

QUEENSLAND

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ANNUAL REPORT

OF THE

DEPARTMENT OF AGRICULTURE
AND STOCK

FOR

THE YEAR 1946 - 47

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1947.

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THE YEAR 1946-47.

PRESENTED TO PARLIAMENT BY COMMAND.

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REPORT OF THE DEPARTMENT OF AGRICULTURE AND STOCK FOR THE YEAR 1946-47.

TO THE HONOURABLE THE SECRETARY FOR AGRICULTURE AND STOCK.

SIR.—I have the honour to submit herewith the Annual Report of the Department of Agriculture and Stock for the year ended 30th June, 1947.

This report was largely compiled under the direction of my predecessor in office, Mr. R. P. M. Short, who retired on 30th June after 49 years of service in this Department. Mr. Short had seen the Department grow from its embryonic stage to become a very important and diversified organization and his wise counsel and wide experience will be greatly missed.

SEASONAL CONDITIONS.

The April-September period of 1946 was exceptionally dry and without sufficient rain for successful sowings of seasonal crops. Some relief came in late September with soaking rains over the south-eastern division. Lighter falls were recorded in some pastoral districts, but, except for isolated showers, there were few beneficial falls in other parts of Queensland. In the wheat-growing areas the change was too late and farmers were faced with the prospect of almost a complete crop failure.

Aggregate rain registrations in October were below normal throughout the State. Fairly well distributed storms occurred in some of the southern agricultural areas, but in other districts only very light rainfalls were recorded.

November was a month of storm rains over a wide expanse of the far western pastoral country. In the South-west, however, there was practically no break in the protracted dry weather. Local thunderstorms improved the seasonal outlook in agricultural and dairying districts.

December rainfall was below normal in most divisions of the State and substantial general seasonal rains were by then badly needed.

In January the rainfall distribution was very light over most of the pastoral districts, but under cyclonic influences there were very heavy downpours in the south-eastern division. In some localities registrations were phenomenal and there were serious inundations in the basins of seaward-flowing rivers. The highest floods since 1887 and 1893, respectively, occurred in the drainage areas of the Logan and Albert Rivers. There also were moderate rises in the Condamine and MacIntyre Rivers.

February was another month of excessive rainfall aggregates and consequent high floods in the coastal districts. The central and subtropical interior received from 3 to 7 inches. The South-west had the best rains for years, which altered entirely the pastoral outlook in that region. A second heavy flood series com-

menced in the coastal districts near the end of the month and continued into the first week in March.

March also was a month of generous rains and the South-west again shared in the benefit, some streams reaching flood reporting levels. Throughout other divisions of the State most rivers and their tributaries were either in flood or flowing strongly. High monthly aggregates (in inches) included: Burketown, 31½ inches; Normanton, nearly 23; Mount Surprise, over 9; Atherton, nearly 11; Innisfail, over 32; Giru, over 25; Rolleston, over 8; Duchess, over 6; Calliope and Childers, nearly 17; Chinchilla, nearly 11; Talwood, nearly 8; St. George, over 6. Several districts in the Port Curtis division reported from 10 to 15 inches; many localities in the Moreton district from 10 to 20 and many places in the eastern Darling Downs from 4 to 8 inches. There were flood rises in most of the coastal river systems and also in the basins of some inland streams.

April rainfall was above normal in the South Coast, Moreton, and Darling Downs divisions and caused more local flooding. The Condamine and McIntyre Rivers continued to carry a considerable run-off from their swollen head waters.

The most useful May rains fell late in the month and extended from the seaboard to the Warrego and central highlands. In the wheat-growing areas sowings for grain commenced on a record acreage—500,000—for Queensland.

At the close of the year, seasonal prospects were good as a result of the late summer rains and recent freshening falls and in most districts stock were wintering well. In July, light to useful rains in southern and far south-western pastoral districts spread eastwards through the Warrego, Maranoa, and Darling Downs divisions to the South Coast, but, except on the tropical coast, gaugings were below the light to moderate July averages. Normal dry winter weather was the general experience; however, crop prospects were promising in every farming district.

PLANT INDUSTRY.

A perusal of the several reports covering the activities of the Division of Plant Industry will show that, in spite of the somewhat unsatisfactory nature of the seasonal conditions, a great deal of useful work was carried out by the officers handling both the investigational and advisory services.

Many crops grown in Queensland are either produced commercially nowhere else in Australia or are predominantly Queensland grown. As a consequence, the Department of Agriculture and Stock has, in large measure, to rely on its own efforts to solve the problems of these crops

and in handling them can draw only to a limited extent on experience gained elsewhere. This has led to the building up of a considerable team of workers recruited specially for investigational work. Much of the work of some of these officers can be carried out in the Head Office laboratories in Brisbane and, to some extent, in co-operation with farmers, orchardists, and market gardeners on their own properties. On the other hand, many of the projects on which it is desired to concentrate their efforts can best—and in some cases can only—be satisfactorily handled on departmentally controlled properties. It was for this reason that the recent departmental reorganisation provided for the establishment of a number of regional experiment stations with which are now associated several branch stations. The important part played by these various stations in the departmental investigational programme is very evident from this year's annual report; and the plans which have been prepared for their further development imply that, within the course of a few years, each of these several stations will function as a major centre of plant industry activities within its district.

Soy Bean.—The potential importance of the soy bean in Queensland's rural economy has led to the establishment of observation plots in various districts, these plots containing well over 100 varieties. The report of the Commonwealth Commission of Investigation into the Soy Bean Industry in the United States of America—one of whose members was the Director of Agriculture—has now been made available. It contains a very comprehensive assessment of the status of the soy bean industry in North America and of its possibilities in Australia. Another crop which may have possibilities in Queensland is rice and, here again, seed of a considerable range of varieties has been obtained from overseas. These are being tested as an essential preliminary to the possible establishment of rice-growing in certain districts in the State.

Fertilizer and Varietal Trials.—As in previous years, the experimental programme on established field crops covered a very wide range of fertilizer and varietal trials. Another important feature of the activities of the field officers was their participation in a seed selection programme covering maize, wheat, grain sorghum, peanuts, and tobacco. This important seed selection work has now been supplemented by a seed certification scheme which already provides for hybrid maize, sorghum, and beans.

Plant Breeding.—Plant-breeding activities in field crops have been maintained more or less on the same basis as in previous years, except for the fact that improved facilities are now available for handling this type of work in the case of wheat, oats, and sorghum at the Hermitage Regional Experiment Station outside Warwick. While on the subject of plant breeding, attention might be directed to an article which will appear in the August, 1947, issue of the *Queensland Agricultural Journal* in which departmental progress in wheatbreeding during the 1946-47 season is discussed. The illustrations contained therein may be regarded as striking evidence of the promising nature of the material at present being produced and tested in the case of this valuable field crop.

Storage and Transport Problems.—One of the most important recent developments in the horticultural activities of the Department has been the initiation of extensive work on fruit and vegetable storage and transport problems. Satisfactory progress has been made in this investigational sphere which is of particular importance in a tropical and sub-tropical State such as Queensland.

Pest Control.—The work of the several sections of the Science Branch also has been attended with a considerable measure of success. Naturally, further possibilities of new insecticides, such as DDT and Gammexane, have been investigated by the entomologists of this branch, as also have new fungicides by the Plant Pathology Section.

Agricultural Chemistry.—The Chemical Laboratory is playing a part of growing importance, particularly in the realm of soils, irrigation waters, and biochemical problems. Land settlement projects for ex-servicemen have placed an increasingly large measure of responsibility on the Plant Nutrition Section of this branch. This responsibility, involving as it does a great deal of soil surveying and analytical work, which has been carried out in co-operation with officers of several branches, has been discharged with a marked degree of efficiency. It can be claimed that every precaution which can be taken by this Department to ensure that new areas made available for settlement have a reasonable prospect of success is being observed. The biochemical work is being steadily developed, because of its obvious great importance to the herds and flocks of what is still—and is likely to remain largely—a primary producing State.

Sugar Production.—Final sugar production figures for the 1946 season, as supplied by the Sugar Board, show that 512,086 tons of 94 n.t. sugar were manufactured. The figure is 132,503 tons short of the 1945 production following a prolonged dry period in all sugar districts and serious frosts in the southern and central areas. In only one of the war years was a lower production figure recorded. This quantity of cane harvested was 3,714,475 tons and consequently 7.25 tons of cane were required to make 1 ton of 94 n.t. sugar. This is only the fourth occasion in the past 16 years on which more than 7 tons of cane have been required. The c.e.s. value of the cane was 13.89, an exceptionally low figure and caused largely by continuous dry weather and frost-damaged cane. This low quality is reflected in the tons of cane required to manufacture 1 ton of sugar.

The average price for the 1946 sugar crop was £21 16s. 10d. per ton, an advance of £1 10s. 9d. per ton on 1945 figures (compared with £19 16s. 1d. in 1944). The total value of the crop was, therefore, £12,160,000 compared with £13,000,000 in 1945.

The 1947 crop is estimated to produce 3,900,000 tons of cane, and this should yield 550,000 tons of sugar. This figure, if achieved, will be a distinct advance on 1945 production, but will not be up to 1944 manufacture and will be a long way behind pre-war peak years. Crop estimates are improving as the result of the early spring rains, and it is probable that the estimate of 1947 production is somewhat conservative.

Advisory Work.—No reference to the work of the Plant Industry Division would be complete without mention of the very great volume of advisory work which is handled both by the Head Office staffs and by the staffs of the various branches located at different country centres. These officers whole-heartedly discharge a very worthwhile service to the primary producers in their various districts. The work performed by them contributes very largely to the success of the Department and to the esteem in which it is held by the general body of primary producers.

The policy of providing improved accommodation for departmental officers at country centres—which was of necessity suspended during the war years—has been continued during the year under review. The latest improvement is at Toowoomba, where the officers of the Science Branch now occupy commodious and well-equipped laboratories. The field officers of the Division of Plant Industry and other departmental officers stationed at Toowoomba have also been supplied with markedly improved office accommodation at that centre.

FIELD CROP PRODUCTION.

Wheat.—Weather conditions from the time of sowing until mid-September were very dry with a succession of heavy frosts. Practically all the early and mid-season sowings, which constituted most of the area planted, failed for grain and were grazed off.

After the September rains, some sowings were made and despite the lateness of the season yields of up to 18 bushels per acre were obtained. In the circumstances, the behaviour of these late-sown crops was remarkable as they showed little or no signs of rust and developed good quality grain. The total yield, however, was only about one million bushels, the lowest for 20 years.

As has been the experience for several seasons, varieties bred by the Department of Agriculture were outstanding and filled the first seven places in a census of wheat varieties planted in Queensland this season.

One unnamed crossbred (Three Seas x Florence x Kenya 6041) again demonstrated its resistance to rust and also yield capacity under adverse conditions and may prove to be the best of many excellent varieties bred by the Department.

Maize.—The yield on the whole was not good because of an increased acreage of grain sorghum and also seasonal conditions. In most districts early-sown crops were poor, consequently most of this season's grain will come from the late-sown crops which on the whole were much better.

On the Atherton Tableland an area of approximately 24,000 acres was sown for an estimated yield of between 18,000 and 19,000 tons.

Grain Sorghum.—Both acreage sown and total yield were easily a record. It is anticipated that the yield will be between three and four million bushels of grain. This crop is progressively increasing in popularity, and while this is to some extent the reason for the record acreage

sown, the fact that large areas which normally would be under wheat were available for sowing with grain sorghum also was a factor.

Potatoes.—The potato crop in southern districts was the lowest since the contract scheme came into operation in 1942. The spring crop was light because of the dry weather, and it was only in localities where irrigation is practised that satisfactory yields were obtained. The autumn crop was very light because of excessive wet during February and March.

In North Queensland, it has been necessary to reduce the area under potatoes since Defence Force demands ceased. It is hoped, however, that it will be possible to maintain the industry at its present level of sufficiency for the requirements of the population north of the tropic of Capricorn. The crop for the past season in the Burdekin district was satisfactory in both quantity and quality.

Moth attack, which is usually severe towards the end of the season, caused only minor damage. Growers who used the insecticide DDT were highly satisfied with the result. The varieties Bismarck and Brownell were the most widely grown, but Factors also are gaining favour.

Tobacco.—The area under tobacco was greater than that of the previous season. In the Mareeba and Dimbulah districts, the season was not very favourable for non-irrigators. In the dry-farm areas no trouble was experienced in getting good strikes in the field, and although the crops continued to look promising curing difficulties arose because of the seasonal conditions. The rainfall during January was the lowest for over 70 years. February rains were normal, yet insufficient to compensate for the lack of moisture during the previous months. Blue mould did not show up at all during the season and mosaic was less severe than usual.

The total area planted was 1,361 acres—738 acres in the Mareeba district and 623 in the Dimbulah district. It is expected that approximately 950,000 lb. of cured leaf will be appraised for the season.

In the south-western districts the area planted was greater than that of the previous season. Conditions were favourable for the raising of seedlings, and after planting out had been completed large numbers of seedlings were still available. Crops made very good growth. DDT was used extensively in the seed beds, with the result that seedlings were remarkably free from insect injury. The area planted was 865 acres for an estimated yield of approximately 928,000 lb. of cured leaf.

Peanut.—A record peanut acreage was planted, the area being over 40,000 acres—50 per cent. greater than any previous acreage planted. The estimated yield is 20,000 tons. There was an expansion of the industry not only in the South Burnett but also in the Upper Burnett and on the Atherton Tableland.

Canning Bean.—The area cropped was below that of previous seasons, but yields generally were excellent, and it is anticipated that the yield will be equal to if not greater than that of any previous season. Yields of up to 33 bushels per acre were obtained in the Kingaroy district. The quality was excellent.

Sunflower.—The area under sunflower increased because of a ready market for all seeds with a high oil content. The increase in acreage also has been influenced by the introduction of the short-growing varieties, Mannonite and Sunrise, which can be mechanically harvested. Yields from these varieties, so far, have not been as heavy as those from the tall-growing varieties, but analyses have shown the oil content to be high. The reduced cost of harvesting the dwarf varieties compensates for any reduction in yield.

Soy Bean.—Some fairly large individual areas were sown; results on the whole were sufficiently good to encourage growers to sow again next season. Yields of up to 20 bushels per acre were reported, and, considering the season and the lack of experience in mechanically harvesting the crop, were satisfactory. Despite high prices for the beans, it would seem that the bulk of the crop is being retained for seed for the next season's sowing.

Although it has been demonstrated over a number of years that the crop can be grown successfully in many districts, field officers are not recommending production on a large scale until such time as an assured market is available.

Cotton.—Weather conditions in the past season were not conducive to successful cotton-growing, and many crops were checked to such an extent that when the abundant February rains occurred they were unable to respond and did not fully recover. The cotton acreage for the 1946-47 season was again small, although the seed applications showed an appreciable increase over the 1945-46 season, being 18,000 acres applied for by 1,085 growers. In many cotton-growing areas sufficient moisture to prepare the seed-beds and to plant cotton was not available until late November and December, which resulted in a reduction of acreage. From past experience, best results are obtained from October plantings.

Tropical Agriculture.—The main activities of the Bureau of Tropical Agriculture included the establishment of pastures for grazing trials, designing of paddocks and water supplies, and the introduction of grasses and legumes and their further increase for seed supply. In addition, various tropical crops have been grown and the details of their behaviour recorded.

Agricultural Research.—Agricultural research work of the year included winter cereal breeding; cotton breeding and pest control; field trials with potatoes, oats, maize, lucerne, tobacco, sorghum, soy bean, and cow pea; and seed selection—wheat, maize, rice, sorghum, peanut, and tobacco.

HORTICULTURE.

Investigational Work.—In the course of the year investigations into problems associated with fruit and vegetable production covered: Refrigerated transport; wastage in pineapples; storage of pineapples for canning and marketing; packing experiments; maturity standards; banana ripening; and oiled fruit wrapping substitutes.

Experiment Stations.—The development of the new fruit and vegetable experiment station near Nambour in the Maroochy district was continued. Investigations included field trials of

various leguminous cover crops, soil management, plant breeding, and the harvesting of ginger. Papaw-breeding plots also were established.

At the Kamerunga Experiment Station, near Cairns, North Queensland, appreciable progress was made in soil management investigations. Field work in relation to tropical agriculture was continued.

Land for a new experiment station was purchased in the Redlands district, largely for investigation into the cultural, pest, and disease problems associated with market gardening.

Citrus Fruit Production.—Among important departmental activities is the supplying of pedigreed budwood to nurserymen, among whom nearly 100,000 buds were distributed.

Bananas.—The area under bananas increased slightly to over 13,000 acres. Bunchy top continues as a major problem in the industry and active measures were applied towards its effective eradication.

Deciduous Fruits and Vines.—Further evidence has been forthcoming that, while so-called trace elements are an important influence in the nutrition of deciduous fruit trees in the Stanthorpe district, the basic problem for this area is one of supplying trees with adequate nitrogen at the right time.

An area of suitable land has been acquired in the Granite country for experimental work in viticulture, particularly in respect of the control of phylloxera, phylloxera-resistant stock performance, and of planting distances. Up to the present time the Stanthorpe district has been free from phylloxera and every precaution is being taken to keep it free.

The Stanthorpe district produced a very heavy crop of apples and some 60,000 bushels were exported to Singapore and the Far East.

QUARANTINE.

New varieties always make an appeal, and with air services now available greater facilities exist for the importation of plant material from overseas. In consequence, there are many progressive orchardists and others seeking permission to import, while others, not realising the risks involved or of the existence of quarantine laws, import material direct. While it is recognised that every opportunity should be taken to improve varieties, it is felt that the harm done by introducing a disease may far outweigh the possible advantages. The position is that quarantine restrictions must be enforced and also that the Department and Plant Introduction Service of the Commonwealth are fully alive to the advantages and no opportunities are lost to import potentially valuable material and growing it, in the first place, under such conditions as to eliminate risks of disseminating new strains of disease or new diseases.

ANIMAL INDUSTRY.

PASTORAL CONDITIONS.

Live Stock Statistics.—The latest available figures show the approximate number of the principal classes of live stock within the State as at 31st March, 1947, to be (figures for the previous year are in parentheses):—Horses, 343,172

(367,357); sheep, 16,084,340 (18,943,762); cattle, 5,945,285 (6,538,067); swine, 340,150 (415,411).

Extension Work and Animal Health.—An extended programme of extension work, including disease and pest control, was carried out during the year.

Sheep and Wool.—Seasonal adversity is reflected in the sheep population which, as estimated, has considerably decreased. Losses in some districts were as high as 25 per cent., while many returns show losses of 10 per cent.

The seasonal conditions also have been reflected in the sheep market. Because of the British agreement, fat lambs have commanded a uniformly high price throughout the year.

The last wool sale in June closed the first year in which wool has been sold by auction since the second world war began. Prices have been at a record high for good quality stylish spinners' wool, free or practically free from vegetable fault, but towards the end of the year a marked price differential was obvious against poor quality faulty wools. American competition has been partly responsible for the stability of the market, and in all 467,772 bales of wool were sold, realising £16½ millions.

The Farmers' Wool Scheme.—The Farmers' Wool Scheme continued to function as usual and 747 bales of wool were handled in the departmental wool room. This shows an increase of 101 bales on last year's total and 267 growers availed themselves of this service. The top price obtained was 46½d. per lb. for one bale. The market's discrimination against poorer quality wool has been reflected in the prices received for the lower lines.

PIGS.

Prices.—The *Pig Meats Acquisition Plan* of the Federal Department of Commerce terminated on 31st December, 1946, so that the price of pigs is no longer controlled. However, the original agreement with Great Britain for pig meats has been varied, whereby quantitative restrictions have been removed and the existing price equivalent to 9d. per lb. for first quality baconer carcasses up to 180 lb. dressed weight, at port of export, is to continue to September, 1948. This agreement influences the local price to some extent and tends to give a measure of stability to the industry.

Production.—Production figures for the year reveal a decline as a result of a number of factors, including adverse seasonal conditions, shortage of feeding stuffs, and shortage of building materials.

As a result of these unfavourable conditions, many farmers sold breeding stock for slaughter. With better seasonal conditions and the improved grain position, production is now returning to normal.

Stud Pig Breeding.—The demand for stud pigs was firm throughout the year, not only within this and other States but from New Guinea and other Pacific Islands. Breeders are making every effort to obtain fresh blood lines in order to maintain and improve the quality of their stock. In the selection of breeding stock the services of the Department were made available to buyers and duly appreciated.

POULTRY.

Because of a general scarcity of poultry feeding stuffs, egg production declined considerably during the past year. The intake of the South Queensland Egg Board was 8,777,248 dozen, as compared with 11,085,699 dozen in the previous year.

These figures, however, are far short of the State aggregate, as complete production statistics for the Central and Northern Divisions are unavailable.

Slaughter of Poultry.—During the period under review, two large slaughtering works were established. These new establishments are modernly equipped with chilling and cold store rooms. Poultry are slaughtered on these premises for the local and overseas markets. In addition to these establishments, poultry are still being slaughtered on smaller premises which were operating in previous years.

There is evidence of increased slaughterings during the present year, largely because of the shortage of food supplies. Following is a comparison for the years 1945-46 and 1946-47:—

	1945-46	1946-47
July to December	232,765	316,202
January to June	305,773	327,803

Export.—During the year approximately 557 tons of dressed poultry was exported to Great Britain. This is equivalent to about 300,000 fowls.

Table poultry values have been maintained throughout the year at ceiling prices.

DAIRYING.

Seasonal Conditions.—The 1946-47 season opened unfavourably for the dairy industry. All dairying districts were affected by the dry weather which had continued since the autumn. Fair storm rains occurred in September in parts of the South-east division and were followed by further falls in October, but other districts did not benefit. In districts so favoured, production commenced to rise, but continued dry conditions in other parts of the State necessitated the purchase of relief fodder. Stock losses occurred in some areas.

Good soaking rains fell in November in the Port Curtis district, while scattered storms occurred elsewhere. Although most herds had by this time commenced their new lactation periods, rainfall generally had been insufficient to stimulate production. Summer fodder crops were planted on a smaller acreage than normally, because of the lateness of soaking rains.

Heavy summer rains in January and February assured pasture and crop growth, and consequently a substantial increase in dairy production. Flooding caused crop and stock losses in some areas. Dam and other water supplies were replenished and dairy cattle regained condition. Favourable conditions continued for the rest of the summer, but production was much below the peak of other years. Good weather conditions were general in the autumn and to the close of the statistical year. Large acreages of winter fodder crops have been planted, and dairy production should be well maintained in the first quarter of 1947-48.

DAIRY CATTLE STATISTICS.

The dairy cattle population of Queensland during recent years is shown in the following table supplied by the Government Statistician:—

	1943.	1944.	1945.	1946.
Dairy cows including—				
Heifers over 1 year	1,308,780	1,290,398	1,267,829	1,242,071
Calves under 1 year	232,276	225,134	210,960	171,318
Bulls 1 year and over	32,569	30,522	30,453	29,312
Total dairy stock	1,573,625	1,546,054	1,509,242	1,442,701

IMPERIAL CONTRACT AND SUBSIDIES.

As from 1st July, 1946, the contract price of butter exported to the United Kingdom was raised to 216s. 10½d. per cwt. The contract between the British and Australian Governments will continue until 30th June, 1948. Negotiations in connection with the renewal of the contract will possibly be opened when the report of the Dairy Industry Costs Committee is received; it is anticipated that the contract will continue until at least 1950.

The present price, including Commonwealth Government subsidy, expected to return to the producer 1s. 7½d. per lb. commercial butter, was to be reviewed after 31st March, 1947, and the Commonwealth Government has guaranteed the industry that the price for the year ending 31st March, 1948, will not fall below the average price which operated in 1945.

A matter of major interest in relation to the review of prices to be paid producers from April, 1947, was the setting up of a joint dairying industry advisory committee consisting of representatives of the Commonwealth Government and dairy organisations. This committee is charged with investigating the costs of production of dairy produce.

The long-term contract for the sale of the exportable surplus of dairy produce has given a measure of marketing stability never previously experienced by the Australian dairy industry. Land values are buoyant—indicative of the faith of dairy farmers in the future prospects of the industry.

During the war years, and since, all butter distributed in England bore no other description than "National Butter." As from 1st October, 1947, wrappers will be marked with the brand of the country of origin in addition to term "National Butter."

BUTTER PRODUCTION AND QUALITY.

Production.—Factory-made butter aggregated 74,068,021 lb., which was estimated to be valued at £6,069,327. This was the lowest butter output in Queensland since the 1927-28 season, and was less than half that of the record season of 1938-39, when 154,377,535 lb. were produced. Although the dry season was the main cause of the decline in butter output, in comparison with that of the preceding season, comparisons of butter production for recent years give a false impression of the decline in dairy production. Over a period of years there has been a pronounced diversion of milk to the market milk trade, cheesemaking, and the ice-cream trade, all at the expense of butter.

During the war years emphasis was placed on volume of dairy production rather than on maintenance of quality. While the urgent need for increasing production to meet the needs of food-hungry nations continues, it is equally necessary to produce butter of uniformly high grade. The marked downward trend of butter quality in recent years is deplored. Action to arrest this decline is regarded as urgently necessary. The full co-operation of the advisory services of the Division are obviously available, but success can only be achieved by the united action of all sections of the industry.

New Ways of Making Butter.—Much interest is evinced in new processes for making butter which were developed during the war years in several countries, including the Australian "New Way" process. These methods obviate the use of the churn, the age-old means of changing cream into butter. They are better adapted to the handling of milk and fresh or "sweet" cream, rather than self-ripened, or "sour" cream. Because of sparse settlement, road conditions, and climate, "sour" cream is at present received at all Queensland factories. One of the new machines, developed by Dr. Senn of the Dairy Research Institute in Switzerland, does, however, treat sour cream. In order to determine the suitability under Australian conditions of these machines, which are governed by three underlying principles, the Australian Dairy Produce Board has arranged for the purchase of four machines. These machines will be installed in factories in Victoria, New South Wales, and Queensland, and a technical committee has been appointed to supervise the trials. The "Senn" machine will be placed in the Caboolture butter factory in this State.

Butter Improvement Service.—Field officers of the Division co-operated fully in providing the necessary liaison between the laboratory and the factories in respect of our butter improvement service.

CHEESE PRODUCTION AND QUALITY.

Production.—Queensland cheese production was 17,291,768 lb. in comparison with 26,931,781 lb. in 1945-46. The values were £887,919 and £1,365,919, in the respective years. The decline in production was mainly attributable to the adverse season, but the diversion of large quantities of milk from the Toowoomba and Warwick factories for the Brisbane market milk trade was also a contributory factor.

Milk produced for cheese manufacture returned to the producer an average price of 2s. 3d. per pound butterfat, including Commonwealth Government subsidy. There was a slight

change-over from cheese to butter manufacture, but the price margin in favour of the cheese factory supplier has ensured the retention of most cheese factory suppliers.

Grading.—Reciprocity between Commonwealth and State in grading of butter and cheese was continued this year. This has resulted in the official grading of a much higher proportion of cheese than could have been done by State officers alone. The total quantity graded was 9,480,521 lb. The grading results were—

	lb.	Per cent.
Choice and first grade	6,844,074	72.9
Second grade	2,453,233	25.88
Third grade	183,214	1.93

These results are almost similar to those of the preceding season, the corresponding figures for which were 1.26 per cent. choice, 69.01 per cent. first, and 28.28 per cent. second. This is an achievement for which the cheese industry is to be commended, for the protracted dry season caused a serious unbalance of milk constituents, especially protein and mineral salts, which in turn caused much difficulty in maintaining cheese quality. Butterfat content of milk received at some factories in the prolonged dry period fell to the low average of 3.3 per cent., casein 2.2 per cent., and cheese yield 9 lb. per 100 lb. milk; the normal figures average fat 4 per cent., casein 2.7 per cent., and yield 10.7 lb. per 100 lb. milk.

MARKET MILK.

In recent years, there has been a world-wide increase in the consumption of fresh wholemilk, a trend which also is evident in Queensland. Information from the Government Statistician shows that in 1945-46 over 14,000,000 gallons more milk (approximately equivalent to 2,800 tons of butter) was consumed in this way and as ice cream than in 1940-41. In view of this, it is pleasing to note the lively interest of many Queensland dairy associations in the pasteurised milk trade. A keener public appreciation of nutrition and, in this connection, of the pre-eminent place of a safe, high-quality milk supply is evidently mainly the reason for the greater quantity of milk consumed. This trend is a good thing in the interest of public health, the more effective use of the food constituents of milk, and the potentially more stable and higher-price market for dairy farmers.

The quantity of protein in the separated milk fed to pigs in Australia approximates the whole of the protein produced by the Australian beef, mutton, lamb, and pig-meat industries.

The services of field officers have been freely available to dairy companies which have entered the market milk trade in assisting them to obtain clean, high-quality milk. Our laboratories also have given good service to both producers and factories.

The system of quality control in respect of board-controlled milk is operated by the Division of Dairying. It has materially helped in raising the quality of market milk during the period of seven years since its inception. The scheme provides for effective liaison between the milk treatment plants, producers, laboratory, and field staff.

Board-controlled milk has increased from about 10,000 gallons daily in 1938 to 30,000 gallons daily. The proportion sold as bottled pasteurised milk is estimated to have risen from about 6,000 gallons to 20,000 gallons daily. Every effort is being made to ensure a safe, clean, and wholesome milk supply for consumers.

OTHER PRODUCTS.

Butter manufacture stands pre-eminent as the the major use to which milk is put in Queensland, with the cheese and market milk sections of the industry of relatively lesser importance. Until recent years, there has been little attempt in Queensland to manufacture other milk products or milk by-products.

Buttermilk.—Several factories have installed roller dryers for the drying of buttermilk, which is used in stock-feeding, particularly by poultry farmers. At two factories, a better quality dry buttermilk is produced. This is sold to the confectionery, ice-cream, fruit drink and biscuit trades. The State's output of dry buttermilk of both qualities in 1945-46 was about 500,000 lb.

Concentrated Milk.—In the course of the year a plant was installed at one factory for concentrating milk.

Margarine.—A world-wide shortage of vegetable fats prevented margarine manufacturers from being able to fulfil the quotas of table margarine allocated them under *The Margarine Act Amendment Act of 1939*.

Dairy Research.—Officers of the dairy research laboratories at Brisbane, Hamilton and Toowoomba investigated many problems of the dairy industry in the course of the year. Research projects included: Manufacture of a non-fat-leaking cheddar cheese; control of mites in cheese factories and cold stores; control of bacteriophage in cheese factories; variations in the composition of milk throughout the year; control of milk quality for the Brisbane Milk Board; improvement in butter composition and quality; and chemical engineering investigations.

Herd Recording and Improvement.—The average production of purebred cows which completed a lactation period of 273 days was 658 gallons of milk and 326 lb. of butterfat. The average butterfat test was 4.84 per cent.

Grade Herd Recording.—For many years the Department has operated a scheme of herd testing, whereby farmers weighed and sampled the milk of the cows in their herds once every two months and forwarded the sample to a factory or the Herd Testing Section in Brisbane. Butterfat tests were made and all records were compiled in Brisbane and sent to the farmer. This scheme is entirely free of cost to the co-operating farmer.

An improved system of herd recording and its early establishment are now under consideration. This new system provides for the formation of herd recording units of about 25 farmers, milking an aggregate of 800 cows; and for the monthly testing of each herd by a recorder who will visit farms, weigh and test the milk and make the necessary calculations. Many dairy

farmers have already signified their desire to co-operate with the Department in the establishment of this projected new service.

MARKETING.

A daily market reporting service was instituted in the course of the year. Through this service, farmers and others interested are kept fully informed by Press reports and radio broadcasts on current market conditions, prices and prospects. A monthly production trend and crop reporting service was also inaugurated.

An amendment of *The Primary Producers' Organisation and Marketing Acts* was enacted in the course of the year for the purposes of clarifying the authority of the Northern Pig Marketing Board to control the selling of carcasses as well as live pigs within its area; including the word "marketing" in the designation of commodity boards with marketing powers; and giving power to commodity boards to establish superannuation schemes for the benefit of employees and their dependents.

Two new marketing boards were set up—the Navy Bean Marketing Board and the Central Queensland Egg Marketing Board.

Early this year a wheat production costs committee was appointed by the Commonwealth Government. Evidence prepared for submission to this committee in the course of its inquiry outlined the peculiarities of wheat growing in Queensland, with particular reference to production costs in this State.

The year's operations of the commodity boards constituted by statutory authority are reviewed fully in the Report of the Director of the Division of Marketing.

PUBLICATIONS.

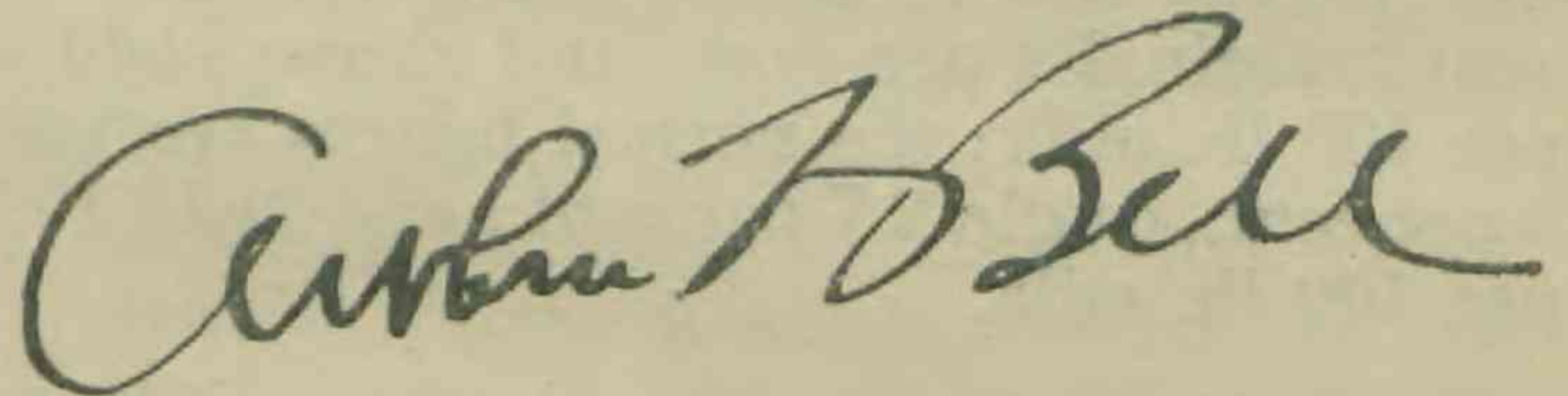
An extensive departmental information service was maintained during the year. The chief channels of communication were *The Queensland Agricultural Journal*, *The Queensland Journal of Agricultural Science*, bulletins and advisory leaflets, and the public press and radio services.

