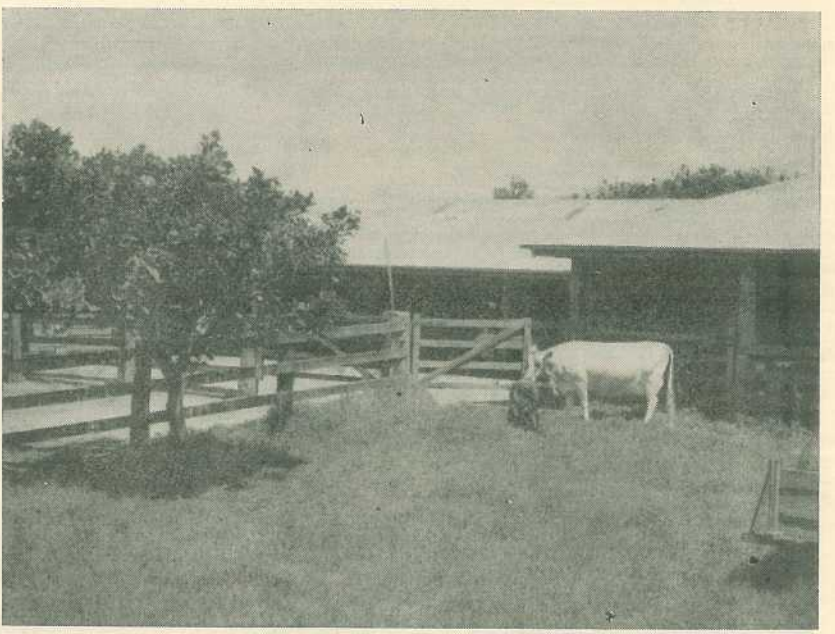


Plate 1

Cow and Calf in a Shady Maternity Paddock. This is situated close to the bails and house for observation.

exhausted and shocked you can call in a veterinary surgeon.

Value of Early Treatment

If a calving cow receives early skilled attention followed by proper treatment when trouble first appears, the chances of subsequent infection and toxaemia, injury to the womb and damage to vital nerves are lessened.

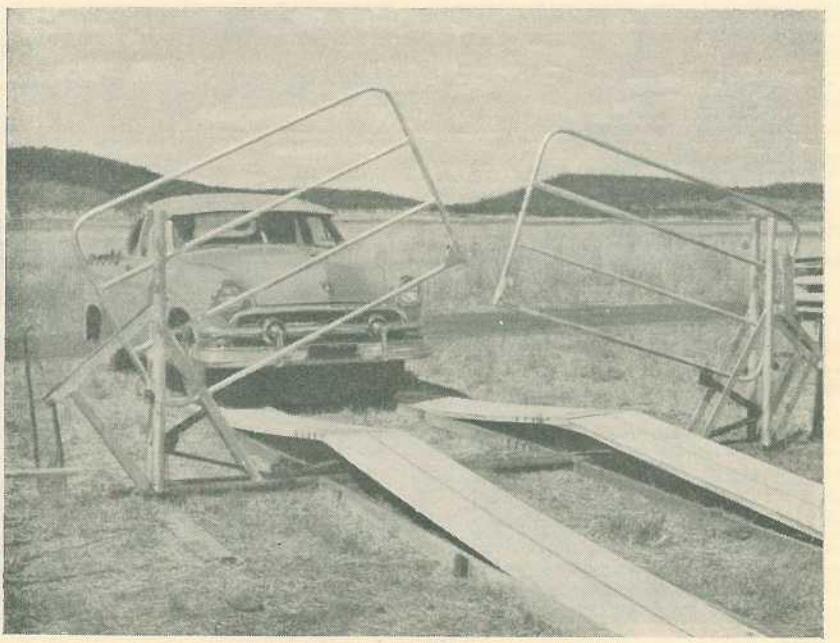
But early attention is emphasised if a cow is to make a quick recovery and milk to capacity.

Another advantage in keeping these cows close to home is that you can spot milk fever cases early. Early treatment will help prevent complications setting in.

If cows are allowed to become prostrate with milk fever, they run a big chance of inhaling regurgitated ruminal fluids into their lungs. Such cases may develop a pneumonia which usually ends in death. Keeping them handy can help to prevent this happening.

Cows lost at calving time represent a severe economic loss, but most of this can be avoided by putting them in a maternity paddock where they can be watched.

A Farmer's Ingenuity



Another Popular Gadget at the Toowoomba Farmers' Festival. These self-opening and self-closing gates were the prize-winning entry of Mr. C. H. Epple, of Goombungee.

Taking The Labour From Grain Feeding

By P. ROUND and K. A. TAYLOR*
Cattle Husbandry Branch.

HAND feeding of dairy cattle can make heavy demands on labour. In order to make better use of the work force, many dairymen aim to feed cows in the milking shed. This is especially so when concentrates are being fed.

In districts where cereals are readily grown, the feeding of some grain for long periods each year is common. The means of doing this vary. Some farmers carry each cow's ration from the feed room to the manger, while others install a feed hopper in the dummy bail.

In most cases the manger has to be filled when the cow is trying to enter the bail.

Where the feed hopper is located above the manger a gravity feeding system is often devised. This usually consists of a flap or valve operated by a lever extending out towards the operator.

There is general agreement that some type of elevated hopper is the most useful one but it poses some problems. The height above ground level calls for much lifting if the hopper is filled from bail floor level.

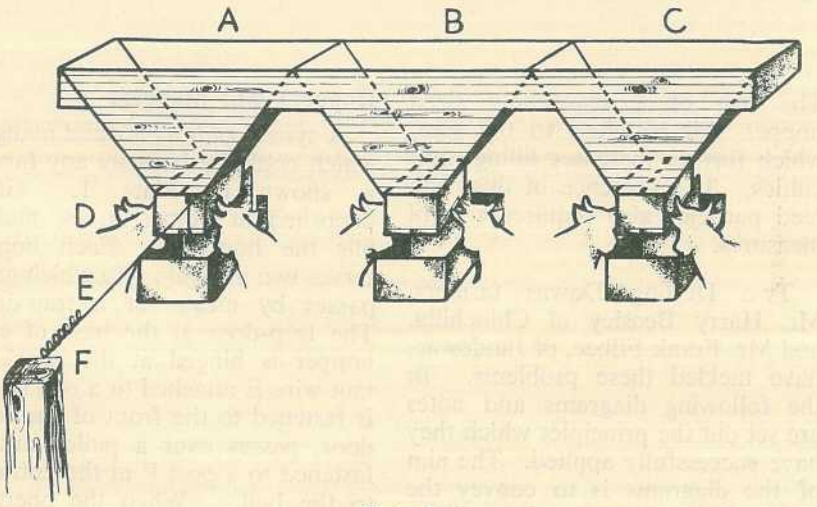


Plate 1
Suitable Hoppers and Mangers in the Bails.

* Mr. Taylor has resigned since this article was written.

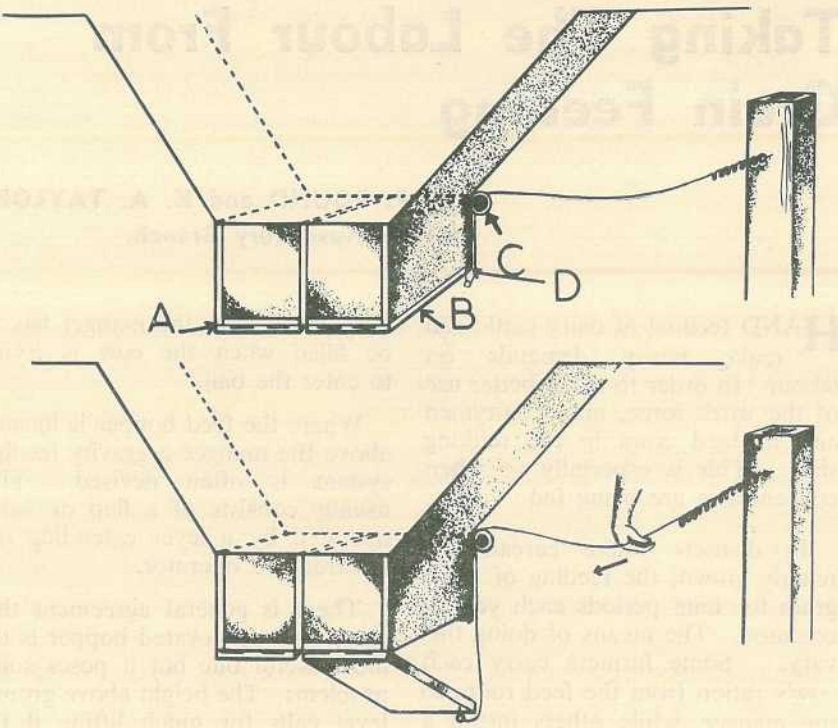


Plate 2

Shut (above) and Open Positions of the Mangers, as Seen from the Rear.

The top of a reasonably sized hopper will be close to the roof, which further increases filling difficulties. The presence of dust and feed particles also requires control measures.

Two Darling Downs farmers, Mr. Harry Beasley of Chinchilla, and Mr. Frank Filbee, of Jandowae, have tackled these problems. In the following diagrams and notes are set out the principles which they have successfully applied. The aim of the diagrams is to convey the general idea of two or three different installations. Interested farmers will be able to adapt the ideas to their own requirements.

Hoppers and Mangers

A system of hoppers and mangers which could be built by any farmer is shown in Plate 1. Grain deposited at points A, B, and C fills the hoppers. Each hopper serves two mangers into which grain passes by means of a trap-door. The trap-door at the base of each hopper is hinged at the rear. A taut wire E attached to a coil spring is fastened to the front of the trap-door, passes over a pulley and is fastened to a post F at the entrance to the bail. When the operator pushes forward on the wire (thus stretching the coil spring) the trap-door opens and grain flows into the

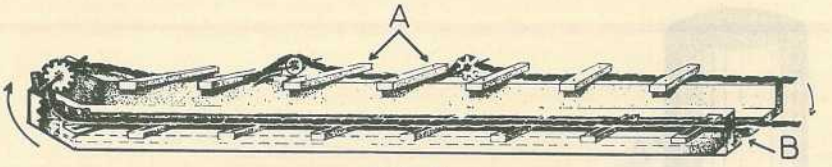


Plate 3

The Section of the Conveyor Belt Above the Hoppers.

manger. When he releases his hand the spring recoils and shuts the trap-door.

More detail of the trap-door as seen from the rear is shown in Plate 2. The top diagram shows the trap-door in the closed position. In the lower illustration the spring is extended and the trap-door open. Note that the hinges are inside the trap-door A and that the front end of the trap-door fits inside the front of the box D. This prevents a cow from opening the door with her muzzle. The pulley C is located in a position which ensures fast closing of the trap-door B.

Filling the Hoppers

The hoppers can be filled by means of a conveyor, shown in Plate 3. This consists simply of a chain belt to which wooden chocks A are attached. The chocks are at right angles to the direction of the run of the conveyor and they move the grain along over a smooth surface. Where the "floor" of the conveyor is above the hoppers it consists of spaced wooden strips B, thus allowing the grain to fall through and fill the hoppers. The wooden strips are placed parallel to the direction of travel of the conveyor.

This conveyor system is installed above the hoppers (Plate 1) and fills hoppers, C, B, and A, in that order.

Crushed grain can be fed onto the conveyor in different ways.

A Complete Layout

One system is shown in Plate 4. Here, grain gravitates from the silo

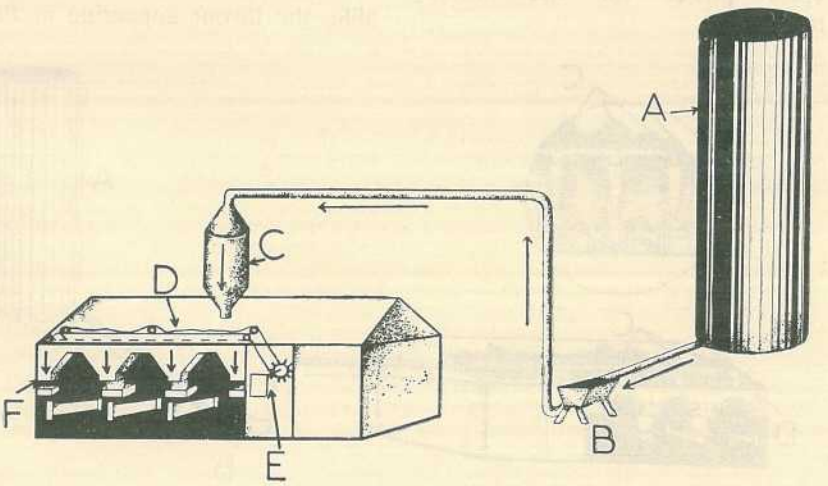


Plate 4

A Diagram of One Type of Complete Layout, Using a Hammer Mill.