DIVISIONAL REPORTS.

The work of the Department during the past year is reviewed in detail in the annexed reports of the Director of the Division of Plant Industry, the Acting Director of the Division of Animal Industry, the Director of the Division of Dairying, the Director of the Division of Marketing, the Special Administration Officer, and the Editor of Publications.

I am, Sir,

Yours faithfully,



Under Secretary.

REPORT OF THE DIRECTOR, DIVISION OF PLANT INDUSTRY.

This report reviews the activities of all branches of the Division of Plant Industry—other than those of the Bureau of Sugar Experiment Stations—during the twelve months ended 30th June, 1947. The work of the Bureau is discussed elsewhere in accordance with the provisions of “*The Sugar Experiment Stations Acts, 1900-46.*”

STAFF.

Since last year's report was submitted a number of officers have resigned to accept appointments elsewhere—in other State and Federal departments, on the staff of the University of Queensland, and in private employment. These losses have been compensated for, to some extent, by additions to the staff, but the latter appointments have, in most instances, been made to much more junior positions than those vacated by officers transferring elsewhere. Several officers who served in the armed forces are exercising their rehabilitation privileges at the University of Queensland and have been granted leave of absence to do so. The Director of Agriculture returned from his visit to the United States of America in December, but the Supervisor of Field Staff in the Horticulture Branch is still absent on extended leave in Europe, where he is serving on the staff of the United Nations Relief and Rehabilitation Administration. During the year under review the Agriculture Branch suffered the loss of a valued officer in the person of Mr. Les. Wood, whose untimely death followed on an accident in the field while engaged on duty as Field Officer (Silo Construction). The Chief Inspector in the Horticulture Branch, Mr. Anton Person, retired after giving forty-six years of valuable service to the Department.

In view of the fact that staffing conditions are now more or less normal, consideration was given to the initiation of a refresher course in which all field officers of the Agriculture Branch, the Horticulture Branch, the Regional Stations, and the Bureau of Sugar Experiment Stations would ultimately participate. The State of Queensland is so large and the field officers are of necessity so scattered throughout the territory served by the Division of Plant Industry that some undesirable degree of isolation inevitably occurs. An earnest endeavour is made to counteract this isolation, partly by visits of senior officers from Head Office to the various districts in which the men are stationed and partly by regularly supplying to them the fullest possible information regarding the progress of agricultural activities in general within the State and elsewhere. During the war years it was not practicable to do more than this but, with a return to normality in staffing, it was felt that the next logical step should be taken in overcoming the isolation problem—i.e., the institution of a refresher course system which will ensure personal contact between the individual field officers on the one hand and between them and their colleagues in Head Office on the other.

There are some sixty field officers on the staffs of the branches mentioned who should be included in the refresher course system and arrangements have been made for approximately one-third of them to attend a five weeks' course in Brisbane commencing in July of this year, the remaining two-thirds of the field officers to attend a similar course during 1948 and 1949.

An extensive programme dealing with all aspects of plant industry, for inclusion in the refresher course, was drafted and prepared during the latter portion of the year under review.

SEASONAL CONDITIONS.

As in 1945-46, the seasonal conditions, on the whole, were disappointing and the yields of some of the more important field crops therefore were seriously affected. The heavy rains and consequential flooding experienced last year in some northern districts were not repeated in the 1946-47 twelve months period nor were such severe frosts experienced in the winter months of 1947 as in 1946. Nevertheless, climatic conditions, including very heavy rains and serious floods in some southern districts, were unsatisfactory in general, though some crops, such as grain sorghum, yielded very good results. Yields of some of the more important crops are referred to in the accompanying reports of the Director of Agriculture and the Director of Horticulture.

TOBACCO.

Tobacco and cotton are two Queensland-grown crops, the production of which still falls very far short of meeting Australia's domestic requirements. In view of this fact the Department of Agriculture and Stock in the past has devoted a great deal of attention to the investigation of problems associated with the growing of these two crops. During 1946 the work on tobacco was extended to include exploratory plots in the Burdekin River district. The results obtained on these plots were very promising and a more extensive programme accordingly was drafted for implementation on the Burdekin during 1947, the crops to be grown and harvested before the onset of the heavy rains of summer. One of these experiments—at Home Hill—is being carried out in co-operation with the Council for Scientific and Industrial Research. The other Burdekin River tobacco experiment, situated at Clare, is a purely departmental one and is duplicated at Abergowrie on the Herbert River, a coastal district in which the outlook for tobacco is also promising, provided it is grown during the spring and early summer months.

Another development in tobacco experimental work to which reference must be made was the decision by the Federal Government to make available—through the Department of Commerce and Agriculture—a grant of £10,000 per annum for five years to the States of Queensland, New South Wales, Victoria, and Western Australia for the purpose of carrying out additional experimental and demonstration work in tobacco production. Queensland's share of this grant is £3,750 per annum, which must be expended by the State on a pound for pound basis on new tobacco projects. The manner in which these funds might be spent most profitably was the subject of much discussion at a week's conference of departmental tobacco officers convened in Brisbane in November. The conference met for the purpose of reviewing the status of the industry in Queensland, for assessing the nature and the relative importance of the problems to be overcome before the industry could be thoroughly stabilised and expanded, and for preparing suggestions as to

how these problems could be tackled best. Subsequently, further extensive discussions took place between interested parties and it is hoped that, as a result thereof, an expanded tobacco experimental programme will be launched at an early date. Two of the most serious handicaps with which the tobacco-grower was faced in the earlier years of the present phase of tobacco-growing in Queensland—blue mould in the seed-beds and leaf miner in the seed-beds and in the field—have been placed on a satisfactory footing, but one most important group of problems awaits solution. These are the problems associated with the production of the crop under irrigation and it is precisely that group of problems which the Department proposes to feature in its expanded experimental and demonstration programme. The 1946-47 tobacco experimental projects are discussed in the Director of Agriculture's annual report.

COTTON.

The other crop for which there is still a large unsatisfied local market is cotton, and here again the Department has played—and is continuing to play—its part in securing the information required by the farmer to guide him in the actual growing of the crop. This has largely been obtained over a series of years at the Biloela Regional Experiment Station which, at its inception in 1925, was devoted exclusively to cotton experimental work. At first the programme at this centre was restricted to experiments on rain-grown cotton but, in later years, work with crops produced under irrigation has been featured at Biloela. This has been done because it has been obvious for some time that cotton may merit serious consideration in the cropping programme of some of the areas on which irrigation facilities are likely to be developed in the near future. Another most important aspect of the problem of the establishment of cotton as a major crop in Queensland's rural economy—apart from the question of the price obtainable by the farmer—is that of mechanical harvesting. The State Government has already co-operated in the importation of two mechanical pickers and, during the year under review, it decided to share, with other interested parties, the cost of a picker of a somewhat different type. On its arrival in Australia, this machine's possibilities will be tested out under Queensland conditions. The results obtained during the 1946-47 season with the earlier imported mechanical pickers are discussed in the annual report of the Cotton Specialist.

OTHER FIELD CROPS.

The position with respect to tobacco and cotton has been referred to in some detail, partly because these are the two field crops which present almost unlimited scope for expansion and partly because imported tobacco very largely comes from hard currency areas, as also—but to a somewhat lesser extent—does cotton. Other field crops, however, feature very largely in the work of the Division and, during the year under review, attention has been given to maize, lucerne, oats, sorghum, soy beans, cowpeas, and potatoes in the Agriculture Branch's field experimental programme. As in previous years, that Branch also devoted a considerable amount of time to seed selection in maize, wheat, grain,

sorghum, peanuts, and tobacco. Its Bureau of Tropical Agriculture also handled rice, sweet potatoes, velvet beans, derris, tea, ramie and Balsa wood experiments. Details of these various projects will be found in the report of the Director of Agriculture. This officer's report also deals with the year's results in an extensive plant-breeding programme which included work on wheat, oats, sorghum, and cotton.

SEED CERTIFICATION.

When "*The Seeds Act of 1937*" was amended in 1941 provision was made for the launching of an extensive scheme of seed certification, this scheme to be carried out under the auspices of the Department of Agriculture and Stock. While the war continued and during the period of staff readjustments following the cessation of hostilities it was impracticable to proceed much further with this important project. However, a Seed Certification Committee, consisting of five departmental officers, has since been constituted under the amended Act. This committee has responsibility for the overall supervision of the certification scheme. When it is decided to provide certification of the seed of any particular crop a sub-committee is appointed for the purpose of handling that crop, working at all times under the general control of the Seed Certification Committee. Three sub-committees have been appointed, these dealing with hybrid maize, sorghum, and beans respectively. A great deal of spade work is required before seed attaining to the very high standards implied in a Government seed certification scheme can be made available. Nevertheless, it is believed that the greatly improved results which can be obtained by farmers using certified seed fully justify the work involved in its production.

PASTURE EXPERIMENTAL WORK.

As in the previous year pasture experimental work has been carried out mostly on the departmentally controlled regional and branch experiment stations. The extensive Rhodes grass programme at Biloela was continued during the year under review and pasture experiments were initiated at the Hermitage. Provision also has been made for pasture experiments at Kairi, which is now being developed as a regional experiment station. Much valuable information has been obtained at Biloela and good progress is being made with the legumes and grasses under investigation at the Bureau of Tropical Agriculture. Details of the work in progress at these several centres will be found in the reports of the Specialist Adviser, Experiment Stations, and the Director of Agriculture.

In view of the increasingly important part which irrigation is destined to play in primary production in this State, a considerably increased measure of attention is being devoted to work on irrigated pastures. The Bureau of Investigation has established an Irrigation Research Station at Gatton and the departmental agrostologist participated in the planning of the pasture experimental programme at that centre and undertook some of the work involved in it. Plantings have been made of an extensive range of winter-growing pasture plants at Gatton, 100 plots having been established to date. The programme at this centre provides also for summer-growing pasture mixtures being established during the spring months.

Another important development in irrigated pasture investigations took place when the State Government made arrangements to purchase from the Federal Government a property at Ayr which had been operated by the latter as a vegetable farm during the war years. It is intended that this new station serve for the investigation of irrigated pasture problems in a district in which it is hoped that beef cattle fattening on such pastures will be a major activity in future years. In this case the routine management of the station will be in the hands of the Department of Agriculture and Stock, but the actual pasture experiments will be the responsibility of officers of the Council for Scientific and Industrial Research stationed on the Burdekin for that purpose.

As the quality of the hillside pastures on the Darling Downs is of importance to dairy farmers in that territory an endeavour is being made to ascertain how best they can be improved. This work is being carried out at the Hermitage, where an observation block has been established on a typical hillside pasture by the agrostologist, who has also surveyed the Swann Valley hillside pastures for a distance of 20 miles round the Hermitage. He will resurvey these hillsides as seasonal and stocking conditions change.

Another pasture project to which reference should be made is a demonstration block established in the Maleny district at the request of representatives of the suppliers to the Maleny butter factory. Regular measurements of pasture growth on the twenty-four blocks in this demonstration will be made by the agrostologist, who will work in co-operation with officers of the Plant Nutrition Section of the Chemical Laboratory in assessing soil changes which may take place during the course of the demonstration.

The spreading spear grass position in the central-western district continues to cause anxiety and arrangements were accordingly made for a survey of the position in 1946. Subsequently, plans were prepared for the establishment of an experimental block at Emerald during the spring months of last year. Unfortunately, extremely dry conditions prevailed in the area until January and the initiation of this project accordingly had to be postponed.

HORTICULTURAL CROPS.

The past twelve months have constituted a very active period for the officers of the Horticulture Branch. This has been due in considerable measure to the influx of new growers into fruit and vegetable production, many of these being ex-servicemen. As will be noted on perusal of the Director of Horticulture's report the Branch has also been busily engaged on an extensive field experimental programme covering a wide range of crops. Attention has additionally been devoted to plant breeding and plant selection in some of the more important fruits and vegetables.

One pleasing feature of this Branch's development in recent years has been the acquisition of properties on which a full-scale experimental programme can be carried out. The Department was fortunate in acquiring a property in the vicinity of Nambour on which it has been proved

practicable to handle a wide range of fruits, vegetables, and other crops, and the more recent acquisition of the Redlands station, coupled with the projected development at Kamerunga, places this Branch in a much more satisfactory position in so far as experimental work is concerned.

TRANSPORT AND STORAGE PROBLEMS IN FRUITS AND VEGETABLES.

Reference to the work of the Horticulture Branch would be incomplete without mention of the very distinct progress achieved in handling transport and storage problems in fruits and vegetables. This work has been carried out under the immediate direction of the Assistant Director of Horticulture, and he and his associates are in a position to report very satisfactory results in experiments carried out in co-operation with the Railway Department and the Committee of Direction of Fruit Marketing. Following thereon, regular consignments of these commodities were forwarded to North Queensland during the summer months.

WEED INVESTIGATIONS.

As mentioned in last year's report, the Queensland State Weeds Co-ordination Committee met in Brisbane in May, 1946, to review the weeds position in this State. At that meeting responsibility for the investigation of measures which might ensure a reasonable degree of control of spreading spear grass, blady grass, groundsel bush, brigalow suckers, sour grass, narrow-leaved carpet grass, feathertop Chloris, Mexican poppy, turnip weed, and a number of other weeds was allocated to the Department of Agriculture and Stock. The Department also agreed to co-operate with the Council for Scientific and Industrial Research in the investigation of Johnson grass and Eupatorium control and to handle some work on the toxic nature of weir vine.

A considerable amount of attention has been given to some of these weed problems by the agrostologist, working where practicable, in co-operation with other departmental officers. Chlorate weedicides were found to be effective in dealing with infested patches of Johnson grass, and a considerable amount of useful information has been obtained regarding brigalow sucker control. The latter work has been carried out in the Callide Valley—in the first instance by the Senior Adviser in Agriculture then stationed at Biloela and more recently by the Manager of the Biloela Regional Experiment Station. During the year under review observations also have been made on the method evolved by a local farmer for dealing with the suckering problem. In co-operating with the Bureau of Investigation in planning lucerne renovation measures to be tested at the Gatton Irrigation Research Station, cognizance has been taken of the problem of feathertop Chloris infestation and it is hoped that this particular project will yield information of value in handling such a locally important weed pest. Turnip weed control was investigated in a comprehensive field experiment during 1947, the results obtained indicating that several selective weedicides can destroy this weed without adversely affecting wheat to any appreciable extent. The agrostologist also carried out further work on groundsel bush control, testing non-poisonous

alternatives to arsenicals. So far, the results indicate that success can be achieved with hormone type weedicides—in some classes of infestation—provided the weedicides are sprayed on to the re-growth after brushing. Much time also has been devoted by him to the testing of hormone-type weedicides on an extensive range of weeds. Very promising results have been obtained in quite a number of cases and it has accordingly been practicable to make tentative recommendations for dealing with a number of weeds.

SOIL CONSERVATION.

Last year's report mentioned the increased measure of attention being given to the problem of soil erosion and to the manner in which soil—the absolutely essential asset of the farmer and grazier—might be conserved. A development which occurred during the year under review was a survey of the eastern Darling Downs, carried out with a view to selecting areas which might be suitable for soil conservation demonstration purposes. This work was undertaken by the Soil Conservation Officer of the Bureau of Investigation—who was made available to the Department for this project—working in co-operation with the Senior Advisers in Agriculture at Toowoomba and Warwick. Before this survey had been completed a further step was taken in the appointment of an Acting Soil Conservationist to the departmental staff and he participated in the later stages of the survey. The importance of soil conservation demonstration and investigational work is such that both these aspects are being provided for at the Hermitage and Kairi; details of the soil conservation programme at these stations are supplied in the report of the Specialist Adviser, Experiment Stations. As in earlier years field officers of the Agriculture and Horticulture Branches have been called on to give advice to many farmers requiring guidance as to the best manner in which to check erosion on their properties.

ENTOMOLOGICAL INVESTIGATIONS.

The severity of insect infestation in a number of Queensland's crops is such that for many years entomological projects have been given a very prominent place in the Department's investigational programme. A perusal of the Senior Entomologist's report will show that this work has been continued with a very considerable measure of success. Well-known pests, such as codling moth, banana rust thrips, and fruit fly, are mentioned in that report as receiving a good deal of attention during 1946-47. This is because, though reasonably sound measures were evolved for dealing with such pests in earlier years, the Department is anxious to still further improve these control measures and to test the efficiency—against the old established pests—of any promising new insecticides which may become available.

PLANT PATHOLOGICAL INVESTIGATIONS.

As was indicated in last year's report, the staffing position seriously affected the volume of work carried out by the Plant Pathology Section of the Science Branch. During the whole of 1946-47, however, the Section was more or less back to its normal numerical strength, and this fact is reflected in the report of its activities submitted by the officer in charge, Science Branch. It will be noted therefrom that inves-

tigations were carried out on a wide range of field, fruit and vegetable crops and that a considerable measure of success was achieved in dealing with some of the more important problems.

BOTANICAL INVESTIGATIONS.

Once again the Government Botanist's report shows that the activities of the Botanical Section consist very largely of serving other sections and branches of the Department as well as handling a great deal of advisory work on behalf of the public in general. Time, however, was available for participation in field investigational work and for continuing those taxonomic studies which lay foundations on which much of the advisory work must be based.

GENERAL ANALYTICAL AND TOXICOLOGICAL WORK.

The General Analytical Section and the Toxicology and Therapeutics Section of the Chemical Laboratory were responsible for a great deal of analytical work. As will be seen from the report of the Agricultural Chemist and Biochemist, however, the work of these sections was not confined to routine analyses, and investigational work is playing an increasingly important part in the activities of the officers of the two sections.

SOILS AND WATERS INVESTIGATIONS.

The work of the Plant Nutrition Section of the Chemical Laboratory has been concerned very largely with soils and waters investigations and, as the report of the officer in charge of this section shows, this work has been of material assistance to the primary producing community as a whole. Furthermore, it has constituted an essential part of several important projects being handled by sections and branches of this and other State departments.

BIO-CHEMICAL INVESTIGATIONS.

The Agricultural Chemist and Biochemist, and those officers of his branch who are immediately concerned with bio-chemical problems again participated in the investigation of a number of projects of importance to animal industry.

GULF SURVEY.

During 1946 a survey of the Gulf country was carried out by a committee of three representing the Co-ordinator-General's Department, the Department of Public Lands, and the Department of Agriculture and Stock. The Assistant Director of Agriculture was nominated as this Department's representative on the committee, which submitted its report in February of this year. The ultimate objective of this survey was the establishment of an agricultural experiment station in the Gulf country.

RURAL TRAINING AND LAND SETTLEMENT.

The Assistant Director of Agriculture continued to act as Deputy Co-ordinator of Rural Training and, as such, he had to devote a considerable amount of time to the administration of that portion of the Commonwealth's Post-war Rehabilitation Scheme which involves the rural training of ex-servicemen. Furthermore, in his capacity of Deputy Co-ordinator, he was a member of the Land Settlement Classification Committee which, during the past twelve months, has interviewed some 1,500 applicants for war service land settlement.

ADVISORY WORK.

All branches and sections of the Division again participated in providing an advisory service to the primary producing community. This is one of the most important functions of the Division, its importance being in no way commensurate with the space devoted to it in the annual report.

PUBLICATIONS.

The volume of advisory and technical publications—the former appearing in *The Queensland Agricultural Journal* and the latter in *The Queensland Journal of Agricultural Science*—was maintained at about last year's level.

ROBERT VEITCH,

Director, Division of Plant Industry.*

* Now Assistant Under Secretary (Technical).

(1) REPORT OF THE DIRECTOR OF AGRICULTURE.

The past year was one of extremes, the early part of the year being one of the driest on record with continuous heavy frosts in many agricultural districts. In Southern Queensland, this was followed by useful rains in September, and further very heavy rains which caused serious flooding in December and again in February. The dry conditions which prevailed during the winter months seriously affected the wheat crop, which was the lowest for twenty years. Floods, which in some districts reached record heights during the summer months, caused very considerable damage to summer crops and also resulted in severe erosion to cultivated lands and banks of watercourses.

In the Central District dry conditions prevailed until February, and as the rainfall for the whole period was for the fourth consecutive year considerably below average, crop production on the whole was light.

In North Queensland a particularly dry winter and spring caused pastures to dry off completely. These conditions, however, were ideal for maize harvesting on the Atherton Tableland.

Consequent on the partial failure of the wheat crop, a record acreage was sown to grain sorghum on the Darling Downs with the result that the total yield of grain was far in excess of that from any previous season's crop. Yields of some other crops, including potatoes and maize, suffered as a result of dry weather, and, in the case of potatoes, to a considerable extent later in the season, from excessive rains. The peanut crop was easily a record from the point of view of both acreage and total yield.

As field officers were relieved of the extra duties associated with the District War Agricultural Committees, the experimental programme, which of necessity was greatly curtailed during the war years, was resumed in all districts.

PLANT BREEDING PROGRAMME.

Wheat.—The dry conditions which prevailed during the winter and spring months made it

necessary to curtail the winter cereal breeding programme to such an extent that only two observation plots were established. One was conducted at the Hermitage Regional Experiment Station without the aid of irrigation and the other at the Queensland Agricultural High School and College, Lawes, where irrigation was carried out. As the main purpose of these trials was to test a number of new unnamed crossbreds in association with a number of standard varieties, conditions were such that it was possible to test their drought resistance as well as their resistance to disease.

Included in each plot were approximately 30 standard varieties and 145 unnamed crossbreds from the current Queensland wheat-breeding programme. The results revealed that several of the crossbreds were outstanding from the point of view of resistance to stem rust and also ability to yield grain of excellent quality under adverse conditions. Several of these give every promise of being at least equal to, if not superior to, the best that have yet been bred in this State.

Ten of the crossbreds showed no trace whatever of stem rust and seven of them outyielded all the introduced and local varieties which were used in the trials for comparison purposes. The quality of the grain of ten crossbreds was classified from good to very good and the bushel weights varied from 60½ lb. to 65½ lb. Only one of the standard varieties produced grain which was classified as good, the remainder being pinched or very pinched. One standard variety had a bushel weight of 61 lb. the remainder being below 60 lb.

Oats.—Owing to the unfavourable weather conditions, breeding work was restricted to one centre where water was available for irrigation. A number of crosses were made between some of the new types which have proved highly rust resistant and some standard varieties. In addition, a number of FI's from the previous season's crosses were sown and sufficient grain was produced by these for the following season's observations. Both crown and stem rust were present in the plots, consequently it was possible to make a number of selections from the segregating material.

Sorghum.—The main breeding work was carried out at the Biloela Regional Experiment Station, where weather conditions again proved unsatisfactory for sorghum breeding. Sowings were carried out in mid-December, but drought conditions prevailed until the middle of February, when flood rains were experienced. The best results were obtained from a varietal trial in which ten varieties and strains were tested in each of six replicated blocks.

The plots were satisfactorily harvested by using a header with a power take off. The leading strain 11S is a recent selection from Wheatland which possesses the parental plant habit and grain colour, but the grain differs in size from that of the parent. This strain has shown promise in progeny rows during past seasons and will now be liberated to farmers for more extensive regional testing.

An Early Kalo selection is also a distinctive type and showed up well in the trial, as it had already done in trials which were conducted during previous seasons under adverse conditions.

Replicated strain trials were also conducted with the object of determining differences between 14 strains within the Kalo group, 5 in Wheatland, 3 in Kafir x Milo, 3 in Double-Dwarf Kalo, and 12 in Early Kalo. These plots suffered severely from dry weather, which made yield comparisons impossible, but they did enable useful comparisons being made in height, earliness, and plant habit.

Some hybrid progenies from Shallu crosses are now in a promising stage, as many of these possess the desired open panicle and have been marked off for trial in the coastal areas next season.

Some genetic studies were made of panicle and grain characters, midrib colour and height, in crosses Ajax x Coastland, Hegari x Coastland, and Hegari x Ajax. In addition, in F₂'s of natural crosses which occurred within the breeding plots, some data on the inheritance of grain colour and awns have been obtained.

Observation plots, including a number of strains and crossbreds, were established in the Kingaroy, Boonah, and Lockyer districts.

In the Kingaroy district, selection work which has been in progress for several years, with both grain and sweet sorghum varieties, was continued. Eighteen grain sorghum and 13 sweet sorghum varieties were included in these trials and a number of selected plants of each were hooded and will be used for pure seed increase plots next season.

Cotton.—Cotton breeding activities in the Callide Valley during the 1946-47 season comprised:—

1. A study of progenies from a high ginning percentage Miller strain;
2. Further work in the production and purification of jassid-resistant strains and hybrids;
3. Further testing of new jassid-resistant material under commercial conditions.

The total number of plots involved was 10, including 1 hybridisation plot, 2 progeny plots, 2 increase plots, 2 observation plots, and 3 strain and variety trials. Of these plots, 4 were grown with the help of outside co-operators, while 6 were grown on the Experiment Station.

Miller Progenies (high ginning percentage).—Twenty progeny increases of the strain MIB-43-9-0 were grown under dry-land conditions. These strains showed the same individual vegetative characters as last season, while lint characters are again remarkable in that drag and density are high for Miller. These strains will be tested for yield and the best will be multiplied for distribution.

Hybridisation Plot.—This was irrigated as required and very high yields were obtained, the average for all being 1,112 lb. seed cotton per acre for the first pick. Segregation for leaf hair density and jassid resistance was apparent and once again the marked effect of the immune Ferguson on all its crosses was obvious. Fifty-nine new crosses have been retained for next season and these comprised advanced hybrids and backcrosses of Triumph, Lone Star, Mexico Acala, Miller, and Umil 12, the resistant parent in each case being Rhodesian or Trinidad cottons. Attention has been given to maintaining fibre

strength in this material, and 96 cuttings have been taken from a further 24 plants which were found to combine high resistance with good lint characters, for propagation next season.

Hybrid Progenies.—Progenies of 28 advanced (Miller x U4) x Miller backcrosses were grown, and although webspinners did much damage the surviving plants produced a good crop of seed cotton. Main interest was focused on a group of related progenies from the hybrid B2-8-1-5-0 which has produced in previous seasons large bolls with good drag and high ginning percentage. Four of these strains from this hybrid have again shown the same desirable characters and, in addition, they seem to be quite uniform and to bear well. Bulk selections were taken from these and the remainder of the plants were harvested for large-scale testing next season. This group of hybrids revealed high jassid resistance in other trials.

Jassid Resistant Miller Progenies.—Twenty-eight progenies were planted at Callide, but the plot was completely destroyed by *Loxostege* caterpillar attack. Replanting was impossible before early January, and this late planting date prevented any crop maturing. Seed reserves have been kept and the plot will be repeated next season. Some of the strains represented here have shown good progress.

Hybrid Increases were sown at the Thangool school. This plot also suffered damage from *Loxostege*, but the pest was controlled with DDT. A good crop is being harvested from this small area and it is anticipated that some small observation plots will be allotted next season to these two hybrids, which are (Miller x U4) x Miller backcrosses—viz., B1-2-2-0-4-0-0 and B1-11-2-0-2-0-0. In yield trials in the past and in trials conducted this season, both these hybrids have yielded more highly than the commercial Miller, while the boll size of the first named is particularly good.

Jassid Resistant Miller Increases.—Two Miller strains, III-165-2-1-0-0-0 and III-165-3-1-0-0-0, were grown on Bell Creek, at Jambin. These also suffered severely from *Loxostege* damage despite treatment with DDT and part of the area was replanted. Rainfall in this area was less than in most other parts of the district and plant yields have been disappointing. However, careful bulk selections of the most desirable plants were made and the remainder of each strain is being picked separately and the seed will be used for fullscale testing. These strains are resistant to jassids and have longer fibres than the present commercial resistant Miller Lot 1, which also was produced by this department.

Observation Plot.—A plot consisting of 12 jassid-resistant hybrids and Miller strains together with a commercial Miller, Lot 42, as a control, was planted late and irrigated in order to produce conditions favourable for a heavy jassid attack. A very heavy infestation of jassids was obtained giving much information regarding the relative resistance of the strains being tested.

Only one of the 12 strains had less than 80 per cent. of its population showing good leaf hair length and density, while less than 4 per cent. of the commercial cotton had good leaf hair types—resistance is closely associated with long, dense leaf hairs. By the end of March it was

apparent that the commercial cotton had suffered severely from jassid damage and that while none of the new strains was immune to jassid they were definitely resistant, some of them being highly resistant. Outstanding for resistance are certain strains of the Hybrid B2-8-1-5-0 which, as mentioned previously, seems to produce promising lint. This trial has not yet been harvested.

Strain Trials.—Eleven new strains produced at Biloela were planted in three small trials on the Station under rain-grown conditions. Miller 41S and Rowden 70 were used as controls. Yields were low, Miller producing only 230 lb. seed cotton per acre, but as a contrast, four new strains each produced over 300 lb. per acre. B1-2-2-0-4-0-0, which has been increased at Thangool, gave the highest yield with 450 lb. per acre, and also produced the largest sized bolls in the experiment. The high ginning percentage Miller MIB-43-9-0-0 was second in yield, 352 lb. per acre, and also in boll size.

Two strains, B1-11-2-0-2-0-0 and MIB-43-12-0, were compared with Miller 41S when grown under irrigation, and while picking has not yet been completed the hybrid B1-11-2-0-2-0-0 has outyielded each of the others on each of the first two picks.

The hybrid Umil 12 and Lot 41J were compared with Lot 41S (the commercial Miller) in a 10-acre plot on a private farm. Three replications of each were grown and at 30th June, the area was half picked. It seems that Umil 12 is yielding at least 50 per cent. more seed cotton than either of the others, top yield for one plot $1\frac{1}{2}$ acres being over 1,000 lb. seed cotton. Umil 12 has good fibre of low ginning percentage, but the farmer conducting the trial has grown it on a previous occasion and claims that its reliability and high yield more than outweigh its lower lint percentage. He will continue to grow if Umil 12 is available to farmers.

Despite the losses due to insect damage and dry weather, the past season has been successful from a breeder's point of view in that new strains have again shown their superiority in yield, boll size, and jassid resistance. Their lint characters have not yet been assessed on account of the late season.

In the southern districts the work was confined mainly to a continuation of the work which is in progress with the Triumph variety, which includes four progeny plots. Several special multiplication plots of recently introduced varieties were also established. Weather conditions generally were unfavourable; consequently the number of single plant selections which were made was much below the desired number.

FIELD EXPERIMENTAL PROGRAMME.

Potatoes.—During the year, fertilizer trials were continued in the Lockyer Valley and Lower Burdekin areas, and other trials were set out in the Fassifern Valley and Mackay districts. A variety X spacing trial was also conducted in the Burdekin delta.

The trials in the Lockyer Valley indicated that nitrogen was a limiting factor in potato production for the particular soil types on which the trials were conducted. It has now been demonstrated that nitrogen deficiency in relation to potatoes is widespread in the alluvial

soils of the Lockyer Valley, and that a potash deficiency occurs in restricted localities. No phosphate deficiency has been found. The results of the field trials appear to correlate well with analytical data for the specific soil types.

A deficiency of nitrogen is also indicated in the Fassifern Valley alluvial soils by the data from the two trials which were carried out in that district. More trials are planned to investigate further the requirements of these soils.

A feature of the variety X spacing trial carried out in the Burdekin delta was the high average yields obtained from all the varieties tested. Factor gave the highest yields, averaging over 13 tons per acre for all spacings. Close spacing of 9 inches was shown to give a higher average yield than wider spacings.

In co-operation with officers of the Bureau of Investigation, various trials with potatoes have been set out at the Gatton Irrigation Research Station. These comprise fertilizer, variety, spacing, and irrigation investigations.

Maize.—In the Kingaroy district, two trials have been set out to test the relative merits of various phosphate fertilizers applied to the typical red-brown soils of that district.

In the Monto district, a trial designed to determine the basic nutritional requirements of the crop has been established. Nitrogen, phosphate, and potash at three levels and in all combinations are under test.

The value of the maize-peanut rotation as against continuous maize is being investigated in a trial established on typical red forest soil at Tolga on the Atherton Tableland.

Other trials on the Tableland have been arranged to demonstrate the value of ploughing under maize stalks as compared to the usual method of raking and burning the stalks. This is a long-term experiment planned to continue for a minimum period of four years.

Yield data for the above trials are not yet available.

Lucerne.—In parts of the Lockyer Valley lucerne has been found to respond markedly to applications of superphosphate on soils abundantly supplied with this plant food. Preliminary investigations indicated that a good response was also obtained to gypsum. The reason for this response is being sought in a field trial recently established in which the effects of superphosphate, gypsum, sulphur, and potash applied to the soil are being investigated.

A varietal trial was established on the Darling Downs, and this included ten varieties of lucerne which were recently introduced from overseas.

Tobacco.—The restoration of the productivity of the soils is an important problem in the rain-grown tobacco areas. Long-term experiments designed for the purpose of solving this problem have been established at Miriam Vale and Mareeba.

The experiment at Miriam Vale was set out in the summer of 1945-46, when a number of plots were planted to various grasses and legumes. Prior to the summer of 1946-47, the crops on a few selected plots were ploughed under and the plots were later planted to tobacco. A very satisfactory crop has been harvested from these plots, and data in regard to yield and quality of leaf are awaited.

A more ambitious trial was established at Mareeba during the year. A three and four year rotation, using Rhodes grass, Townsville lucerne, and a grass-weed fallow forms the basis of this trial.

In the Burdekin district trials which were suspended during the war were conducted at Pioneer and at Clare. The results were highly satisfactory and confirmed the opinion previously expressed that this district is likely to become a very important one for tobacco production.

Tropical Legumes.—Trials with the tropical legumes, Puero, Centro and Calopo, are in progress on the Atherton Tableland. These consist of legumes planted in contour furrows in pastures and also on cultivated land.

Oats.—Grazing trials which included five different varieties were continued on the Darling Downs and, despite the unfavourable season, provided some interesting data.

Sorghum.—Varietal trials with both grain and fodder types were established in several different districts, including the Emerald district, where some very interesting results were obtained. Of the fodder types, the variety Italian stood out, and the outstanding grain variety was Kalo.