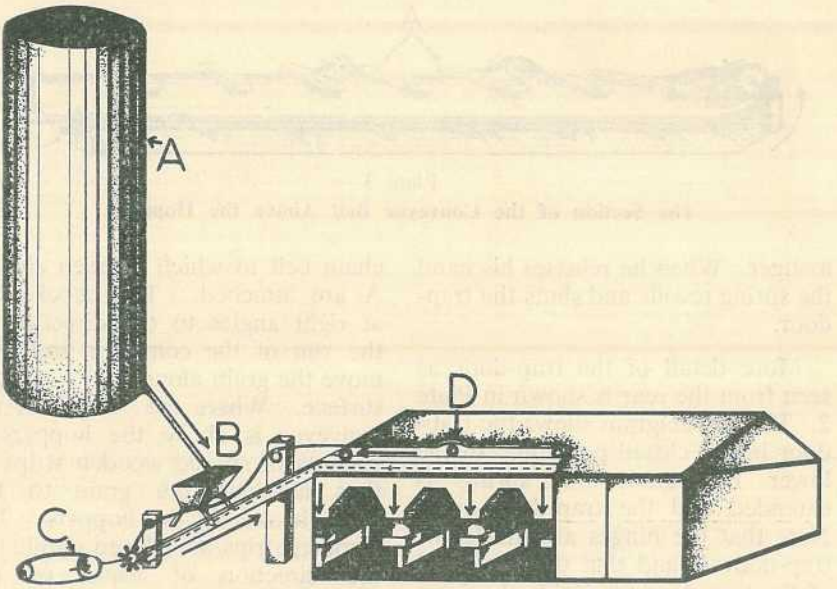


Plate 5

Another Suitable Layout, using a Grinder.

A to a hammer mill B where it is milled and blown into the storage tank at C. This storage tank is fitted into the dairy roof. Grain gravitates from the tank on to the conveyor. In this case the conveyor is driven by the engine which provides power for the milking machines.

A variation of this layout appears in Plate 5. In this case the crushed grain falls from a grinder on to the conveyor which extends out from the end of the shed. The conveyor is driven by an engine or tractor C.

Where a hammer mill is available, the layout appearing in Plate

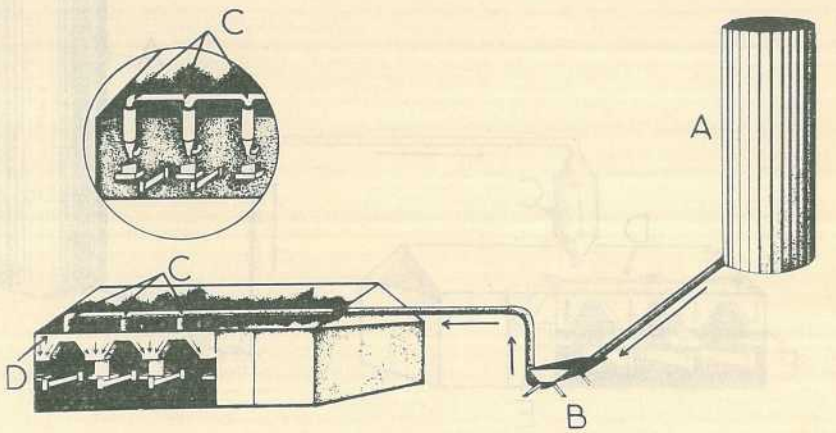


Plate 6

This Layout also Requires a Hammer Mill.

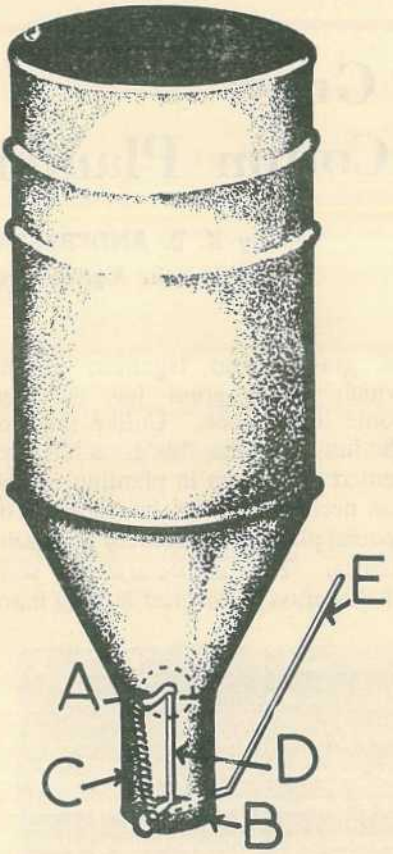


Plate 7

This Hopper Can be Made from a 44-Gallon Drum.

6 may be used. However, additional precautions by way of dust-proofing the hoppers are necessary. The tops of the hoppers need to be closed. As shown in Plate 6, the grain gravitates from the silo A to the hammer mill at B and thence is blown to the hoppers. Provision has to be made to close the outlets at C since in filling, two hoppers would be closed while the third was being filled.

The inset in Plate 6 shows hoppers of a different type. These have been made from 44-gallon drums and a fitted in the bails above the mangers. Hammer milled grain can be blown directly into these drums as shown at C in the inset.

Drum Hoppers

The construction and working of the drum hoppers are shown in Plate 7. A funnel-shaped extension is made to the 44-gallon drum. Circular metal flaps are indicated at Points A and B. A coil spring C holds flaps A and B in the indicated planes. A connecting rod D joins flaps A and B. E. is a lever which when operated alters the position of the flaps.

When the drum contains grain and the mechanism is in the position as illustrated, the grain is contained by flap B. When the lever E is pulled downwards both flaps A and B reverse their position with the result that flap A stops the flow of grain from the main part of the drum while flap B releases the grain held in the "neck". An exact amount of grain is thus released each time. When the lever is released the spring C returns both flaps to the position as illustrated thus allowing grain to again fill the "neck".

The diagrams illustrate systems suited to the walk-through type of bail and some modification may be necessary for other types.

Sowing Buffel Grass With An Old Cotton Planter

By K. B. ANDERSSEN,
Adviser in Agriculture.

A Gayndah farmer has adapted an old corn planter for the sowing of buffel grass seed into prepared land.

The current trend in the dairying and grazing industries towards the improvement or replacement of native pastures is being accelerated by the introduction of exotic species of grasses and legumes, among which buffel grass has assumed some importance. Unlike most of the introductions, this grass has presented a problem in planting, which has necessitated the development of special planting machinery and techniques. This is because the seed of this grass is covered in long hairs

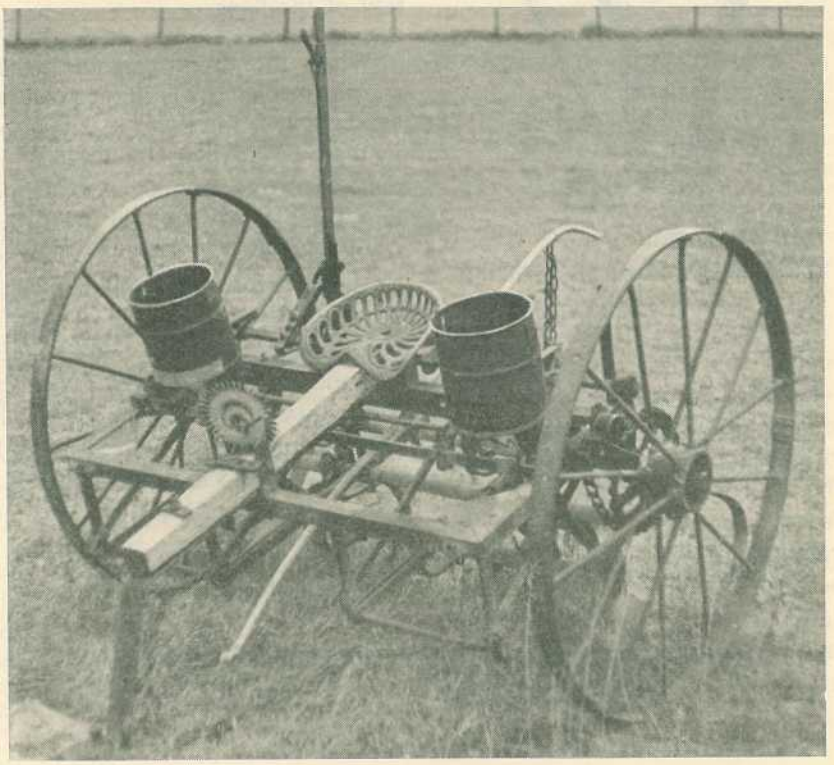


Plate 1
Two Row Cotton Planter.

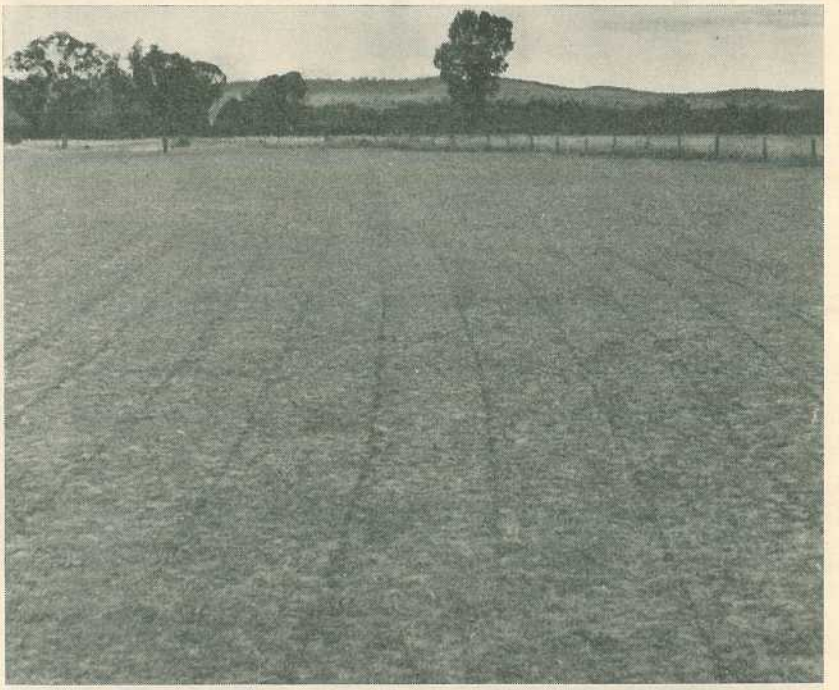


Plate 2

Row Spacing Used in Row Planted Buffel Grass.

and bristles which make it cling together in loose masses. As a result of this, the seed will not flow readily through the ordinary planters, unless activated internally within the planters, or alternatively carried through in a mixture with readily flowing materials, such as sawdust or fertilizer. Minor adjustments or adaptations are frequently necessary.

One such adaptation has been made by a Gayndah farmer for the sowing of buffel grass seed into prepared land. This machine is the old two-row maize or cotton planter, with attached spring tines for scuffling operations (Plate 1).

Two Circular Seed Bins

Two circular seed bins, approximating 2 to 3 gal. in capacity, contain the bulk seed, which is agitated and regulated by revolving plates in the bottom of each bin. The seed drops through an opening in the bin, over the mouth of the concertina type hose, leading down to the appropriate tine, for the required planting depth and row width spacing (Plate 2).

The rate of seed flow is regulated by adjusting the size of the outlet by means of a sliding iron strip which is held in place by a bolt with lock, nut or screw.

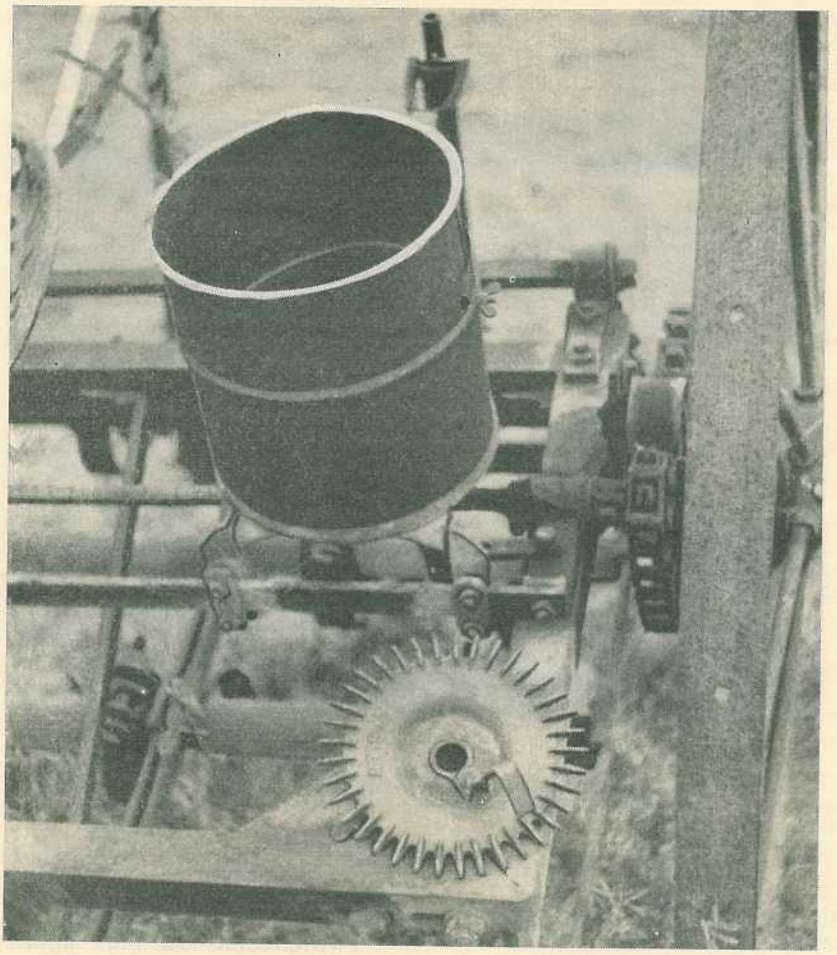


Plate 3
Seedplate Used for Fuzzy Cotton Seed and Buffel Grass.