Soy Beans.—Observation plots were established in several different centres, including Kingaroy, where 120 varieties were sown for observation purposes. In addition, 134 different selections from the previous season's trials were grown and yielded some very promising material for future work. Seed increase plots were also established in the Kingaroy district and at Moggill.

Cowpeas.—Plots were established in the Maranoa district, and also in Central Queensland. These included trials with hay varieties, and also with varieties which are under test for resistance to nematode attack.

Soils.—Various soil investigations, under the direction of the Specialist Adviser, Experiment Stations, have been conducted from time to time at the Regional Experiment Stations, particularly the Hermitage Station, and an active interest taken in some of the field trials, especially in relation to nutritional studies.

SEED SELECTION.

Maize.—Owing to staff shortage, the selection of seed maize for distribution was carried out on a very much smaller scale than during former years. An officer has recently been appointed to specialise in seed selection work and it is hoped to have ample supplies of selected grain of several varieties available in the near future.

Wheat.—As has been done for several years past, the Senior Adviser in Agriculture, Toowoomba, assisted the Wheat Board in the selection of crops to be reserved for seed purposes. This scheme has resulted in high quality seed of approved varieties being available, and as it is the only source of reliable seed it is greatly appreciated by growers. All crops are inspected during growth and are carefully rogued to remove any "off type" plants which may appear.

Grain Sorghum.—During the past few years it has been the practice for field officers to encourage a number of selected growers to produce crops, which could be recommended for seed purposes, and in this way large quantities of good quality seed have been made available to growers. As a Seed Certification Scheme will be operating in future, during the next season it is hoped that supplies of certified seed of some of the most popular varieties of grain sorghum will be available.

Some seed selection was carried out in crops of two recently introduced varieties of grain sorghum—viz., Martin and Plainsman. These varieties, which are now amongst the most popular in the United States of America, have given excellent results in this State.

In addition to the grain types, seed was selected from the breeding plots of sweet sorghums, and propagation plots of several of the proven varieties will be established next season with a view to bringing these under the certification scheme.

Peanuts.—Selection work which has been carried out for several years past, and which has proved of much value to the industry, was continued with the Red Spanish and Virginia Bunch varieties. This work has resulted in a definite all-round increase in yields in both varieties and practically the entire crop for the South Burnett district is now sown with seed which is the result of the local departmental officer's work.

Tobacco.—Pure seed selection plots were sown in the Central district and ample supplies of each of the most popular varieties were produced. Fresh strains of some varieties have been introduced from overseas, including seed of the variety "Kelly," which when grown here previously proved to be still segregating. These strains will be grown with the local strains for comparison purposes.

CROP PRODUCTION.

Wheat.—Weather conditions from the time of sowing until mid-September were extremely dry with a succession of heavy frosts. Practically all the early and mid-season sowings, which constituted the bulk of the area sown, failed for grain and were grazed off. Following the rains in September, some sowings were made and despite the lateness of the season yields of up to 18 bushels per acre were obtained. Under the circumstances, the behaviour of these late-sown crops was remarkable as they showed little or no signs of rust and developed good quality grain. The total yield, however, was only about one million bushels, the lowest for twenty years.

As has been the case for several seasons, varieties bred by the departmental wheat breeder were outstanding and filled the first seven places in a census of wheat varieties planted in Queensland this season. One unnamed crossbred (Three Seas x Florence x Kenya 6041) again demonstrated its resistance to rust and also its ability to yield under adverse conditions and gives promise of proving to be possibly the outstanding of many excellent varieties which have been bred by this Department.

Maize.—The yield on the whole was not good, due to an increased acreage of grain sorghum and also to seasonal conditions. In most districts

the early-sown crops were poor, consequently the bulk of this season's grain will come from the late-sown crops, which on the whole were good. On the Atherton Tableland an area of approximately 24,000 acres was sown for an estimated yield of between 18,000 and 19,000 tons.

Grain Sorghum.—Both the acreage sown and the total yield were easily a record, and it is anticipated that the yield will be between three and four million bushels of grain. This crop has been increasing in popularity each season for the past few years, and whilst this is, to a certain extent, the reason for the record acreage being sown, the fact that large areas which normally would have been under wheat were available for sowing with grain sorghum was also responsible for a considerable increase.

Potatoes.—The potato crop in the southern districts was the lowest since the contract scheme came into operation in 1942. The spring crop was light due to the dry weather, and it was only in localities where irrigation is possible that satisfactory yields were obtained. The autumn crop was poor also, due, on this occasion, to excessive wet during February and March.

In North Queensland it has been necessary to reduce the area under potatoes since the demand for military use ceased. It is hoped, however, that it will be possible to maintain the industry at its present level, which is now sufficient to provide for the requirements of the population north of the tropic of Capricorn. The crop for the past season in the Burdekin district was satisfactory from the point of view of both quantity and quality.

Moth attack, which is usually severe towards the end of the season, was responsible for only minor damage. Growers who used D.D.T. were highly satisfied with the result. The varieties Bismarck and Brownell have been the most widely grown to date, but as a result of the manner in which Factors have performed in departmental trials this variety is gaining favour.

Tobacco.—The area sown to tobacco was greater than that sown during the previous season. In the Mareeba and Dimbulah districts the season was not a very favourable one for those who were producing without the aid of irrigation. In the dry-farmed areas no trouble was experienced in getting good strikes in the field and, although the crops continued to look promising, curing difficulties were experienced owing to the seasonal conditions. The rainfall during January was the lowest for over seventy years. During February normal rains were recorded, but this was insufficient to compensate for the lack of rain during the previous months. Blue mould did not show up at all during the season and mosaic was less severe than usual. The total area planted was 1,361 acres, 738 acres in the Mareeba district and 623 in the Dimbulah district. It is expected that approximately 950,000 lb. of cured leaf will be appraised for the season.

In the South-western district, the area planted showed an increase over that sown during the previous season. Growers consider that conditions were most favourable for the raising of seedlings, and this was borne out by the fact that, after planting out had been completed, large numbers of seedlings were still available

in the seed-beds. Weather conditions after planting out were ideal and crops made very good growth. D.D.T. was used extensively in the seed-beds with the result that seedlings were remarkably free from insect damage. The area planted was 865 acres for an estimated yield of approximately 928,000 lb. of cured leaf.

Peanuts.—A record acreage was planted, the area being over 40,000 acres, which is 50 per cent. greater than any previous acreage planted. The estimated yield is 20,000 tons, which also is a record yield. Expansion of the industry did not occur only in the South Burnett, as considerable areas were sown in the Upper Burnett and also on the Atherton Tableland.

Canning Beans.—The area during the past season was below that of previous seasons, but yields generally were excellent, and it is anticipated that the yield will be equal to, if not greater than, that of any previous season. Yields of up to 33 bushels per acre were obtained in the Kingaroy district. The quality of the beans was excellent.

Sunflower.—The area under sunflower showed a definite increase due to the ready market which exists at present for all seeds with a high oil content. The increase in acreage has also been encouraged to a certain extent by the introduction of the short-growing varieties, Mannonite and Sunrise, which can be mechanically harvested. Yields from these varieties, so far, have not been as heavy as those from the tall-growing varieties, but analyses have shown the oil content to be high. The reduced cost of harvesting the dwarf varieties compensates for any reduction in yield.

Soy Beans.—Some fairly large individual areas were sown and the results on the whole were sufficiently good to encourage growers to sow again next season. Yields of up to 20 bushels per acre were reported and, considering the season and the lack of experience in mechanically harvesting the crop, the yields were very satisfactory.

Despite the high prices which were offering for the beans, it would appear that the bulk of the crop is being retained for seed for the next season's sowing.

Although it has been demonstrated over a number of years that the crop can be grown successfully in many districts, until such time as an assured market is available field officers are not recommending production on a large scale.

Cotton.—The past season was probably one of the worst on record for successful cotton-growing, there being little winter rainfall to allow of any accumulation of subsoil moisture to provide a reserve to carry the crop from the period of planting until the advent of the summer rains. Any cotton planted, therefore, had to rely on periodic rains to maintain plant development, which at this time of the year are usually storm rains.

Although moderate falls were recorded in most of the main cotton-growing areas during September and October, the land was so dry that planting at the normal time was only possible in a few favoured areas, and in most cases these few plantings suffered from temporary dry-ups. Fair rainfall was recorded throughout the Burnett districts, and the southern area

during November, but the resultant moisture was in most cases insufficient to meet the rising temperatures, and it was not until December that the main planting of cotton in these districts occurred. From late January until the end of April, all the cotton-growing districts recorded rainfalls considerably above the average.

Cotton planted in late September and October suffered severely from the very dry, hot conditions prevailing during the first half of January, and in many cases was checked to such an extent that when the abundant February rains occurred it was unable to respond to the improved conditions and never fully recovered. The later plantings, however, had not developed a crop by the start of the stress period and dry conditions, and these developed average-sized bushes, and on the more fertile soils the plants were inclined to vegetate.

The cotton acreage for the 1946-47 season was again very small, although the seed applications showed an appreciable increase over the 1945-46 season, being 18,000 acres applied for by 1,085 growers. The small acreage actually planted was possibly brought about by the very dry conditions during the autumn and winter, causing such a shortage of feed that farmers generally concentrated on the production of cow feed and on the first early summer rains planted much of the available ploughed land to summer fodder crops. An additional factor was that in many cotton-growing areas sufficient moisture to prepare the seed-beds and to plant cotton was not available until late November and December, which resulted in a reduction of acreage, as growers from past experience have found that best results are obtained from October plantings.

BUREAU OF TROPICAL AGRICULTURE.

The activities of the Bureau have centred around the establishment of pastures for grazing work, the designing of paddocks, erection of yards, water supply, &c., for the husbandry of stock, and the introduction of grasses and legumes and their further increase for seed supply. In addition various tropical crops have been grown and the details of their behaviour recorded.

Seasonal Conditions.

The year under review has been a variable one so far as climate is concerned. The last few months of 1946 and the early part of 1947 were unusually dry. Since February, however, almost continuous rain has been experienced. Only such a set of conditions, aided by warm weather, could have brought about such a remarkable recovery in crops. Pastures looked particularly well at the end of the 1946-47 year and sugarcane is cutting far better than early estimates indicated.

Grassland Work.

A few months ago the last of the unit areas was planted to grass. This completes the series in duplicate and provides an area of 20 acres for grazing management and grass-legume association studies.

Eight head of Hereford steers were purchased during October and these were grazed on the earlier developed pastures during the

exceptionally dry period and did remarkably well. In June, 1947, an additional seven were added to the herd.

An opportunity to observe the behaviour of various legumes under grazing and through varying climatic conditions has been afforded through the palatability trial.

The information to date is meagre, but it seems evident that stock tend to show a preference for different legumes at different periods of the year. Throughout the dry period Centro was outstanding. It gave a large body of green material during that period and stock concentrated on this species until they had grazed the areas bare. In April, Stylo, which was scarcely touched in the previous grazing in February, was treated in a similar manner to Centro some months previously.

The procedure with regard to the unit areas has been to graze each paddock for a period of seven days and "spell" for about forty days. The periods appear too long and it is hoped that, with additional stock, this will be rectified.

With regard to the grass-legume associations, most of them appear to be combining quite well. It is early yet to form any definite conclusions, but Guinea grass and Centro as a combination appear to have great promise while a Guinea and Stylo mixture, provided the paddocks are kept well grazed, also looks promising.

Grass and legume introduction work has continued through the year and a few new species are worthy of further consideration. In this connection, seed increase areas of *Desmodium heterophyllum*, *D. scorpiurus*, and *D. canum* have produced seed.

A further 10-acre block was cleared at Utchee Creek during the year. This area has been planted to molasses grass and a good strike was obtained. Stray stock gave trouble in the early stages of establishment and the area had to be fenced in a temporary manner. A small amount of sucker growth has made its appearance, which will necessitate removal.

The original 10-acre block was burnt last year and an extremely fierce fire resulted. The legume which predominated prior to burning (*Calopogonium mucunoides*) has come away thicker than ever and has spread over the molasses grass area. Where it adjoins the Guinea grass plot, however, very little encroachment has taken place and an almost perfect barrier to its advancement has been set up by the grass. The area is to be fired again this season and an effort will be made to establish various grasses.

Field and Other Crops.

Rice.—A number of varieties of rice, both of the upland and swamp species, were planted during the summer, and several of the early maturing varieties have been harvested. Good yields of grain have been recorded in each case. The varieties under trial were received from India and Ceylon. Further varieties have since been received from the United States of America. The upland rice from New Guinea failed to produce a grain crop during the winter of last year. However it was cut and the ratoon crop came away well, eventually producing a heavy crop of grain during the recent summer.

Sweet Potatoes.—The numerous varieties of sweet potatoes were continued with and fair yields were once again obtained. New Jersey, as previously, gave the best yield which, on a rate-per-acre basis, gave a yield of 25 tons. This is also considered one of the superior eating varieties.

Velvet Beans.—Ten strains of velvet beans were planted in the orchard during the summer, but the crop has not yet been harvested. These include the new varieties which were introduced from Rhodesia and which in the past season have shown great promise.

Derris.—A large number of derris plants were harvested during the year and the root material from each plant has been analysed. Some of these were found to be very high in rotenone content, and a trial consisting of the highest yielding strains of both Darwin and Sarawak Creeping has been established for further studies. Work is being undertaken with a view to determining some mechanical means of harvesting derris, and an area of approximately one acre will be used for this purpose.

Tea.—About one-quarter of an acre of tea has been cultivated at the Bureau for some considerable time past. Two rows of this area are to be more closely planted so as to produce a hedge effect in order to observe the result of mechanical clipping on the plant and the nature of the material harvested.

Balsa.—A total of 120 plants of Balsa wood were planted during the year but, as they had to be transplanted at an advanced stage, the mortality rate has been high. Nevertheless, sufficient plants remain to form some opinion as to the rate of growth, &c., of the tree.

Ramie.—One-fifth of an acre of ramie was established towards the end of 1946. The plot showed marked irregularity of growth at the first harvest. The ratoons are progressing very favourably, but a depressed area through the centre seems to indicate soil deficiency rather than a crop factor. Individual plants are stooling very well.

Sugar-cane.—An area of 2 acres has been prepared for sugar-cane. Previously this land had been under Puero since 1940.

Harvesting of Legume Seed.

The harvesting of Stylo and Calopo seed was done with the aid of machinery. In each case the crop was cut with a mower, cured in the field, and, when dry enough, threshed with a header-harvester. There is no doubt that the other legume crops grown at the Bureau could be handled in a similar manner but, at the time, an insufficient area of them was available for trial.

Improvements.

The whole of the fencing of the top grazing area has been completed. This comprises boundary line, laneways, and subdivisions. A temporary 2,000-gallon capacity water supply tank has been installed and pipes laid to take the water to a trough in a laneway. Yards have been erected for the handling of stock, which, while not completed, are sufficiently advanced to enable DDT sprayings to be carried out.

C. J. McKEON,
Director of Agriculture.

(2) REPORT OF THE DIRECTOR OF HORTICULTURE.

In conformity with the ideas expressed in last year's annual report, the horticulture staff this year has devoted the greatest amount of attention in the field towards the solution of soil management problems. At the same time very satisfactory progress was made on aspects concerning the placing of produce on the markets in the best possible condition. The work on storage and transport aspects has called for extra effort on the part of the inspectional service due largely to the fact that, with the return of more normal conditions, many growers have shown reluctance to conform to the more rigorous standards which are essential if stabilised markets are to be attained. The work of the inspectors has been made the more onerous because of the relatively large number of new growers who have entered upon fruit-growing and, more particularly, vegetable production. In many instances these new growers do not appreciate fully that the stability of a market can only be achieved if there is something approaching stability of quality or, at least, that the purchasers of their produce have some reasonably clear indication of the quality. Not only is this aspect of importance, but also too frequently it is not recognised that the best produce as it leaves the farm if badly packed does not arrive at the market in an attractive condition, and it is at the market that the produce must be good. There is no doubt that the actual produce of the farm in the great bulk of cases is of a high standard, but Queensland growers are still losing much money by faulty methods of packing. In this regard it is, however, only fair to state that in some instances the acute shortage of cases and the consequent necessity of using a percentage of inferior ones has been a contributing factor.

Whilst it could not be claimed that anything approaching perfection has been attained, either in quality or quantity of production, it is nevertheless felt that in both of these particulars the position is reasonably satisfactory with many fruits and vegetables. The wastage at consuming centres before the buying public receives the produce is, however, far too high and therefore very particular attention has been given to storage and transport problems. To this end work has been carried out on the following:—

REFRIGERATED TRANSPORT.

Experiments were conducted in 1946, in conjunction with the Railway Department and the Committee of Direction of Fruit Marketing, to determine whether C.M.I. refrigerated trucks would be suitable for transporting fruits and vegetables over long distances.

In November, modification of the bunkers to give greater ice-carrying capacity and a better heat transfer were effected. Three standard C.M.I. trucks were altered and renamed C.M.I.F. Following this, regular consignments have been forwarded by the C.O.D. during the summer season to North Queensland and Mount Isa. One very interesting feature is that the trucks are partially unloaded at Townsville and Innisfail without causing any considerable rise in temperature in the remainder of the load.

All products have arrived in very satisfactory condition, but considerable yellowing of the outer leaves of cabbage occurs during retail distribution. This requires further investigation.

In addition to this investigational work, the condition in which refrigerated consignments are arriving in Brisbane from other States is being closely observed and the respective Departments are immediately advised when conditions are not satisfactory.

WASTAGE IN PINEAPPLES.

A survey of the nature and extent of wastage in Queensland pineapples marketed in Sydney was made in March, 1946. Further work in 1947 indicated that, where no attention was given to shed sanitation, considerable reduction in wastage could be obtained by cutting the fruit from the plant. When tops and pineapple refuse near the packing shed were destroyed and the shed sprayed with formalin, wastage was almost completely controlled.

STORAGE OF PINEAPPLES FOR CANNING.

At the peak of the summer crop it is difficult for canneries to cope with the available supplies, and experiments were carried out to determine whether fruit could be cool-stored satisfactorily for any length of time. The experiments indicated that storage at 45-50 degrees F. for three weeks had no deleterious effect on the yield or quality of the canned product. Temperatures below 45 degrees F. affected both yield and quality.

STORAGE OF PINEAPPLES FOR MARKET.

Preliminary experiments showed that, after a storage period of three weeks at 45 degrees F., low temperature breakdown developed after the fruit had been removed to atmospheric temperatures.

PACKING EXPERIMENTS.

Experiments have been conducted with bananas to determine the effect of packing in singles, clusters, and hands on subsequent blemishes and wastage. Consignments have been forwarded to Sydney and Adelaide. This work is incomplete, but results to date indicate the superiority of cluster and hand packs with respect to condition of the fruit on arrival at distant markets.

MATURITY STANDARDS.

(a) *Citrus*.—A new maturity standard which includes palatability as well as acidity has been gazetted for citrus fruits. This has prevented the marketing of immature artificially coloured fruit.

(b) *Pineapples*.—The present maturity standard based on external colour and sugar content is not entirely satisfactory. External colour is not always correlated with flesh colour and quality but varies from plantation to plantation. Tests are being carried out to study physical and chemical changes during maturation and ripening.

(c) *Grapes*.—The changes in chemical composition of grapes during ripening are being determined over a number of seasons. Samples have been selected from a number of orchards

in the Granite Belt. Under the present regulations, the specific gravity must not be less than 1.066 at 60 degrees F., but the results so far indicate that specific gravity varies with the variety and growing conditions.

(d) *Apples*.—Experiments have been conducted with Gravenstein, Jonathan, and Delicious apples from a number of selected orchards in the Granite Belt. Maturity was judged by eating quality. An apple was classed as mature when it had a fair quality at picking and could be expected to develop a fairly attractive quality under normal marketing conditions. For the 1946-47 season, the following dates should have been generally suitable for the commencement of harvesting:—Gravensteins, 10th January; Jonathans, 27th January, Delicious, 3rd February.

Earliness of maturity within the district was more related to the condition of the trees and orchard management than to geographical or topographical position. The period from full blossom to maturity varied considerably from orchard to orchard and, therefore, the date of full bloom cannot be regarded as a reliable guide in forecasting the date of maturity. There were indications that ground colour was a reliable index of maturity.

(e) *Ginger*.—Approximately 500 tons of ginger are produced in Queensland, the whole crop being processed here. In order to obtain increased yields the tendency has been to delay harvesting, but this results in a tough product of inferior quality. Chemical tests, particularly the determination of fibre content, are being carried out in conjunction with processing trials to determine the optimum stage of maturity.

(f) *Beans*.—The Department has been asked to formulate standards for bean maturity, and observations have been made, in conjunction with field experiments, on changes during maturation. It has been found that changes in the green weight of the seed expressed as a percentage of the total green weight and in specific gravity are, to some extent, correlated with changes in maturity. Such measurements and also determination of tenderness and succulence are difficult to apply under marketing conditions. Seed length, however, can be readily measured and may be a reliable index of maturity. In this respect, the following results obtained from samples of various grades selected from the market floor are of interest:—

1. Sold at 1s. 8d. per lb., percentage of seed over $\frac{1}{2}$ in. = 13.3.
2. Sold at 8d. per lb., percentage of seed over $\frac{1}{2}$ in. = 36.5.
3. Unsaleable, percentage of seed over $\frac{1}{2}$ in. = 56.0.

Further work is in progress.

RIPENING.

(a) *Bananas*.—The conditions under which bananas are being ripened commercially are being investigated. Records are being obtained of pulp temperature, humidity, gas concentration and ventilation, and the condition of the fruit and its subsequent eating and keeping quality are being observed by removing samples from the various ripening rooms at frequent intervals.

(b) *Williams Pears*.—During the summer months, Williams pears will not ripen satisfactorily in Brisbane and coastal towns, apparently because temperature conditions are above the optimum. Experiments have been carried out to determine whether a short time in cool storage, or ripening artificially in banana-ripening rooms, would be beneficial. Fruit held for four days at 40 degrees F., or for the same period at 65 degrees F. in the presence of ethylene, ripened subsequently at atmospheric temperature with good flavour and juice. It is interesting to note that samples ripened satisfactorily in Stanthorpe, where conditions are much cooler than in Brisbane. The ability to ripen at lower temperatures has stimulated interest in refrigerated consignments. Such consignments always arrived in a sprung condition, while similar lots in louvered wagons did not soften or develop juice.

SUBSTITUTES FOR OILED WRAPS.

Experiments are being carried out to determine whether oiled sheets, which have given satisfactory results in New South Wales, could be substituted for oiled wraps in the storage of Granny Smith apples from the Stanthorpe district. In addition, the effect of castor oil in alcohol and in methylated spirits as a fruit coating is being observed. The treatments are being investigated on fruit stored after a holding period and fruit stored immediately.

MAROOCHY EXPERIMENT STATION.

The development of the Maroochy Experiment Station has proceeded in a highly satisfactory manner and with the clearing and cultivation of 22 acres, together with the construction of adequate roads, the station is quickly becoming a most important unit in the work of the Branch.

During the period under review, trials of various leguminous cover crops were carried out and orchardists of the district displayed very considerable interest in the results obtained. As was reported last year, it was considered that soil management problems are of the utmost importance to the fruitgrowers of this State and this cover-crop work represents one very important phase of activities aimed at solving these problems.

In addition to this, on the station an area of pedigreed pineapple plants has been established and it is intended to increase this so as to be able to supply at least a moderate number of growers with superior type planting material. Other areas in the course of preparation will be devoted to the raising of pedigreed papaws and pedigreed citrus.

Ginger experiments carried out indicate that there was a maximum size of seed pieces beyond which no advantage accrued in so far as yield is concerned and it was apparent that many growers are using far too big a seed piece, thus adding to their production costs. It would appear that a seed piece weighing approximately 2 oz. is the most efficient. In addition to this, time of harvesting of ginger trials indicated that a late harvesting not only is prejudicial to the quality of the manufactured article but does not necessarily result in increased yields. From the results to date it would appear that in many instances ginger is left in the ground for two to three months beyond the best time of harvest.

KAMERUNGA EXPERIMENT STATION.

As indicated last year, the main work being carried out at Kamerunga is in connection with soil management problems and appreciable progress has been made in this regard. However, difficulties in obtaining equipment have impeded progress to some extent and until certain equipment again becomes available progress will necessarily be limited.

REDLANDS EXPERIMENT STATION.

Towards the end of the period under review, the Department secured an area of some 20 acres of land at Ormiston which it is intended to develop as an experiment station. This will be largely devoted to obtaining information connected with the production of vegetables. No work has so far been possible as the land was secured only in the last few weeks of this financial year. Again, there is apt to be some delay through the non-availability of some of the equipment necessary for development.

VEGETABLE PROBLEMS.

Work on tomatoes has been advanced a further step both in the metropolitan area and the Stanthorpe district, and further testings of new varieties substantiate the claims that superior types are in the process of being evolved. As reported last year, Sioux, an early maturing variety, and Valiant, a late maturer, are of outstanding merit and with further purification will almost certainly be of great value to many growers. With the acquisition of the Redlands Experiment Station it is hoped to be able to build up seed stocks to be supplied to producers.

PINEAPPLE WORK.

The most important phases of the work on pineapples are covered in what has been said concerning investigations on storage and transport and under the heading of Maroochy Experiment Station. The planting up of the pedigreed areas constitutes the penultimate step in the pineapple selection work, the ultimate being the dissemination of material to growers. This, of course, will not commence for three or four years.

CITRUS.

The most important phase of the work carried out in connection with this crop has been the supplying of pedigreed budwood to nurserymen. Last year it was reported that 60,000 such buds were supplied and this year the total will be not far short of 100,000. Difficulties have again been encountered in obtaining supplies of first-class seed, but it now appears that departmental obligations in this direction will be fulfilled.

PAPAWS.

The papaw breeding work at Nambour has been continued and the area set aside for it at the Maroochy Experiment Station is now in an advanced stage of preparation. It is expected that it will be planted during the next planting season.

BANANAS.

The area under bananas has again shown a slight increase and is now slightly over 13,000 acres. Bunchy top continues to be the greatest

menace to the industry. Inspectors have been very active and several thousands of affected plants have been located and effectively eradicated. It is, however, apparent that the successful control of bunchy top can only be accomplished with the fullest co-operation of growers. An attempt was made to initiate a scheme for the production of disease-free suckers, but many obstacles were encountered and the Banana Industry Protection Board had finally to abandon the scheme.

DECIDUOUS FRUITS AND GRAPES.

Further evidence has been forthcoming that, whilst the so-called trace elements do play an important part in the nutrition of the deciduous trees in the Stanthorpe district, the basic problem for this area is one of supplying trees with adequate nitrogen at the correct time. Unfortunately, seasonal conditions last year precluded the possibility of worthwhile results from experimental work.

During the year arrangements were finalised for the leasing of a small area in the Stanthorpe district to be devoted to experimental work on grapes, the two major problems to be investigated being planting distances and phylloxera-resistant stock. With respect to the latter project, the pest is not at present in the district and every effort is being made to prevent its introduction, but it is so widespread throughout the world that it would be unwise to assume that the present state of affairs will continue indefinitely. Should the pest make its appearance there will be a very considerable demand for stocks which not only are resistant but which will perform reasonably well in the district. Therefore, as an insurance against being caught unprepared, resistant stocks have been imported from other States and grown in quarantine on the Maroochy Experiment Station, whence they will be transferred to the experimental plot if found to be in a satisfactory condition at the end of the quarantine period.

EXPORTS AND IMPORTS.

The following figures show the principal exports and imports of fruit and vegetables during the past financial year:—

EXPORTS.

Crop.	1945-46.	1946-47.
Pineapples.. ..	713,113 cases	632,186 cases
Bananas	119,806 cases	83,769 cases
Citrus	92,029 cases	87,341 cases
Fruit (Miscellaneous)	236,416 cases	228,036 cases
Tomatoes	734,546 cases	772,707 cases
Vegetables.. ..	295,013 bags	285,300 bags
Potatoes	81,622 bags	50,077 bags
Pumpkins	379,387 bags	230,771 bags
Cucumbers	107,379 cases	81,632 cases

IMPORTS.

Crop.	1945-46.	1946-47.
Fruit (Miscellaneous)	1,120,569 cases	888,725 cases
Vegetables (Miscellaneous)	69,551 bags	167,761 packs.
Potatoes	442,565 bags	540,992 bags
Onions	120,232 bags	85,664 bags

Overseas Exports.—The Stanthorpe district produced a very heavy crop of apples and some 60,000 bushels were exported to Singapore and the Far East. In general, these products arrived in very satisfactory condition, but some loss was inevitable owing to the uncertain movements of shipping which necessitated holding fruit, in some cases, for much longer than was desirable. With few exceptions, growers realised the absolute necessity of handling only first-class apples for export, but unfortunately some merchants who handle the trade do not appear to be seized with the fact that quality is of fundamental importance.

GENERAL.

Apart from investigational work, the period under review has been one of very marked increase in the demand for advisory services. This is due very largely to the number of new growers following the demobilisation of servicemen. Whilst it is very gratifying that such a demand should exist, at times very severe strain has been placed on the necessarily limited number of advisers available, but it is felt that a very worthwhile service has been given to the orcharding community.

QUARANTINE.

New varieties always make an appeal, and with air services now available greater facilities exist for the importation of plant material from overseas. In consequence, there are many progressive orchardists and traders seeking permission to import, whilst others, not realising the risks involved or the existence of quarantine laws, import material direct. Whilst it is recognised that every opportunity should be taken to improve varieties grown in Queensland it is felt that the harm done by introducing a disease may far outweigh the possible advantages and a word of caution to those interested in introduction would appear to be worthwhile. The position is that quarantine restrictions must be enforced and also that the Department and the Plant Introduction Service of the Commonwealth are fully alive to the advantages; and no opportunities are lost to import potentially valuable material and growing it, in the first place, under such conditions as to eliminate risks of disseminating new strains of disease or new diseases.

W. A. T. SUMMERVILLE.
Director of Horticulture.*

* Now Director, Division of Plant Industry.

(3) REPORT OF THE SPECIALIST ADVISER, EXPERIMENT STATIONS, AND COTTON SPECIALIST.

The season under review witnessed the inauguration of the first full year of operations at all three of the regional experiment stations. The wide differences in the types of climatic conditions which were experienced at these centres indicate the wisdom of having such a series of experiment stations to provide facilities for conducting investigations relating to most of the crops and types of pasture representative of many of the important agricultural sections of the State. The investigations which will be conducted at these stations may be divided into those carried out by specialist officers of the

various divisions of the Department and those for which the staff of the regional experiment stations is responsible. During this past season the specialist officers assigned to these stations were plant breeders of the Agriculture Branch of the Division of Plant Industry, whose activities are reported upon by the Director of Agriculture. The report of the Specialist Adviser, Experiment Stations, and Cotton Specialist deals, therefore, with investigations carried out by the experiment station staff and also the report of the Cotton Specialist.

REGIONAL EXPERIMENT STATIONS.

Satisfactory progress was made during the past twelve months in the development of the Hermitage, Biloela, and Kairi Regional Experiment Stations, which are located respectively in the Darling Downs, Central Queensland, and on the Atherton Tableland in North Queensland. The more important features of the developmental work and the results obtained in the programme of investigations conducted at each centre are reported in the following summaries for each experiment station.

HERMITAGE.

As described in the Annual Report for 1945-46, this centre was formerly a State Farm that was closed down during the depression period and leased for commercial farming until January, 1946. Much work will therefore be required to restore the cultivations to a suitable condition for carrying out investigational work. Accordingly an overall plan of development of the experiment station was designed last season and the progressive implementation of it commenced. Owing to the adverse seasonal conditions experienced only a limited part of the planting programme for the 1945-46 season could be carried out, namely, some wheat strain and variety observational plots which could not be sown until early October, 1946. Yields exceeding 15 bushels of wheat were produced from this exceptionally late planting and interesting results were obtained in the strains under test for rust resistance.

Much more favourable climatic conditions were experienced for the 1946-47 season, the total precipitation — 26.63 inches — approximating the normal annual rainfall for Warwick, the nearest centre for which recordings over a long period are available. This rainfall was well distributed and not only promoted good growth of summer crops, but wet the soil to a depth of 3 feet in the areas prepared for winter crops.

Owing to the necessity to eradicate weeds and grasses in most of the areas under cultivation this season, only a limited planting of summer crops was made, the remaining cultivations being bare-fallowed until mid-season and then mostly planted to Poonā pea for green manuring purposes in preparation for cropping to winter cereals. Included in the summer cropping was a planting of a small stock of seed of a strain of Kalo grain sorghum supplied from the Biloela Regional Experiment Station by the Senior Plant Breeder. The strain appears to be well suited to the Hermitage conditions and the 3 acres averaged a yield of 53 bushels. This increase will provide a useful foundation stock for farmers desiring to replace the mixed planting stocks largely prevalent in the district.

Soil analyses having indicated that in some of the soils on the lower slopes of the Hermitage station, near Warwick, the supply of organic matter, nitrogen, and phosphoric acid might be somewhat deficient for successful crop production, a combined green manure and phosphate trial was carried out preparatory to winter cereal cropping. Although fairly dry conditions restricted early growth of all five of the green manure crops—namely, maize, maize plus Poonā pea, Sudan grass, Sudan grass plus Poonā pea, and Poonā pea alone—good January rainfall promoted the growth of 12 tons (green weight) of the leading treatment—maize—in suitable time for ploughing under for the following planting of wheat. An overall significant response to an application of 190 lb. superphosphate was obtained, with maize showing the greatest gain.

A comprehensive trial of strains and varieties of cowpea carried out for the plant breeder responsible for this project yielded some promising results, particularly in regard to providing a good strain for grazing by pigs. Bulk plantings of Poonā pea yielded up to 12 tons (green weight) of material for turning under as green manure. A trial of the value of planting inoculated Poonā pea seed indicated that no advantage had been gained by treating the seed—all plants showing good nodulation on their rooting systems. A programme of developing an improved strain of table pumpkins for the district was also commenced.

An extensive programme embracing some 43 acres of winter-growing cereals was planted satisfactorily under good moisture conditions. The investigations included a grazing trial of seven early sown varieties of oats, testing the residual value of the treatments in the green manure and superphosphate experiment on a following wheat crop, an experiment to test the yielding ability and the quality of grain of twelve of the most promising varieties of wheat for the district and multiplication areas of several promising varieties of wheat. In addition an extensive programme of strain testing of wheats and observational trials of wheat and oats embracing a large number of varieties and strains was planted for the district assistant plant breeder. Observational and multiplication plots of several strains and varieties of linseed which had yielded promising results in previous trials conducted by the plant breeder responsible for this work were also planted.