The type of revolving plate found to be most efficient was originally produced in the early 1930's to sow fuzzy cotton seed. This plate is approximately 9 in. in diameter, and is smooth-surfaced on the lower side, in contact with the bottom of the bin. The top side is fitted with a series of small sharp raised fingers around its circumference (Plate 3). In practice, these fingers separated the fuzzy cotton seed and allowed it to drop with some form of regularity, through the outlet into the hose. The seed in the bin was further agitated by a vee-shaped piece of $\frac{3}{16}$ in. round iron, welded in an upright position onto the plate.

This old type plate is capable of sowing from 2 to 6 lb. of buffel seed to the acre, using both bins, by varying the outlet by means of the sliding iron strip. No sawdust admixture is required.

When sowing in rows (Plate 4) the seed hoses are pulled out of the shoes attached to the planting tines and the narrow bands of seed are covered by light trailing harrows. A soil covering of more than 1 in. leads to poor field strikes.

When broadcasting, the seed hoses are removed and a piece of 6in. hardwood is placed transversely across the planter, under the bin outlets. The seed then falls onto this board, which produces a spilling effect. Light tine harrows then complete the coverage of the seed.

A greater seed capacity in the bins can be obtained by attaching 4 gal. or 5 gal. oil drums to the seed bins (Plate 5). The attachment is made by inscribing a circle on the bottom of the drum with the same diameter as the seed bin.

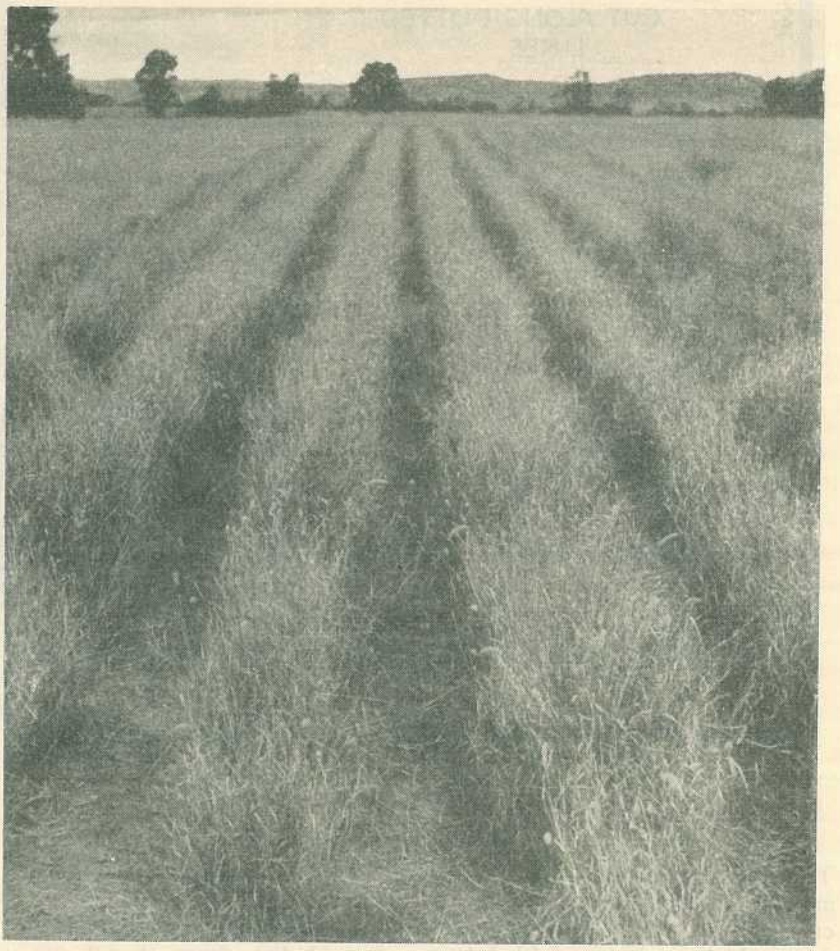


Plate 4

Well-established Buffel Grass Sown with Cotton Planter.

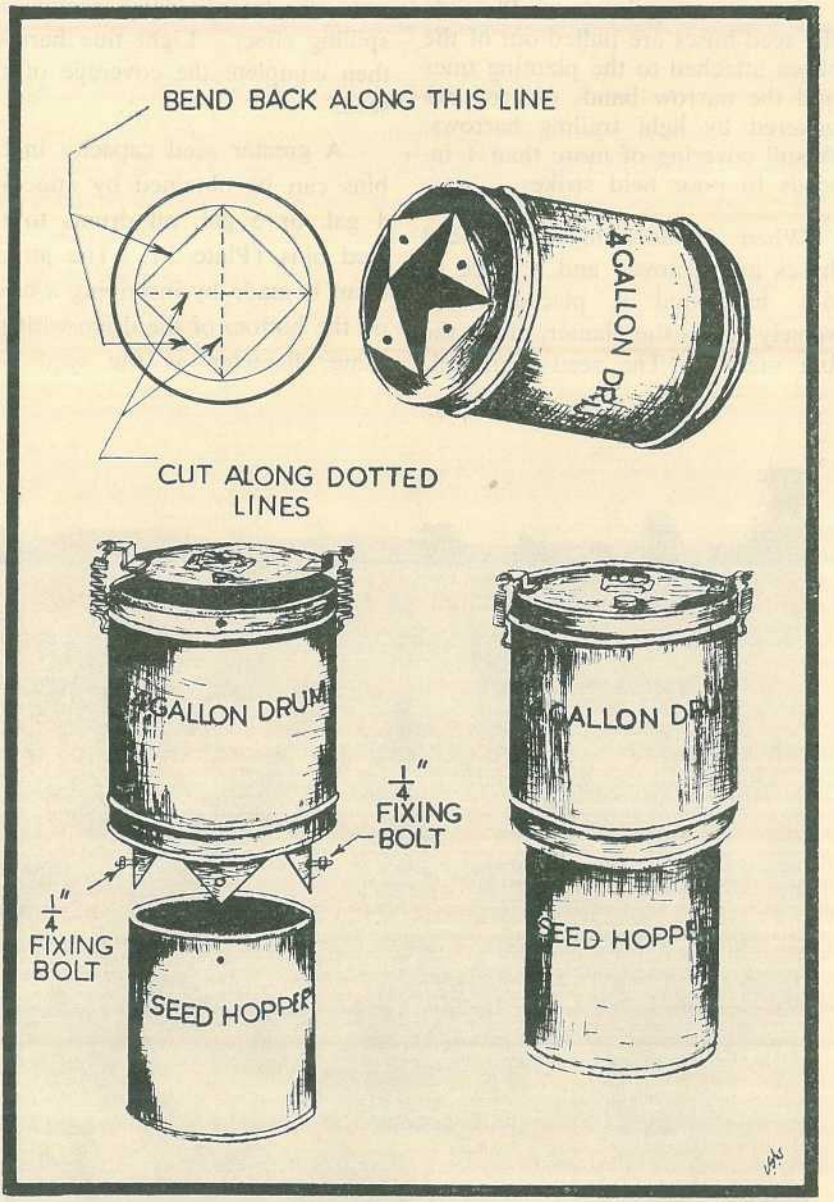


Plate 5

Simple Method of Increasing Seed Bin Capacity.

Two lines are then cut at right angles across the circle to its circumference. This produces four flaps, which are in turn folded down inside the seed bin. Holes are then bored through the bin into the four flaps, when placed in position on the bin. Quarter inch bolts are used to secure the drum in place. The top of the drum is cut out and thereafter used as a removable lid, when filling the joined containers.

Pasture And Crop

Forage Harvesters Under Test.—Flail type forage harvesters need almost twice the power for efficient performance as the chopping types, but they do have the advantages of greater freedom from mechanical trouble and cheaper maintenance. In all other respects, performances of the two types are virtually equal.

This summing up has emerged from tests by the British National Institute of Agricultural Engineering. Flail, fan, flywheel chopper and cylinder chopper types were tested under a variety of normal farm conditions. At present, only the flail and flywheel chopper types are in common use in Queensland.

All except the fan type reached an output of 18 to 20 tons an hour. But at this level, power consumption of the flail types rose steeply. It continued to rise even after an input of 40 h.p. At this figure, peak efficiency still had not been reached. The chopper group, while able to reach just as high an output in tons an hour, was far more efficient about the 20 h.p. level.

Power consumption is by no means the only yardstick by which to measure forage harvester performance. But it is unfortunate that the power requirements of the wider flail types are almost beyond the capacity of the tractors available on many farms. The flail types' heavy demands for power are especially evident when loaded trailers are being hauled up slopes during the harvesting operations.

In flail machines, most power is used in conveying the cut material. These machines cut quite well at rotor speeds far below those normally used, but to obtain adequate conveying of the cut material rotor speeds must be high.

Popularity of the flail machines appears to be due to their versatility in handling a wide variety of forage crops from short grass upwards; their freedom from blockages and mechanical trouble; their lower initial cost, and their simplicity and general cheapness of maintenance. One reported disadvantage of the flail types is that the ensiled material contains a quantity of dirt. This may be simply a matter of skill in operating the machine. But the possibility of the rotor sucking up dust from the bare ground should not be overlooked.

However, the peak has not necessarily been reached in forage harvester design. There is room for improvement in all types.

—V. J. WAGNER,
Chief Agronomist.

Preparing the Summer Seed Bed.—By far the best seed bed for summer pastures is that resulting from the efficient tillage of fertile soil. Most of the common pasture plants have small seeds and require a seed bed of fine tilth. Ploughing well in advance of sowing is desirable and the land should be allowed to lie in the rough state for a few weeks before further cultivation is undertaken. Heavy harrows, disc or tine cultivators will be required to break down the clods. Subsequent workings should aim at destroying weeds and compacting the subsurface soil. By

compacting the soil close to the surface, a seed bed is provided which is favourable to the fine early root systems of the pasture plants. The seed bed should also be provided with ample moisture and in dry districts, cultivation operations throughout the seed bed preparation period should be carried out with due regard to the conservation of moisture.

—A. HEGARTY,
Agrostologist.

Farm Accidents.—More notice is being taken of farm accidents today and that is as it should be.

The use of mechanical instead of animal power makes for a higher proportion of severe injuries. For, while a horse will usually ease off and probably stop if anything goes wrong, a mechanical prime mover will keep going. Thus, if an accident occurs and the person injured is on his own—as is often the case—he may be quite unable to reach the controls to stop the machine.

Most machinery can be dangerous if wrongly or clumsily handled, but lack of thought, or the absence of a proper plan of work, may introduce quite unnecessary hazards.

Quite apart from the suffering involved, an accident may upset the whole routine of the farm. For example, a valuable worker may be put out of action for some time, and the machinery may be damaged. So remember it is better to be safe than sorry.

—C. G. WRAGGE,
Agricultural Engineer.

Fumigation of Tobacco Seedbeds.—Further studies on the fumigation of tobacco seedbeds with methyl bromide suggest that planting should be delayed until at least three days after treatment. There is now reason to believe that it is not safe to plant an hour after the covers have been removed. Last season, there were numerous complaints of bad strikes and patchy stands in tobacco seedbeds following the use of methyl bromide. In many cases, the trouble could be traced to fumigating for longer than 24 hours or to planting too soon after removing the covers. It is now felt that the beds should be aired for at least three days after removing the gas-tight covers.

Methyl bromide is a poisonous fumigant that evaporates readily. It is supplied as a liquid under pressure in cans or cylinders. When the pressure is reduced by opening the valve on a cylinder or piercing a can with a special dispenser, the liquid flows through a rubber tube into an evaporating pan. Earlier, this pan has been placed under an airtight plastic sheet covering the seedbed. The fumigant quickly evaporates from the pan and penetrates the soil. The cover is left on for 24 hours to ensure adequate penetration. One pound of methyl bromide is sufficient to treat 40 to 50 sq. ft. of seedbed.

In using methyl bromide, take extreme precautions to avoid inhaling any of the colourless, odourless but very poisonous vapour.

—W. PONT,
Pathologist.

Tobacco Seedbed Diseases.—Several destructive diseases lie in wait for tobacco seedlings right from the time the tiny seeds germinate. To neglect strict disease control in the seedbed is to risk total crop failure.

Damping-off is the disease likely to appear first. The collapse of patches of plants in the seedbed is

usually the first indication of its presence.

If damping-off breaks out, prompt drenching with thiram will check its spread. Thiram drench, at 1 oz. of 80 per cent. thiram in 4 gal. of water, will give effective control of the disease. The drench should be applied at ½ to 1 gal. to 1 sq. yd. of seedbed.