It was also possible to start a programme to provide suitable pasture mixtures to meet the requirements of the district. The experiment station is well situated in this respect as it embraces a typical cross-section of the western side of the Swan Valley, consisting of the rich alluvium along the creek and then a long undulating slope surmounted by a wooded ridge. An area of approximately 100 acres is included in the upper slope and hilltop wooded pasture. Studies of the botanical composition of the native pastures on the different soil types and the effect of pasture management and the response to applications of superphosphate were initiated by the agrostologist, with the assistance of the soils chemist of the Agriculture Branch. The possibility of other grasses and legumes from other parts of Queensland and Australia, as well as introductions from other countries, being either

superior to the native species of the district or well worth incorporating in the pasture mixture has also been appreciated. Accordingly provision has been made for the testing of all likely material and, as a start, some 83 species were established this past season.

The experiment station is likewise well located to study the problem of the soil erosion which is prevalent in varying degrees on most farms of the district. It is proposed, therefore, to conduct a comprehensive programme of investigations relating to correct land use and soil conservation. Terraces, or graded banks as it has been proposed to name them in Australia, were constructed in two fields of approximately 30 acres each on black-soil slopes not exceeding a 5 per cent. gradient. A gradient of $2\frac{1}{2}$ to 3 inches per 100 feet length of the bank on banks spaced at $2\frac{1}{2}$ feet vertical drops proved to be satisfactory on this soil type, even when the soil was fallowed during the summer. Investigations demonstrated, however, that all cultural operations in the intervals between two banks should be conducted parallel to the lower bank. Where harrowing was done across the banks at even a slight angle the marks left by the harrow teeth proved to be capable of concentrating enough run-off of an inch storm to silt up cross-sections of the channels above the banks almost sufficiently to cause overtopping of the latter. Where the harrowing paralleled the lower bank little movement of soil into the channel immediately above it occurred, although considerable run-off water passed down the channel to its outlet.

The cultivations on the upper slopes of the experiment station, which are black soils of a gradient from 3 to 10 per cent., will be used largely for investigations in soil conservation. Towards the end of the season preparatory measures for conducting these investigations were carried out under the supervision of the soil conservator. As these become vegetatively stabilised, further construction work will be carried out in the coming season to enable the full programme of planned investigations to be commenced. Large banks and pasture furrows were also established in the cleared pastures on the upper slopes to test their value to divert or to reduce the run-off of storm rains from the pastures of the upper slopes and thereby reduce the possibility of the run-off of severe storms causing serious damage to the lower cultivations.

Altogether a very useful and extensive programme was successfully carried out in the first full year of the experiment station.

BILOELA.

The programme of changing this old-established experiment station into a regional experiment station was furthered with considerable difficulty during the season under review, through very dry conditions in the second half of the season preventing the establishment of new pasture areas in preparation for the location of a dairy herd on the experiment station. A new area of 10 acres for irrigation investigations was cleared, however, towards the end of the season in preparation for growing cotton under irrigation in 1947-48 and then conducting pasture irrigation investigations in 1948-49.

The climatic conditions experienced in the season under review were unfavourable for satisfactory crop production in that the period from

the preceding January to planting in October experienced practically no rainfall—the total deficiency from the 22-year mean for this period amounting to 12.50 inches of rain. Under the circumstances considerably above normal rainfall was required this season during October to January inclusive to carry the summer crops through to the usual February soaking rains. Unfortunately, while October and November provided satisfactory planting rains, December and January each experienced subnormal rainfall—the total deficiency amounting to 3.42 inches compared to the previous mean for the life of the experiment station. Consequently all crops reacted so severely to the hot, dry conditions of January that they did not profit materially from the excellent soaking rainfall of 9.70 inches experienced in February. This particularly applied to cotton, grain sorghum having made very substantial recovery, but to no avail, as the cloudy conditions of February resulted in an outstandingly heavy attack of the sorghum midge which practically prevented the setting of any seed in open pollinated heads on the experiment station. From mid-March onwards dry conditions prevailed again for the rest of the period under review, consequently with the exception of an oat varietal hay trial and a bulk area of oats for hay no planting of rain-grown winter cereals was possible.

A total of 200 acres of various types of experiments in crops and pastures was planned for the season, but the adverse climatic conditions prevented the planting of some of them and naturally materially affected most of those grown under only rainfall conditions. The following brief summaries present the most outstanding features in each crop grown.

Cotton.—Thirty-two acres of cotton were planted, of which 9.1 acres were grown with supplementary irrigation. The yields from the experiments grown only with rainfall were naturally affected by the irregular seasonal conditions and as a whole were very low. Confirmation of the value of planting on only land not more than three years out of grassland was obtained once more—cotton on land in both the first and second year after Rhodes grass outyielding land successively planted to cotton by at least 130 lb. seed cotton per acre. Investigations pertaining to the merits of planting cotton where grassland had been ploughed early in March instead of June and August—when most commercial areas are usually ploughed—failed to show any differences in yields, the lack of late summer rainfall in 1946 nullifying the effect of time of ploughing that has generally been obtained in previous experiments of this type.

In the experiment in which following three years of Rhodes grass on old cultivation, the merits of planting three successive crops of cotton compared with planting successively cotton, grain sorghum, and cotton, a slight difference in favour of the latter rotation was obtained. Further work is required in this investigation before any conclusions can be drawn. Soil nitrate determinations showed, however, that during the first half of the season the top 6 inches of soil in the plots following grain sorghum contained less nitrate-nitrogen, the objective which it was hoped to attain in the experiment, and had more favourable climatic conditions prevailed, a greater gain might have resulted.

The results obtained in the various investigations relating to the growing of cotton with supplementary irrigation, indicated once more the merits of practising this form of cotton culture where water can be applied economically. Under the combination of no subsoil moisture prior to the planting rains and very dry conditions in December and January, few areas of rain-grown cotton on the experiment station yielded in excess of 500 lb. seed cotton per acre. By the application of 3 inches of spray irrigation to supply planting moisture and three additional 3-inch applications at critical periods in the plants' development, it was possible to produce up to 1,687 lb. seed cotton per acre from plants whose fruiting potentials had been considerably reduced through mutilation by an early attack of the cotton web-spinner. The results obtained in a time of watering experiment indicated, however, that it is highly advisable in irrigated cotton to have an adequate supply of subsoil moisture at planting time to provide not only moisture for the growing plants but also to assist in the trapping of the early summer storms which penetrate deeper in moist soil than where the plants have nearly exhausted the moisture to considerable depth. In cotton planted after a 3-inch preplanting irrigation at mid-October and which received no further irrigation until early January, the subsoil was not wet to a depth exceeding 16-17 inches during the period between irrigations. This cotton reacted seriously to dry conditions prevailing at the end of December. Where the subsoil was wet to greater depths better yields were obtained, the greatest gain over the above treatment amounting to 245 lb. seed cotton per acre. The results indicate that the subsoil should be wet to a depth of at least 24-27 inches at planting time. Time of application of irrigation after planting is important, however, as is also the quantity of water applied, and further investigations bearing on these points are proposed for the coming season. An additional important point arising out of this season's investigations was the demonstration of the necessity of planting the rows across slope rather than up and down slope, where spray irrigation is applied, in order to avoid run-off where a 3-inch watering is applied on even a very slight slope. Apparently the striking force of a continuous application of 1 inch of water an hour for three hours causes a sealing over of all but very light soils which results in run-off of most of the last hour's application of such a watering.

Considerable difficulty is generally encountered in the Callide Valley in controlling the growth of black pigweed (*Trianthema portulacastrum*) in row cultivations. With timely and efficient cultivation this deep-rooting weed can be kept reasonably under control in the "middles" between the rows of cotton and grain sorghum—the two main row crops grown in the district. With inefficient methods of cultivation it quickly becomes so firmly established that the teeth of the normal types of horse-drawn cultivators used in the district are frequently deflected in the later cultivations sufficiently to prevent the destruction of the weed. In addition, even with efficient cultivation, some plants become established in the rows of either cotton or grain sorghum and when fully developed compete seriously with these crops during dry periods. The problem of obtaining better eradication of

this weed pest by mechanical means was therefore tackled by first testing the merits of a rotary weeder and a peg-tooth harrow when drawn across a field in which the cotton seed had been planted in dry ground and the field then spray-irrigated to simulate where a heavy packing storm follows planting. It is necessary to harrow as soon as possible after such a rain, otherwise the soil sets sufficiently to prevent a good stand coming through the crust and also weed growth becomes prolific. On clay soils the use of the spike-tooth harrow may cause considerable loss of stand of very young seedlings if they are just emerging. It was found that the rotary weeder destroyed more weeds than the harrow—a reduction of weed coverage by 50 per cent. being obtained—and also a slightly better stand of cotton resulted with the rotary weeder, although both implements increased the stand on an average of one plant per row foot compared with the control, through the breaking of the crust. Preliminary trials were also conducted in increasing the efficiency of cultivation of older cotton. In this investigation row cultivation equipment attached to a tractor was compared with the ordinary type of horse-drawn riding cultivator normally used in Queensland. The results obtained indicated that more efficient work was done with the former on the heavy clay loams of the experiment. Accordingly a more comprehensive investigation is planned for the coming season.

The eradication of weeds by the application of selective weedicides that has been achieved in some crops influenced the Queensland Cotton Marketing Board to request that investigations be conducted at the experiment station into the merits of Dinoc to control black pigweed, the weedicide being supplied by the Board. The results obtained in an area in which both the cotton and weed plants were of a toughened growth indicated that Dinoc alone, even when applied in a 1 to 50 solution, did not affect either the cotton or the weeds. The addition of sulphate of ammonia as an activator increased the efficiency of the weedicide in that young weed plants were killed, but also the terminal parts of the cotton plants were destroyed. When used in a combination of young cotton 3 to 4 inches tall and black pigweed with a spread of 3 to 8 inches, an application at the rate of 100 gallons per acre of a mixture of 1 part of Dinoc in 100 parts of water and 1 lb. sulphate of ammonia per 100 gallons of spray completely killed the cotton plants and all but the larger plants of the weed. The latter recovered and eventually set seed. Dinoc appears, therefore, to be unsuitable for control of this pest in cotton, but tests conducted in young sorghum indicated that it may have possibilities in this direction and further investigations are planned for the coming season.

The benefits being obtained by cotton-growers in the United States of America through defoliating their cotton crops prior to either hand or mechanical harvesting made it appear advisable to test the merits of this procedure in this State. Accordingly in the 1945-46 season preliminary trials of a cyanamide manufactured in Australia were carried out at the experiment station but with only indifferent success. During this past season it was possible, through the courtesy of the Department of Commerce and Agriculture, to test the merits of Aero Defoliant obtained

from the United States of America. Practically complete defoliation was obtained with this material when applied at the rate of 48 lb. per acre in tall and very leafy cotton. The Australian preparation, even when mixed with a lighter carrier, failed to work efficiently. It is suspected that this material should be more finely ground, and this point has been taken up with the firm who supplied it.

Sorghum.—A total of 11.7 acres of grain sorghum was planted this season. The bulk of the plantings consisted of breeding plots and strain and varietal trials conducted by the Senior Plant Breeder and the results obtained in them are presented in the report of the Director of Agriculture. The very dry conditions experienced after planting and then an extremely heavy infestation of midge during wet, cloudy weather in February and March combined to produce one of the poorest sorghum crops ever experienced on the experiment station and in the immediate district.

Wheat.—The non-occurrence of winter rains in 1946 prevented the planting of the usual acreage of wheat for strain and variety trials and bulk hay production. Consequently plantings of this crop were restricted to where supplementary spray irrigation could be applied—a total of 5 acres comprising an area of some 200 rod rows under test for rust resistance by the Senior Plant Breeder and an area for bulk hay production. Approximately 7 inches were applied to the latter area, which produced a good yield considering the otherwise dry conditions. The results obtained in the material under test for rust resistance are included in the report of the Director of Agriculture.

Cowpeas.—A total of 11.4 acres of cowpeas was planted for green manuring purposes in preparation for later planting of oats, wheat, and Rhodes grass. Only moderate yields were obtained considering the February rainfall and the results raise the question as to whether the previous run of very dry seasons, in which growth of all cowpea plantings on the experiment station have been poor, has caused a lack of suitable soil bacteria to promote the highly satisfactory growth of cowpeas that has always been previously obtained at this centre without inoculation of planting seed. Tests will therefore be undertaken during the coming season to throw light on this important point.

Sudan Grass.—A total of 13.7 acres of Sudan grass was grown, which produced from 3 to 4 tons of good hay per acre as a result of the above-normal February rains.

Rhodes Grass.—Altogether 62.5 acres were under Rhodes grass, and once more evidence was obtained of the merits of including this valuable grass in the cropping programme. Each season witnesses native pastures, old-established Rhodes grass pastures, and summer fodder crops either providing little or no feed early in the spring—particularly if a dry one—or drying up badly during severely dry periods during the summer. In contrast Rhodes grass in the second or third year after cotton on old fertile cultivation provides a body of green feed of good quality very soon after the first rain is experienced, which is maintained for the rest of the season if properly grazed during any dry spells encountered. Undoubtedly the inclusion of Rhodes grass in the

cropping programme on a basis whereby in each season there will be areas of the grass in respectively the first, second, third, and fourth year of establishment, following three or four years of cultivation of crops such as cotton and cowpeas, would provide much better pastures than are usually observed on most farms in Central Queensland and other districts experiencing similar climatic conditions.

The investigation of the merits of Rhodes grass when grown with supplementary irrigation which was commenced in the 1945-46 season was continued this season. Since the inauguration of the experiment in February, 1946, a total of only 27.57 inches of rain has been experienced. The application of six spray irrigations totalling 20.3 inches of water increased the production of grass by 2.98 tons of green weight per acre or 1.11 tons per acre of dry weight. Although the increase in weight of grass produced, which occurred mostly in the dry autumn and spring, seems rather small for the supplementary water applied, the improvement obtained in the quality of the grass is noteworthy—being to the end of January, 1947, an average of 144 lb. crude protein, 10.5 lb. CaO and 25 lb. P₂O₅ per acre. The investigation is being continued.

In some seasons evidence has been obtained at the experiment station that difficulty may be experienced in obtaining a good stand of Rhodes grass on the heavier clay and clay loam soils when beating storms occur either as the planting rain or soon after the planting of the Rhodes grass seed. An experiment was conducted this season to test the merits of a comprehensive range of methods of planting. Very irregular rainfall prevailed, which provided extreme conditions for the trial, but striking evidence was obtained which indicated that a light mulch, such as is provided by distributing the whole unthreshed seed heads, greatly assists in obtaining a good stand of grass. The results suggest that where a farmer having a field of Rhodes grass desires to sow a new area, the surest way to obtain a satisfactory stand in it would be to mow some of the old grass when the heads have ample ripe seed and distribute it lightly over a well-prepared seed-bed in the new area when rains can be anticipated.

Introduced grasses.—Although very satisfactory results have been obtained with Rhodes grass in the cotton-grassland rotations which have been investigated at the experiment station for several years, the broadening of the basis of operations of this centre whereby a dairy herd and piggery will be established there makes it advisable to investigate the suitability of other grasses and legumes that may have possibilities in such climatic conditions, either as single species pastures or in combinations of grasses and legumes. Accordingly work was started this season in establishing a nursery of a comprehensive range of grasses and legumes, provision being made for the eventual testing of some 160 species.

Miscellaneous.—In addition to the above-described major activities conducted this season, preliminary trials of new introductions of varieties of sweet potatoes were grown prior to carrying out in conjunction with the other regional experiment stations a comprehensive trial of the most promising varieties of sweet

potatoes now available in this State. Small increase plots of a range of upland and paddy varieties of rice were also grown for the Director of Agriculture.

Brigalow Sucker and Forest Sapling Control.

—The amount of brigalow suckering and the rapidity of growth of the suckers that is occurring under certain conditions in the Central District is causing considerable concern in that area. Departmental investigations conducted in 1945-46 indicated that the use of a tractor equipped with a bulldozer did not achieve satisfactory eradication of the brigalow suckers. A more promising method was developed, however, which involved the dragging of a grader equipped with a saw-tooth fire-plough blade. At this juncture a promising method of sucker control being tested by a local farmer came under departmental notice. As this embraced an approach involving plant physiology the previous departmental operations were suspended and a programme of investigations into the farmer's method was commenced in co-operation with him, and also on the experiment station, in both control of brigalow suckers and forest saplings. Briefly, the method of controlling brigalow suckers used by the farmer is to drag a heavy multi-furrowed disc plough by means of a large track-equipped tractor over the suckers so as to bend them over and bark them along their trunks, but not to break them off. This procedure appears to fracture and interrupt the internal nutrient transport system of the plants so that there is no replenishment of the food reserves in the rooting system. Consequently the tree lives on the starches stored above and below the fracture and as these are depleted the tree gradually dies upward and also downward from the fracture. After several months the area of bent-over suckers is disc-harrowed with a heavily weighted implement and saccaline seed is sown into the resultant mulch of sticks, leaves, and soil. The dead crop of saccaline at the end of the season is fired to destroy as much rubbish and young suckers as possible, and then Rhodes grass is planted for pasture. Studies of the effect of carrying out the original bending and fracturing operations at different times of the year in relation to the interruption of the transport of the plant nutrients has been initiated at the experiment station in both brigalow suckers and forest saplings in an endeavour to place this method of control of suckers and saplings on a sound basis that will achieve their permanent destruction.

Soil Investigations.—In keeping with the results obtained in previous seasons at this centre, the value of determining the moisture and nitrate content of the soils under various types of experiments was once more clearly demonstrated. Such information has frequently explained results that were apparently in conflict with previous findings. Undoubtedly such determinations should be made in investigational work whenever possible. Mention has been made elsewhere of the lack of response of the cotton crops to the different times of ploughing in the experiment dealing with this subject. Soil moisture determinations indicated that with the lack of rains in February, 1946, there was no penetration of moisture to the subsoils. Consequently, as there was very little subsequent effective rain until the planting rain in October,

no advantage was gained by ploughing at any particular time. Following the excellent rains of late summer in 1947, however, when a total of 9.7 inches in February and 3.05 inches in March, penetrated to a depth of approximately 3 feet under a Rhodes grass pasture, it was found that by early April the Rhodes grass had practically exhausted the moisture in the top foot of soil. This evidence supports previous findings at this centre that it is advisable, where cotton is to follow grassland, that the latter be ploughed soon after the wet season so as to kill the grass before it has utilised much of the subsoil moisture. Leaving the ploughed area in fallow from then until planting time for the cotton in the following spring also increases the absorption of any rainfall experienced during that period, thereby furthering the prospects of having the depth of wet subsoil at planting time that previous moisture determinations have indicated to be necessary in most seasons for the production of satisfactory yields of rain-grown cotton at this station. Evidence was also obtained in another investigation of the advisability of adopting all procedures that will increase the possibilities of obtaining ample supplies of subsoil moisture prior to planting time. During the long dry period which terminated with the planting rains, the moisture content of the top soils was well below their permanent wilting point, as evidenced by the fact that a clay loam soil was wet to only 13½ inches at the end of November, although 5½ inches of rain had been experienced during the previous six weeks. Similarly in another area a 3-inch spray irrigation plus 1.51 inches of rain soon after only moistened the top soils to a depth of 13 inches. In previous years when a wet winter has been experienced such additional water at planting time has wet the soils to a depth of 30-35 inches. The value of moist soil in obtaining better penetration of all types of rainfall was also demonstrated in an area which was in sorghum in 1945-46, and then left clean fallowed until mid-May, 1947, when it was ascertained that the total of approximately 25 inches of rainfall from October to April inclusive had brought the soil to field capacity to an average depth of 58 inches, which was a greater depth than obtained in any of the cropped areas.

Confirmation of previous findings of the degree of nitrification occurring in different cropping rotations was obtained. In the areas of rain-grown cotton it was found that the nitrate contents of the surface 6 inches of soil of the older cultivations were rather high—a phenomenon generally encountered in seasons experiencing dry winters and early springs as compared with low readings after wet winters and springs. The high nitrate content of the soils combined with some mutilation of the plants through attacks by the cotton web spinner promoted a very leafy vegetative type of plant which undoubtedly utilised large quantities of water under hot, dry conditions. This feature was particularly noticeable early in January, when cessation of growth of the larger plants in the rain-grown areas quickly occurred.

Sieving determinations of the size of the water stable aggregates—which is a factor correlated with the permeability of the soil—indicated that the areas previously under four years of Rhodes grass had a greater number of

aggregates larger than .7 mm. than either areas which had been under Rhodes grass for a lesser period or Sudan grass following cotton. Evidence was also found of the destruction of the soil structure brought about by repeated annual cropping of clay loam soils, the percentage of water stable aggregates larger than .7 mm. being much greater in the 7-12 inch subsoil layer than in the 0-6 inch cultivated layer. Undoubtedly grassland of at least four years' establishment should be included in the cropping programme of most of the cotton-growing districts to maintain a suitable degree of permeability of the top 6 inches of soil.

KAIRI.

This property, which was formerly the Kairi State Farm, but was closed down during the depression period and leased for commercial farming until 1944, when it was taken over by the Australian Army for vegetable production, was handed back to the Department on the 3rd of July, 1946. The work of rehabilitating the area and developing it for departmental activities was immediately commenced through the courtesy of the Director of Agriculture making available the services of his field staff stationed at Atherton. On the 21st October a temporary manager was appointed to the experiment station thereby allowing of the release of the Atherton staff, whose help not only then but at different times during the season has been gratefully appreciated.

The experiment station is located on the typical red soil of the maize-growing section of the district, and was originally covered with dense scrub. It is close to where the red soils of the scrub and forest series meet, however, and the annual rainfall approximates 48 inches, which is roughly the mid-point of the rainfall range of the maize-growing district which averages around 56 inches in the wettest portion down to 40 inches in the driest. The station adjoins the Barron River and ranges back by first gradual and then steep slopes of up to 10 per cent. gradient to the rolling upland country of the main maize district. It is accordingly well situated for conducting experiments relating to cropping practices of much of the maize growing area of the Atherton Tableland. In addition springs located on the property, as well as on the Barron River, allow of the conducting of investigations in the irrigation of crops during the long dry period from July on to November which usually characterises this section of the Tableland.

For several years prior to Japan coming into World War II, a comprehensive programme of investigations into pasture problems was conducted under the aegis of the Tableland Pasture Improvement Committee—a body representative of the Department and district growers. This Committee suspended operations after Japan's entry into the war to allow the departmental members to engage in other lines of work for the rest of the war. Sufficient progress had been made in some directions, however, to allow of suggestions being formulated for a system of crop and pasture rotations to use in the sections of the Tableland where both pastoral dairying and maize-growing are practised. Accordingly it was decided to set aside an area of some 145 acres of upland country of the old Kairi State Farm,

that is typical of such sections of the Tableland, as a demonstration farm to test out under commercial practices the merits of the system of rotations evolved. This system embraces the use of dairying and pig raising in conjunction with the growth of pastures and maize. The rest of the property will be utilised as a regional experiment station to supply facilities for the conduct of investigations of district problems by all divisions of the Department.

The main activities for the season have therefore been essentially of a developmental type preparatory to initiating the programmes devised for the two areas. This work was seriously handicapped through the non-occurrence of the usual storm rains of November and December to germinate weed and grass seed and thus allow the cultivations totalling approximately 200 acres to be cleaned up satisfactorily prior to planting the cropping and pasture programme. Consequently it was necessary to plant on the first good rain experienced, which was not until mid-January, following on which frequent showers during February and heavy rain in March provided such very favourable conditions for the germination of successive crops of weeds that the cropping programme was brought through with the greatest of difficulty. Undoubtedly prevention of excessive weed growth is a very important factor in crop production in this district, particularly on old cultivations in a season following a very dry one when, in keeping with other agricultural districts of this State, excessive weed growth generally occurs.

Although the maize plantings could not be carried out until the occurrence of the first planting rain at mid-January, better yields were obtained than are usually produced with such a late planting—some areas yielding at the rate of 60 bushels or better per acre. Apparently the delay of heavy leaching rains until March provided very favourable conditions for such late-planted maize, for the resultant growth was more typical of December plantings.

Cowpeas were used extensively as a green manuring crop wherever possible and satisfactory growth was obtained with both the Giant and Poona varieties, although in the latter on some areas a bacterial disease caused loss of plants. An experiment to test the value of inoculating the seed of the Poona variety did not yield any differential response in either the cowpea or the lucerne crop planted following the ploughing under of the cowpea.

An early June sowing of Warput wheat made excellent growth during the rest of the month, when rain totalling 3.41 inches was experienced, whereas it is problematical if a sowing of this variety and Charter wheat on the 23rd of June will produce a yield of any value, although subsequent growing conditions have been unusually favourable. The earlier sowing appears to have escaped the adverse effect of the incidence of leaf rust to a greater degree than has the later sowing.

An early May sowing of the Klein variety of oats produced an excellent growth of feed free of rust and it would appear that with the

provision of seed of rust-resistant varieties of oats this crop should play an important part in the cropping programme on a dairy farm in this section of the Tableland.

The unfavourable structure and the low moisture-holding capacity of the soils in the old cultivations repeatedly cropped to maize over a long period is a matter of concern on the Tableland. Accordingly a series of different types of rotations is planned for investigating on the experiment station. As a preliminary to starting some of the rotations, investigations into the merits of different grasses and legumes that have possibilities on the Tableland have been commenced, the Bureau of Tropical Agriculture at South Johnstone, having provided seed of several tropical legumes, some of which have shown promise in their first year of establishment at Kairi. It is proposed to expand considerably this aspect of the work.

Preliminary work relating to the conduct of soil conservation investigations was also carried out, in that waterways were constructed for stabilisation vegetatively, preparatory to constructing sets of graded banks for experiments. A very satisfactory installation of large banks to divert run-off waters from an adjoining farm to a safe disposal pasture area on the experiment station indicates that much prevention of soil erosion can be effected in this manner.

Altogether very considerable progress in the development of both the demonstration farm and the regional experiment station was effected under the difficult conditions of an irregular season.

COTTON.

The comprehensive programme of cotton breeding discussed in previous annual reports by the Cotton Specialist was continued during this past season with satisfactory progress being achieved in several directions where the seasonal conditions were reasonably favourable. Strains have now been evolved to meet the conditions of all sections of the State where cotton has been grown commercially. Further work of both maintenance and improvement of strains is required, however, and the programme described in the report of the Director of Agriculture presents some idea of the scope of these activities.

A feature of the season's operations was the success obtained in the Wowan district in Central Queensland with the trials of the Rust mechanical picker. Although only relatively small areas producing moderate yields were available for the trials, the results were so impressive that most of the farmers attending the demonstrations signified their intention to plant their cotton areas for machine harvesting in the coming season. The average grade of the cotton of each variety that was mechanically harvested compared favourably with the average grades obtained with hand picking. It would appear that given a reasonably suitable type of plant in clean cultivated fields this machine can harvest cotton satisfactorily.

W. G. WELLS,*

* Now Director, Regional Experiment Stations.

(4) REPORT OF THE OFFICER-IN-CHARGE, SCIENCE BRANCH.

Herewith are presented the annual reports of the Entomology, Plant Pathology, and Botany Sections of the Science Branch. These have been prepared by the heads of the respective sections.

J. H. SIMMONDS,
Officer-in-Charge, Science Branch.

(A) REPORT OF THE ENTOMOLOGY SECTION.

Climatic conditions during 1946-47 were somewhat unusual, and an incidental effect was the remarkable activity of some pests which normally are considered of minor importance.

CODLING MOTH.

The investigational programme on control measures for codling moth, *Cydia pomonella*, was continued during 1946-47. An experiment was designed to supply information on "safeners" which might be added to lead arsenate sprays in order to reduce the amount of leaf burn normally experienced on orchards where this insecticide is used throughout the greater part of the season. Zinc fluoarsenate, which has been developed overseas as a substitute for lead arsenate, and D.D.T. were also included in the treatment series. The work was carried out on an orchard at Applethorpe using trees of the late-maturing variety, Granny Smith. Eight cover sprays were applied.

Cover sprays containing 0.1 per cent. D.D.T. gave outstanding control of codling moth, but residues on the fruit at harvesting were rather high. Sprays containing 0.05 per cent. D.D.T. with or without white oil were rather less effective but still superior to cover sprays based on white oil or lead arsenate. Zinc sulphate and hydrated lime when added together to lead arsenate sprays reduced the foliage injury caused by the insecticide to negligible proportions, though neither zinc sulphate nor hydrated lime when added separately to lead arsenate sprays caused any apparent improvement. Zinc fluoarsenate failed to live up to its overseas credentials; the percentage of damaged fruit on treated trees was high and foliage burn appreciable. It seems inevitable therefore that D.D.T. will soon displace the insecticides formerly used for the control of codling moth in apple orchards. Such a change will almost certainly alter the status of some other pests such as red mite and woolly aphid both of which tend to increase in numbers on trees sprayed with the insecticide. In next season's experiments an attempt will be made to overcome these disadvantages by modifications in the spray programme.

BANANA RUST THRIPS.

The incidence of banana rust thrips, *Scirtothrips signipennis* Bagn., followed the general pattern of that recorded in 1945-46. The pest was present in most plantations, few of which were free from rust, while many growers cut severely blemished bunches from the warmer slopes.

As exploratory work had already indicated that D.D.T. might simplify control measures an experiment was placed on a South Coast plantation where losses had been severe the previous year. The treatment schedule was designed to permit comparisons between D.D.T. in dust and

spray forms, bunch *versus* whole plant treatments, and long-term *versus* short-term treatment schedules during the period in which the bunch is developing. Two of the standard recommendations—viz., bagging plus applications of nicotine dusts, and routine applications of a nicotine dust at weekly intervals—were used as standards for comparison. Bunch infestation was low until midsummer and the insecticides were only applied to bunches thrown after December. Observations confirm the value of D.D.T. as an insecticide for the control of rust thrips in bananas. It has a long-term effect which makes applications of a 2 per cent. dust at fortnightly periods during the life of the bunch adequate for most purposes. Plantation treatment on this basis is well within the compass of growers and the older methods of control involving the use of nicotine dusts will no doubt be superseded.

RED SPIDER.

Red spider, *Tetranychus urticae* Koch., attacks numerous field crops. Papaws in the near-Brisbane district showed signs of mite injury in October and the position grew steadily worse until the monsoonal rains fell in February. Sulphur in either dust or spray form is normally recommended for the control of the pest, but many growers failed to obtain an adequate "kill" this season. It was therefore decided to recheck the efficiency of current recommendations and also to assess the merits of a new insecticide, hexaethyltetrathosphate, which is said to be lethal to mites.

The experiment was located at Brookfield in bearing papaws heavily infested by red spider. The sprays applied were hexaethyltetrathosphate (1-1,000), white oil (1-80), lime sulphur (1-40), wettable sulphur (8lb.-100 gal.), the other treatments being a sulphur-hydrated lime (1-1) dust and an untreated control. Insecticides were applied weekly from the end of January.

At the concentration used, hexaethyltetrathosphate caused wilting of the foliage and induced "gooseneck" malformations in the leaf stalks. Lime sulphur burned the margins of the leaves and produced an upward claw-like curl at the tip. This latter symptom also appeared on the white-oil-treated plants though without actual burning. Both hexaethyltetrathosphate and lime sulphur reduced mite populations very rapidly. Wettable sulphur and sulphur dusts were slower in their action and two or three applications were needed to obtain equivalent results. The white oil spray failed to control the mite at the concentration used. A satisfactory spray cover is not easily secured on papaw plants and studies of the relative merits of some modern wetting and spreading agents as supplements to the spray may lead to an improvement in field practice.

RED SCALE ON CITRUS.

Red scale, *Aonidiella aurantii* Mask., is a major pest of citrus in sub-coastal and in some coastal districts. Control measures are applied each year with reasonably good results, but in some parts of Gayndah current recommendations are difficult to fit into orchard programmes and the pest has got out of hand. A review of the position led to the inception of experimental work designed to test the efficiency of white oil,

white oil plus D.D.T., and fumigation, these treatments being applied in late December, early January, or in both late December and early January.

The experiment was placed on a block of grapefruit trees heavily infested with red scale. Obvious differences were apparent on experimental trees and the comparative merits of the several treatments were clearly demonstrated. Two successive oil sprays proved more efficient than a single oil spray, but both treatments were inferior to a single fumigation, a double fumigation, and an oil spray followed by fumigation. The addition of D.D.T. to the white-oil spray failed to increase the efficiency of the latter insecticide for red scale control and tended to accentuate the amount of rind blemish caused by Maori mite.

The experiment indicates that when the red scale position has got out of hand fumigation is the only satisfactory method of reducing the pest population to low values. Sprays containing white oil are better adapted for the treatment of orchards where pest populations, though low, are still a potential threat to the grower if precautionary measures are not taken at the time.

FRUIT FLY.

Losses attributable to fruit fly, *Strumeta tryoni* Frogg., were low in deciduous fruit areas. In citrus districts the pest was very active for a short period in March when the grapefruit crops were maturing. Luring studies were continued during the year in order to record the seasonal abundance of the pest. Lures were also used as a check on the efficiency of D.D.T. sprays applied during the pre-harvesting period as a control measure for the pest. In this experiment, sprays were applied to a block of grapefruit trees when fruit fly activity, as recorded by lures, threatened to be dangerous. The results obtained indicate that fortnightly applications of an 0.2 per cent. D.D.T. spray will be needed for at least one month prior to harvesting, at least in those varieties of citrus which mature during late summer and autumn. A coarse spray applied as an inside cover at a rate of approximately one gallon per tree showed considerable promise for the control of the pest.

CORN EAR WORM.

Lead arsenate has been used for controlling corn ear worm, *Heliothis armigera* Hbn., in tomatoes for some considerable time. The pest and disease problems in the crop are such, however, that the insecticide is normally combined with a fungicide, the dual purpose dust or spray being applied at regular intervals to the crop. In experimental work designed to assess the value of D.D.T. as a possible substitute for lead arsenate, treatment schedules were arranged in such a way that the effect of copper carbonate and/or sulphur on the insecticidal efficiency of D.D.T. could also be determined. Treatment schedules began at the commencement of flowering in irrigated crops of staked tomatoes near Rockhampton. The activity of the pest was assessed at weekly intervals by recording the number of eggs on the terminal growth. The crop losses due to corn ear worm were low in tomatoes treated weekly with dusts containing lead arsenate at a concentration of 50 per cent. Straight dusts containing 2 per cent. D.D.T. were more efficient than lead arsenate when

applied at weekly intervals, but rather less efficient when applied at fortnightly intervals. When combined with copper carbonate in freshly mixed dusts, D.D.T. lost a great deal of its efficiency for corn ear worm control and crop losses were almost as great as in the untreated plots. It follows, therefore, that combined dusts containing D.D.T. and copper carbonate may prove unsatisfactory on the farm until the cause of the trouble can be located and remedied. Incidentally, dusts containing D.D.T., unlike those containing lead arsenate, failed to keep the green looper, *Plusia chalcites* Esp., in check.

POTATO TUBER MOTH.

In 1945-46, experimental work on control measures for the potato tuber moth, *Gnorimoschema operculella* Guen., indicated that application of D.D.T. dusts and sprays to potato crops in the post-flowering period reduced tuber infestation considerably. Crop losses were, however, still excessive and the current season's programme at Ayr was designed to supply information on the number of treatments required and the period during which the insecticide should be applied. No conclusive results were obtained, mainly because leaf and stem infestation was light. However, in spite of the fact that the leaf and stem injury usually associated with the pest was negligible, approximately 10 per cent. of the harvested crop showed signs of damage. It must be inferred therefore that the larvae may enter the soil as soon as they hatch from the eggs and attack the tubers. In spite of the fact that insecticidal control of potato tuber moth can now be obtained with D.D.T., costs are high and the economics of crop production will continue to focus attention on cultural methods of control. The importance of late hilling in this connection has long been recognised. Modifications in cultural practices to ensure efficient hilling in the later stages of plant growth when the pest is most active are to be investigated.

LOCUSTS.

Following the establishment of egg beds in the Waggamba and Jondaryan Shires during autumn, hoppers of the Australian plague locust, *Chortoicetes terminifera* Walk., appeared in spring. The roving bands attacked pastures and fodder crops in a few localities causing some damage. The spring generation developed normally and the next brood of hoppers proved troublesome in December. The outbreak, though severe in some areas, did not affect agricultural interests on the Darling Downs to any great extent. However, it is possible that the position will become more acute in 1947-48. Control measures were required in some of the affected areas, in particular at Bowenville. Bran was in short supply when it was most needed and the baiting method of control was therefore supplemented by the use of fuel-oil sprays applied with power equipment. Results were satisfactory.

The yellow-winged locust, *Gastrimargus musicus* Sjost., caused less trouble in Central and Northern Queensland than in the two previous years and it appears that the present outbreak, which has persisted for some time, is coming to an end. The biology of the insect has been studied in some detail and control measures were further investigated.

The new insecticide, gammexane, promises to replace arsenic pentoxide as the toxic ingredient

in the poisoned baits used for locust and grasshopper control and its introduction may stimulate interest in spray machinery for dealing with these pests. The shortage of bran during the year led to a test of bagasse, a fibrous bi-product of sugar-cane mills, as a substitute carrier in poison baits. It proved satisfactory when sieved to the appropriate degree of fineness.

TOBACCO PESTS IN SOUTH-WEST QUEENSLAND.

In South-west Queensland, tobacco is grown under irrigation. In some respects, the pest position differs from that in other parts of the State and a number of insects—e.g. tobacco thrips, *Hemianaphothrips concinnus* Morr., and brown vegetable weevil, *Listroderes costirostris* Sch.—are not injurious to the crop elsewhere. The damage caused by tobacco thrips is, in some stages at least, not unlike that associated with the jassid, *Empoasca terra-reginae* Paoli., and both pests may be present in the crop at the same time. In 1946-47, thrips did not reach pest proportions, but jassids were sometimes responsible for a reduction in leaf quality. Another pest, an Eriophyid mite, presumed to be *Vasates lycopersici* Mass., attacked the leaves. Though well known as a pest of tomatoes and some other solanaceous crops, the mite has not hitherto been recorded from tobacco. The symptoms associated with the pest consist of a slight bronzing of the lower surface of the leaves, which do not colour normally in the curing barn.

Control of the tobacco bud worm, *Heliothis armigera* Hbn., is also a problem in this area. In the South-west, flowering is well advanced when topping begins, and numerous well-developed larvae may be present in the upper parts of the plants, which are sometimes badly damaged. Lead arsenate-pollard dusts are used to keep the pest in check. Though reasonably efficient during light outbreaks, they fail to give adequate control of the tobacco bud worm when the pest is very active. Dusts containing D.D.T. may provide a solution to this problem.

ARMY WORM OUTBREAKS.

Widespread outbreaks of army worms occurred throughout the State in late summer and autumn. The principal pest species was *Sideridis unipuncta* Haw., though corn ear worm larvae, *Heliothis armigera* Hbn., were associated with it on some crops. On the Darling Downs, larval populations in fodder crops such as dwarf Setaria, Sudan grass, and white French millet were very high during March and the damage was considerable. The large areas infested and the rather dispersed feeding habits of the larvae complicated control work a great deal. Sprays containing D.D.T. were applied to some infested crops with apparently good results, power equipment being improvised from local plant. The relatively low cost of the control measure suggests that the treatment of infested field crops may be easier than it was some years ago. When dense swarms of the larvae occurred and showed migratory habits, poison-bran baits proved very effective.

In both native and established pastures the variegated army worm, *Spodoptera exempta* Walk., was the most important pest species. Severe outbreaks were recorded in the coastal belt of Southern Queensland. Lawns, bowling greens, and the like suffered severely in the

metropolitan area. Other species involved in pasture damage were *Spodoptera mauritia* Boisd. and *Psara licarsialis* Walk. As expected, good control was obtained with a poison-bran bait, but in residential areas D.D.T. sprays were effectively used at a concentration of 0.1 per cent.

CHEESE MITES.

Transport difficulties during the year led to abnormally long-term storage of cheese in cold stores and factories. It is not surprising, therefore, that cheese mites, the most important of which are *Tyrophagus putrescentiae* Schr. and *Tyroglyphus farinae* De G., became a problem. Control measures recommended for these pests have never been wholly satisfactory and interest has therefore turned to dichloroethyl ether, the acaricidal value of which was recently established in New Zealand. This fumigant was first used in Queensland for the treatment of curing rooms at Murgon in a joint project between the Science Branch and the Division of Dairying. The liquid fumigant was atomised under air pressure of approximately 75 lb. per square inch, the dosage being 1 lb. per 1,000 cubic feet and the period of exposure 48 hours. Gas masks were, of course, worn by operators applying this spray. The "kill" obtained wherever the fumigant reached mite-infested surfaces was good. Experimental work was also commenced at the Hamilton Cold Stores, mainly in an attempt to use dichloroethyl ether as a vapour treatment. Technical difficulties were encountered in designing a suitable apparatus and the spraying method of application was therefore used on the premises. A single treatment with a dichloroethyl ether spray cannot be expected to keep curing rooms and cold stores clean for long periods of time. Repeat treatments whenever mite activity is again noticed may therefore be necessary. Experience to date suggests that spray applications at intervals of three months should be adequate if the premises are of modern design and efficiently managed.

FORESTRY PESTS.

White grubs of the Scarab beetle, *Rhopaea magnicornis* Blkb., are particularly destructive to young hoop pine seedlings in forestry nurseries in the Brisbane Valley. Experiments on control measures for the pest included the application of gammexane, D.D.T., and lead arsenate to the soil prior to sowing. Plants in the untreated plots were almost completely wiped out, while all treatments gave satisfactory protection. The lowest rates of application were gammexane, at 2.0 gm. of an 0.25 per cent. gamma isomer dust, and D.D.T. at 20.0 gm. of a 10 per cent. para para isomer dust per square foot of nursery bed area. Large scale nursery treatments with lead arsenate at the rate of approximately 12 lb. per 1,000 square feet have given practically complete protection from the pest. On the score of cost and duration of protection, the lead arsenate may be preferred to gammexane or D.D.T. in nursery-bed practice.

Field work is nearing completion on starch resorption experiments with a number of rain forest timber species such as brown tulip oak, tulip satinwood, and crow's ash. These species store abundant starch in the sapwood and they are susceptible to heavy attacks by the powder post beetle, *Lyctus brunneus* Steph. In all of

these species high ringbarking has induced starch resorption to the *Lyctus* immunity level, while in some of them resorption has continued until all starch has been depleted.

LANTANA BUG.

Very few colonies of the lantana bug, *Teleonemia scrupulosa* Stal., were distributed through the year, for periodic surveys show that the insect is spreading rapidly from areas where it is already established. The bug is present throughout coastal Queensland from the New South Wales border to the far North and has penetrated inland to Toowoomba and Clermont. Populations of the insect vary from place to place and from time to time for reasons which are not quite clear. It is too early yet to express a final opinion on the merits of this insect introduction. The bug can and does check the growth of lantana. Such checks are often severe enough to make the clearing of dense lantana a much easier task than it would otherwise be. In some parts of the far North the weed is now much less aggressive than it was before the introduction of this bug.

MISCELLANEOUS RECORDS.

A new larval host plant of fruit-sucking moths *Ophideres* sp. is recorded from Central Queensland; it is the Menisperm, *Pleogyne cunninghamii*. Silvering in the rind of papaw and citrus fruits was caused by gross infestations of the mite, *Tenuipalpus californicus* Banks. The Hydrophilid beetle, *Dactylosternum hydrophiloides* Macl., which was introduced from Malaya some years ago, was recovered in large numbers at Kiamba; it is now established in most parts of Southern Queensland where its host, the banana weevil borer, *Cosmopolites sordidus*, Chev., is a pest. The banana rust thrips, *Scirtothrips signipennis* Bagn., attacked passion vines at Cardwell; silvering on the leaves was a characteristic symptom.

A Coreid bug, *Miperis scutellaris* Dall., which was last recorded as a pest in 1921, caused severe damage to French beans in the Gympie district. Rhubarb plants at Mount Tamborine showed malformation and bronzing of the leaves in spring during an outbreak of Eriophyid mites.

The cotton web spinner, *Loxostege affinitalis* Walk., was active in Central and Southern Queensland during spring and early summer; damage to fodder and cotton crops was heavy in some districts. White grubs were again active on the Atherton Tableland, where the main species, *Lepidiota caudata* Blkb., is spreading to pastures in the wetter areas.

The grass mite, *Septanychus tumidus* Banks., was conspicuous in Rhodes grass pastures in the Burnett Valley; predatory thrips belonging to the genera *Scolothrips* and *Phibalothrips* were associated with the pest. The Crambid moth, *Calamatropha leptogrammela* Meyr., occurred in various parts of the State, Pearamon being the centre of extensive pasture destruction; larvae of this insect were also responsible for the destruction of nut grass in the Lockyer Valley.

Roses at Richmond were infested by swarms of the thrips, *Haplothrips froggattii* Hood., which sometimes interferes with fruit setting in grapes and other fruits.

The red spider, *Eotetranychus telarius* L., was collected in dense webbing on convolvulus at Sandgate. Boxthorn at Stanthorpe was heavily infested by the Chrysomelid beetle, *Lampolema binctata* Lea., some plants being killed outright.

A lerp insect, *Neocarsidera sterculeae* Frogg., defoliated bottle trees at Jericho, where they are an important fodder reserve in dry periods. An interesting scale insect, *Octaspidipotus subrubescens* Green., was recorded at Stanthorpe on the leaves of *Pinus caribbaea*.

J. HAROLD SMITH,
Senior Entomologist.

(B) REPORT OF THE PLANT PATHOLOGY SECTION.

The work of the Plant Pathology Section during 1946-47 is discussed under the following headings: field crops, fruit, vegetables, and general.

FIELD CROPS.

Despite the late planting of wheat in 1946, rust was not severe. This was probably due to the hot and dry conditions which prevailed subsequent to the September planting rains. In some respects this was unfortunate as there is a pleasing interest being taken in the use of rust-resistant varieties. The New South Wales varieties, Charter and Gabo, were available in quantity and more freely planted. Both show practical immunity to stem rust and good resistance to leaf rust. Both stem and leaf rust were abundant on susceptible varieties in the departmental wheat breeder's plots at Lawes and Hermitage. However, a large number of clones in these plots show a high degree of resistance to one or both rusts. Notes on individual performances have been supplied to the plant breeder.

The field trial laid down to investigate the suspected root rot of wheat in the Bongeen district advanced no further as drought conditions prevented sowings being made.

Oats planted in early February, 1947, exhibited an unusual physiological injury. A hot day following a week of dull showery weather when the oats were just through the ground caused the oats to burn at ground level. The injury varied from narrow necrotic bands on the first leaves to death of the seedlings. This occurrence was widespread but, although many paddocks appeared badly affected at the time, sufficient seedlings survived in most instances to produce a moderate to good stand after stooling out.

Grain sorghum, particularly the variety Kalo, was seriously affected with covered kernel smut in a number of cases. Seed sterilization has been shown to effectively prevent this disease and it is desirable that more attention be paid to the treatment of sorghum seed in the future.

The summer crop of panicum or Hungarian millet was extensively affected by blight (*Piricularia grisea*). This disease causes a leaf spot and also failure of the seed to develop in one or more sections of the head. The losses were estimated to vary between 20 per cent. and 60 per cent. The disease was no doubt accentuated by the continual wet conditions during two months of the growing period. Other summer crops were free from any noteworthy disease.

Potatoes in the Burdekin delta were again seriously affected with leaf roll. A better quality seed than has been available in the past is definitely required for this area. In order to obtain information towards this end the entomologist stationed at Ayr visited the main potato-growing centres of New South Wales, Victoria, and Tasmania and has since been able to advise on sources of seed supply which should meet the needs of the northern districts. Owing to the abnormally dry winter target spot was not so prevalent as usual.

The autumn potato crop suffered from a trouble which is of frequent occurrence in that crop on the irrigated flats of South-eastern Queensland. This is a rotting of the seed tubers which occurs when heavy rains are encountered at planting time. There is some evidence that chemical treatment of the planting material may reduce this loss and this question will receive further investigation.

Onion downy mildew was practically absent during the past season as a result of the dry winter and spring. This was in marked contrast to the previous year.

The peanut crop in the South Burnett received only light and scattered planting rains. In addition to poor germination due to shortage of moisture there was considerable evidence that crown rot seriously interfered with stand. This obtained in spite of the universal adoption of seed treatment, without which the position would have been much worse. Evidence was forthcoming that soil organic matter played an important part in determining the extent to which crown rot developed. Loss of stand due to crown rot was considerable when rotational practice had been poor and soil organic matter was low.

A spraying trial for the control of peanut leaf spot was carried out at Kingaroy in continuance of the previous year's work, which had proved inconclusive on account of the dry weather at the end of the peanut season. The experiment compared three applications at three-weekly intervals of Burgundy mixture, copper dust, and sulphur dust with untreated controls. The treatments, though resulting in marked reduction of leaf spot, did not exercise the degree of control desired and it would appear that the three-week interval between applications was too great. Sulphur appeared somewhat more effective than the copper fungicides.

A crop of French beans grown for seed certification purposes developed a small amount of bacterial blight. No explanation can be found for this outbreak, which was the first in the locality for some years. Attention was paid to various plots of soy beans growing on the Downs and in the South Burnett but without encountering anything of pathological interest except one record of a leaf spot (*Cladosporium* sp.) of minor importance.

FRUIT.

Apple trees in the Stanthorpe district were as usual affected by a number of unexplained troubles of the dieback type. Bacterial spot of the plum still causes considerable concern, but there is no reason to believe that careful adherence to the recommended control measures will fail to hold it in check.

The fungus disease causing most loss in this district this year was grey mould rot of the grape. In previous seasons the Gros Coleman variety was worst affected. In the 1946-47 season heavy rains occurred during the ripening of the variety Waltham Cross and fine weather for the maturing of the Gros Coleman. As a result the former was more severely affected with grey mould rot than the latter. An extensive experiment was carried out in the hope of obtaining control measures for this disease. This consisted in late spraying with some eight different materials during late January, February, and early March. The Gros Coleman variety was used. The results were so poor that it is considered very unlikely that spraying will be found to give a solution to the problem. Reduction in losses may be possible by a modification of the fertilizing practice so as to avoid excessive foliage development on late-maturing varieties, by foliage thinning and pruning for wider-spaced bunches, and the use of higher trellises.

In addition to grey mould rot, grapes, particularly Gros Coleman, were heavily damaged towards the end of the season with bitter rot. This fungus infection is believed to have followed berry shrivel induced by hot, dry conditions in December and early January prior to the wet season. Berry shrivel is not usually followed by fungal infection, which was probably induced in this instance by the abnormally wet conditions developing subsequently.

As would be expected from the weather conditions obtaining, water blister (*Ceratostomella paradoxa*) caused extensive transport loss in the summer crop of pineapples. A demonstration was carried out in co-operation with seven North Coast growers which showed conclusively that loss from this disease can be practically eliminated even during a severe outbreak by the well-established practice of packing-shed hygiene. In experimental consignments losses were reduced from an average of 30 per cent. where strict hygiene was not practised to 2 per cent. where it was.

The survey of Lady Finger banana plantations for determining sources of Panama-free planting material has been continued. A device has been worked out whereby a boring can be made of a suspected corm and further evidence obtained of the presence of the disease without cutting down the plant.

Two separate field experiments were carried out to determine whether Panama disease could be held in check by inoculating plants subject to infection with four local strains of *Trichoderma* sp. The subsequent growth of these plants suggested that little benefit was derived from the treatment.

With the return to normal conditions work on passion vine and papaw disease has been considerably augmented. As virus diseases play an important part in these two crops a considerable amount of glasshouse work has been involved. Field surveys of the incidence of passion vine woodiness have been made at regular intervals throughout the year. It has been shown that isolation results in the avoidance of early infection. It is hoped to show statistically the relationship of infection in a crop to nearby sources of the virus. Systematic insect collections have been made in selected areas with a

view to obtaining evidence of a possible vector. Artificial infection with certain of these insects is being attempted. Experiments have been started to determine the extent to which woodiness may be transmitted by pruning.

Papaw yellow crinkle is assumed to be a virus disease, although nothing is at present known regarding its transmissibility. Attempts have been made at mechanical transmission to indicator plants and to papaw. Collections of insects associated with the papaw have been made, but these have so far proved to be scanty. Attempts at insect transmission from diseased to healthy papaws have so far produced negative results. The seasonal incidence of the disease has been noted in different areas with a view to determining when natural infection is occurring.

Papaw dieback is a disease the cause of which has so far been obscure. Systematic studies regarding its incidence in selected plantations with reference to time have given evidence regarding the seasonal development of the disease. Preliminary investigations have been made into factors likely to be causing the disease and the symptomatology carefully studied. Present indications are that heavy losses from this disease will follow the abnormally heavy summer rains experienced this season. Symptoms usually become manifest as the soil dries out in the autumn and winter.

VEGETABLES.

Tomato bacterial spot was abnormally prevalent during the early part of 1947 owing to the frequent rains. An experiment comparing the relative efficiencies of a commercial copper oxychloride spray with one containing phenyl mercuric triethanolamine lactate revealed that the latter is no more efficient than copper in controlling this disease. Only the earlier fruit were affected by bacterial spot and then fairly lightly, but the following figures were obtained for the percentage of diseased fruit:—Copper oxychloride (1 lb. copper per 40 gall.), 15 per cent.; phenyl mercuric triethanolamine lactate 1 in 10,000, 19 per cent.; the same at 1 in 50,000, 17 per cent. The mercury compound was responsible for a reduction in crop yield of 42 and 29 per cent. respectively as compared with the copper treatment.

The control of collar rot (*Alternaria solani*) on tomato seedlings was attempted in three experiments. In one of these, in which the disease reached serious proportions, good control was obtained by watering the seed bed immediately after planting with suspensions of copper oxychloride and fermate. Calomel was not so successful.

Several striking examples were noticed of stunting from mosaic in pruned and trellised tomato crops. In each it appeared that some 30 to 50 plants had been affected apparently from one or at most a few originally diseased plants.

Further work was done in connection with determining a method for testing the phytotoxic properties of sprays. Use was made of common spray mixtures whose general reaction is known and the results obtained confirmed the suitability of the methods employed. The greatest source of error lies in the variability of the seedlings employed.

Carrot leaf spot (*Macrosporium* sp.) caused very extensive defoliation during the year. Owing to the spasmodic occurrence of this disease growers are not in the habit of taking the precaution of routine spraying.

Crown rot of carrots was again prevalent in the one locality where this disease commonly occurs. Two trials employing various methods of soil treatment were laid down but the disease incidence in the particular area was not sufficiently high for conclusive results to be obtained.

Black rot of cabbage was very serious in the late summer and autumn crops. The abnormally wet and windy rainy season no doubt contributed to this. Areas normally producing cabbage as a routine crop appear more severely affected, suggesting some soil carry over of the causal organism.

GENERAL.

The legume inoculum service has been continued and is increasingly availed of. The number of bottles of inoculum supplied during the year amounted to 1,032. This was sufficient to treat 1,683 bushels of seed. Lucerne and lupin crops account for the greatest proportion of these. Poona pea and field pea call for moderate numbers with a few for soy beans and clovers and other miscellaneous legumes.

The forest pathologist has mainly been engaged in rounding off the fertilizer trials and in making field surveys in connexion with the selection of new plantation sites.

A general point of interest is the number of reports which have been received during autumn and winter months of ill-defined troubles of nutritional or pathological origin but which are usually associated with more or less abnormal root decay. This is probably related to the abnormally heavy summer rains which followed the long period of drought, and the effects showed up in various ways as the season advanced.

J. H. SIMMONDS,
Officer-in-Charge, Science Branch.

(C) REPORT OF THE BOTANY SECTION.

The work of the Botany Section for the year ended 30th June, 1947, is discussed under the following headings:—general, noxious weeds, fodder trees, mulga, poisonous plants, the Herbarium and systematic botany, and Botanic Museum.

GENERAL.

As in previous years most of the time of the officers of this section has been taken up determining specimens and reporting on weeds, grasses, fodder plants, &c. During the current year a great deal of information has been sought on tree-planting for shade, ornamental, and fodder purposes by private persons, shire councils, school committees, &c. A list of trees suitable for different parts of the State, together with their chief features, was drafted for the Save-the-Trees Campaign, which embodied it in a useful pamphlet for general distribution.

The Botany Section has worked in close co-operation with the Forestry Sub-department, and forest botany has occupied the attention of the staff at frequent intervals during the year. Specimens of trees from different parts of the State have been identified and, in some cases, field and botanical descriptions supplied to the Sub-department to facilitate the location of certain species for investigation and exploitation.

In the course of investigations of vegetable taints in dairy products by the Council for Scientific and Industrial Research and the Department of Agriculture and Stock, numerous weeds suspected of causing unpleasant flavours have been identified and reported upon.

NOXIOUS WEEDS.

Following on representations by several northern shire councils the devil's fig (*Solanum torvum*) was added to the list of plants declared noxious throughout the State. At the request of the Department of Local Government an illustrated article on it was prepared for the *Queensland Agricultural Journal* and afterwards issued in leaflet form, and copies were distributed to all shires and municipal authorities in the State. Three times during the year a member of the staff has given one-day lectures on weeds and poisonous plants and instructions in the field to students of the Commonwealth Post-War Rehabilitation Scheme at the Queensland Agricultural High School and College.

FODDER TREES.

There has been considerable interest in the matter of the planting and preservation of fodder trees, both on the coast and inland. A list of suitable trees for special study was drawn up for consideration by the Fodder Conservation Committee of the Department. One of the staff visited the Maranoa district for the purpose of collecting samples of edible trees and shrubs for chemical analyses. These analyses have now been received from the Chemical Laboratory and will be extremely useful in reporting on the relative fodder value of many plants submitted. The information will also be of value in the compilation of an illustrated account of the fodder trees of the State.

MULGA.

Special attention was paid to mulga (*Acacia aneura*), which can be regarded as the principal fodder tree of South-western Queensland. A visit was paid on two occasions to study mulga regeneration in the field. Much controversy has raged round the method of treatment and its subsequent effect on the stands of this valuable tree. During times of drought large quantities of mulga are cut for sheep and fears have been expressed that the mulga forests would eventually be destroyed.

Mulga occurs very widely throughout Australia and in Queensland, four fairly well-defined growth forms are to be found:—

1. *Low Mulga*.—A low shrub, much branched from about ground level. The shrub usually forms dense stands and their growth form is due to grazing.

2. *Whipstick Mulga*.—Small trees, up to 10 feet high, growing close together. This form occurs only where dense stands of young trees have grown up untouched by stock.

3. *Umbrella Mulga*.—Medium-sized trees up to 30 feet high, sometimes forming closed forest; sometimes in open parkland formation. This form represents mulga at its best. It flowers fairly regularly and often produces ripe seed.

4. *Tall Mulga*.—Medium-sized trees up to 40 feet, sometimes forming closed forest; often growing in shallow, hard, red-brown soils on ridges. This form appears to be mulga in its old age. The leaves are tough, thin, and hard but are relished by sheep and cattle.

The studies so far indicate that—

- (a) Mulga will grow readily from seed if given proper conditions of moisture, temperature, and light.
- (b) Cutting, burning, or pushing down destroys mulga trees.
- (c) Lopping above lowest lateral branches does not usually destroy mulga trees.
- (d) Thinning dense stands of mulga increases the amount of ground vegetation and improves the remaining trees.
- (e) Stocking with sheep will prevent the establishment of young mulga forests.
- (f) Fire stimulates growth of mulga seedlings for a short time, but areas burnt over some years before suitable rainfall may be left devoid of seed.
- (g) In the paddocks, mulga grows very slowly, but in favourable places may grow quite quickly.

It is intended to prepare an article on mulga regeneration for *The Queensland Journal of Agricultural Science* and a more popular one for *The Queensland Agricultural Journal*.

POISONOUS PLANTS.

During the year a very large number of specimens have been received of plants suspected of causing losses among stock. A few of these are recorded here for the general information of veterinarians and toxicologists.

Family Aizoaceae.

Trianthema decandra, Hogweed.—Forwarded from the Charleville district with the report that some sheep had dug up the roots of this plant and eaten them; the sheep had subsequently developed paralysis.

Family Apocynaceae.

Ervatamia angustisepala.—Received from Bauple with the report that it had caused the deaths of odd cattle over considerable periods. Symptoms were stated to be inco-ordination and paralysis.

Family Asclepiadaceae.

Hoya australis, Wax Flower.—Received from Proston and from Wandoan with reports that the vine was believed to be the cause of the deaths of a number of cattle in both districts.

Family Celastraceae.

Denhamia obscura.—Sent from Homestead, G.N.R., with the report that the leaves when eaten by cattle were suspected of causing several deaths. Earlier reports from the same district were to the effect that cattle had been poisoned from chewing bark and wood.

Family Compositae.

Eupatorium adenophorum.—Received from the Numinbah Valley with the report that it was suspected of causing a disease in horses in that district.

Family Leguminosae.

Millettia megasperma, Native Wistaria.—Received from Bracalba with a report that the seeds had caused the death of three cattle.

Family Zygophyllaceae.

Zygophyllum apiculatum, Gall Weed or Twin-leaf.—Received from Goondiwindi as having been suspected of causing the death of several fat cattle which had been grazing in a paddock thickly infested with this plant.

Field investigations were carried out in company with officers of the Division of Animal Industry in special cases where serious losses had occurred. At Pittsworth in November, where cattle had died supposedly from eating some poisonous weed, the plant mostly suspected was soft roly poly (*Salsola Kali*). The plants were very young and of an average height of 3-5 inches. They had been severely grazed, leaving only very short stubble. This plant—in the same stage—has been suspected before.

Walk-about disease of horses is a very common trouble in North Queensland, the Northern Territory, and North-west Australia. It has been proved by feeding tests that it can be produced by whitewood (*Atalaya hemiglauca*), and this is generally regarded as the main cause of the trouble. A serious outbreak occurred this year in North Queensland over a wide range of country from the Reid River to Julia Creek, but in most cases it occurred where little or no whitewood was growing. It is essentially a wet season trouble, but, unfortunately, a botanical investigation of the area was not practicable before June, when much of the ephemeral summer vegetation had disappeared. It seemed fairly certain, however, that, if the trouble is due to plant poisoning, some other plant or plants are involved. A list of the plants observed showed that few of them were common to all paddocks where losses had occurred and were in insufficient quantity to have caused the loss of so many horses. There is a possibility that the plant, if any, is an ephemeral which comes up quickly after rain and dies off quickly. In this case one would expect to find some evidence of dry stalks or fruits or other remains.

Included in the list of plants observed is *Crotalaria* sp. This is a slender, erect perennial about 6 inches high with silvery leaves and stems. No flowers or pods were seen and the plant has not been matched amongst the named species of *Crotalaria* in the Queensland Herbarium. The older stalks all showed evidence of severe grazing in all paddocks. In view of the known fact that *Crotalaria sagittalis* causes a somewhat simi-

lar disease of horses in the United States of America, this plant must be regarded with strong suspicion. Material for a feeding test will not be available until after the next summer rains.

In a paddock on a property in North Queensland 2,600 sheep were trapped by flood waters, and for two days were in water. Approximately two weeks after the flood receded sheep commenced to die, the chief symptom being paralysis of the hindquarters. Odd sheep were still dying at the time of the inspection in June. A total of 400 sheep had died. Another 2,200 sheep running in an adjoining paddock were trapped by water in similar circumstances. None of these died. It was impossible to definitely accuse any one plant of being responsible, but two that were severely grazed and were conspicuously more plentiful in the paddock where the losses occurred were *Crotalaria linifolia* (Leguminosae) and *Phyllanthus maderaspatanus* (Euphorbiaceae). The former plant appears to represent a rather different form than that which grows in coastal Queensland and which is included under the same name. There were a few other suspected plants growing only in the paddock where the losses had occurred, notably *Malvastrum spicatum* and *Sida fibulifera* (Malvaceae), *Trianthema decandra* (Aizoaceae), and *Pterigeron odoratus* (Compositae).

Officers of the Botany Section continue to cooperate with the Council for Scientific and Industrial Research in a survey of the flora of the State in search of plants of possible pharmacological value and of a poisonous nature, especially those containing alkaloids. A considerable amount of botanical material has been identified for this purpose. In some cases officers of this Section have accompanied officers of the Council in field trips in search of material. Several field expeditions to areas of rain forest such as Mount Glorious and Pine Mountain were participated in during the year. An officer of the Section accompanied Council personnel to Imbil for alkaloidal material in June, and another to the Darling Downs and West Moreton districts. This work is steadily increasing the fund of knowledge of the poisonous plants of the State and some really remarkable discoveries have been made.

At the school of instruction for advisers in sheep and wool and stock inspectors in the principal sheep-raising areas, a session was again devoted to the principal poisonous plants of these areas. The booklet referred to in last year's comments on plants poisonous to sheep has now been published as Pamphlet No. 112. A similar one on plants poisonous to cattle is in course of preparation.

THE HERBARIUM AND SYSTEMATIC BOTANY.

As in the past few years the employment of part-time assistance from university undergraduates and departmental cadets enabled a good deal of accumulated material to be placed away and arrears have now been largely caught up with. In the future, therefore, it should enable the Section to employ such assistance to a greater extent than in the past in mounting, rearranging and indexing material already in the Herbarium cabinets and boxes.

Exchanges of specimens with kindred institutions abroad has now been recommenced and during the year parcels were sent to and received from the Royal Botanic Gardens, Kew, and the Arnold Arboretum at Harvard University. Specimens were also despatched to the Rijk's Herbarium, Leiden, Holland, and the New York Botanic Gardens. A very fine series of specimens from France was received from a private botanist—M. A. Lemée of Rennes. These are of particular value, as some represent species naturalised in Australia or likely to occur here in the future. Such material is essential in checking up determinations made from published floras and monographs. The Department is much indebted to the Government Botanist, Melbourne, for the loan and gift of pieces from type sheets in the extensive collections of the National Herbarium, Melbourne. Exchange of critical material has also been maintained with that Herbarium and the National Herbarium, Sydney. In addition, material of special groups, particularly the Cyperaceae and Gramineae, has been received from the University of Adelaide, the Dominion Museum at Wellington, the Plant Research Bureau at Wellington, the Tasmanian Museum in Hobart and the Herbarium of R. A. Black, Melbourne.

As time permits, a special study has been made of the Cyperaceae of the three Archbold Expeditions to New Guinea. Two papers have already appeared in the Journal of the Arnold Arboretum, where most other accounts of the botany of the expeditions have been published. Two other papers are on the way.

Most of the Government botanists own time available for systematic botany has been given over to the study of the Solomon Islands collections made in 1945. This year should see these cleared up.

One member of the staff was on loan to the Council for Scientific and Industrial Research for six months in continuation of the survey of the Northern Territory. The Council has since appointed a botanist for this work and he spent some time in the herbarium at Brisbane working on his collections.

"Contributions to the Queensland Flora" No. 9 was published in the Proceedings of the Royal Society of Queensland. This contained the record of twenty-eight plants not previously known to occur in Queensland. Of these, ten were previously undescribed species and three were new varieties of previously known species.

BOTANIC MUSEUM.

In last year's report it was stated that it might be found necessary to place the display cases closer together to allow a couple of rooms to be cut off from the main museum room for offices and workrooms. This has now been done and rooms made available to two of the staff, a great improvement on their previous quarters. The collections, in consequence of these alterations, are now in course of rearrangement, and in next year's report it is hoped to be able to state that this work—along with a lot of fresh labelling—has been completed. Additions to the Museum have not been numerous though several specimens of fruit, barks, and woods have been added.

C. T. WHITE,
Government Botanist.

(5) REPORT OF THE AGRICULTURAL CHEMIST AND BIO-CHEMIST.

The work undertaken by the Chemical Laboratory covers an unusually wide range. The nature and extent of its field of inquiry led to the grouping of interests into sections. This subdivision of what was formerly a general analytical laboratory acting as handmaiden to other branches within the Department, has had two effects: (i.) It has increased the tendency to specialise; (ii.) It has fostered a desire by officers to initiate and prosecute investigations within their own branch.

The latter development has shown the necessity for "balancing" a staff of analysts so that physical and biological chemistry are adequately represented. This need is acutely felt by those whose duty it is to integrate all work, whether it be of the branch or for other branches, so that the Department has its analysts in their most gainful employment.

In an attempt to amalgamate the interests of all sections, the laboratory has selected for investigation a number of endemic disorders relating soils and waters to plants, and these, in turn, to the grazing animal. Short histories of two programmes show the progress made and are given in the following paragraphs.