Even if damping-off does not kill the seedlings, it may cause infections on the stem which are not noticeable at transplanting time. These may develop into stem rots in the field. Control of damping-off, therefore, helps to prevent outbreaks of stem rot later on.

Blue mould, however, is the major tobacco disease in Queensland. It is a fungus disease that attacks tobacco at any stage from small seedlings to mature plants ready for harvest. First indication of blue mould in a seedbed is the change of leaf colour from green to yellowish-green.

Fumigation with benzol will control blue mould in seedbeds and should not be delayed longer than 10 to 14 days after germination. The seedbed is enclosed overnight under a gas-tight cover and benzol vapour is introduced. The usual procedure is to enclose the beds and then introduce containers of benzol, supported on stands 5 to 6 in. above the ground. The best concentration of benzol is obtained when 1 sq. in. of evaporating surface is allowed for each square foot of seedbed.

In north Queensland, treatment should be applied every third night. But in south-western Queensland, where the plants are covered every night to prevent frost injury, it is advisable to carry out the benzol treatment each night also.

—W. PONT,
Pathologist.

Penetration of Wheat Roots

Wheat is often looked on as a comparatively shallow-rooted crop, and it may not be generally known that wheat roots frequently penetrate to, and obtain moisture and nutrient supplies from, depths over 6 ft.

Penetration of wheat roots to 8 ft. and below were recorded in a late-planted trial on deep alluvial soil of medium texture at the Biloela Regional Experiment Station some years ago. Only ·32 of an inch of useful rain was recorded between germination and maturity and a yield of 25 bushels to the acre was obtained.

Subsoil moisture was found to penetrate at least 8 ft. in many sampling sites. In five of nine sites, plants were using moisture below the 6 ft. level at maturity. At these sites, the moisture taken from the 6–8 ft. zone represented one-eighth of the total moisture utilized by the plant. This perhaps seems only a small proportion of the total but it is considered important in bringing the crop through to maturity and in helping to produce a good grain sample. Practically all available moisture in the top 4 ft. of soil had been utilized by the time of heading.

—J. HARBISON,
Regional Experiment Stations Branch.

Tuberculosis-Free Cattle Herds (As at 1st October, 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., Seafield Farm, Wallumbilla
Crookey, J., Arolla A.I.S. Stud, Fairview, Allora
Davis, W. D. "Wamba", Chinchilla
Dennis, L. R., Diamondvale, A.I.S. Stud, Mundubbera
Edwards Bros. "Spring Valley", A.I.S. Stud, Kingaroy
Evans, E. G., Lauraven A.I.S. Stud, Maleny
Green, D. B., Deloraine, A.I.S. Stud, Fairdale
Heading, C. A., "Wilga Plains", Maleny
Henry, Mrs. K., Greenmount
Henschell, W., "Yarranvale", Yarranlea
H. M. State Farm, Numinbah
Littleton, H. V., "Wongalea", Hillview, Crow's Nest
Marquardt, A. C. & C. R., "Cedar Valley", Wondai
Mears, G. S. & E., M. S. 755, Toogoolawah
Moore, S. R., "Sunnyside", West 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., "Walena", A.I.S. Stud, Blackbutt
Shelton, R. A. & N. K., "Vuegon" A.I.S. Stud, Hivesville, Murgon
Sokoll, A. H., "Sunny Crest", Wondai
Sperling, G., "Kooravale", Kooralgin, Cooyar
Sullivan Bros. "Valera", Pittsworth
Sullivan, D. "Bantry", Pittsworth
Sullivan, F. B., "Fermanagh", Pittsworth
Thompson, W. H. "Alfavale", Nanango
Webster, A. H., "Millievale", Sabine, via Oakey
Wieland, A. W., "Milhaven", A.I.S. Stud, Milford, via Boonah

Ayrshire

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

Friesian

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

Guernsey

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

Jersey

Beckingham, C. Trout's Rd., Everton Park
Birt, W. C. M., Pine Hill Jersey Stud, Gundiah
Borchert, Mrs. I. L. M., "Willowbank" Jersey Stud, Kingaroy
Burrows, R. N., Wondai, Box 23
Bygrave, P. J. L., The Craigan Farm, Aspley
Carpenter, J. W., Flagstone Ck., Helidon
Conochie, W. S. & Sons, "Brookland", Sherwood Rd., Sherwood
Cramb, S. A., Bridge St., Wilsonton, via Toowoomba
Crawford, R. J., Inverlaw, Kingaroy
Farm Home For Boys, "Westbrook"
Fowler, P. & Sons, "Northlea", Coalstoun Lakes
Harley, G., "Hopewell", M.S. 189, Kingaroy
H. M. State Farm, Palen Creek
Hutton, D. R., "Bellgrath", Cunningham, via Warwick
Johnson, H. G., Windsor Jersey Stud, Beaudesert
Lau, J. F., "Rosallen", Goombungee, Toowoomba
Matthews, E. A., "Yarradale", Yarraman
McCarthy, J. S., "Glen Erin", Greenmount, Toowoomba
Meier, L. E., "Ardath Stud", Boonah
Noone, A. M. & L. J., "Winbirra", Mt. Esk Pocket
Porter, F., Conondale
Queensland Agricultural High School & College, Lawes
Ralph, G. H. "Ryecome", Ravensbourne
Scott, Est. J. A., "Kiaora", Manumbar Rd., Nanango
Semgreen, A. L., "Tecoma", Coolabunia
Seymour, B. T., "Upwell", Jersey Stud, Mulgeldie
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", Pickanjinnie
Wilson & McDouall, Calliope Station, Calliope

Poll Shorthorn

Leonard, W. & Sons, Welltown, Goondiwindi

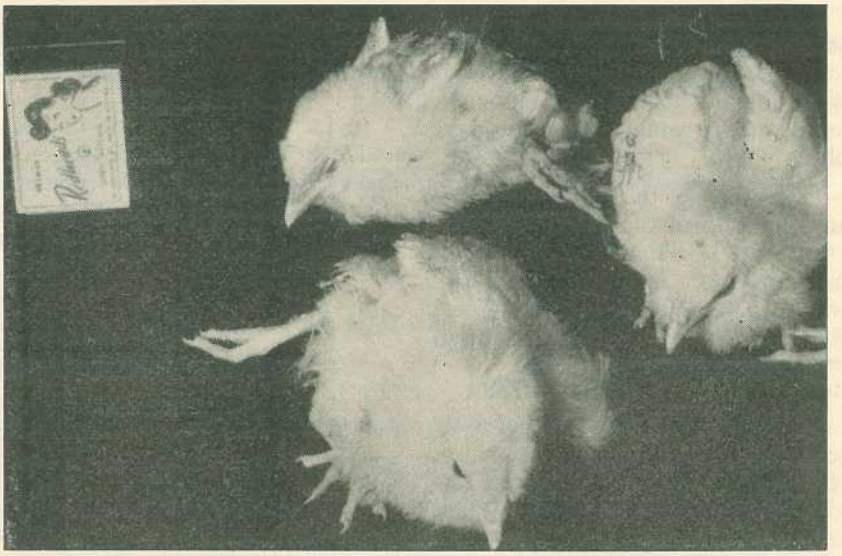


Plate 1. These Week-Old Cross-bred Chickens are Affected by Epidemic Tremor, or Avian Encephalomyelitis. Note the complete paralysis of the legs.

Epidemic Tremor in Chickens

By P. D. RANBY,
Veterinary Officer.

In the light of new knowledge, some helpful measures may be tried in the treatment of epidemic tremor in chickens.

Epidemic tremor or avian encephalomyelitis is a nervous disease of young chickens. The disease is caused by a virus which attacks the brain and spinal cord.

Outbreaks were much more frequent in Queensland last year than in previous years. The pattern was for one to four successive hatches to be affected. There is evidence overseas (in U.S.A.) based on blood tests that infection may be present in most flocks. Observations in the Brisbane area suggest that a low incidence of the disease occurs in many batches of young chickens hatched in the autumn and early winter and such cases are generally overlooked.

Signs to Watch

Outbreaks of epidemic tremor are seen in chickens up to about three weeks of age.

In a severe outbreak, 50 per cent. of the chickens may become paralysed (see Plate 1) while about 5 per cent. exhibit a peculiar rhythmic tremor of the head and neck and sometimes the tail. When the affected flock is small, the tremor may be absent.

In outbreaks in Queensland, the severity of the disease and death losses were high when chickens were affected at an earlier age than usual, that is, when only a few days old.

A cataract of the eye occurred as an aftermath of the disease on several farms in the Brisbane area. In addition, the usual leg weakness was seen in some of the survivors, while odd ones were slow-growing.

Be Sure It is Epidemic Tremor

The leg weakness and paralysis seen in epidemic tremor may be easily confused with any of the following: (*a*) rickets (*b*) crazy chick disease and (*c*) vitamin A deficiency.

Where confusion arises, veterinary advice should be sought. These various diseases can be readily distinguished even in the field. The presence of epidemic tremor can be confirmed by sending live chickens to the veterinary laboratory. The disease is identified by microscopic examination of brain tissue and by transmission tests.

How Infection Occurs

The virus of epidemic tremor is transmitted through the egg to the hatching chicken. Contact infection probably does not occur. It is likely that mosquitoes transmit the virus to older fowls. Breeding fowls thus infected do not develop the disease themselves, but pass the virus on through the eggs to the chickens. The 1958 outbreaks occurred after a heavy autumn mosquito wave and the hatcheries involved were situated in mosquito-infested areas.

Older Recommendation Changed

A recommendation made in the past should be changed in the light of new knowledge:

Rejecting breeding stock that have produced epidemic tremor chickens is of no advantage.

In fact, survivors of an outbreak and also the hens which produced them will not throw epidemic tremor chickens that next season. This is a result of immunity being passed through the egg.

Trial Measures

Measures that offer promise are:

Until more is known about how the disease is spread, it would be wise to reduce the local mosquito population.

Several types of vaccine have been tried overseas.

Vaccination of day-old chickens by the stab method using a live virus shows some promise. However, very small percentages develop the disease as a result of vaccination. The variable incidence of the disease from year to year would tend to reduce the practicability of vaccination.

Killed virus vaccines have the disadvantage that several injections are required in order to build up sufficient immunity.

It is generally accepted that many affected chickens may recover if separated and nursed. These measures are usually successful but may be disappointing in some outbreaks.

After recovery, the chickens may be kept for table purposes. With some culling, pullet chickens may be kept as layers.

Breeding from older hens should be safer but this is not always practicable. Older birds are more likely to be immune and pass the immunity through the egg.

The Fight Against Disease—II.

Causes Of Infectious Disease

By G. C. SIMMONS, Senior Bacteriologist.

The major groups of pathogens—those micro-organisms that produce disease—are explained.

It is not so very long ago that people believed in the spontaneous generation of disease and furthermore that sickness could be cured by ritual, incantation, or witchcraft. Ill health is such a personal thing that it is no wonder that quackery and mysticism were able to exert influence out of all proportion to the value of such practices.

Probably the first man to connect disease with the spread of living agents was Fracastorius in the 16th century. We know now that not all disease is caused by microscopic agents. However, the discovery of the germ theory of disease and the invention of the microscope by the Dutchman Anthony van Leeuwenhoek in the 16th century proved the forerunner of advances in medical and veterinary microbiology that have meant the virtual elimination of the great epidemics of infectious diseases that decimated both man and animal populations in the not-so-distant past.

Micro-organisms have been studied extensively and as a result classified into major groups. The vast majority of them are not disease-producing and are called *saprophytes*. Man learnt unwittingly of the benefits that certain microbes could give him in such processes as the manufacture of cheese and fermented beverages.

Also, in the Asian countries the beneficial effect of growing legumes with non-legumes had been realised for hundreds of years, but only recently has research shown that this is because bacteria present in nodules on the roots of legumes take up atmospheric nitrogen and convert it into materials that can be utilized by plants.

A small number of types of harmful micro-organisms have been a dominant factor in the history of mankind in spite of their microscopic size. Their characteristic of producing disease has been called pathogenicity, so we say that *Brucella abortus* is a pathogen or a pathogenic bacterium and that Brucellae are pathogenic bacteria.

The severity of an infectious disease depends on many factors but one of the most important is the ability of the organisms to enter the body, grow and produce harmful effects. The term virulence has been coined to denote this ability and so a pathogenic bacterium may vary in the degree of virulence it possesses. The highly virulent organism will produce a severe, often fatal, disease.

The microbiological laboratory must be able to isolate the different organisms and then identify them to determine whether pathogens are present.

VIRUSES

The smallest organisms are called *viruses*. At one time, the term virus was used to denote any infective agent but further investigation has shown that the name should only be used in the restricted sense used here.

Viruses are so small that they will pass through filters which will hold back bacteria and they cannot be seen under the ordinary microscope. This latter characteristic and the necessity for them to have living cells in which to grow retarded recognition and study of this group.

Most of the major animal diseases are caused by viruses but fortunately Australia is free of them. Such diseases are rabies, rinderpest, foot and mouth disease and Newcastle disease. The foothold that several of these have obtained in past years was vigorously and successfully opposed by slaughter and disinfection procedures employed rigorously by our forefathers in their wisdom.