Reports of pasture and sown crop deterioration, reduced milk production, and gross abnormalities in appetite of cows—viz., eating of clothing, bags, &c.—came from a locality formerly regarded as safe country. Officers were selected from the appropriate sections of the laboratory to make certain surveys of strategic elements in the soils, plants, and stock of affected properties. The necessary equipment was assembled and a field laboratory sent. The soil and pasture data showed that (a) erosion and management, aided by high rainfall, had depleted the soil lime and phosphate; (b) the pasture plants, being shallow-rooting types, were unable to draw on deeper reserves of nutrients; (c) the soil was rich in material which rendered the phosphate of applied fertiliser unavailable to the plants.

The blood tests showed that cattle grazing on the affected area were grossly deficient in phosphate and at a dangerously low calcium level.

The response to feeding of sterilised bone meal was reflected in an almost immediate amelioration of the depraved appetite (*pica*) and in improved milk production.

Further confirmation of the findings—if such were necessary—has been obtained by growing test plants in pots filled with soil taken from a badly-affected farm. The remedial measures to be adopted have been formulated. Their application on a field scale is in hand.

The second programme to which it is desired to make reference deals with the so-called St. George disease. The gross symptoms are well known and some biochemical data gleaned by this laboratory were available. There was, however, no local knowledge of soil and plants which would yield supporting evidence for some of the theories propounded.

A soils officer from this laboratory and a botanist from the Science Branch reported on their respective observations. In addition, composition data of both plants and soils were

assembled in the laboratory. Biological material from affected stock was examined. It seemed, from the combined information, that a strong case for protein deficiency—not uncomplicated, but almost certainly a deficiency of quality protein—could be stated. It is interesting to note that even after six weeks of soil incubation it was impossible to obtain one part per million of nitrate.

At this juncture officers of the Division of Animal Industry and others from this laboratory conferred to decide what form experiments to (a) induce, (b) prevent the disease should take. A search was made for fodder presenting some of the outstanding features of plants growing in the endemic zone. This presented many difficulties, not all of which were overcome. Eventually 13 steers were penned at the Animal Health Station, Yeerongpilly, and fed a maintenance level of this basal ration. A control group, designed to represent the first portion of the experiment received no supplement. Other groups were fed allowances of vitamin A and peanut meal, separately and together. The similarity of St. George disease to the anasarca of range cattle suffering from vitamin A deficiency in the United States of America led to one of these treatments. The details of results will be tabulated when a final publication is made, but it is worth recording at this stage that, although the control group reached a lower vitamin A level than that found in the American work, no oedema developed. Hence, though Vitamin A deficiency may be a contributing factor toward some of the advanced symptoms observed in the field it is not of itself the prime cause. The field work designed to run parallel with the laboratory investigations, but arranged to represent curative treatment after outbreak of the disorder, was frustrated by rain, when, following the "new shoot," all cattle fattened and were marketed. As the opportunity occurs this work will continue.

It will be seen from the examples cited that team work has given results not previously obtained by isolated individual effort. It follows, too, that the extent to which inquiries of this nature can be developed will be more and more dependent upon the number and calibre of the men in the various sections of the laboratory.

Set out below are abbreviated accounts of the operations of each section other than Plant Nutrition, which is dealt with separately.

GENERAL LABORATORY WORK.

Initially the General Analytical Section was largely occupied in examination of commodities whose standards were controlled by Acts administered by the Department of Agriculture and Stock. The remainder of its endeavours were centred round projects initiated by other branches of the three Divisions—Plant Industry, Animal Industry, and Marketing. This is changing. The tendency to specialise has not escaped the section; not because there is insufficient work under its original design, but because so many of the projects engender their own problems. Special techniques have to be devised for examination of the more intricate preparations now being marketed. If the methods are unsound the results are untrustworthy. It follows that more time must be

spent on fundamentals. The point is probably best illustrated by enumerating some of the investigations, either completed or in course of prosecution.

Derris root is the raw material from which powerful paralytic extracts are derived. To obtain greatest toxicity consonant with yield per acre, selection of planting stock must be made and that selection is based primarily on yield of toxic principle. The preparation for analysis is an unpleasant duty and the tedious process of estimation requires more than a little skill and patience. This work has been carried out on 48 specimens, using the total root specimens and groups of roots arranged according to diameter. It is interesting to note that under the conditions of their production there was no appreciable difference in yield of the main active principle (rotenone) whether it be taken from "pencil" roots or "main" roots. It is equally important to learn from this work that imported strains of alleged high rotenone content are inferior to long-established plants.

The analysis of tobacco leaf of different appraisal values to determine, if possible, what factor or factors alter the value of apparently similar leaf has been undertaken for the Agriculture Branch.

Cattle-tick problems are as numerous as ever and the efforts of the senior officer in the General Analytical Section in this connection deserve special mention. It is possible to obtain an almost bewildering diversity of results from the one cattle "dip" charged with D.D.T. unless a very rigid set of conditions is followed. If there is any field in which things which appear equal to the same thing are different, this is it.

And, this is not confined to "dips." Spray residues on fruits, storage of specimens under different climatic conditions and in varying concentrations of different reactants, call for ingenuity and experience that can only come from years of endeavour.

The position must obviously become increasingly complicated as more and more of the old standing pest destroyers are replaced by modern selective poisons. It was possible to examine dips by the score daily when arsenic alone was the active ingredient. Only a small fraction of this is possible with D.D.T. and gammexane.

BIOCHEMISTRY.

Nutritional oedema (St. George Disease).—On the basis of data accumulated from examination of biological material taken from affected stock an attempt was made to induce the disorder in penned cattle. A large number of blood analyses were made at regular intervals, so that any significant differences in strategic requirements might be noted, were the disease to develop in the controls. The laboratory data on the pen experiments showed many interesting features. These will be submitted for publication elsewhere. Though the disease was not produced it was clearly demonstrated that the anasarca of cattle, so well known in range cattle of the United States, was quite dissimilar from that under investigation. The peculiar oedematous condition associated with vitamin A deficiency was not produced even though the

serum level of carotene, the precursor of vitamin A, fell below that recorded in American literature.

Fluorosis.—The two directions in which this problem has been investigated were foreshadowed in the annual report for 1945-46. The less interesting, but probably more important, task of mapping affected sources and of correlating results with clinical symptoms in livestock has come under an inter-departmental committee appointed by the Government.

The more difficult but very necessary experimental programme has yielded results of practical value. The experiments were designed to answer questions regarding (a) transmission of fluorides, (b) ameliorative treatment. Part (a) has been completed. When the longer term projects associated with part (b) are complete, the results and conclusions will be submitted for publication in *The Queensland Journal of Agricultural Science*.

One of the most exacting tasks in this work is the standardisation of technique. Many of the earlier overseas publications on the toxic effects of soluble fluorides suffer from two marked disabilities. These are: (i.) Caged laboratory animals were used—i.e., no ruminants; (ii.) the variation in techniques often vitiated both results and interpretations.

The main difficulties associated with the work in hand have been overcome. Moreover, as merino sheep are the experimental animals, any mitigating treatment will have a direct application.

Enzootic Haematuria.—Only one outbreak was recorded. Following the combined attack principle, work on soils, waters, pastures and biological material was undertaken. The most interesting feature of this isolated outbreak was the constantly "low" levels of copper in soils, pasture plants, and all organs.

Biophysics.—The first set of biophysical observations on sheep has been completed and is now ready for publication. Fundamental data on the physiology of young sheep form the basis of this work. It is a matter of no little concern that so little is known of functional physiology in sheep when subjected to the abnormal conditions which characterise the more arid areas. Without this knowledge a logical approach to many of the problems of the industry cannot be made. In this connection due acknowledgment is again made to the help afforded by the Department of Physiology within the University of Queensland.

Work for Other Branches.—During the year numerous specimens arrived for special determinations. Large numbers of ticks, blood and waters were examined for fluoride content. Serum proteins, calcium, inorganic phosphate, and carotene were done for other branches or sections.

Analyses of livers and other organs for both copper and molybdate, when either wool or hair showed the typical lesions due to deficiency of the former or excess of the latter, were done for the appropriate branches of the Division of Animal Industry.

Methaemoglobin determinations were made for the toxicologist investigating nitrite poisoning. Checks were made regularly on the stability of

certain emulsions used in tick control work under varying field conditions. Finally officers of this section were members of the "teams" investigating the endemic nutritional disorder already mentioned.

TOXICOLOGY.

Routine work associated with the determination of poisons in plants, waters, stomach contents, or organs, engage the attention of the Toxicology and Therapeutic Section. Most specimens are submitted through the Division of Animal Industry. If a veterinarian or experienced stock officer can visit the area when mortalities occur, it is possible to obtain from clinical data some lead on the cause of death and, nearly always, sufficient material to make more than qualitative tests. Deaths due to arsenic ingestion are the most common.

Suspected malicious poisoning of pets occur—usually dogs, cats, or poultry. Strychnine and phosphorus are the most common poisons found in these cases.

An unusual case presented itself when the disposal of unwanted excess army material led a pig owner to buy and feed a "bread improver." The toxic agent was ammonium chloride.

An even more unusual case associated with loss of pigs has led the senior officer of this section into a major investigation on nitrate—nitrite toxicology. Specimens had been submitted for arsenic determination. The history of the case led him to suspect a different agency. He accordingly set about the painstaking procedure of checking all relevant materials and finally was able to show that the water on the property involved was of an unusual type in that it contained very high levels of nitrates. He demonstrated that the amount used was sublethal, but in the process of preparing the pig food the nitrate was converted to nitrite in sufficient quantities to cause fatalities. The mechanism of this conversion is not yet elucidated but it is certainly not by microbiological agencies. Some useful leads have been obtained and these are being followed with great interest. It seems logical in the light of examination of material from localities where previously unexplained "crashes" had occurred that this type of poisoning may not be so rare as had been imagined. In the ruminant the nitrate is converted to nitrite. This on absorption reduces the oxygen transporting pigment of the blood to methaemoglobin which is incapable of transferring oxygen to the sites of use. Eventually the animal dies of oxygen lack. The blood becomes chocolate in colour as the nitrite effect is felt and unless immediate steps are taken death supervenes.

ADVISORY SERVICES.

It is hardly necessary to focus attention on the advisory services which the laboratory offers. From the softening of waters to the preparation of stud animals for exhibition may seem a far cry, but the staff is so constituted that whereas chemistry represents the main training, its supplementary interests cover geology, physiology, biochemistry, biophysics, toxicology and nutrition.

MONTGOMERY WHITE,
Agricultural Chemist and Bio-Chemist.

(5A) REPORT OF THE OFFICER-IN-CHARGE, PLANT NUTRITION SECTION.

The past year has seen such a large increase in the volume of work that it has been impossible to complete all the analytical determinations required and a considerable number of samples have, of necessity, been carried over.

SOIL SAMPLES FOR FERTILITY MEASUREMENTS.

A large increase in this class of work has occurred during the past year. Many samples are received direct from farmers and graziers who are seeking advice concerning the lime requirements or general fertility of their soils with a view to placing their fertilizer programme on a sound footing. Whenever practicable, field officers of either the Agriculture or Horticulture Branches are asked to co-operate by making a field inspection before soil analyses are carried out, as poor growth may be due to causes other than low fertility, such as bad drainage or the presence of disease, and in such cases soil analyses would be valueless. It is felt, however, that soil fertility measurements have, in a great many instances, provided a valuable clue to the cause of the failure or partial failure of a crop and the fact that an increasing number of producers are writing in to the Department seeking advice as to the correct method of taking soil samples for analysis, is a good indication of the popularity of this service which is given free to all farmers and graziers.

Apart from general analytical work of this description, a number of farms in the metropolitan area were visited by members of the staff to inspect and report on the soil. This was done at the specific request of farmers in some instances and of departmental officers in others. Extension of the scope of this service is considered to be essential.

WATER ANALYSES.

The long drought last year caused the failure of many wells and bores and the drying up of much surface water normally considered to be of a permanent nature. This resulted in old bores and wells being deepened and new bores being put down in the search for fresh supplies. As a consequence, there was a phenomenal increase in the number of water samples received for analysis and at one period two officers were engaged full time and a third part time on this important service.

In many instances it is possible to assess the quality of water for suggested irrigation use by carrying out a partial analysis only, thus saving valuable time, but it frequently happens that producers require to know in addition whether the water is suitable or not for stock, and to determine this further tests are required.

Several instances of the use of saline irrigation waters for vegetable production have come to the notice of the Section. One water in particular, which had been classed as unsuitable for irrigation, has been successfully used in growing salt tolerant vegetables, but only at the expense of the soil structure which has deteriorated appreciably in five years. This land will probably become quite unproductive in a few years unless some cultural system, involving a long fallow combined with chemical treatment,

is introduced. Periodical visits will be made to this farm to study any soil structural changes which may occur from time to time.

Other cases have been reported from the western areas, where the use of bore water containing excess alkali in the form of sodium carbonate has rendered the soil unproductive after a few years. Unfortunately, although warned, producers frequently take a risk with such water and initially obtain good results, but the combined effects of unsuitable water and a climate with a high evaporation rate, eventually take their toll.

The harmful effect of excess quantities of fluorides in water on young stock has been mentioned in the Agricultural Chemist and Biochemist's report and a determination of the fluoride content is now done in all samples of stock waters as a routine procedure.

During the recent drought, certain waters of doubtful quality were used for stock, and many producers were written to and asked to give details of the effect of such waters on stock. It is pleasing to be able to record that numerous replies were received in answer to these requests and the recorded observations of these stock-owners have provided the laboratory with valuable data.

In certain areas where sub-artesian waters are of unsuitable composition for stock, and where graziers and farmers had to cart surface water during recent dry times, it was possible to indicate from an analysis of the sub-artesian supply in what proportions it could be mixed with surface water and still remain safe for stock. This information was greatly appreciated as it often enabled the producer to cut down his cartage costs as much as one-third.

SERVICES TO THE DEPARTMENT OF PUBLIC LANDS.

A large number of soil analyses, both chemical and physical, were completed for the Land Administration Board and the Bureau of Investigation. Those for the former were in connection with the assessment of the fertility of land required for soldier settlement and the latter with the various reconnaissance surveys conducted by the Bureau of Investigation under the Land and Water Resources Development Act.

In all cases, a report on the chemical and physical properties of the soils accompanied the analytical results and attention was directed to any abnormalities in these and to the probable effect of intensive cultivation on soil fertility.

Frequently these analyses point to the need for soil survey work of a more detailed character, as was stressed in last year's annual report.

WORK FOR THE FORESTRY SUB-DEPARTMENT.

Work for the Forestry Sub-Department has increased considerably, and as a large expansion in forestry is taking place in this State, it is inevitable that additional chemical problems, associated with the establishment and maintenance of fresh plantations and nurseries, will occur and require solution. The soil surveyor, after an initial period in the laboratory, has been engaged almost continuously on a survey of the Tuan Creek area near Maryborough. This will be finished in the near future, so far as the field work is concerned, but the analytical determinations entailed will take several months to complete and will necessitate the soil surveyor

returning to the laboratory to assist in the completion of the necessary analyses and to prepare a soil map of the area. This survey has been conducted on somewhat different lines from most, as complete topographical and vegetational data are being compiled simultaneously by members of the forestry staff attached to the Soil Survey Unit.

Results obtained to date indicate that a close relationship exists between native vegetation and soil type in most of the area. Exceptions occur, however, and it is felt that the accurate mapping of the soil type boundaries will be of great benefit in helping to explain the reason for the puzzling differences in tree growth, which are bound to occur in later years under plantation conditions.

Interesting results have been obtained in connection with the analyses of soil, litter, and fresh needles from the various plots of a field trial for *Pinus Taeda* and *Pinus caribea* initiated by the Forest Pathologist. These results show that the nutritional requirements of the two species differ appreciably and a close relationship appears to exist between the uptake of the elements aluminium and phosphorus. The ash analysis of the fresh needles and the litter was carried out in some detail and the results provide valuable data for future reference. Further work of this description is planned during the present year.

Routine soil analyses for the Forestry Sub-Department have consisted largely of the determination of total phosphate, as an estimate of this plant food is of great assistance in the establishment of optimum conditions for mycorrhiza in plantation soils. As the official method for total phosphate is somewhat time consuming, an investigation of a new analytical method for determining it is being undertaken with a view to speeding up the routine measurements.

INVESTIGATIONAL WORK.

Studies on Soil Structure.—During the progress of certain reconnaissance surveys it was noticed that the texture of the soils in many cases appeared to be related to the vegetational cover and it was decided to make use of a water dispersion and sieving method to determine the size of aggregates in the soils under review. Encouraging results have been obtained to date and it is planned to continue the work during the coming year with a view to publication.

The method should prove valuable in estimating any changes in soil structure which have taken place following irrigation and in studying the effects of soil erosion.

Nutritional Disorders in Animals.—Two important problems dealing with nutritional disorders in animals and their relationship to the fertility of soils and the composition of pastures were investigated from the soil angle by Mr. H. Wood of this Section, as part of a team. Progress reports were compiled on these investigations before Mr. Wood left to join the University staff. The good results obtained have already been indicated by the Agricultural Chemist and Biochemist in his annual report.

It is hoped to carry out additional investigations on these problems during the present year.

C. R. von STIEGLITZ,
Officer-in-Charge, Plant Nutrition Section.

REPORT OF DIRECTOR, DIVISION OF ANIMAL INDUSTRY.

ANIMAL HEALTH STATIONS.

YEERONGPILLY.

Stud animals submitted by private owners for vaccination against tick fever totalled 170 (previous year, 190). Most cattle were of the beef breeds, although in recent months many high quality dairy cattle were submitted. "Bleeders" for use in herd inoculation against fever and which were distributed among stock-owners numbered 76 steers.

More than 23,000 specimens covering a wide range of disease conditions were received.

OONONBA.

As at Yeerongpilly, the year's work at Oonoonba covered a wide range of veterinary investigation and service. Stud animals numbering 62 passed through the station after inoculation, and six cattle were prepared as "bleeders" for tick fever vaccination. For brucellosis, 4,000 agglutination tests were made. Mortalities caused by walkabout disease in horses were investigated.

DISEASE CONTROL.

Buffalo Fly.—Abnormally dry conditions during the first seven months of the year had a modifying effect on the activities of the fly. This parasite had previously extended as far south as Maryborough on the coast and Dalby, but disappeared apparently over a wide area. When the heavy rains came at the end of January there was a recrudescence of the fly in some isolated places, but the cold weather in April and May reduced the numbers again. At the present time the fly is not very active south of an east-west line through Gladstone, while many districts in the north also are now fly-free.

Spraying has been carried out at two points on the coastal railway for all cattle moving south by rail, and also at Injune. At other places cattle moving by road also have been sprayed.

Experience gained during the past two years leaves no doubt that the fly can be effectively controlled by the use of D.D.T. when properly applied.

Cattle Tick and Tick Fever.—Outbreaks of tick fever continue to occur. After the long dry spell covering the earlier part of the year, the heavy rains of the late summer and autumn caused an increase in tick incidence in many districts and with this increase there were outbreaks of tick fever. Most owners are now able to control these outbreaks themselves.

Work on the control of ticks with D.D.T. has been continued and some useful results are being obtained. On one property, where a comparative trial is being carried out using two strengths of D.D.T., i.e., 0.5 per cent. and 0.25 per cent., it has been observed that apparently complete control of the parasites has been obtained in an experimental mob of cattle running, at the start of the experiment, on very heavily infested pasture by periodic dipping in the 0.25 per cent. solution. This important observation naturally has to be confirmed in other parts of the State.

Over a period of some eight months, during which the interval between treatments has never been fewer than five weeks, frequently longer, tick life has been very greatly reduced in the experimental area as judged by the infestations on the cattle.

More recently, observations have been commenced with benzine hexachloride, 666 or "gammexane," quantities of which have been placed at our disposal by the manufacturers. After some preliminary testing as to the correct strength to be used, dipping vats have been charged and a series of observations started. To date results have been most encouraging.

Brucellosis.—As mentioned in previous reports, this disease is widespread, especially in dairying districts, but the economic loss involved is difficult to assess, although it must be very heavy.

In the course of the year 18,000 agglutination tests for the disease were carried out at Yeerongpilly and nearly 4,000 at Oonoonba.

The test and slaughter method of eradication, which has never been very popular and indeed is quite out of the question in the case of owners whose herds show a high incidence at the initial test because of the expense involved, has been replaced to some extent by the use of Strain 19. There is little doubt that there will be a considerable demand for this line of control in the near future. Vaccination, of course, does not eradicate the disease, but the available evidence indicates that it will reduce the economic loss involved in abortions. This is the most important aspect from the point of view of the average owner.

Pleuropneumonia contagiosa.—In the year under review there were twelve outbreaks. This does not represent a true picture of the disease as it is enzootic in certain areas of North Queensland and sick cattle are not reported. As is well known, the disease can remain dormant for years on a property and only show up in the travelling cattle turned off in the annual draft. Outbreaks in the more settled areas are nearly always caused by contact with cattle from the north.

Recently, action was taken to apply the complement fixation test for the detection of infested animals in outbreaks of the disease and the first tests indicate that the percentage of animals *not* showing clinical evidence of the disease is extraordinarily high. Subsequent tests suggest that these non-clinical cases recover. The question arises as to whether one is justified in destroying these non-clinical cases in any outbreak, especially where wholesale vaccination is practised among the surrounding herds, for the vaccinated animals buffer the non-clinical cases until they subsequently recover and are no longer a potential danger. It should be mentioned that no compensation is paid for animals destroyed for this disease.

Tuberculosis.—In the last two annual reports reference has been made to the work which has been done with a view to eradicating tuberculosis from the herds supplying Brisbane with milk and more especially raw milk.

This work was advanced a stage further during the year under review and the present position is shown by the following figures:—

HERDS SUPPLYING RAW MILK; METROPOLITAN AREA
Testing for tuberculosis.

—	No. of herds.	No. of animals.	Reactors.	Per cent.
Herds which have undergone—				
One test only	20	486	10	2.06
Two tests ..	80	2,608 2,568	109 14	4.18 0.54
Three tests ..	74	2,479 3,194 3,047	284 52 24	11.46 1.63 0.79
Four tests ..	31	2,024 1,732 1,784 2,089	465 68 32 22	22.97 3.93 1.79 1.05
Five tests ..	22	1,699 1,504 1,534 1,549 1,429	661 210 161 84 30	38.90 13.96 10.49 5.42 2.10
	227	29,726	2,226	..

In addition, one herd has been tested six times. It will be observed that there has been a gradual reduction in the incidence of tuberculosis in these herds and the position at the present moment is quite satisfactory. A very high percentage of the herds now supplying the city with raw milk are free, or practically so, from the disease.

It was stated in my last report that a start had been made with the testing of the herds supplying bulk milk which is pasteurized before distribution.

The present position in respect of these herds is set out in the following table:—

HERDS SUPPLYING OTHER THAN RAW MILK.
Testing for tuberculosis.

—	No. of herds.	No. of animals.	Reactors.	Per cent.
Herds which have undergone—				
One test only	72	4,279	257	6.0
Two tests ..	125	8,200 7,044	1,215 130	14.82 1.84
Three tests ..	31	3,584 2,917 2,947	584 130 49	16.24 4.45 1.66
Four tests ..	16	1,928 1,438 1,669 1,375	888 168 57 20	46.36 11.68 3.41 1.45
	244	35,381	5,498	..

In addition two herds have been tested five times.

These figures also show that the incidence of the disease is being rapidly reduced.

It has always been the custom to apply short interval testing to herds with a high incidence, as these are obviously the most dangerous.

There are very many more herds in the country around Brisbane which have never been tested. These will be done as more staff becomes available. Figures indicate that more than half of the herds have not yet been tested.

In addition there are a number of herds which supply milk to the city from the Darling Downs. Of these, 188 (45 reactors, .58 per cent.) were tested by a private practitioner by arrangement with the Downs Co-operative Dairy Co. This would represent more than half of the herds concerned.

A considerable amount of tuberculin testing was done for the Royal National Association in respect of stock entries for the August show, while many dairy herds were tested in the country after heavy condemnations of pigs at the slaughter yards.

PARASITIC DISEASES OF CATTLE.

The very dry period during the winter and until late summer was associated with serious outbreaks of helminthiasis among young stock. The widespread use of phenothiazine in some of the affected areas prevented heavy losses, but, even so, it is considered that in general serious losses were experienced. *Haemonchus contortus*, *Bunostomum phlebotomum*, *Cooperia* spp. were encountered in very large numbers. The position regarding *Paramphistomum* spp. is obscure. It is a very common trematode and frequently occurs in heavy infestations. It is known that the young forms in the small intestine can be associated with a serious enteritis, but no information is available regarding the pathogenicity of the adult forms in the rumen and reticulum.

Work on the epidemiology of those nematodes inhabiting the digestive tract has been continued, but is not sufficiently advanced to enable any conclusions being drawn.

Lice have been troublesome in one or two areas during the early part of the winter. *Haematopinus eurysternus* and *Solenopotes capillaris* were the species involved.

Amblyomma triguttatum continues to be a very common tick on cattle. Numerous specimens from widely dispersed areas were submitted for identification. Work on its life history has commenced.

Heavy infestations of *Ixodes holocyclus* were responsible for mortalities among adult cattle in the Boonah area. Tick paralysis and deaths from this tick have been observed in previous years among grown cattle in North Coast localities. Heavy infestations are apparently required to cause ill effects in grown beasts.

Hæmaphysalis bancrofti also was frequently seen on cattle during the year.

Liver Fluke.—An outbreak of liver fluke occurred in cattle in the Gympie district in a tract of swampy country. Losses were observed to be severe at a dry time when the cattle were grazed in the vicinity of springs and water holes. Snails collected in the area were identified as *Limnea Brazieri*.

OTHER STOCK AILMENTS.

Among the more important conditions which came under notice were:—

Wallum Disease of cattle was investigated on the North Coast. It is suspected that the condition is caused by the ingestion of *zamia*

(*Macrozamia* species), which occurs in the area, as the symptoms are similar to those described in the literature as being caused by this plant. Further work is required.

Ergot poisoning was very common on the near North Coast, especially after the heavy rains of the late summer had brought about a prolific growth of the paspalum. There was a marked loss of production on some of the farms. Morbidity varied from a few cases up to 100 per cent., the nervous symptoms in some cases being most severe.

Foot Rot was observed in both beef and dairy cattle in more than one district after the rainy season commenced in January.

Ephemeral Fever occurred in cattle in the South Burnett during the early part of the year with a 10 per cent. incidence in some of the affected herds. A few animals which were recumbent over several days had to be destroyed. In some instances, the condition was complicated with mastitis.

Ophthalmia in cattle was reported as being serious in some districts.

Cowpox complicated with severe mastitis was observed in the South Burnett.

Mycotic dermatitis was recorded from two herds on the Darling Downs. This condition is apparently becoming more prevalent than hitherto.

Calf Diphtheria caused by *Fusiformis necrophorus* was recorded from a North Coast dairy.

Salmonella infection among dairy cattle was noted on the Darling Downs. The organism was isolated from post-mortem samples and from faeces. Where blood from the affected herd of 46 was examined, eight showed high titres.

Poisoning by arsenic was again noted. It usually follows the careless use of the drug. The use of arsenic for the destruction of vegetation is very widespread and a common cause of mortalities.

HORSES.

Tallebudgera horse disease is a condition occurring in a South Coast district bearing the same name. The cause is unknown. The symptoms and post-mortem lesions are not unlike the condition seen in South Africa and known as "Jaagziekte." A similar condition appears to be found in other countries, among them Hawaii. As in Australia, the disease is found in areas where the plant *Eupatorium adenophorum* (mist weed) is found. This plant has been suspected as the causal agent in Queensland. Feeding a young horse with 203 lb. of the plant failed to produce any symptoms, however.

Ataxia (Coastal Staggers).—This disease was very prevalent in the Bundaberg district during February to June, being most prevalent in April. Further attempts to determine something of the etiology of this disease were no more successful than previously.

Three paddocks on farms on which the disease had been very prevalent were topdressed with a mineral mixture with trace elements excluding cobalt, which was not available. Cases of coastal staggers appeared on one of these topdressed paddocks.

Intercerebral injections of mice, rabbits, and a horse with material from the brain and spinal column of an advanced case were unsuccessful. Subcutaneous injections into a horse of saline emulsions of insects collected on affected farms and flown to Brisbane also failed to produce the disease. The insects collected included *Stomoxys calcitrans*, *Musca* spp., *Aedes vigilax*, *A. vittiger*, *Culex annulirostris* (prevalent), *C. sitiens*, and *Anophiles annulipes*.

Walkabout Disease.—Considerable losses from this disease occurred along the Great Northern Railway from Reid River to Gilliat during the latter end of the year. Losses were also reported from Gilbert River. It is considered that the disease has been more widespread than our information indicates. A typical advanced case from Reid River was examined at Oonoonba and visits were made to Nonda, where 30 had died out of 60 horses running on the property. An investigation of the flora at Nonda, Julia Creek, and on one property at Hughenden was made. The general impression gained is that there is insufficient whitewood on some of the properties to be the sole cause of the disease.

Bot Flies.—Two species occur in Queensland, *Gastrophilus nasalis*, the adults of which are seen from September to November, and *G. intestinalis*, with adults prevalent from March to early June. The latter has been particularly prevalent this year.

DOGS AND CATS.

Rhipicephalus sanguineus.—Comparative trials with D.D.T. and gammexane washes against this species show that while gammexane (0.03 to 0.13 gamma isomer content) kills more quickly than D.D.T. (0.5 to 2.0 per cent.), the period of protection against reinfestation is not as great. Gammexane gave a complete kill at all concentrations tested and protected for 4 to 7 days; while 1.0 and 2.0 per cent. D.D.T. also gave a complete kill and protected for 10 to 17 days.

Disease of Cats.—In June a disease accompanied by intense ulceration of the mucous membrane of the mouth and throat was very prevalent in Brisbane. Streptococcus Group C was isolated from a case brought to this station.

Anchylostoma caninum infestation in dogs.—Heavy hookworm infestation in a Brisbane kennel caused four deaths in young dogs within a period of ten days. A total worm count on one animal submitted for post-mortem examination yielded 3,400 worms, and egg counts in remaining dogs on the property showed egg counts rising to 51,400 egg per gm.

D.D.T. Poisoning.—In connection with the control of stickfast flea by dipping in a 2 per cent. D.D.T. suspension, mortalities in cats have been very high. One case of D.D.T. poisoning occurred in a dog. This animal showed mild symptoms when given its first treatment. A second treatment a few weeks later was followed by marked trembling, inco-ordination, and collapse. The animal died about an hour after treatment.

SLAUGHTERING.

During the war the maintenance of slaughterhouses and shops lagged because of the difficulty in obtaining the necessary supply of materials,

but an attempt has been made to improve the standard. As a result, officers in charge of the various districts have been able to report a general improvement.

FEDERAL QUARANTINE.

Since the end of the war work under the *Federal Quarantine Act* has been reduced considerably. Nevertheless, strict vigilance has been maintained in all ships entering and leaving ports.

The following animals and birds were held in quarantine:—

Bondings	72
Cats	89

Dogs	24
Canaries	13
Budgerigahs	5
Monkeys	4
South African sparrows	5
Cockatoos	1
Finch	1
Tiger cubs	3
Rabbits	200

Seizures and destructions:—

Cats	46
Dogs	15
Budgerigahs	7
Parrakeet	1
Monkey	2
Turtle	1

The following is a summary of animals, &c., exported and for which permits were issued:—

SUMMARY OF ANIMALS EXPORTED FROM QUEENSLAND.

	Papua New Guinea.	China.	Holland.	U.S.A.	England.	Hong Kong.	Singapore.	N.E.I.	Christmas Island.	Total.
Horses	13	..	..	..	..	100	..	..	..	113
Cattle	23	..	..	..	..	2	..	11	..	36
Goats	38	..	..	..	..	..	..	..	7	45
Pigs	86	..	..	..	..	..	..	120	49	255
Dogs	34	1	7	2	..	3	4	32	..	83
Fowls	189	..	..	..	..	..	..	64	..	253
Day-old chicks	11,435	..	..	..	..	..	..	..	..	11,435
Turkeys	2	..	..	..	..	..	..	4	..	6
Ducks	38	..	..	..	..	..	..	..	..	38
Cats	2	..	1	..	..	..	..	..	..	3
Kangaroos .. .. .	..	..	..	..	..	..	..	..	..	2
Canaries .. .. .	..	..	..	..	28	..	..	..	..	28
Native birds .. .. .	..	..	..	820	..	..	..	..	..	820
White mice .. .. .	..	..	..	..	..	..	..	..	..	2 boxes
Guinea Pigs .. .. .	..	..	..	..	..	..	..	2 boxes	..	2 boxes
Sheep .. .. .	..	..	..	..	..	..	..	12	..	12
								..	25	25

THE PASTORAL INDUSTRY.

TRANS-BORDER STOCK CROSSINGS.

	Cattle.	Sheep.	Pigs.
Entered from Northern Territory	58,597	..	..
Entered from New South Wales	18,217	215,716	1,060
Removed to Northern Territory	301	..	..
Removed to New South Wales	360,911	725,181	25,259

SLAUGHTERING STATISTICS.

Below are set out the total number of stock slaughtered for local consumption and other uses.

	Bullocks.	Cows.	Calves.	Sheep.	Swine.
Bacon Factories	15,024	25,849	11,253	731	287,082
City of Brisbane	53,138	11,885	86,351	463,555	28,935
Larger Population Centres	62,096	57,371	22,034	285,296	34,876
Country Centres	27,566	27,537	18,290	77,688	8,139
Totals	157,824	122,642	137,928	827,270	359,032

In addition, 43,324 pigs were slaughtered in bacon factories for export.

A total of 2,174 (0.757 per cent.) carcasses of swine was totally condemned for tuberculosis at bacon factories. In addition, there were 6,158 (2.14 per cent.) partial condemnations.

LIVE STOCK STATISTICS.

The latest available figures are as follows:—

Horses	343,172
Cattle	5,945,285
Sheep	16,084,340
Swine	340,150

(These figures show the approximate number of livestock in the State as at 31st March, 1947.)

SHEEP AND WOOL.

Seasonal adversity is reflected in the sheep population, which, as estimated, has considerably decreased. Losses in some districts were as high as 25 per cent., while many returns show losses of 10 per cent.

The seasonal conditions also have been reflected in the sheep market. Before the September rains demand for sheep was depressed

because of continuous dry weather. Prices rose sharply in the South-east at the first sale after the rain, when young cull ewes carrying seven months' wool sold at 38s. 6d. The market eased considerably in the Central Division because of the lack of a substantial body of feed later in the year, but, even so, 53s. was offered for young cull ewes in half wool. Fat wethers also sold well at Cannon Hill.

Because of the British agreement, fat lambs have commanded a uniformly high price throughout the year, but production was down as a result of the dry seasonal conditions.

The last wool sale in June closed the first year in which wool has been sold by auction since the second world war began. Prices have been at a record high for good quality stylish spinners wool, free or practically free from vegetable fault, but towards the end of the year a marked price differential was obvious against poor quality faulty wools. American competition has been partly responsible for the stability of the market and in all 467,722 bales of wool were sold, realising £A16½ millions.

The Farmers' Wool Scheme.—The Farmers' Wool Scheme continued to function as usual and 747 bales of wool were handled. This shows an increase of 101 bales on last year's total, and 267 growers availed themselves of this service. The top price obtained was 46½d. for one bale. The markets discrimination against poorer quality wool has been reflected in the prices received for the lower lines.

Extension Work.—Officers have been engaged mainly in extension work during the year. To this end a special school was conducted at the Animal Health Station, Yeerongpilly, the Australian Wool Board's films were shown extensively in pastoral districts, demonstration field days were arranged for woolgrowers, and many properties were visited. The details are as follows:—

(1) *Staff School.*—A school of instruction, which lasted for three weeks, was conducted at the Animal Health Station. Three officers from the branch, Messrs. M. N. S. Jackson, H. Pope, and W. Fielding, and Inspectors of Stock from the sheep areas attended.

(2) *The Wool Board Films.*—Five documentary films dealing with production problems facing the woolgrower were shown in 29 towns in the pastoral districts during August and September. The films dealt with drought feeding, hydatids, control of worms, control of blowfly strike, and brand damage to wool.

(3) *Extension Work on Parasite Control.*—

(a) *Internal Parasites.*—A series of field days was organised in conjunction with local graziers and the McMaster Laboratory. The Department and certain woolgrowers have been co-operating with the Council for Scientific and Industrial Research in research work into the seasonal occurrence of worm parasites of sheep. Field days were conducted at Emerald, Clermont, Jericho, Barcaldine, Roma, St. George, Goondiwindi, and Karara. In addition, the field advisory staff gave twenty demonstrations on the diagnosis and control of internal parasites.

(b) *External Parasites.*—(i.) *Blowfly activity and control:* Two fairly well defined blowfly waves occurred during the year but, with few exceptions, breech strike only has been recorded.

As July and August were very cold, only very slight fly activity occurred during those months. The usual spring wave commenced in September and in the Central-west up to 10 per cent. of the non-Mules treated sheep were struck. Practically no strike occurred among sheep which had been subjected to the Mules Operation. The fly wave was of short duration, but on the Darling Downs and in the Goondiwindi area it commenced later and lasted longer, marked fly activity being recorded in October and November.

In the North-west, some breech strike occurred in December, but a sharp wave of bush flies (*Musca vetustissima*) commenced in that month in the Central-west and South-east.

During January and February no blowfly activity was reported from any part of the State.

In March, up to 10 per cent. breech strike occurred on the Darling Downs, where rams' heads also were struck. On the central highlands 3-5 per cent. breech strike also was reported at this time and in the Central-west and Maranoa the wave of bush flies continued.

The blowfly wave continued on the Darling Downs until well into April and some body strike was reported in the latter half of that month from the Stanthorpe area. At the same time, a sharp wave of breech strike worked up in the Maranoa and in the North-west, although it was less severe in the latter area and abated earlier. No appreciable decline in the population of either blowflies or bush flies was reported from the Maranoa until well into May.

In the Central-west, the usual autumn fly wave did not develop, but in the Maranoa losses were heavy.

Twenty-five demonstrations on the correct technique to be used in applying the Mules Operation under field conditions were organised. Because of the drought and the extended bush-fly wave, the greater part of the year was unsuitable for the extensive application of the Mules Operation and, in view of this, the number of demonstrations has been satisfactory. Two demonstrations also were given at field days organised in association with the visit of an officer of the Council for Scientific and Industrial Research.

Under seasonal conditions then prevailing, there was a further opportunity of observing the results obtained from the Mules Operation. Treated sheep carrying different lengths of wool were subjected to fly waves of varying lengths and intensity. All results show a high degree of protection and there are signs that woolgrowers as a whole are realizing the value of the operation in curtailing crutch strike. More extension work still has to be done, however, and if seasonal conditions are favourable during the coming year it is anticipated further progress will be made. An effort has been made to train woolgrowers to become proficient operators and this policy will be pursued.

The development of the Mules Operation as a preventive against crutch strike has focussed attention on the occurrence of breech strike originating on the tail. This can be overcome largely by correct procedure at lamb marking time by—

- (1) Cutting the tail at an optimum length—i.e., level with the tip of the vulva,

- (2) Cutting the tail so that the bare skin from the ventral surface of the tail is turned back over the severed stump.

As many woolgrowers do not seem to realise the importance of these two principles, considerable attention has been given to them in extension work and field advisory officers have given a large number of demonstrations and have attended the lamb marking on many properties in order to assist owners and managers to follow correct procedures.

(ii.) *Pediculosis*: While no spectacular spread of the body louse (*Bovicola ovis*) has been reported from any district, a considerable amount of extension work remains to be done. The adviser at Hughenden has focussed attention on the occurrence of lice in the country to the east and south-east of that centre and reports that woolgrowers are taking action to control these parasites. The officers at Barcaldine and St. George also have been consulted on many occasions about lice control and have assisted woolgrowers in planning dips and have supervised dipping where it is being done for the first time.

(4) *Extension Work on Animal Husbandry and Production Methods.*

(a) *Sheep Classing and Ram Selection*.—The demands on field officers for the classing of sheep and the selection of rams has increased and in the course of the year work was carried out in 17 flocks and six studs. This work has been done in merino as well as in flocks of British breeds of sheep. New South Wales was visited to select rams for a large flock in the Central-west.

(b) *Sheep Breeding*.—Because of the adverse seasonal conditions, lambings were poor and the losses among breeding ewes were heavy. A considerable amount of information was disseminated on optimum mating times, the management of inlamb ewes, and on the selection of rams with special reference to their comparative fertility. Most of this work was done by personal contact on properties.

(c) *Fat Lambs*.—Although the Queensland fat lamb industry is as yet of small dimensions, there is ample scope for extension work on production methods. The appointment of a field officer, with headquarters on the Darling Downs, has greatly increased the amount of work which can be undertaken. One of the greatest handicaps to the industry is the lack of suitable crossbred ewes as fat lamb mothers.

(d) *Drought Management*.—Under the abnormally dry conditions which prevailed through the greater part of the State, many inquiries were received about drought management and feeding. In most cases, suitable food-stuffs were unobtainable at a price which would be economic to feed flock sheep; accordingly, most advice centred around management in relation to the drought amelioration.

(e) *Preventive Medicine*.—Many inquiries on flock management in relation to disease control were answered. The specific subjects dealt with included the diseases of lambing ewes with special reference to hypocalcaemia; pregnancy toxæmia; hypomagnesemia and dystokia; preventive measures to be adopted against tetanus; malignant oedema and gas gangrene as sequelae of shearing; crutching or lambmarking; copper supplementation in deficient areas; and flock

management in relation to fluorosis, etc. A field day was conducted at Hughenden to deal with some of these subjects. The initial use, on any property, of the labial dermatitis vaccine has been controlled by departmental officers and 39,500 lambs were treated under supervision.

Research.—The following research work has been carried out by officers of the branch either independently or in association with the staff of other branches or organisations:—

1. *Animal Production*.—

(a) *Climatological Survey of Queensland*.—Work which was commenced last year has been extended. Rainfall-evaporation ratios have been studied and the seasonal incidence of influential rainfall in pastoral Queensland has been computed. Seasonal and yearly R-E. differences also have been calculated and the occurrence of average maximum and minimum temperatures have been mapped, together with the average duration in months, of hot periods with continuous temperatures of over 95 degrees Fahr. This information has been correlated with soil formations, pasture associations, and the different types of wool produced in Queensland. Studies also have been undertaken on lambing percentages, drought losses, and sheep population in relation to seasonal conditions. The map showing the average duration of hot periods (of over 95 degrees Fahr.) is of particular interest in that it discloses the existence of an area in the Richmond-Kynuna-Winton district where, for six months of the year, the average maximum temperature is likely to render rams comparatively infertile. This probably explains why difficulty is experienced in obtaining high lambing percentages in this district. The results of this work are being prepared for publication and attention is being given to a more detailed study of drought and production.

(b) *Sheep Breeding*.—The occurrence of "parrot mouth" (undershot lower jaw) in a Corriedale stud was investigated and a breeding programme to determine which animals were carrying the recessives for the condition was planned. A statistical analysis of some data, made available by C. E. Young, of Noondoo, was undertaken. This revealed a strong correlation between clean scoured wool, staple length, and body weight off shears of the sheep on which the observations were made.

2. *Parasite Control*.—

(a) *Internal Parasites*.—Co-operation with the C.S.I.R. McMaster Laboratory, in conducting epidemiology trials designed to determine the seasonal influence of worms in sheep has continued. In addition, an epidemiology trial has been commenced in the Prairie district.

(b) *External Parasites*.—The Department was associated with the Joint Blowfly Committee in its conduct of field and semi-field trials on the use of D.D.T. against body strikes in sheep. This work involved the making of initial arrangements with property owners and the spraying and inspecting of the sheep.

3. *Poison Plant Feeding Trials*.—

(a) *Weir Vine (Alpomea Calobra)*.—A continuous grazing feeding trial, in which the toxicity of weir vine to sheep was tested, was conducted on a property near Roma. For many years this plant has been considered to be poisonous to sheep, but no clear-cut information was

available on the amount which had to be eaten to produce symptoms, stage of growth when the plant was most toxic, and the time it takes for weir vine eaters to become affected. Positive evidence of the plants' toxicity to sheep was obtained after about one month's feeding of green plants and the clinical symptoms, which are rather unusual, were recorded. Detailed post-mortem examination of specimens was undertaken and a well-developed nephritis was recorded.

(b) *The Wild Mulberry (Malvastrum spicatum)*.—Following analyses which showed that this plant contained 3.8 per cent nitrates (on a dry matter basis) an initial feeding trial was organised. It has been suggested on several occasions that the plant causes the condition referred to as "humpy back of sheep," which is most common among full-woolled wethers during the summer months.

After one month's feeding, one of three full-woolled ewes was unable to travel far on a fairly warm winter afternoon. The symptoms exhibited by this animal were suggestive of those shown by wethers affected with "humpy back," and accordingly it is intended to repeat the trial in the coming summer.

4. Disease Control.—

(a) *Infectious Labial Dermatitis Vaccination*.—The officer at Barcaldine co-operated in arranging, conducting, and observing the results of the infectious labial dermatitis vaccination trials, which were conducted in the Central-west.

(b) *Post Shearing Mortalities*.—Some heavy mortalities occurred in the Cunnamulla district as the result of infected shearing wounds. *Cl. septique* was isolated and the symptoms and post-mortem picture shown by some sheep were consistent with such an infection.

It would appear from clinical and post-mortem findings that some animals may also have been suffering from an infection with *Cl. oedematiens*.

Several mortalities, associated with shearing, and due to pregnancy toxæmia or hypocalcæmia, were investigated by the field officers, and, where possible, treatment was undertaken.

(c) *Conditions of Unknown Etiology*.—Several investigations into conditions of unknown etiology were undertaken. It would appear from the symptoms and post-mortem findings that two of these probably occurred as the result of a salmonella infection.

(d) *Copper Deficiency*.—The survey of the incidence of copper deficiency has been continued and methods of copper supplementation have been examined. The results so far obtained indicate that it might be practicable to arrange an even weekly intake of micro amounts of copper by adding copper sulphate to drinking water.

5. Toxicological Conditions.—

(a) *Poison Plants*.—Circumstances surrounding losses caused by poison plants were investigated on a number of occasions. These included mortalities associated with photosensitisation, caused by eating yellow wood (*Terminalia oblongata*) and native couch (*Brachyachne convergens*).

Three investigations were made into mortalities after dipping sheep in arsenical baths. A study of the daily evaporation figures on a

three-hourly basis showed that in each case where trouble occurred as the result of percutaneous absorption of arsenic, the usual daily rise in evaporative rate to reach a maximum at between noon and 3 p.m. did not occur. It is thought this may be a factor leading to post-dipping mortalities resulting from percutaneous absorption of arsenic.

Two mortalities resulting from the ingestion of arsenic were investigated.

(b) *Fluorosis*.—Field officers have co-operated in the fluoride survey and have collected water samples and made clinical examinations. In many cases they have reported that owners have considered that the condition of their sheep was caused by worm infestation, whereas the real trouble was fluorosis.

PIG BRANCH.

Staff.—Mr. B. R. Martin, Adviser, Toowoomba, has indicated his intention to retire early in the new year, in order to commence farming on his own account. Mr. N. B. Poulsen, and Mr. R. A. R. Aldridge, graduates of the Queensland Agricultural College, were appointed as cadets and Mr. T. Abell, who returned from military service and resumed duties with this branch on the 16th August, 1946, as assistant adviser, has been transferred to the Northern Tablelands as district adviser with Atherton as headquarters, the district to be served being the Northern Tableland Pig Board area.

It is hoped to secure the services of a suitably trained man to fill the Toowoomba vacancy so that the service at present given may be maintained without undue delay, and it is believed that the branch will give increasingly good service to the industry, when it has had the opportunity to properly settle down under the new organisation.

Prices.—The Pig Meats Acquisition Plan of the Federal Department of Commerce terminated on 31st December, 1946, so that the price of pigs is no longer controlled. However, the original agreement with Great Britain for pig meats has been varied, whereby quantitative restrictions have been removed and the existing price equivalent to 9d. per lb. for first quality baconer carcasses up to 180 lb. dressed weight, at port of export, is to continue to September, 1948. This agreement influences the local price to some extent and tends to give a measure of stability to the industry.

Production.—Production figures for the year reveal a decline, and it is attributed largely to drought conditions which extended throughout the main pig-producing areas of the State, also the strike early in the year and the continued shortage of grain, protein foods, and building materials, especially wire.

As a result of these unfavourable conditions, many farmers sold their breeding stock for slaughter, thus production is only now, with improved seasonal conditions and grain position, commencing to return to normal.

Correspondence Course.—During the year 136 students enrolled who, with carry-over from the previous year, maintain the student list of approximately 200.

Originally initiated in 1932, the course has now been in operation for fifteen years and still has a popular appeal, not only among senior

DISEASES.

men, but among women and juniors of both sexes, who are anxious to expand their knowledge and keep up to date in matters associated with modern pig raising. The course should also appeal to members of the Junior Farmer Organisations. However, there has been no difficulty in maintaining a satisfactory enrolment; in fact, it is necessary to limit publicity in order to keep the numbers on a basis suited to staff available.

A good deal of revision of the lessons has taken place and generally the course is kept in line with the latest information available.

Stud Pig Breeding.—Reports indicate that there has been a keen demand for stud pigs throughout the year, not only within this and other States but from New Guinea and other Pacific Islands, and breeders are making every effort to secure fresh blood lines in order to maintain and improve the quality of their stock. In this respect the Royal National Show enables breeders to compare their pigs and provides the opportunity to procure fresh breeding stock, and the Services of Pig Branch officers in the selection of such stock was appreciated and readily availed of.

PIG PRODUCERS' CONFERENCE.

This Department and Queensland producers were represented at a conference between the Meat Industry Advisory Committee and representatives of pig producers held in Sydney in November, 1946.

The object of the conference was to consider what action should be taken to carry on the orderly marketing of pig meats after the termination of the Acquisition Plan on 31st December, 1946, but because of the short notice delegates did not have any scheme to suggest and it was left to the Queensland representatives to put forward a plan of equalisation similar to that which operated in the dairying industry before the war.

This proposal caused a lengthy discussion and several resolutions were carried. It also was indicated that State committees would be set up under the Australian Meat Board Organisation, but no appointments have been made.

However, increased production will depend largely on the future price of pig meats, the price and availability of feed grain, the continued improvement of the quality of Queensland pigs in combination with improved methods of husbandry to produce pigs at the lowest possible cost, the chief factor of which is the feeding of a balanced ration.

Approval was granted to carry out half-yearly inspections of Government piggeries, such inspections to be of a supervisory nature, and reports submitted to the Departments concerned. Eight inspections have been carried out.

Co-operation is maintained with the Commonwealth Rural Training Scheme by giving lectures and demonstrations on pig raising to members of each school. Three schools have been attended and, in addition, members have been accompanied on two visits to bacon factories and on one farm inspection.

Field days and lantern lectures, usually generally followed by farm inspections, were held in various centres of the State. Inspection of suburban piggeries in the Greater Brisbane Area were made, and advice was given on the letting of contracts for collection of garbage from Service establishments and otherwise.

Brucellosis agglutination tests were carried out on 1,367 specimens of blood serum. Of these, 29 were positive, 89 suspicious, and 1,249 were negative.

Influenzal Arthritis (Glasser's Disease) *Haemophilus sp.* was isolated from the fluid from hock joints of pigs which on post-mortem showed pneumonia, acute peritonitis, and arthritis.

Nitrite Poisoning.—Deaths among pigs in the Rathdowney district attributed to well water are now known to have been caused by nitrite poisoning. The well water has a high nitrate content. Reduction to nitrite occurred when the water was stored in a tank and subsequently used for boiling meat scraps. Initial work with sodium nitrite determined that when given in solution in water at the rate of 0.8 grams per kilogram body weight it was very toxic, but not fatal; 0.9 grams per kilogram was fatal.

Water from the same source was then used for making soup with meat scraps. Chemical analysis and toxicity trials showed: (1) boiling was not the reason for any marked reduction of the nitrate to nitrites; (2) on standing in tin-lined vessels the nitrite content increased quickly to lethal proportions. This was not due to any bacterial action, but probably to the tin acting as a catalyst and promoting reduction.

Sodium Fluoride as an Anthelmintic.—Further work with this drug was carried out, mainly to ascertain whether frequent treatments might result in the production of fluorosis. Young pigs given three treatments at monthly intervals showed that an appreciable quantity of fluoride had been deposited in the long bones. There were no clinical indications that treatment had been otherwise harmful. It was concluded that sodium fluoride is quite safe for pigs reared for pork or bacon, but should be avoided for sows where treatment might be given each time before farrowing.

Epidemiology of Ascariasis.—Faecal examination of pigs from the day they were born indicated that mature *Ascaris* is not uncommon in pigs as young as 5 to 6 weeks old. The possibility of pre-natal infection is indicated.

Balantidium coli.—Specimens of large intestine from Townsville with marked ulceration and thickening of the mucous membranes showed on histological examination a heavy infestation of an infusorian—probably *B. coli*. Although this protozoan is very common, we have never previously had reason to associate it with any pathogenicity.

Other Diseases.—Paratyphoid and erysipelas were diagnosed in pigs from the Brisbane area.

POULTRY BRANCH.

As forecast in the last annual report, it has not been possible, because of the shortage of all classes of poultry foodstuffs, to maintain the flocks at the level that existed during the previous year, with the result that production for the twelve months ended June, 1947, has declined.

The reduction in poultry flocks has been State wide and there appears sufficient indication to lead to the belief that it has been greater in North and Central Queensland than in South Queensland. No measure exists for accurately

gauging production in any area other than in South Queensland. A comparison of the intake of eggs by the South Queensland Egg Board for the years ending June, 1946, and June, 1947, illustrates how extensive the decline in production has been. The difficulty of obtaining supplies of poultry feed has caused the lowering of income of many farmers because of reduced flocks; and has caused others who were just keeping enough birds to obtain a livelihood to cease to engage in the industry.

The poultry adviser stationed at Cairns states that since the end of the war there has been a considerable reduction in poultry flocks on the Atherton Tableland, and that unsatisfactory food supplies and quality of the feed available was the cause of the lowered output per bird. He has found that the average egg production on farms where records have been kept from year to year is from two to three dozen eggs per bird below previous years.

INTAKE OF EGGS IN DOZENS, SOUTH QUEENSLAND EGG BOARD.

Month.	No. of Weeks.	1945-46.	1946-47.
July	4	797,268	494,385
August	5	1,612,757	1,258,151
September	4	1,436,753	1,190,062
October	4	1,399,144	1,206,665
November	5	1,490,198	1,265,849
December	4	870,720	675,580
January	4	764,274	606,106
February	4	686,698	454,957
March	5	757,703	484,013
April	4	448,389	306,825
May	5	478,648	436,025
June	4	343,147	398,630
		11,085,699	8,777,248

POULTRY FOODS.

Poultry foodstuffs have been in short supply during the greater portion of the year and have had a serious effect on the industry in general, as well as on individual production. The shortage of supplies has been so acute that many flocks have been reduced below the minimum necessary for gaining a livelihood, with the consequence that some poultry farmers have had to seek other employment. An indication of the extent to which this has occurred can be gathered by the number of suppliers of eggs to the South Queensland Egg Marketing Board, which was in June, 1946, 2,098; and in 1947, 1,858. It is desired to point out that during the peak period of production suppliers are greatly in excess of this number, but the difference in the suppliers in June, 1946, and June, 1947, although they may not all be engaged in poultry raising as a sole means of livelihood, is significant.

Of still greater importance to those engaged in poultry raising during the period under review was the poor quality of foods available. Protein-rich foods of both animal and vegetable origin were in extremely short supply, with the consequence that many of the prepared foods both for growing and laying purposes which poultry raisers have been in the habit of using were deficient in protein and not up to the standard of pre-war or early war years.

In addition to protein deficiency in many of the mashes on the market there was an excess of fibre due to the necessity of using oats extensively on account of the shortage of other grains.

The high fibre content of these mashes could not be offset by the feeding of grains low in fibre, as oats was the only grain available, consequently, with the lack of protein and the excess of fibre in general poultry rations, farmers were faced with a lower output per bird than should normally be the case and poor development and probably a higher mortality rate in growing stock.

There has been an increase also in the cost of poultry foodstuffs as is indicated by the following figures:—

	1946	1947
	s. d.	s. d.
Wheat—per bushel .. .	4 11	6 2
Maize—per bushel .. .	7 6	7 6
Mash—per 100 lb. .. .	10 5	13 2

Note.—During the first six months of 1947 sorghum has been available at about £9 per ton.

SLAUGHTER OF POULTRY.

Two large slaughtering establishments have been erected. These new establishments are fitted with modern equipment and have upon their premises chilling and cold store rooms, and permit of poultry being slaughtered under hygienic conditions. Poultry are slaughtered on these premises for the local and overseas markets. In addition to these two establishments, poultry are still being slaughtered on smaller premises that were operating in previous years.

There is evidence of increased slaughterings during the present year. These it is contended are largely due to the shortage of food supplies. A comparison of poultry slaughterings for the years 1945-46 and 1946-47 by the firms who have erected these new establishments supports this contention:—

Poultry Slaughterings (Two Establishments).	1945-46	1946-47
July to December ..	232,765	316,202
January to June ..	305,773	327,803

Export.—During the year approximately 557 tons of dressed poultry was exported to Great Britain. This is equivalent to about 300,000 fowls.

Table Poultry Values.—Values for table poultry have been maintained throughout the year at ceiling prices. This is because of the export values and the facilities offered by the two new establishments.

SEX DETERMINATION OF CHICKENS.

In the course of the year eight examinations were conducted for persons who had studied this subject. Under *The Poultry Industry Act of 1946*, provision is made for the issue of first and second class licenses. To obtain a first class license it is necessary for a candidate to determine the sex of 200 chickens within 35 minutes with an accuracy of 95 per cent. or more, provided that the error in either those determined as males or those determined as females is not greater than 6 per cent. For a second class license, the sex of 100 chickens has to be determined within 20 minutes with an accuracy of 90 per cent. or more; the margin of error in either those determined as males or those determined as females must not be greater than 12 per cent. Two candidates qualified for a first class license, one with an efficiency of 100 per cent., and one qualified for a second class license.

During the year 26 persons were engaged in this work. The total number of chickens which passed through their hands was 1,884,714. Slightly over 70 per cent. of the chickens of which the sex was determined were hatched on farms near Brisbane. In the northern portion of the State (i.e., north of Rockhampton) no person qualified for this work.

REGISTRATION OF STOCK SUPPLIERS.

Regulations were published on the 3rd March, 1947, governing the registration of stock suppliers. These superseded the voluntary registration of hatcheries. At the 30th June 209 applications for registration had been received, of which 202 were finalised. Registration now covers a wider field than was the case with the former system of registration as it includes stock suppliers operating hatcheries only, hatcheries with an associated flock, and those supplying eggs to hatcheries, as well as poultry dealers. The number of stock suppliers with associated flocks registered is 140; those supplying eggs for hatching purposes, 55; and those with hatcheries without associated flocks, 7. The following table, which shows the localities in which stock suppliers are resident, hatchery capacity, flocks, and also the number of chickens sexed in those areas, indicates to some extent the influence that stock distributors have on the poultry flocks of this State:—

Locality.	Capacity of Incubators.	Number of Fowls.	Number of Chickens, sex of which was determined in 1946.
Darling Downs	237,252	30,588	283,450
*Ipswich ..	113,060	16,701	88,985
*Brisbane ..	804,096	122,003	1,321,829
*Nambour ..	36,820	13,855	125,800
*Gympie ..	32,492	4,647	..
*Maryborough	5,032	831	950
*Bundaberg ..	124,956	9,487	63,700
*Rockhampton	31,632	7,011	..
*Mackay ..	4,000	1,378	..
*Townsville ..	27,622	10,251	..
*Cairns ..	12,500	2,300	..
*Atherton ..	15,596	5,951	..
Totals ..	1,445,058	215,003	1,884,714

* And adjacent areas.

This table is not a complete index of the incubator capacity of distributors of stock throughout the State, nor the flocks owned by all those with hatcheries. Registration is still voluntary for those engaged solely in the distribution of stock hatched by themselves. Many owners of hatcheries have not yet applied for registration. This applies particularly to northern areas of the State and is probably because of the fact that the services available have not yet been fully appreciated. The registration of stock suppliers, with a hatchery capacity of 1,445,058 is an achievement, for the output from these hatcheries, even if they only operated on four occasions throughout the year, will produce many more chickens than general statistics disclose.

Registration of stock suppliers cannot fail to bring about an improvement in the health and general quality of the chickens distributed from hatcheries. This improvement, in time, will be reflected in a marked improvement in the quality and health of the flocks throughout the State.

The regulations governing the registration of stock suppliers make it incumbent upon stock suppliers to use only birds that are negative to a test for pullorum disease. Officers, however, who are engaged in carrying out this test take every opportunity of advising stock suppliers on breeding and mating, culling from flocks all those unsuitable for breeding. Where practicable and if required, they actually select birds to be used for breeding replacements in the stock supplier's own flock.

Although stock suppliers cull their own flocks, officers culled a further 9,482 birds in the course of the past year.

DISEASE CONTROL.

Avian Leucosis.—The incidence of this disease has reached very high proportions on some properties and it is, from an economic point of view, undoubtedly one of the most serious diseases in the State. It is considered that on some farms the culling necessary exceeds the loss caused by all other diseases combined. Many farmers do not ask for advice until the disease has a firm hold on their flocks.

In order to obtain more complete information as to its incidence, a survey was made on farms in districts adjacent to farms on which the disease had been reported. This survey was spread over seven districts, an inspection being made of 42 farms carrying approximately 58,000 birds and evidence of the disease was found on 34. It was estimated that the mortality slightly exceeded 2,200 birds. In addition to these, more than 500 birds had been culled. From the inspections it was calculated that there were another 6,400 birds affected.

The losses in many flocks had not been heavy, but on one farm in one locality the rate of mortality had reached 47 per cent.; on four other farms in four different districts the highest mortality was 30 per cent.; and in one area the mortality rate on any one farm had only reached 5.5 per cent.

The mortality rate from this disease is not as a rule spectacular, but deaths persist throughout the year. One particular case might be cited of a farmer who had purchased 2,600 chickens valued at £200 in August, 1946. He experienced some mortality during the breeding period, but leucosis was evident from the time the birds were about four months old, and at the end of February, 1947, only 1,400 birds remained—i.e., approximately 600 had died from leucosis. Officers are endeavouring to give farmers every assistance in an advisory capacity, and by the actual culling from flocks, where this has been practicable, of all birds showing symptoms of this disease. This procedure also is adopted by the country officers in whose districts outbreaks have occurred.

Pullorum Disease.—In the course of the year officers tested 204,584 birds, while 28,064 were tested by other authorised persons. The total of positive reactors was 11,268, 4.84 per cent. This is 0.16 per cent. higher than last year, but it is necessary to point out that there were approximately 50,000 more birds tested this year and that many of these were on farms where testing had never been practised previously.

The incidence appears to be higher in southern than in northern districts and the following figures are given for the testing north of Ayr for the last three years:—

	1945.	1946.	1947.
Number of hatcheries ..	14	24	25
Number of birds tested ..	13,659	17,542	23,471
Number of reactors ..	556	819	727
Percentage of reactors ..	4.07	4.65	3.06

There have been several appearances of the disease in flocks which had for some time previously been considered clean. It has not been possible to determine the cause of this reinfection.

Coccidiosis.—Cases of caecal (*Eimeria tenella*) and intestinal (*E. necatrix*) coccidiosis were diagnosed. We also encountered an outbreak of what was probably *E. cervulina*. No deaths occurred, but the birds lost weight and were otherwise visibly affected. Extensive trials have been carried out with sulphamezathine and sulphamerazine for the treatment of the caecal form. Given at the rate of 9 grams of the sodium salt per gallon of drinking water, sulphamezathine proved toxic. The water consumption of both drugs dropped considerably during treatment. Sulphamerazine has so far been superior, and when provided for five days gave a significant decrease in the death rate.

Stickfast Flea (Echinophaga gallinacae).—As previously reported this pest spread in the Normanby poultry district in September, 1945. Despite rigid policing, before it could be checked, however, the infestation spread to 63 properties. In this area there are approximately 584 holdings. These had to be inspected in order to find the 63 infested ones. One property was on the border of the Normanby and Moreton poultry districts, which necessitated an inspection of all properties to a depth of from 4 to 5 miles into the latter district in order to be sure that the flea had not travelled further. There have been occasions when dogs have been removed from infested areas because of the ignorance of the farmer of the need to obtain a permit. This has necessitated checking properties to which dogs have been removed.

Fourteen properties have been released from quarantine in the Normanby Shire, but of the 49 farms still in quarantine only five are known to be infested.

In the Boonah poultry district there are 1,334 properties, and of these 293 have been found to be infested. A total of 77 have been released from quarantine and a further 86 are apparently clean. The number of quarantined farms now known to be infested is 130. There is an area, however, which has not yet been surveyed in which there are about 200 properties. The efforts of the staff engaged in this work have been directed more to the cleaning up of the Normanby poultry district in order to prevent spread into other areas.

Further trials in the use of D.D.T. against this parasite showed that when all birds are immersed in a dip containing 0.5-2 per cent. all fleas are killed and protection is afforded for 2 to 3 weeks (0.5 per cent.), 7 to 11 weeks (1 per cent.), and 19 weeks (2.0 per cent.). It is possible that dipping in 2 per cent. D.D.T. and spraying the poultry house floor may give complete eradication.

Some mortalities in both chickens and ducks occurred during the stickfast flea control campaign where birds were dipped in a 2 per cent. suspension of D.D.T. A trial indicated that these mortalities are probably associated with a deficient diet—i.e., calcium.

Vitamin Deficiencies.—Vitamin A deficiency has been very common throughout the whole of the State among both young and old birds, mainly because of the dry conditions prevailing and the difficulty of obtaining vitaminized oils.

Vitamin B. (riboflavin) deficiency was observed on several occasions in hatcheries and among growing chickens. Farmers are taking a keener interest in the vitamin requirements of poultry and feed manufacturers are putting up mashes with an eye to the vitamins needs of growing and laying fowls.

Helminths of various kinds were very prevalent. Several severe infestations with tapeworms were encountered in the early part of the year. It is difficult to make recommendations in respect of these parasites, as anthelmintics are not efficient.

Ant Poisoning.—Heavy mortalities associated with the ingestion of the winged forms of *Monomorium rothsteini* occurred on the Darling Downs during the late spring. These ants swarm after rain and are readily ingested by fowls.

Other Disease Conditions.—Other conditions observed were arsenical poisoning, visceral gout, fowl pox, black comb, infectious bronchitis, spirochaetes, blackhead and phosphorus poisoning (ducks).

BRANDS.

DETAILS OF REGISTRATIONS, TRANSFERS, &c., FOR YEAR 1946-47.

	Number.	Fees Received.	Number since Inception of Legislation.
Three-piece ordinary horse and cattle brands registered	142	142 0 0	92,242
Cancelled horse and cattle brands registered	670	976 0 0	9,266
Horse and cattle symbol brands registered	73	547 10 0	2,128
Horse and cattle brands transferred	1,981	990 10 0	68,838
Cattle earmarks registered	420	420 0 0	32,206
Sheep brands and earmarks registered	109	82 15 0	13,075
Sheep brands and earmarks transferred	297	74 5 0	7,802
Distinctive brands registered	8	No fee	1,298
Alteration of address of brands	153	No fee	..
Brands cancelled	14	No fee	..
Earmarks cancelled	123	No fee	..
Total		£3,233 0 0	

There has been an increase in the number of registrations of cancelled brands, symbol brands, registrations of sheep brands and earmarks, transfers of horse and cattle brands, and transfers of sheep brands and earmarks, and a decrease in the number of registrations of cattle earmarks and distinctive brands, compared with the figures for 1945-46.

There has been a decrease in the amount of fees collected with the previous year, but taking into consideration the effects of the recent dry conditions and the fact that the fee for the registration of a cancelled brand was reduced from £3 to £1 in January last, the figures are satisfactory.

There were two prosecutions for breaches of the Brands Acts, the defendants being convicted and fined in each case.

Warnings were issued to a number of other offenders in connection with minor infringements of the Acts and Regulations.

A close inspection of brands and earmarks on stock arriving at Cannon Hill Saleyards was maintained and action taken on any irregularities observed.