Table 1 is a list of viral diseases known to occur in Queensland animals. Undoubtedly more will be added to the list in the future. The isolation of these organisms involves highly technical procedures which are relatively costly. A glance at the list shows another important characteristic of viruses and this is their adaptation to a single host. For instance infectious laryngotracheitis occurs in fowls and pheasants, not in other birds or animals. This high degree of host specificity is advantageous for, if it was not so, man and animals would be exposed to many more infectious agents.

TABLE 1

VIRAL DISEASES OCCURRING IN ANIMALS IN QUEENSLAND

Name of Disease	Host (s)
Contagious pustular dermatitis ("scabby mouth")	Sheep
Ephemeral fever ..	Cattle
Warts	Cattle
Virus pneumonia ..	Pigs
Swine pox	Pigs
Distemper	Dogs
Contagious Hepatitis ..	Dogs
Myxomatosis	Rabbits
Leucosis	Fowls
Avian encephalomyelitis	Fowls
Fowl pox	Fowls, turkeys
Infectious laryngotracheitis	Fowls
Psittacosis	Cage birds
Q-fever	Cattle

From a scientific aspect, however, host specificity has its disadvantages for the cost of research increases tremendously when large animals such as cattle must be used in research. This has been the case in poliomyelitis of man, where the present highly favourable position was only obtained by the sacrifice of a huge number of monkeys which are the only animals besides man susceptible to the viruses that cause poliomyelitis.

Some viruses also possess the characteristic of growing only in certain tissues of the host. For example, contagious pustular dermatitis, or "scabby mouth" as it is commonly called, is a disease of the skin and is most commonly seen affecting the areas around the lips of sheep. Other skin areas such as the udder may also be affected but no lesions are seen inside the sheep. This characteristic is often used in vaccination methods, as, for example, a mild infection on the inside of the thigh of a lamb is produced to immunize it against infection in the mouth region.

Until recently most vaccination techniques against virus diseases used living or weakened viruses. The now famous Salk vaccine for poliomyelitis is a dead vaccine and its successful use has shown that

efficient dead viral vaccines can be made, although the process may be costly.

Except for those organisms belonging to the psittacosis group, the viruses are resistant to antibiotics. Treatment is therefore not easy.

RICKETTSIA

Larger organisms but still dependent on living cells are those called *Rickettsia.* Only two rickettsial diseases have so far been recognised in Queensland in domestic animals although man is the casual host of many. Q-fever, which occurs in cattle, and pink-eye or "blight" of sheep, are attributed to a Rickettsia.

PLEUROPNEUMONIA ORGANISMS

Larger than the Rickettsia and no longer requiring living cells are those organisms belonging to the pleuropneumonia group. One of the earliest animal diseases recognised to be caused by a living agent was contagious agalactia of goats, which is caused by a pleuropneumonia organism. Of greater importance is the member of this group named *Mycoplasma mycoides,* which is the cause of bovine contagious pleuropneumonia. This is one of the most important cattle diseases in this country as it not only causes sickness and death, but has meant restriction on cattle movements within Australia and to

TABLE 2

BACTERIAL DISEASES OCCURRING IN ANIMALS IN QUEENSLAND

Name of Disease	Name of Organism	Main Host
Blackleg	*Clostridium feseri* (*Cl. chauvoei*)	Cattle, sheep
Enterotoxaemia (Pulpy kidney)	*Clostridium welchii*	Sheep
Malignant oedema	*Clostridium septicum*	Sheep
Tetanus	*Clostridium tetani*	Sheep, pigs, horses
Botulism	*Clostridium botulinum*	Cattle, birds
Tuberculosis	*Mycobacterium tuberculosis*	Cattle, pigs
Caseous lymphadenitis	*Corynebacterium ovis*	Sheep
Erysipelas	*Erysipelothrix rhusiopathiae*	Sheep, pigs
Listeriosis	*Listeria monocytogenes*	Sheep
Actinomycosis (lumpy jaw)	*Actinomyces bovis*	Cattle
Actinobacillosis (wooden tongue)	*Actinobacillus lignieresi*	Cattle
Mycotic dermatitis	*Dermatophilus dermatonomus*	Cattle, sheep, horses
Melioidosis	*Pseudomonas pseudomallei*	Sheep, goats, pigs
Coryza	*Haemophilus gallinarum*	Fowls
Brucellosis	*Brucella abortus*	Cattle
Brucellosis	*Brucella suis*	Pigs
Brucellosis	*Brucella ovis*	Sheep
Fowl cholera	*Pasteurella septica*	Fowls
Pasteurellosis	*Pasteurella septica*	Birds, sheep, cattle, pigs
Salmonellosis	Numerous species of *Salmonella*	Most animals and birds
	Actinobacillus equuili	Horses
Vibriosis	*Vibrio fetus*	Cattle
Leptospirosis	*Leptospira pomona* and *L. hyos*	Cattle, pigs
Avian spirochaetosis	*Borrelia anserina*	Fowls
Mastitis	*Streptococcus agalactiae*	Cattle
Mastitis	*Streptococcus dysgalactiae*	Cattle
Mastitis	*Streptococcus uberis*	Cattle
Mastitis	*Staphylococcus aureus*	Cattle and sheep
Mastitis	*Corynebacterium pyogenes*	Cattle and sheep

other countries. This disease has been eradicated from many countries.

Two other members of this group are known to cause disease in Queensland. One occurs in goats and the full importance is not known and the other is thought to be the cause of chronic respiratory disease of poultry. Study of this group of organisms is still in its infancy.

BACTERIA

By far the largest number of pathogens belong to the group of micro-organisms we know as bacteria. Table 2 demonstrates fully the importance of bacteria as the cause of disease. One famous American scientist has calculated that milk production is 23 per cent. lower on farms with brucellosis in the dairy herd than in those herds free of this bacterial disease. Such figures surely illustrate how financially rewarding would be the eradication of brucellosis.

Bacteria vary in shape and size considerably. They can be grown in non-living materials but they differ tremendously in their food requirements. Some require simple chemical substances, others must have complex substances including vitamins and trace elements. As their nutritional requirements are diverse so also are the methods by which they affect animals.

At one extreme we have the bacterium *Clostridium botulinum* which does not even have to enter the body to exert its effects, as the poison, or more correctly the toxin, is produced in rotting vegetation or carcases and on ingestion by the animal is able to poison the nervous system to give the disease known as botulism.

Other bacteria, as for example the tetanus bacillus, grow in a localised region of the body but produce a toxin that spreads throughout the tissues.

Quite a number of pathogenic bacteria have the ability to enter the body and if they are not defeated by local body defence mechanisms spread throughout the body and so disrupt the normal body processes that death results. Examples of this type are the bacteria causing erysipelas and salmonellosis. Such organisms usually produce a fevered carcass.

Another division of bacterial pathogens are those that remain localised, rarely cause death but lead to decreased production and growth. All dairy farmers are familiar with representatives of this group, namely the bacteria causing mastitis. Fortunately, many bacterial diseases can be controlled by vaccines, antibiotics and good husbandry.

FUNGI

The fungi are of more complex structure than the bacteria. They are readily seen under the microscope and are capable of growth on non-living materials. In fact, most people are aware of fungi as mushrooms and moulds growing on stale

TABLE 3

FUNGAL DISEASES OCCURRING IN ANIMALS IN QUEENSLAND

Name of Disease	Name of Fungus	Host
Aspergillosis	*Aspergillus fumigatus*	Fowls
Moniliasis (thrush)	*Candida albicans*	Birds
Ringworm	*Microsporum* spp. and *Trichophyton* spp.	Cattle, horses, dogs

TABLE 4

SOME PROTOZOAL DISEASES OCCURRING IN ANIMALS IN QUEENSLAND

Name of Disease	Name of Protozoa	Host
Piroplasmosis (babesiosis) (redwater or tick fever)	*Babesia bigemina*	Cattle
	Babesia argentina	Cattle
Trichomoniasis	*Trichomonas foetus*	Cattle
Histomoniasis (blackhead)	*Histomonas meleagridis*	Turkeys, fowls
Coccidiosis	*Eimeria tenella*	Fowls
	Eimeria necatrix	Fowls
Toxoplasmosis	*Toxoplasma gondii*	Dogs, bandicoots, rats

bread. Table 3 lists those fungal diseases known to occur in Queensland. These are often diseases of the external body surfaces. Therapeutic agents are available for these diseases but treatment is often a long-term process.

PROTOZOA

Lastly we have the group of micro-organisms known as *protozoa*. These organisms are complex in life history and variety. The important protozoal diseases are listed in Table 4. Only a few can be cultivated outside the living body, and whereas all the other groups of pathogens are usually considered to belong to the plant kingdom, protozoa belong to the animal kingdom.

Mixed Infections

The major groups of pathogens have each been considered separately, but it does not follow that such is the case in nature. It is not unusual to find two pathogens

Plate 4

Fungi Inoculating Hood Being Used for the Handling of Fungi Behind Glass to Prevent the Spread of Infection.

of the same or different types in the one animal. For instance, pneumonia of pigs probably starts with a viral infection but bacterial pathogens quickly invade the weakened lung tissue and may eventually be the real cause of death. In such cases accurate laboratory diagnosis is particularly important.

Pathogenic micro-organisms may seem too numerous for us to contemplate complete control over them, but the more we know of them and their distribution in our livestock the better does our control become.

(To be Continued)

Stock And Station

Beat Tetanus with Good Hygiene.—Improved hygiene around sheep yards and shearing sheds will do much to reduce the toll of tetanus. This widespread disease is responsible for deaths ranging from a few sheep to several hundred.

Tetanus usually occurs after routine sheep work. At shearing, crutching, lamb marking, mulesing, and on dipping heavily grass-infested sheep, the animals can pick up tetanus germs. These germs often live for years in the soil around shearing sheds, dips and sheep and horse yards. Infection takes place through wounds, especially deep ones. When it has gained entrance, the tetanus germ produces a poison that affects the nervous system. It is generally fatal.

Tetanus is very difficult to cure, so it's better to prevent it. Before shearing and crutching, the board should be scrubbed with disinfectant and the counting out pens cleaned. Lamb marking and mulesing tools should be dipped in a disinfectant solution regularly during these operations.

If tetanus occurs after lamb marking and mulesing, be warned and next time mark the lambs in temporary yards well away from the infected area. In any case, temporary lamb marking yards are an advantage. Besides being removed from the heaviest sources of infection, they allow you to drop the lambs onto clean grass after the operations.

Sheep can be inoculated to give them immunity from tetanus, and for all sheep, especially valuable rams and show stock, this may be worthwhile. Two injections 12 months apart will ensure life-long protection.

—A. T. BELL,
Director of Sheep Husbandry.

Keep Pleuro in Check.—Queensland cattlemen are getting on top of pleuro, but only regular inoculation will keep the disease incidence low. Graziers should not neglect pleuro inoculation in their herds this year.

Extensive inoculation programmes undertaken by many property holders in the last few years have sharply reduced the number of pleuro cases reported. On most of these properties, fewer than one per cent. of slaughter cattle have shown evidence of pleuro in the last year or two. Yet five or six years ago, it was common for meatworks' reports to indicate that up to 15 per cent. of cattle slaughtered showed evidence of pleuro.

Although the position is encouraging, pleuro is still present. Any relaxation in herd vaccination will merely invite trouble. Neglecting to inoculate will allow large numbers of animals to become susceptible to pleuro, and a recurrence of the great outbreaks of the late 1940's could easily result.

Deaths, restrictions on stock movements and destruction of infected animals make pleuro one of Queensland's most serious cattle diseases. But regular vaccination will protect your herd against it. Don't miss vaccinating your young stock every year. Combined with the vaccination of all older cattle every two or three years, this is a good insurance against future outbreaks.

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

Hot Iron Method of Dehorning.—The hot iron method of dehorning calves is popular on many Queensland farms. Chief advantages of this method are that there are no bad after-effects and no after-care is needed.

Dehorning by this method destroys the growing buds at the base of the horn button. The operation is most effective if it is performed when the calf is about 10 days old.

The iron should be heated to a cherry colour and applied over the horn centre. On application, the iron should be twisted, either clockwise or anticlockwise, to give firm contact around the horn base. A copper-coloured ring must be burnt right around the base of the horn.

In the beginning, you may make the mistake of using too little pressure or of not leaving the iron on the horn long enough. Here, experience is your best guide. After the first application of the iron, the calf appears to suffer little pain, so you need not be afraid of burning a deeper ring.

Before starting, clip away the hair around the horn bud. It is convenient to have someone hold the calf, but the whole operation can be done by one man. If working alone, put the calf on the ground and straddle it. With one hand, hold the calf's head securely over your knee and use your other hand to apply the iron.

Electrically heated irons are available, but old soldering irons can be adapted to make irons for heating in a fire. The part of the iron used on the horn consists of a ring of copper around a hollow centre. In use, the centre of the developing horn fits into the hollow of the iron. The copper ring sears a circle around the horn base.

The main inconvenience of this method lies in having to do calves at a particular age. Calves born as little as a week apart would probably have to be dehorned at different times. If you have a lot of calves, you would probably find gouge-type dehorners more suitable.

—W. F. MAWSON,
Senior Adviser in Cattle Husbandry.

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 usually only 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 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

Food Wastage Greatest at the Hoppers.—Officers of the Poultry Section of the Department of Agriculture and Stock have found that feed wastage can be staggering. Control of feed wastage is an avenue by which costs can be reduced.

The type of feed hopper used, and the filling of hoppers too full, are two common causes of feed wastage.

Studies have revealed that even with good trough-type hoppers, filling them to the brim will cause feed wastage as high as 33⅓ per cent.

If the same hoppers are only half-filled, feed wastage is reduced to a mere 2 per cent.

The fowl won't save feed, but the alert farmer can, by the way he controls the feeding of his birds.

—C. W. TUTT,
Poultry Adviser.

Timely Tips for November

In areas where blackleg has occurred in the past, November may be the best month to vaccinate for blackleg. If you haven't done it before, write for a pamphlet on the subject.

Worms work by the weather. Warmth and rain in November may cause an upsurge of worm activity. Be prepared to treat about three weeks after rain if the condition of your animals warrants it. What to treat with is important, especially with modern remedies becoming available.

If animals are put back into the same paddock after treatment, they are likely to pick up a lot of worm larvae from the infested environment. Arrange to put them into a paddock that has been spelled for three weeks. Most of the larvae will have died out by then.

If November is dry and it is a long time (over 3 months) since pigs have had adequate green feed, a dose of vitamin A concentrate will help maintain good growth and health. But succulent green feed is the best source of all vitamins for pigs.

Cyanide poisoning may occur this month. Be careful when animals are grazing crops of plants known to be cyanide producers. Have supplies of "hypo" on hand. Prompt treatment of affected animals saves a lot of lives. Watch for excitement, rapid breathing, tremors, blue membranes and sudden collapse.

Calves may be at a good age this month for Strain 19 vaccination.

Brucellosis-Tested Swine Herds (As at 1st October, 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 & Hichey, 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, A. J. 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., "Mannuem Brae" Stud, Mannuem, 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
Zahnow, 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., Neumgua
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

Growing Summer Vegetables In North Queensland

By S. E. STEPHENS, Horticulturist.

The growing of summer vegetables is now an established industry in north Queensland, its success depending on the maintenance of a regular supply to the market selected.

During the early part of this century and, indeed, right up to 1940, vegetables for the north Queensland markets during the summer months were practically all imported from southern Queensland or New South Wales. Regular and frequent refrigerated shipping services maintained supplies of even the most perishable vegetables without difficulty, and these sold at reasonable prices. This system of supply was so well organised that farmers in north Queensland found local production uneconomic. Pests and diseases are very active in summer, and climatic conditions at that period of the year make the production of good quality vegetables far from easy.

The War Time Pattern

The disorganisation of shipping brought about by the second World War caused a complete breakdown in the established supply arrangements and local production was expanded to meet local needs. These were increased some four or five fold by the billeting of large concentrations of army, navy and air force personnel within the area. Furthermore, the establishment of a number of military hospitals and convalescent centres in the north necessitated a regular supply of large quantities of salad vegetables in particular.

Production of vegetable crops during the winter months, which had been a normal practice for many years, was stepped up to meet the increased demand and, since the demand was continuous and the prices offered were attractive, farmers attempted to extend the production period into the summer. It was soon found that, even on the coastal plain, some vegetables could be grown as late as Christmas while in the Tableland areas, particularly outside the heavy rainfall belt, vegetables could be grown right through the summer months.

The Post-War Period

In the course of the succeeding decade, a clearer picture of the possibilities in various localities gradually emerged.

For commercial purposes, the coastal plain is suitable only for winter and early spring production of vegetable crops. Long beans and cucumbers are exceptions to this rule, for both can be grown during the summer months also. Occasionally, French beans and tomatoes may be harvested as late as January but, at that time, both are unreliable crops; yields are often low and pests and diseases constitute serious hazards.

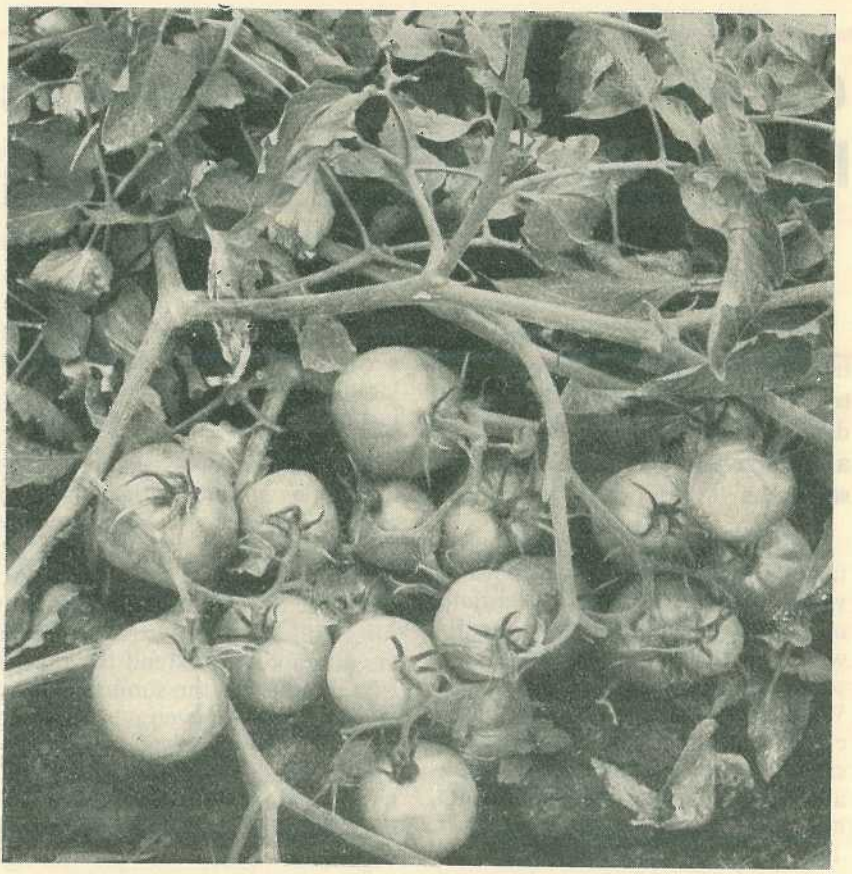


Plate 1

Tomato Fruit. Interior of the bush exposed to show the heavy fruit set in winter-grown crops of North Queensland.

At medium altitudes between 1,000 and 1,400 ft. where frosts are not normally encountered, vegetable crops may be grown not only in the winter and early spring but also in autumn, late spring and early summer. At this altitude, strictly temperate vegetables like green peas and cauliflowers may be grown successfully only during the winter period but the more heat-tolerant crops like beans and tomatoes may be grown both in autumn, winter and early summer. Land at this elevation has been the main source of local vegetable supplies in the north for many years and it is in such areas that the greater number of full-time vegetable farmers are found.

The higher altitudes above 2,500 ft. open up the most interesting possibility for vegetable growing in the tropics. Though situated within a few degrees of the equator, mean temperatures differ from those of the Granite Belt in southern Queensland by only a few degrees F. and stone fruits and grapes can be grown with reasonable success. It would be expected therefore that summer vegetable production would

show some of the characteristics of the Granite Belt in southern Queensland. And this indeed is so, even though present production in the north is on a more restricted scale.

The Tablelands

The principal areas concerned are parts of the Atherton Tableland, and the Evelyn Tableland. The soils are chiefly red basaltic loams but small pockets of alluvium are also used. They are well-drained, of good structure and stand up well to cultural practices required by vegetable crops. Their nutrient status has no abnormal features and where standard fertilizer practices are adopted, no serious deficiency problems have been recorded.

The areas preferred for summer vegetable production are on the fringe of the high rainfall belt that covers the eastern part of the Tablelands. They experience a comparatively short wet season and, consequently, irrigation is necessary for successful crop production. Many farms draw water for irrigation from surface streams but at least one—and, incidentally, this is probably the largest single vegetable farm in Queensland, with up to 300 acres under crop—depends upon several large earth dams for irrigation.

Large scale vegetable production requires careful organisation and, on the Tableland, the best results have been obtained by specialisation. The maintenance of seedling supplies is the responsibility of a nurseryman employed for that purpose alone. Land preparation for planting in the field is the responsibility of another man or men. Each vegetable or, sometimes, a group of two or three similar vegetables,

Plate 2

French Beans Grown Under Irrigation. The crop thrives in North Queensland in late autumn, winter and spring.

is allotted to one man who specialises in growing it. Marketing of the produce is another separate problem and is handled by a senior member of the organisation—usually the proprietor.

These methods are practiced by at least two large growers in Tableland areas. They presuppose a high degree of organisational skill for all operations must be dovetailed so that no delays occur in the production programme and adequate supplies are continuously available to meet the market demand.

Distribution

The more important markets from Townsville northward are now receiving summer vegetables from the Tablelands but the quantities available only meet a fraction of the current demand. Large quantities are still brought forward from Brisbane.

Superficially, it might appear that any farmer with suitable land in Tableland areas who specialised in summer vegetable production should be able to command a good income. In actual fact, however, success or failure depends on his ability to maintain regular supplies to the market he selects. The wholesale and retail vegetable markets have an obligation to maintain reasonable supplies to the consumer at all times of the year. When locally grown vegetables are scarce, market operators make arrangements for supplies from southern wholesale markets. Should unexpected deliveries from local sources meet a market already well supplied from the south, they might only be sold with difficulty.

During the transition period from sparse local supplies to plentiful and regular supplies from the south, any northern grower who enters the summer vegetable growing business must organize his markets very carefully and well in advance of harvest.

Zinc Deficiency In Citrus

Mottle-leaf—a common nutritional disorder in Queensland citrus orchards—is due to a deficiency of zinc. The foliage assumes a characteristic mottling—or yellowing between the lateral veins—and the trees present a generally unthrifty appearance. The leaves tend to be small and narrow with a bunched, upright growth habit, and twig dieback occurs.

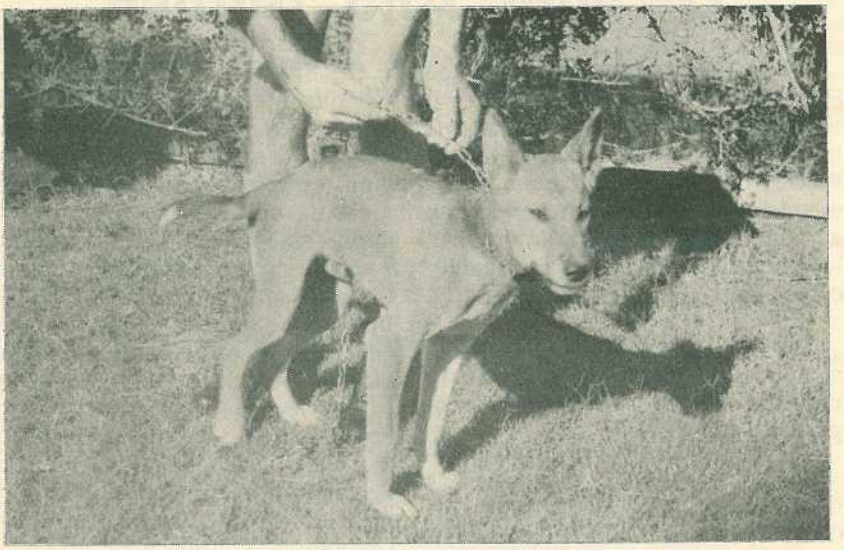
The overall effect of zinc deficiency is a weakening of foliage growth, and fruit drop may increase to abnormal proportions.

Foliage sprays containing zinc sulphate will correct the deficiency. The recommended spray mixture is 10 lb. of zinc sulphate plus 3‡ lb. of soda ash in 100 gal. of water. The spray can be applied at any time when tree symptoms tell the story, but it is most effective when applied in the spring. The spring application can be combined with the copper fungicidal sprays usually applied at blossom-fall.

Even on healthy orchards, an annual zinc spray at half-strength is desirable and is recommended.

—D. DOWDLES,
Adviser in Horticulture.

Sheepmen Deal With Predators



A Young Dingo Reared from Puppyhood by a Sheepman. The observation of live dingoes can give sheepmen much information on the habits of these sheep killers.

Caged Poultry Used As a Decoy for Eagle Destruction. Note the dingo traps set around the cage. In contrast with dingoes, eagles take little notice of exposed traps, and are easily caught in them.

Orchard And Garden

Controlling Pests of the Cabbage Family.—Experience has shown that in Queensland it is almost impossible to grow cabbages, cauliflowers, broccoli and some other members of the cabbage family without using methods to control insect pests. The pests are mainly caterpillars and aphids.

As the insects attack the plants at all stages of growth, controls are required in the seedbeds and in gardens and fields.

Weekly sprayings of seedbeds with endrin at a concentration of 0.025 per cent. active ingredient are recommended. Should aphids appear, an additional treatment with benzene hexachloride (BHC) at 0.03 per cent. gamma isomer should be given. Spray immediately before lifting from the seedbed to ensure that clean material is planted out.

Transplants should be sprayed with endrin at a concentration of 0.025 per cent. active ingredient soon after setting out, and spraying should be repeated at fortnightly intervals. If endrin is not available, dieldrin at a concentration of 0.05 per cent. active ingredient may be substituted.

When aphids are present, a BHC spray at a concentration of 0.03 per cent. gamma isomer should be used instead of one of the fortnightly treatments with endrin or dieldrin.

Discontinue spraying at least a fortnight before harvesting.

—B. R. CHAMP,
Entomologist.

Oil Sprays and Orange Trees.—Oil sprays are recommended as the standard control for several species of scale insects occurring in Queensland, especially on citrus. In commercial orchards the best time to apply these sprays is in the summer. There are two main reasons why the applications should be made at this time. Firstly, the summer generations of scale insects are large, they have a high percentage of survival and the young insects move to the younger parts of the trees as well as onto the fruit. Secondly the oil sprays for citrus are formulated specially for use in summer.

Occasions could arise where one or more of the scale species has bred to unusual numbers at other times of the year. Under Queensland's climatic conditions some advantage may be obtained by using an oil spray at these times. In the spring, however, orange trees are at the critical stage of flowering and setting fruit and may react to oil sprays made in this period by dropping the flowers or shedding the young fruit.

—A. R. BRIMBLECOMBE,
Senior Entomologist.

Carrot Weedicides.—Now that we have white spirit and kerosene sprays, weed control in carrots is not the backbreaking, soul-destroying job it used to be.

Two sprays are usual.

The first, a spray to destroy weeds germinating before the carrots. Make certain of this point, *before* the carrots germinate, say

about 4 days after sowing. Apply the spray when the carrots are germinating and you certainly kill the weeds—*but you kill the carrots, too!*

This pre-germination spray is usually white spirit.

The second spray can be white spirit or a mixture of lighting and power kerosene. *The time* to use it is when the plants are in the 4 fern-leaf stage. Power kerosene varies in composition so it's a good plan to pre-test part of a row the day before full treatment. One part of lighting kerosene to four parts of power kerosene is a suitable basis to work on. If this damages the tested plants, add more lighting kerosene until the mixture is both safe and effective.

Preferably, spray the carrots in the cooler, late afternoon to minimise chances of burn and plant injury. Only a light spray is required—35 gal. to the acre for double rows and 20 gal. for single rows.

—D. DOWDLES,
Adviser in Horticulture.

Clean Containers for Produce.—The presentation of fruit and vegetables is a very important item to the farmer who wants to get top prices for his produce.

Lettuces grown in the metropolitan area are usually marketed in one bushel cases. While the use of second-hand cases is permissible, some growers are abusing this concession by using dirty cases, some even with soil or other offensive foreign matter on them.

Many growers fail to remove the old brands from their cases and do not mark them with their own name and address as required by the Grading and Packing Regulations.

Market inspectors have been directed to take action against persons selling lettuces in dirty cases and therefore any grower who continues to do so will have his produce withheld from sale until the lettuces are repacked into clean cases which are properly branded.

Suitable types of waterproof plastic labels now available in Queensland are priced at approximately 1½d. each, and are easily attached to the case. This type of label would be acceptable for use on lettuce cases in terms of the Fruit and Vegetables Acts.

—A. J. CROCKER,
Senior Market Inspector.

Tree Spacing in Citrus Orchards.—How many citrus trees can you plant to the acre? . . . 50? . . . 100? The objective, of course, is to grow good trees and good crops of fruit. The trees must have enough room for top and root development. You must allow for inter-tree space to provide access for implements, spray equipment, and so on. And last but not least, there's the moisture problem.

Certainly, when you have no irrigation water, a wide tree spacing of up to 30 ft. x 30 ft. is essential, and you're limited to 50 trees to the acre.

But if you have the water, 20 ft. x 20 ft. (or say 24 ft. x 17 ft.) is ample. This way you get over 100 trees to the acre . . . medium-sized, undoubtedly, but with a high potential for early production.

As a general rule, 100 trees to each acre of orchard is not an over-crowded planting rate, and the trees are quite manageable.

One reminder! For regular cropping, you *must* have that supplementary irrigation water!

—D. DOWDLES,
Adviser in Horticulture.

STAPYLTON

A Queensland Fauna Sanctuary

By C. ROFF, Fauna Officer.

The marshlands near Beenleigh have been the popular haunt of waterfowlers since early days. The gradual build-up of population in South-East Queensland, resulting in an increase in the number of hunters and a more intensive use of land in this area, however, has required consideration to be given to conservation of the game species that were being affected adversely.

Accordingly, in conjunction with those local residents who showed interest, an area of 3,926 acres of swampland at Stapylton was selected as a waterfowl sanctuary in 1949.

The principal waters of this sanctuary arise from Sandy, Bridge and Halfway Creeks which, at the anabranch of Sandy Creek, spill into wide swamplands. These are fringed by extensive tea-tree forests on the eastern and southern margins.

The sanctuary is situated 26 road miles south-east of Brisbane, and is reached by journeying along the

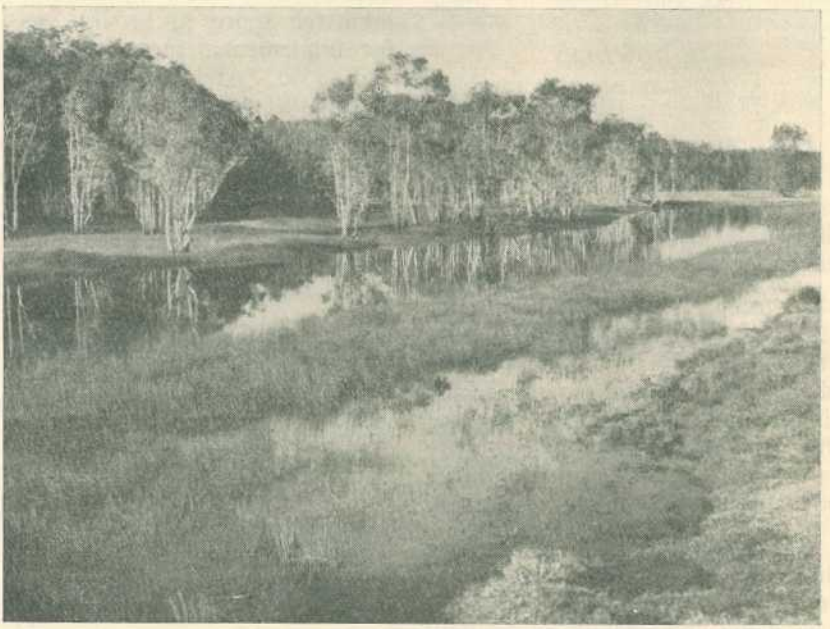


Plate 1
Stapylton, a Queensland Fauna Sanctuary.

Pacific Highway, then turning coastwards two miles past Stapylton in the direction of Norwell.

In 1949, when only a few black swans and small numbers of other wild ducks and wading birds inhabited the swamps, a survey indicated that the area, under suitable management, would provide the permanent food, water and shelter necessary for any wildlife refuge.

Today, the Stapylton Fauna Sanctuary is noted for its magnificent flights of ducks, swans, ibis and spoonbills. Occasionally the graceful jabiru is to be found feeding in the shallows. It is a feeding and resting area for black ducks, white-eyed ducks, grey teal, maned geese, black swans, yellow-billed spoonbills, white-faced herons and Australian white ibis, some of which breed there. Other fauna found commonly there include plovers, egrets, grebes, cormorants, darters, rosellas, eagles and harriers. Snakes are present, the red-bellied black snake being quite common.

On the higher parts of the land, the vegetation comprises grey ironbarks, swamp mahogany, and an occasional scrub-box. Nearer the water are swamp oaks standing in dense couch and other grasses.

In the swamps, the grasses give way to sedges, rushes and water couch. Wildflowers such as water buttercups, water snowflakes and blue water lilies add colour to the surface of the water. The water birds obtain their food from these plants and the smaller animal species of the swamp.

Management of this sanctuary is largely prevention of hunting and shooting, and a number of resident honorary protectors are active.

SCIENTIFIC NAMES OF FAUNA AND FLORA

Fauna

Australian white ibis	*Threskiornis molucca* Cuvier.
Black duck	*Anas superciliosa* Gmelin.
Black snake	*Pseudechis porphyriacus* Shaw.
Black swan	*Cygnus atratus* Latham.
Cormorant	*Phalacrocorax varius* Gmelin.
Darter	*Anhinga novae-hollandiae* Gould.
Eagles	*Haliastur spenurus* Vieillot.
	Haliaeetus leucogaster Gmelin.
Egret	*Egretta alba* Linnaeus.
Grebe	*Podiceps ruficollis* Urseg.
Grey teal	*Anas gibberifrons* Muller.
Harrier	*Circus approximans* Peale.
	Circus assimilis Jardine and Selby.
Jabiru	*Xenorhynchus asiaticus* Latham.
Maned goose	*Chenonetta jubata* (Latham).
Plover	*Lobibyx novae-hollandiae* Stephens.
Rosella	*Platycercus adscitus* Latham.
White-eyed duck	*Aythya australis* (Eyton).
White-faced heron	*Notophoyx novae-hollandiae* Latham.
Yellow-billed spoonbill	*Platalea flavipes* Gould.

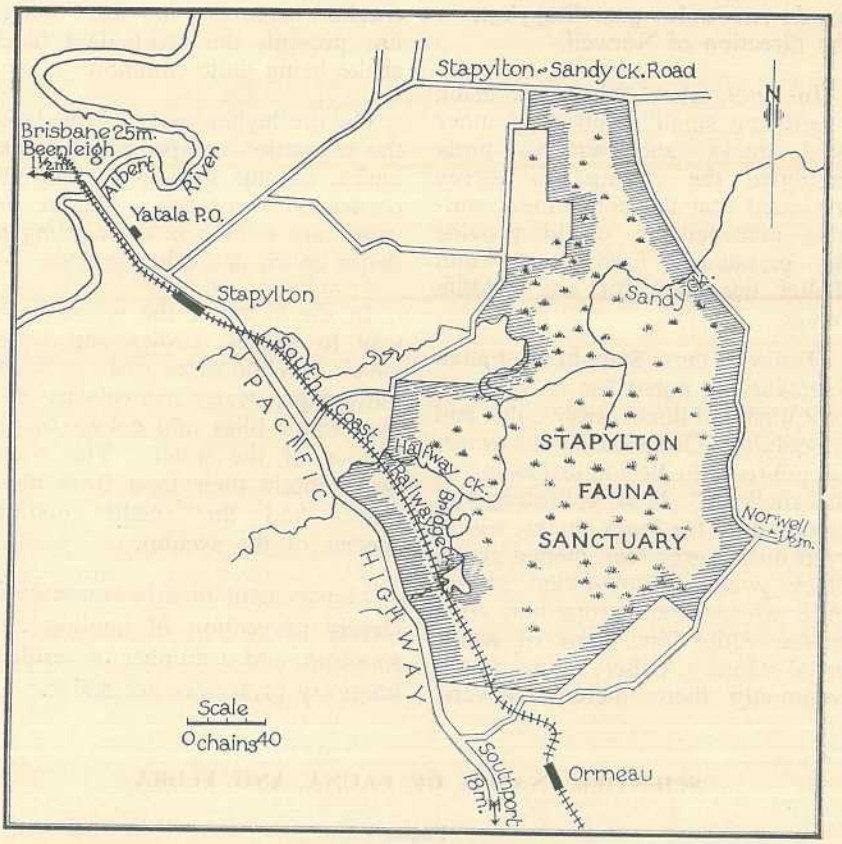


Plate 2

Map Showing the Stapylton Fauna Sanctuary.

Flora

Blue water lily	*Nymphaea capensis* Thunb.
Couch grass	*Cynodon dactylon* (L.) Pers.
Grasses	*Hemarthria* sp.
Grey ironbark	*Eucalyptus drepanophylla* F. Muell. ex Benth.
Rushes	*Juncus* sp.
Scrub-box	*Tristania conferta* R. Br.
Sedges	*Eleocharis equisetina* Presl
	Lepironia articulata (Retz) Domin
Swamp mahogany	*Tristania suaveolens* (Gaertn.) Sm.
Swamp oak	*Casuarina glauca* Sieb.
Tea-tree	*Melaleuca quinquenervia* (Cav.) S. T. Blake.
Water buttercup	*Jussieua repens* L.
Water couch	*Paspalum distichum* L.
Water snowflake	*Nymphoides indica* (L.) O.K.

THE FARM FAMILY

Meat And Poultry Grills

Tender cuts of beef steak such as fillet, rump, sirloin, and porterhouse are suitable for grilling. The meat should not be too fresh and should be cut at least 1 in. thick. Pan grilling is more suitable for thin steaks, as they will not brown under direct heat in the short time required to cook them.

As toughness of meat is associated with the amount of connective tissue present, all steaks, with the exception of fillet, will be improved by beating with a spiked meat hammer or the edge of a saucer.

Treatment before cooking with one of the special "meat tenderisers" will also make steak more tender. These tenderisers usually contain dried papaya juice, which acts on the connective tissue and softens it.

Chops (Lamb or Mutton)

Loin chops are most generally used for grilling, but chump chops are also suitable. Excess fat should be trimmed off and the outer edge of the remaining fat cut at intervals to prevent the chop curling during cooking. The bone may be removed and the chop neatly shaped and secured into position with a small skewer.

Marinade.—To improve the flavour and also to increase their tenderness, steak or chops may be soaked in a marinade. This consists of an acid such as vinegar which is usually combined with oil, seasonings, and herbs.

Bacon

Grilled bacon should be crisp but not brittle. To prepare it, cut off the rind, arrange the slices on the rack of the grilling pan, and place the rack 3 in. below the heat. Turn once during cooking. Remove when the bacon is light brown and crisp.

Kidneys

Sheep or lamb kidneys are suitable for grilling. Skin the kidneys and remove the core. Brush with oil or melted butter. As kidneys are small and may slip through the griller rack, they can be cooked more easily if threaded on a metal skewer. They should not be overcooked, as they tend to toughen.

Pork and Veal

Methods other than grilling are considered better for pork and veal. However, young, tender pork chops may be grilled provided they are very thoroughly cooked. As veal is deficient in fat and has a large amount of connective tissue, it will be more tender if cooked by moist-heat methods.

Poultry

Only very young chickens from six to eight weeks old and weighing about 1 to 1½ lb. are suitable for grilling. The chicken is split in half or cut into suitable-sized portions and brushed well with oil or melted fat. The portions are then placed on the griller rack about 4 in. below the heat. When one side is cooked, salt is sprinkled over

the portions turned and brushed with additional fat. The time required will be about 30 to 45 min. If a barbecue sauce is brushed over the portions while they are cooking, it will keep them moist as well as improve the flavour.

MEAT RECIPES

Filet Mignon

Use eye fillet steak cut thick. Preheat the griller. Brush the slices with melted butter or oil and place them on the griller rack about 2 to 3 in. below the heat. Adjust the heat to a moderate temperature. Grill until the top is brown. Season the top with salt and pepper. Turn the meat and grill until the second side is brown. Season the second side. Serve immediately with pan-fried mushrooms, French fried onions, or grilled tomatoes.

Grilled Steak

Use rump, sirloin, or porterhouse steak and grill as for filet mignon. Serve with maitre d'hotel butter.

Maitre d'hotel Butter

2 oz. of butter
1 tablespoon of finely chopped parsley
1 tablespoon of lemon juice
½ teaspoon of salt
Shake of pepper

Cream the butter, add the parsley, seasonings, and lemon juice. Form into a block and leave the block to harden. Shape into balls with butter pats. (If preferred hot, the butter may be melted and the other igredients added to it.)

Pan Grilled Steak with Oyster Sauce

1 rump steak
Butter or fat
Salt and pepper

Heat a heavy frying pan and lightly grease it with butter or fat. Place the meat in the pan. Adjust the heat so that the meat will cook moderately slowly. Turn occasionally, using tongs or a spatula. Pour off the fat as it collects in the pan. Cook until the outside of the meat is brown and the inside rare or medium done, according to preference. Season and serve immediately with oyster sauce.

Oyster Sauce

6 oysters
1 tablespoon of flour
1 tablespoon of butter
¼ cup of milk
¼ teaspoon of salt
Shake of pepper
1 teaspoon of lemon juice
¼ cup of oyster liquor

Melt the butter, add the flour, salt, and pepper and cook until frothy but not brown. Remove from the heat, add the milk, and stir until smooth. Return to the heat and cook until thick. Remove from the heat, add the oyster liquor, and cook. Cut the oysters into halves or quarters. Add the oysters to the hot sauce and heat gently but do not boil. Remove from heat and add lemon juice. If a richer sauce is desired, add one egg yolk or two tablespoons of cream before adding the oysters.

Hamburg Steaks

1 lb. of mince
2 tablespoons of chopped onion
1 egg
½ cup of fresh bread crumbs
¼ teaspoon of pepper
2 tablespoons of chopped parsley
2 tablespoons of tomato sauce
1 tablespoon of worcester sauce
½ teaspoon of salt

(Five servings)

Saute the onion in a little bacon fat. Beat the egg slightly. Combine all the ingredients and shape into five patties. Wrap a strip of bacon round the outside of each patty and secure with toothpicks. Place on a rack under the preheated griller about 3 in. from the heat and cook at moderate temperature. When half done and

brown on top, turn and brown on the other side.

Marinated Lamb Chops

6 lamb loin chops
½ cup of olive oil
¼ cup of vinegar
Juice of 1 lemon
1 bay leaf (crumpled)
½ teaspoon of peppercorns
2 onions (finely minced)
Salt and pepper

Cover the chops with a mixture of the oil, vinegar, lemon juice, and seasonings. Allow to stand in a cool place for two to three hours. Preheat the griller. Remove the chops from the marinade and place on a rack about 3 in. from the source of heat. Regulate the griller so that the chops will cook at a moderate temperature. When the chops are browned on one side, turn and finish cooking on the other side. Time 12 to 15 minutes.

Mixed Grill

A mixed grill consists of two or more kinds of meat grilled with vegetables or fruits. Choose an interesting combination of foods which will require about the same time for cooking or add those which require a shorter time as cooking progresses.

Before beginning, prepare either French fried or straw potatoes or potato crisps and keep hot. Prepare maitre d'hotel butter.

The grill may be selected from the following—

Meat: Steak or chop, kidney, sausage, bacon or precooked sweetbreads.

Vegetable: Mushrooms or tomatoes.

Fruit: Apple rings, pineapple slices, or tinned peaches or apricots.

Place mushrooms or tomatoes in the pan of the griller, where they will cook in the dripping from the meat. Brush the meats with melted butter or fat and arrange on the rack. If using apple rings or fresh pineapple, brush with melted butter. Tinned fruits have sufficient syrup to grill without butter. Place the grill 2 to 3 in. from the heat and cook at moderate temperature.

Serve immediately with maitre d'hotel butter and the crisped potatoes.

Kebabs with Pilaff

½ lb. of lean mutton
½ lb. of rump steak
3 lambs' kidneys
3 rashers of bacon
Pineapple chunks

Marinade

4 tablespoons of salad oil
3 tablespoons of vinegar
1 bay leaf
Salt
Black pepper
1 crushed clove of garlic

Trim the mutton and steak of all fat and gristle and cut them into cubes. Mix the marinade ingredients and pour them over the meat cubes. Steep the meat for two hours or longer. Skin the kidneys, cut in halves, and remove the cores. Remove the rind from the bacon, cut each rasher into two, and shape into rolls. Place the pieces of meat on skewers alternating with the other ingredients, and grill until the meat is tender, turning frequently. Service on a bed of pilaff or plain boiled rice.

Pilaff

2 oz. of butter
6 oz. of rice
Salt and pepper
1 skinned tomato
¾ pint of stock or water

Heat the butter, add the rice, and cook until it is slightly browned. Add seasonings, tomato,

and stock or water and simmer until liquid is absorbed.

Grilled Kidneys with Bacon and Tomato

6 sheep kidneys
Bacon slices
3 tomatoes
6 slices of toast
¼ cup of oil
½ cup of vinegar

Skin the kidneys, split in halves, and remove the cores. Place in a marinade made from a mixture of the oil and vinegar and leave for an hour or more. Drain. Wrap each piece of kidney in a slice of bacon and fasten with a toothpick. Grill for five to eight minutes, turning frequently. Serve on toast and garnish with fried tomato slices.

Chicken Livers En Brochette

Cut chicken livers into small squares. Cut bacon into squares the size of the pieces of liver. Place alternate squares of bacon and liver on skewers, beginning and ending with the bacon. Preheat the griller. Cook at a moderate temperature for about 15 minutes, turning several times during cooking.

Bacon Open Faced Sandwich

6 slices of bread
6 rashers of bacon
12 slices of cheese
12 slices of tomato

Toast one side of the bread. Butter the untoasted side. Place two slices of the tomato on each slice of bread, cover with two slices of the cheese and two half rashers of the bacon. Toast under the griller until the bacon is cooked and the cheese melted.

Bacon Appetisers

Wrap stuffed olives, cooked pitted prunes, or oysters in thin slices of bacon. Secure with toothpicks. Grill at a moderate temperature until the bacon is cooked. Serve immediately.

Barbecue Sauce

(Suitable for basting grilled chicken)

2 tablespoons of oil
2 tablespoons of vinegar
1 teaspoon of mixed mustard
1 tablespoon of worcester sauce
3 tablespoons of tomato sauce

Combine all the ingredients and mix thoroughly.

Queensland Pocket Year Book, 1959

The 1959 issue of the Queensland Pocket Year Book will be of value to all persons interested in the political, business, and social life of the State. The new issue follows the pattern of the nine previous issues as a small reference book of Queensland statistics. It provides the latest available statistical information on all the matters included in the earlier issues, including in most cases the financial year 1957-58 or the calendar year 1958. Copies may be obtained from the Deputy Commonwealth Statistician, 42 George Street, Brisbane, at a cost of 6d. each, or 10d. when posted.

The job of guiding a club

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

Everyone associated with a junior farmers' club should know why the club advisory committee exists. Unfortunately this is frequently not so, and as a result the advisory committee does too little, being ignorant or afraid of interfering, or does too much, thereby usurping the authority that belongs to the club, and preventing members from becoming confident and sure of themselves. Obviously both extremes are wrong, because, Youth benefits by consulting those who are experienced, and at the same time learns by doing.

Club members learn by making their own decisions and observing the results. Club and advisory committee members share the responsibility for maintaining harmony in their relationships. Co-operation is a two-way affair, and the club members cannot reasonably expect help from their advisers if they keep them in ignorance of what is going on. Unless the advisory committee is treated by the club as an important part of the organisation its members will lose interest.

All advisers may rightly expect to receive notices of meetings, and details of programme arrangements; similarly they should be kept informed of the content of the reports of various sub-committees. In all their dealings with them, the club members should treat the members of the advisory committee with courtesy and respect. To feel grateful to them is not enough. Gratitude should, from time to time, be expressed. As "it is the thought that counts," a timely vote of thanks or a personal letter of appreciation will be greatly appreciated.

Finally, advisers should be invited, and not asked to pay, to attend club functions.

Suggestions to Advisers

It has already been stated that one function of the advisory committee is to advise. Talking is not the only way of giving advice.

The old adage that "example is better than precept" applies most assuredly to advisers. It is strongly recommended that advisory committee members might themselves plan and conduct one meeting each year. This meeting might preferably be conducted early in the life of the newly-elected club executive and might be either serious or humorous in nature. In their handling of this meeting the advisers can by example show the club members how, or how not, to do the job.

Similarly, advisers might well conduct a model discussion group, or give short talks which will serve as examples for the club members.

The annual general meeting of the club should be attended by all advisers; other meetings need not be attended "in force." It is usually sufficient for two members of the committee to attend each meeting with advisers taking turns to be present. It is not desirable for the older people "to swamp" a club meeting.

When adults attend a meeting presided over by a chairman much younger than themselves, they must at all costs avoid placing the

leader and themselves in an embarrassing position. Do not confront the young chairman with the difficult task of having to politely yet firmly tell a much older person that she or he is speaking out of turn or trying to exert too much authority.

Whilst it is everybody's duty to make the club, its purpose and its doings, known in the community, to recruit new members and to influence public opinion in its favour, this is particularly the task of the advisory committee members. Advisers will know many people whose goodwill is important and whose views carry weight. They should seek to gain this goodwill and by their attitude towards the club make known to all the good influence which a strong and effective club can have in the district. However loyalty to the club and the cause should not extend to stimulating unhealthy rivalaries between clubs or between the junior farmers and some other organisation.

Help with New Members

The advisory committee must be ready to discuss the club programme with the members, and if invited to do so, to select one of their number to "sit in" on meetings of the club's programme planning committee. When for some reason or another the club programme breaks down, members of the advisory committee should be available and ready to help either with suggestions or with personal assistance.

In assisting with the training of new members the advisory committee can be particularly helpful, and it is suggested that it is to these members rather than to the experienced ones that they can give the greatest assistance.

Advisers can be of particular help to clubs in suggesting, and helping with the planning of, club projects. Whether the project be a field day, the establishment of an experimental plot or some scheme to raise club funds or to help the community generally, it will be the better for discreetly given adult guidance, particularly during the planning stages. Such service in this instance as in most others, is best rendered indirectly or at the planning sub-committee meetings.

Where the club's finances are concerned the advisory committee should be ever alert to ensure that correct book keeping methods are employed, and that the club's funds are being spent in such a way that the objectives of the organisation might be achieved.

Finally, it might be stated that the function of the club advisory committee is to serve youth. The way in which the service is rendered is an important as the service itself. Service which smacks of patronage or which is given with some ulterior motive is as repugnant and as damaging as that which restricts the full development of the personalities of members. Let us hope that the service which is given by the advisers will be helpful, and that it will ensure that the club becomes and remains a happy one.

Hints to Club Members

To guarantee the necessary annual intake of new members it is essential that the junior farmers' club establish a friendly liaison with the local State schools. Invite the upper grade pupils, and more particularly project club members, along to several club meetings each year. Arrange an interesting evening, and encourage the pupils to take part. As the year draws to a close, special efforts should be made to induce those pupils who are leaving school to join the club. Remember though that these new and young members will need special care and encouragement, so make provision for them in your club programme.