The Horse and Cattle Brands Directory, which because of the exigencies of war has not been issued since 1940, will be available at an early date.

The Sheep Brands and Earmarks Directory revised to 31st December last has been published.

JOHN LEGG,

Acting Director, Division of Animal Industry.*

* Now Director of Research, Division of Animal Industry.

REPORT OF DIRECTOR, DIVISION OF DAIRYING.

SEASONAL CONDITIONS.

The 1946-1947 season opened unfavourably for the dairy industry. All dairying districts were affected by the dry weather which had continued since the autumn. Fair storm rains occurred in September in parts of the South-east division and were followed by further falls in October, but other districts did not benefit. In districts so favoured, production commenced to rise, but continued dry conditions in other parts of the State necessitated the purchase of relief fodder to maintain dairy herds. Stock losses occurred in some areas.

Good soaking rains fell in November in the Port Curtis district, while scattered storms occurred elsewhere. Although most herds were by this time commencing their new lactation periods, rainfall generally had been insufficient to stimulate production. Summer fodder crops were planted in a smaller acreage than normally, because of the lateness of soaking rains.

Heavy summer rains in January and February assured pasture and crop growth with a substantial increase in dairy production. Flooding caused crop and stock losses in some areas. Dam and other water supplies were replenished and dairy cattle regained condition. Favourable conditions continued for the rest of the summer, but production was much below the peak of other years. Good weather conditions were general in the autumn and to the close of the statistical year. Large acreages of winter fodder crops have been planted, and dairy production should be well maintained in the first quarter of 1947-48.

DAIRY CATTLE STATISTICS.

The dairy cattle population of Queensland during recent years is shown in the following table supplied by the Government Statistician:—

	1943	1944	1945	1946
Dairy cows including—				
Heifers over 1 year	1,308,780	1,290,398	1,267,829	1,242,071
Calves under 1 year	232,276	225,134	210,960	171,318
Bulls 1 year and over	32,569	30,522	30,453	29,312
Total dairy stock	1,573,625	1,546,054	1,509,242	1,442,701

The classification of dairy herds according to the latest figures available (31st March, 1944) was:—

Cows per Herd.	No. of Herds.	Percentage.
Fewer than 5	5,791	18.46
5-9	2,623	8.36
10-19	3,000	9.56
20-29	2,941	9.37
30-49	6,286	20.04
50-99	8,227	26.23
100 and over	2,495	7.95
Total No. of herds	31,363	

This classification probably shows little variation from year to year.

The numbers of registered purebred herds of the various dairy cattle breeds are:—

Breed.	Herds.
Jersey	646
A.I.S.	430
Ayrshire	33
Friesian	20
Guernsey	15
	<hr/> 1,134 <hr/>

IMPERIAL CONTRACT AND SUBSIDIES.

As from 1st July, 1946, the contract price of butter exported to the United Kingdom was raised to 216s. 10½d. per cwt. The contract between the British and Australian Governments will continue until 30th June, 1948. Negotiations in connection with the renewal of the contract will possibly be opened when the report of the Dairy Industry Costs Committee is received; industry representatives believe the contract will continue until at least 1950.

The present price, including Commonwealth Government subsidy, expected to return to the producer 1s. 7½d. per lb. commercial butter, was to be reviewed after 31st March, 1947, and the Commonwealth Government has guaranteed the industry that the price for the year ending 31st March, 1948, will not fall below the average price which operated in 1945.

A matter of major interest in relation to the review of prices to be paid producers from April, 1947, was the setting up of a Joint Dairying Industry Advisory Committee consisting of representatives of the Commonwealth Government and dairy industry organisations. The committee is charged with investigating the costs of production of dairy produce. For this purpose about 1,050 random-selected dairy farms throughout Australia will be thoroughly surveyed. These farms, representing about 1 to 1.5 per cent. of all suppliers to butter, cheese, and milk processing plants, will each be visited by two officers, one nominated by producers and one by the Government. 375 Queensland farms are included in the costing survey. The services of several officers of the Division of Dairying have been made available to the committee in connection with the work to be done in Queensland. It is expected to complete the collection of data from farms by the end of June, and the committee's report on its findings should be placed before the Commonwealth Government soon afterwards. As a consequence of this survey, reliable data on dairy-farm production costs will, it is expected, be obtained. Moreover, certain other data being collected simultaneously with the cost of production data should enable a good factual survey of many aspects of farm management in Australia.

The long-term contract for the sale of the exportable surplus of dairy produce gives a measure of marketing stability never previously

enjoyed by the Australian dairy industry. Prices of dairy farms are buoyant, indicative of the faith of dairy farmers in the future prospects of the industry.

During the war years and since, all butter distributed in England bore no other description than "National Butter." As from 1st October, 1947, it will be permissible to mark on the wrapper the brand name and country of origin of the butter, in addition to the words "National Butter." The amendment of the Regulations

to permit of this altered system of marketing was made in response to representations from some of the countries which always marked the country of origin on their produce in pre-war years. This announcement suggests a definite trend in Britain back to pre-war methods of marketing.

The position in respect of Commonwealth Government subsidy to the Australian dairy industry is summarised hereunder:—

Year.	Return to Producer per lb. Commercial Butter.		Return to Producer per lb. Butterfat Basis.		Subsidy Required and Paid by the Commonwealth.	Recoupment from British Government.	Nett Cost to the Commonwealth Government.
	s.	d.	s.	d.			
1942-43	1	5½	1	9-27	£ 1,186,306	..	£ 1,186,306
1943-44	1	6	1	9-88	7,346,120	1,439,579	5,906,541
1944-45	1	7-3	1	11-458	6,812,197	2,693,191	4,119,006
1945-46	1	7½	1	11-7	6,373,511	1,654,692	4,718,819
1946-47	1	7½	1	11-7	6,250,000	..	6,250,000 (estimated)
Totals .. .. .	..	..	..	..	27,968,134	5,787,462	22,180,672

BUTTER PRODUCTION AND QUALITY.

Production.—Factory-made butter aggregated 74,068,021 lb., which was estimated to be valued at £6,069,327. This was the lowest butter output in Queensland since the 1928-29 season, and was slightly worse than half that of the record season of 1938-39, when 154,377,535 lb. was produced. Although the dry season was mainly responsible for the decline in butter output in comparison with that of the preceding season, comparisons of butter production for recent years give a false impression of the decline in dairy production. Over a period of years there has been a pronounced diversion of milk to the market milk trade, cheesemaking, and ice cream trade, which has all been at the expense of butter. This is clearly brought out in the following table which was submitted to a recent meeting of the Victorian Division of the Australian Society of Dairy Technology:—

APPROXIMATE PER CAPITA CONSUMPTION OF DAIRY PRODUCTS IN AUSTRALIA.

Product.	Pre-war. Milk Gals. Millions.		1946. Milk Gals. Millions.	
	lb.	gals.	lb.	gals.
Butter	32	450	26	370
Cheese	4½	32	7	50
Fresh Milk	158	147	200	190
Ice cream	1	7	1½	10
Milk powder and milk products ..	3	20	5	35
Total .. .. .	..	656	..	655

Grading.—The results of all butter graded by Commonwealth and State graders are summarised as follows:—

	Boxes.	Per cent.
Choice grade	332,552	32-46
First	612,135	59-75
Second	72,503	7-08
Pastry	7,303	·71

This quantity represents 77-46 per cent. of the total production. It is thus seen that the grading figures may be expected to give a fair reflection of the quality of Queensland butter.

During the war years, emphasis was placed on volume of dairy production rather than on maintaining quality. While the urgent need for increasing production in order to meet the needs of food-hungry nations continues, it is equally necessary to strive to produce butter of uniformly high quality. The marked downward trend of butter quality in recent years is greatly to be deplored. Action to arrest this decline is urgently necessary. In this regard, the full co-operation of the advisory services of the Division are available, but success can only be achieved by the united action of all sections of the industry.

In the butter factories the deterioration of factory equipment, through inability in recent years to provide for normal maintenance and renewals, is partly to be blamed for lowered butter quality. This factor is, however, considered of much lesser significance than the declining quality of cream and the tendency among factories to lenient grading.

It is regretted that some factories do not, apparently, realise their obligation to adhere to cream-grading standards. This is evident from the percentage of butter which is not passed by Commonwealth and State graders as true to the quality packed. Naturally, any farmer who is credited with choice grade for cream not of that quality is falsely led to believe his shed methods are satisfactory. This short-sighted policy is a serious disservice to the industry. It hinders departmental efforts to assist in the improvement of cream supplies, as borderline suppliers will show their factory cream grade dockets as evidence of their taking the requisite care to produce sound quality cream. It is, too, directly opposed to what must be the ultimate objective of the Australian dairy industry—butter of uniform quality comparable at least with that of its chief competitors.

Farm Refrigerators.—In connection with quality improvement, the efforts of the Queensland Butter Board to foster the use of refrigerators for cooling milk and cream on dairy farms are deserving of commendation. The Board has set up a refrigerator manufacturing department and is now assembling units for supply to dairy farmers at cost price. A long-term hire-purchase plan will enable any dairy farmer to install a

refrigerator on a low deposit and to repay the purchase price over an extended period. The ordinary milking machine engine provides the motive power.

Weed Taints.—Field officers of the Division have co-operated with officers of the Council for Scientific and Industrial Research in investigations commenced in the course of the year on weed taints in dairy produce. These taints have caused heavy de-grading of butter in recent years. The field survey disclosed that carrot weed (slender celery), cress weed (lesser swine cress), mustard weed, Hexham scent, stinking roger, and wild turnip (turnip weeds) were the chief causes of weed taints in Queensland dairy produce.* Several other weeds caused much tainting in localised areas. Up to 20 other weeds were reputed to cause some tainting, but the extent was not regarded as of economic significance. It is evident that some confusion arises because of differing local names for some weeds.

Officers of the Council for Scientific and Industrial Research are carrying out feeding trials at Gatton with some of the more widely occurring weeds. Modifications in manufacturing technique, especially lower pasteurising temperatures, will also be carried out with a view to ascertaining if the severity of taint can be minimised.

Mottling.—This defect was again prevalent in the output of some factories. The whole subject of body and texture of butter and its relationship to keeping quality is being investigated in the Dairy Research Branch. The findings should be of great practical and economic value. It is fairly clear from experimental work conducted in factories during the year that mottling most commonly, if not always, occurs in butter in which, through insufficient working, the moisture droplets are large. Mottling has not been observed in well-worked butter in which the moisture droplets have been finely dispersed. By careful control of churning temperature, size of butter granule, thorough draining at the grain stage, and adequate working the butter-maker should be able to avoid mottling in the resultant butter.

Streaky Butter.—This defect was a cause of some de-grading. With the large modern churns of up to 100 boxes capacity, butter may remain longer in the churn room before packing. There is consequently some risk of the exposed surface of the butter becoming softened in the summer months and, when put through the butter packer, causing a streaky condition throughout the mass. Temperature-controlled packing rooms would be desirable in the Queensland climate.

New Ways of Making Butter.—Much interest is being evinced in new processes for making butter developed during the war years in several countries, including the Australian "New Way" process. These methods obviate the use of the churn, which has been the age-old means of changing cream into butter. They appear to be better adapted to the handling of milk and fresh or "sweet" cream, rather than self-ripened, or sour cream. Because of sparse settlement,

road conditions, and climate, "sour" cream is at present received at all Queensland factories. One of the new machines, developed by Dr. Senn of the Dairy Research Institute in Switzerland, does, however, treat sour cream. In order to determine the suitability under Australian conditions of these machines, which depend on three different underlying principles, the Australian Dairy Produce Board has arranged for the purchase of four machines. They will be installed in factories in Victoria, New South Wales, and Queensland, and a technical committee has been appointed to supervise the trials. The Senn machine, already mentioned, will be placed in the Caboolture butter factory in this State.

Butter Improvement Service.—As in former years, the Butter Marketing Board has made a grant of £1,000 towards the cost of laboratory services. The field officers of the Division co-operated fully in providing the necessary liaison between the laboratory and the factories in respect of the butter improvement service. The year's work is reviewed in the report of the Senior Dairy Technologist.

CHEESE PRODUCTION AND QUALITY.

Production.—Queensland cheese production was 17,291,768 lb. in comparison with 26,943,245 lb. in 1945-46. The values were £1,365,919 and £887,919, in the respective years. The decline in production was mainly attributable to the adverse season, but the diversion of large quantities of milk from the Toowoomba and Warwick factories for the Brisbane market milk trade was also a contributory factor.

Milk produced for cheese manufacture returned to the producer an average price of 2s. 3d. per pound butterfat. This included the Commonwealth Government subsidy. There was a slight changeover from supplying cheese factories to producing cream for butter manufacture, but the price margin in favour of the cheese factory supplier ensured the retention of most suppliers by cheese factories.

Grading.—The scheme for reciprocity between Commonwealth and State officers in the grading of butter and cheese was continued this year. It enabled the official grading of a much higher proportion of the cheese production than could have been carried out by State officers alone. The total quantity graded was 9,480,521 lb. The grading results were as follows:—

	Lb.	Per cent.
Choice and First grade	6,844,074	72.19
Second grade	2,453,233	25.88
Third grade	183,214	1.93

These results are almost similar to those of the preceding season, the corresponding figures for which were 1.26 per cent. choice, 69.01 per cent. first and 28.28 per cent. second. This is an achievement for which the cheese industry is to be complimented, for the protracted dry season caused a serious imbalance of milk constituents, especially protein and mineral salts, which in turn created much difficulty in maintaining cheese quality. Butterfat content of milk received at some factories in the prolonged dry period fell to the low average of 3.3 per cent. casein 2.2 per cent.,

*The names in brackets are those given in Bulletin No. 156 of the C.S.I.R. entitled "Standardised Plant Names."

and cheese yield 9.0 lb. per 100 lb. milk; the normal figures average, fat 4.0 per cent., casein 2.7 per cent., and yield 10.7 lb. per 100 lb. milk.

Milk Grading.—It is also pleasing to report the decision of yet another three associations, including that with the largest number of factories and highest cheese output in the State, to introduce systems for the grading of milk supplies and payment of differential prices for milk according to quality. The methylene blue test is used as the only test for the grading of milk by Queensland cheese factories, and is proving quite satisfactory.

Bacteriophage.—Observations on the control of bacteriophage by propagating cheese starter cultures in a starter room completely isolated from the main factory building were continued. The starter cultures, both mother and bulk, were kept free from phage. Nevertheless, slow acid development during the making process was sometimes experienced. Factory hygiene was satisfactory and all equipment was rinsed with chlorine before starting manufacture every day. It seems that bacteriophage may be introduced in the milk cans used by suppliers in sufficient amount to retard acid production during cheesemaking. Investigations will be continued with a view to finding means for effective control of phage brought to the factory via farmers' milk supplies. The isolated starter room, by enabling propagation of phage-free starters, has, at least, minimised phage so that serious breakdown in acidity during manufacture does not occur.

Experiments are also being made in inoculating starter cultures in factories under a mercury quartz vapour lamp and also in using an "oil seal" on the starter milk to exclude bacteriophage from starter cultures.

Cheese Mites.—Reports have been received from England about mite infestation in Australian cheese. The increasing trouble in this connection was probably brought about by a lowered standard of curing room hygiene because of overcrowded premises as a result of the expansion of cheese manufacture, manpower shortage, and the longer time of holding cheese in factories through irregular shipments in recent years.

In association with officers of the Science Branch, Division of Plant Industry, investigations on the control of cheese mites (*Tyrophagus putrescentiae*) were made in the course of the year. For ordinary cheese factory curing rooms the trials were made by spraying dichlorethyl ether with an atomising spray trigger gun with an adjustable fine spray nozzle. The atomising gun was fitted to a compressed air system and the apparatus operated at 70-75 lb. pressure per square inch. Standard army gas masks were used by the men doing the work. Dosage was 1 lb. per 1,000 cubic feet of room space. After the first treatment, the rooms were closed for 48 hours, then opened and aired, and all cheeses turned on the shelves. A second treatment was then given and the room again closed for about 72 hours.

This method of treatment has given good results inasmuch as all mites on exposed surfaces were destroyed, although mites under cheese and sometimes in cracks were not affected. Observations are being made over a six-months

period to see how long the rooms remain mite-free or, at any rate, in populations not serious enough to be of economic importance. Even if two or three applications to curing rooms may be needed yearly, the cost would be small and the method practicable for all cheese factories.

The investigations have been extended with the object of developing a method for treating large cheese maturing rooms such as at central cold stores. A method of utilising the dichlorethyl ether in gaseous form has been worked out and trials in the large cheese room at the Hamilton Cold Stores are in progress.

Non-fat-leaking Cheese.—For several years officers of the Division have been attempting to produce a type of cheese which would not exude fat at tropical temperatures. The advantages of such a cheese are obvious. The work was successfully accomplished and a factory has installed the necessary plant for commercial manufacture. Many inquiries have been received from the Near East and other countries about the prospects of obtaining supplies of this cheese. It is understood export licenses will not be issued at the present time.

Pliofilm Wrapping.—Preliminary trials with the packaging of cheddar cheese in consumer-size $\frac{1}{2}$ -lb. and 1-lb. packs, using a transparent rubber wrapping known as pliofilm, were carried out. The retail selling of cheese packed in this manner should prove a distinct sales advantage.

Varieties of cheese other than cheddar are evidently increasing in popularity among Queensland consumers, for their production is steadily expanding. Gouda cheese is now being made at one factory and ready sales are obtained.

Cheese manufacture was commenced during the year at the factory of the Queensland Farmers Co-operative Association, Booval. This plant was installed mainly to enable treatment of milk surplus to the market milk requirements of Ipswich during the flush production of summer.

Field officers are giving service to cheese factories in checking yields of cheese in relation to the composition of milk. These surveys assist factories in taking any action necessary to reduce avoidable losses during manufacture.

The stationing at Dalby of a senior dairy adviser who has had several years experience primarily in connection with the cheese industry should assist factories in the Oakey-Dalby cheese area in maintaining the quality of their produce.

MARKET MILK.

In recent years there has been a world-wide increase in the consumption of fresh wholemilk, a trend which is also evident in this State. Information from the Government Statistician shows that in 1945-46 over 14,000,000 gallons more milk (approximately equivalent to 2,800 tons of butter) were consumed in this way and as ice cream than in 1940-41. In view of this, it is pleasing to note the lively interest of many Queensland dairy associations in the pasteurised milk trade. A keener public appreciation of nutrition and, in this connection, of the pre-eminent place of a safe, high-quality milk supply is evidently mainly responsible for the greater quantity of milk consumed. This trend is a good thing in the interests of public health, the more effective use of the food constituents of milk, and the potentially more stable and

higher-price market for dairy farmers. It may be of interest to mention that the quantity of protein in the separated milk fed to pigs in Australia is greater than the whole of the protein produced by the Australian beef, mutton, lamb, and pig meat industries.

The services of field officers of the Division have been freely available to dairy companies which have entered the market milk trade in assisting them to obtain clean, high-quality milk supplies; and the laboratories also have given good service both to producers and factories.

The Brisbane Milk Board made a grant of £2,000 towards the cost of services rendered by the laboratory and field staff during the year. Additionally, the Board employs two field officers for advisory work among producers, and these officers are under the supervision of the Senior Dairy Adviser (Mr. F. C. Coleman) who is responsible for supervising field work connected with the market milk industry and who is liaison officer between the Dairy Research and Field Branches in this work. Two additional officers are to be appointed by the Board from July, 1947.

The system of quality control in respect of Board-controlled milk is operated by the Division of Dairying. It has materially helped in raising the quality of market milk over the period of seven years since its inception. The scheme provides for effective liaison between the milk treatment plants, producers, laboratory, and field staff.

Random-picked bottles of pasteurised milk are taken daily by an officer of the Milk Board or Department and brought to the laboratory. The efficiency of pasteurisation is checked by the well-known phosphatase test and bacteriological tests are made to determine the extent of any recontamination which may occur in processing. The sensitive phosphatase test will show if the milk has been heated even to the slightest degree below the prescribed temperature, or if it has not been held at the requisite temperature for the necessary period; if even the smallest quantity of raw milk becomes mixed with the pasteurised milk it is indicated by this test.

At each pasteurising plant and at country factories the raw milk supplied by producers is examined three times weekly. The test used—the methylene blue test—gives a measure of the care taken in producing and caring for the milk on the farm. A drop of any milk which fails the standard is smeared on a microscopic slide. This slide is sent to the Dairy Research Laboratory for microscopic examination. A report on the result of the examination, giving the probable cause of the trouble and suggestions for overcoming it, is sent promptly to the farmer. Dairy officers are informed of the inferior milk supplies in order to give all possible help in ascertaining the actual cause on the farm and assisting the producer to rectify it.

It may be mentioned that the volume of Board-controlled milk has increased from about 10,000 gallons daily in 1938 to 30,000 gallons daily at the present time. The proportion sold as bottled pasteurised milk is estimated to have risen from about 6,000 gallons to 20,000 gallons daily in the period just mentioned.

Every effort is being made to ensure a safe, clean, and wholesome milk supply for consumers.

Some concern is felt by milk pasteurising firms about the high percentage of milk delivered by farmers in the spring which is of low butter-fat content. In order to determine the causes of this seasonal decline in fat percentage an investigation was commenced during the year. Nine producers scattered throughout the area from which milk is drawn are co-operating. Samples of milk are taken once monthly for exhaustive analysis and full information on pastures, fodder crops, feeding, and general management is obtained at each visit by an officer. The investigation has not yet proceeded long enough for any conclusions to be drawn.

Investigations also are in progress to determine the relationship between the hygienic quality of raw milk and its pasteurisability and the keeping quality of the pasteurised milk.

In recent years in England, attention has been given to developing a test for quickly determining the suitability of milk for pasteurising. A test known as the resazurin test which gives a result in ten minutes is now used in the British national milk testing scheme. Experimental work on the suitability of this test under Queensland conditions is being carried out. It gives promise of being useful in milk quality control work, especially in directing field advisory officers as to the producers most in need of their services.

MILK AND CREAM TRANSPORT.

The continuance of Commonwealth Government controls over liquid fuel and the release of motor vehicles again imposed a good deal of work on the Cream Transport Committee. The committee again distributed, through the dairy factories, the fuel ration tickets for all milk and cream carriers throughout the State. The co-operation of the Departments interested has ensured efficient transport of milk and cream ever since the Commonwealth controls were introduced.

New milk and cream routes gazetted during the year numbered 15; 10 more routes have been applied for and the necessary inquiries are in progress. The renewal of 56 licenses which expired on 30th June was effected and 137 new licenses were issued. During the year 13 visits were made by a member of the committee to various centres to inquire into matters affecting cream transport or the gazettal or amendment of routes. Milk or cream carriers' licenses transferred numbered 67.

The committee views with concern the number of transfers of carriers' licenses. Some cream-carrying businesses seem to be sold at inflated prices; there is a risk in this of the buyer endeavouring to get a higher rate for cartage, to give minimum service, or to cut down the number of deliveries weekly in order to make the business pay. Dairy associations have an obligation to protect the farmers by making adequate inquiry before recommending the transfer of licenses. Cream carriers should be informed by dairy companies that it is necessary to seek their approval before disposing of cream-carrying businesses. Factories should also call tenders, on expiry of the license and agreement, for the cartage of cream or milk on any route, when requested by the suppliers.

The sections dealing with transport were inserted in the *Dairy Produce Act* to effect orderly control of transport and to eliminate

unnecessary, uneconomic competition for supplies, to the detriment of the quality of Queensland dairy produce. The protection afforded the dairy associations imposes on them an obligation to deal with many purely domestic matters affecting transport.

There is a tendency for associations to submit any domestic matter affecting the control of transport to the Department for investigation, often without making any inquiries or attempting to conciliate in any dispute which may arise. The cream cartage agreement gives ample power for factories to control licensed milk or cream carriers.

OTHER PRODUCTS.

Butter manufacture stands pre-eminent as the major use to which milk is put in Queensland, with the cheese and market milk sections of the industry of relatively lesser importance. Until recent years there has been little attempt made in Queensland to manufacture other milk products or milk by-products.

Buttermilk.—Several factories have installed roller dryers for the drying of buttermilk, which is disposed of for stock-feeding purposes. This product is becoming widely used by poultry farmers. At two factories a better-quality dry buttermilk is produced. This is sold to the confectionery, ice cream, fruit drinks, and biscuit trades. The State's output of dry buttermilk of both qualities in 1945-46 was about 500,000 lb.

Concentrated Milk.—During the year a plant was installed at one factory for concentrating milk. The concentrated milk is used by a large ice-cream manufacturer.

Casein.—There is only one casein factory in Queensland, although a crude product, which is forwarded to the factory, is manufactured by several persons. Although there is a strong demand, at prices well above those of pre-war, the fact that milk is not received for separation at Queensland butter factories is possibly the main factor which has operated against an expansion of casein production.

Margarine.—A world-wide shortage of vegetable fats prevented margarine manufacturers from being able to fulfil the quotas of table margarine allocated them under the *Margarine Amendment Act of 1939*.

HERD RECORDING AND IMPROVEMENT.

Purebred Testing.—The number of stud dairy herds which entered cows for recording for admission to the advanced register of the respective dairy cattle breed societies was 95, and the total number of cows 708. Of these, 366 qualified for entry, 80 failed to attain the prescribed production standards, and 262 were withdrawn from test. The protracted dry season accounted for the relatively high proportion of withdrawals.

The results are summarised, according to breeds, in the subjoined table:—

Breed.	Passed.	Failed.	Withdrawn.
Australian Illawarra Short-horn	128	34	131
Jersey	227	37	115
Guernsey	6	6	3
Ayrshire	3	3	13
Friesian	2	..	..
Total	366	80	262

The average production of purebred cows which completed a lactation period of 273 days was 658 gallons of milk and 326 lb. of butterfat. The average butterfat test was 4.84 per cent. A complete summary according to breed and age is attached.

Grade Herd Recording.—For many years the Department has operated a scheme of herd testing whereby farmers weighed and sampled the milk of the cows in their herds once every two months and forwarded the sample to a factory or the Herd Testing Section in Brisbane. Butterfat tests were made and all records were compiled in Brisbane and sent to the farmer. This scheme is entirely free of cost to the co-operating farmer. It has been very helpful to many farmers in improving their herds, but the increasing use of milking machines has created difficulty for many farmers wishing to test their herds by the farmers'-sample scheme. Labour and other problems of dairy farmers in the war years also caused grade herd recording to be almost abandoned.

In response to requests from dairy industry organisations, it is proposed to introduce a revised herd-testing scheme. This will enable the setting up of herd-testing units similar to those in other States. Each unit will consist of about 20 to 25 farmers, owning approximately 800 to 1,000 cows, in a compact area. A herd tester will be employed to test each herd once monthly and he will be equipped with milking machine buckets to enable him to test machine-milked herds. The Commonwealth Government has agreed to pay one-third of the cost of testing carried out under this scheme, provided the State bears one-third of the cost and the participating farmers the remaining third. The cost per cow for the farmer is estimated at 4d. or 4½d. for each monthly test according to the size of the units. It is anticipated that ten units will be formed in Queensland in 1947-48. For farmers in the more recently opened dairying districts in which farm improvement has not yet progressed sufficiently to support herd-testing units, the older farmers'-sample system of recording will be continued.

The number of grade herds recorded during the year was 34, with a total of 1,307 cows. Adverse seasonal conditions retarded any prospect of a revival of interest in herd recording during the year. The need for the improvement in the production of dairy cows by the provision of sufficient fodder at all times, continuous herd testing, use of suitable sires, and systematic culling on records has been emphasised in a series of lectures at field days and elsewhere, in the country press, and in radio talks on the Country Hour session.

The Australian dairy industry cannot ignore the improvement taking place in the dairy herds of other countries, especially U.S.A., Denmark and New Zealand, from the researches in the feeding and breeding of dairy cattle—the latter based largely on the proving of sires by means of the extensive use of herd recording. The New Zealand work has shown only one purebred bull in three can improve herds, one maintains production, and one reduces the level of production of his daughters in comparison with that of their dams. Herd recording is fundamental to any constructive breeding policy and emphasis must henceforth be on improvement being mainly effected via the sire,

Messrs. T. Flood Plunkett, M.L.A., and J. A. Heading, M.L.A., were appointed members of the Dairy Cattle Improvement Board, vice Messrs. W. T. Harris and Cowen Keys. The Director of Dairying is Chairman of the Board.

Fodder Conservation Drive.—The average production of dairy cows in Queensland has shown rather marked variations from year to year, but little long-term trend. The data for average milk yield per cow for the years 1920-21 to 1943-44 are shown in the following table:—

Year.	Gallons.	Year.	Gallons.
1920-21	255	1932-33	315
1921-22	301	1933-34	362
1922-23	240	1934-35	347
1923-24	194	1935-36	287
1924-25	310	1936-37	227
1925-26	270	1937-38	304
1926-27	246	1938-39	361
1927-28	319	1939-40	322
1928-29	307	1940-41	276
1929-30	293	1941-42	235
1930-31	334	1942-43	282
1931-32	322	1943-44	254

The average production in Queensland for the above period is 290 gallons, compared with 348 as the Commonwealth average. The Queensland average is lowest of all States. The Queensland average is, no doubt, influenced by the large number of cows milked in non-dairying districts. In Queensland, too, the pasture problem is reflected in average production per cow. In Southern States, average dairy cow production has risen in sympathy with pasture improvement resulting largely from the response to superphosphate of the temperate pasture species which predominate there.

The better feeding of dairy cows, especially in the normally dry winter and early spring, is considered to be the first approach towards raising the average productivity of Queensland dairy cows. There is a period every year when ordinary pasture grasses cannot sustain milk production; in fact, often they may not provide enough nutrients for maintenance of condition. The summer rainfall season in Queensland is reliable and the growing of summer fodder crops for conservation and use later in the year for feeding in the "off" season is practicable. Modern machinery will relieve the former chief obstacle—the difficulty of harvesting the crops to be conserved. A Fodder Conservation Committee was set up in the course of the year and field officers of the Division spent much time in extension work aimed at fostering the interest of dairy farmers in fodder conservation. A survey was also made by field officers to obtain factual information for inclusion in a brochure which is being prepared by the Department.

Herd Wastage Survey.—Preliminary steps have been taken for the purpose of commencing a survey of the factors affecting disposal of dairy cows from dairy herds. Ready co-operation is being given in this matter by farmers in different districts. This survey of herd wastage will provide much needed information as to the extent of various diseases in each district and other causes of cullings from dairy herds. It will be mutually advantageous to Departmental officers and to farmers.

Advisory Feeding.—There was a marked increase in the number of inquiries received for information on the feeding of dairy cows and the rearing of calves on a limited amount of wholemilk. This was no doubt because of the much larger number of farmers now selling wholemilk for city milk requirements. The need for maintaining a more uniform production, and especially to prevent a serious falling off in winter, by farmers engaged in producing for the market milk trade necessitates supplementary feeding being carried out as a normal practice, except in the months when pastures are of high nutritive value. The need to use concentrates and other foods which have not previously been widely availed of in this State has also been partly responsible for the many inquiries on feeding. Similarly, farmers having to economise in the quantities of fresh milk or separated milk available for calf feeding, when a diversion has been made from supplying cream to a butter factory, seek advice on methods of rearing calves to the best advantage with lesser quantities of separated milk.

FIELD DAYS AND LECTURES.

Field days were held at 52 centres, and evening lectures were arranged at many other centres. Two officers attended for three consecutive days at each two-monthly Rural Rehabilitation Training Course for ex-servicemen held at the Q.A.H.S. and College, Lawes. An officer of the Division gave a radio talk once every month in the Country Hour session of the National stations. Addresses were given by three officers at the annual conference of the Australian Institute of Dairy Factory Managers and by two at the annual meeting of the Queensland Cheese Manufacturers' Association. Displays, featuring several phases of the activities of the Division, were arranged at a number of agricultural shows.

Publications.—The following are the subjects and authors of 20 articles published in *The Queensland Agricultural Journal* during the year by officers of the Division:—

- Observations on Dairy Manufactures in New Zealand—E. B. Rice.
- Determination of Salt in Butter—L. A. Burgess.
- Water on the Dairy Farm—D. S. Robertson.
- Care of the Cream Separator—E. Sutherland.
- Feeding the Cow before Calving—T. K. Kelly.
- How Butter is Made—F. C. Coleman.
- Observations on Dairy Production in New Zealand—E. B. Rice.
- Low Butterfat Content of Late Winter Milk—S. E. Pegg and C. R. Tummon.
- Improvement of Cream Grades—V. R. Smythe.
- Queensland Cheese Production 1945-46—E. B. Rice.
- Queensland Butter Production 1945-46—E. B. Rice.
- The Determination of Milk Solids and Its Applications—L. A. Burgess.
- Hot Weather and Milk Quality—V. R. Smythe.
- Bacteria in Milk—P. McCallum,

A Strainer which Lasts Longer—H. W. Jenyns.

The Cooling of Milk on the Farm—F. G. Few.

The Composition of Milk—L. A. Burgess.

A Non-Fat-Leaking Cheddar Cheese—L. E. Nichols.

Sampling for Butterfat Tests—E. B. Rice.

Requirements for Milk-Supplying Farms—C. R. Tummon.

OTHER DIVISIONAL ACTIVITIES.

Survey of Dairying.—In connection with a projected visit in September, 1947, of two New Zealand dairy specialists, a comprehensive survey of the Queensland dairy industry was collated from material supplied on a questionnaire sent to all field officers. This visit is being made on behalf of the Australian Committee on Animal Production.

Re-establishment Allowances.—Field officers were required to make numerous reports on properties which were being worked by ex-servicemen receiving re-establishment allowances.

Handbook.—In recent years a large number of papers dealing with the syllabus for the examinations for certificates of proficiency in milk and cream testing and grading, butter-making and cheesemaking have been prepared by officers of the Division. Reprints of these papers are distributed gratis to factory operatives studying for the Departmental examinations. This has caused a marked improvement in the standard of technical knowledge possessed by factory employees. At the present time a number of officers is engaged in amalgamating the available reprints, together with additional material, into a handbook written primarily to furnish the instruction necessary to qualify for the Departmental examinations and to be a textbook on Queensland dairy factory practice.

Rebate of Freight.—Refunds of freight paid on the Queensland railways in respect of 53 approved dairy bulls amounted to £218 0s. 5d.

Examinations.—The numbers of candidates who presented themselves for the theoretical examinations for certificates of proficiency issued under the Dairy Produce Acts were—

Teachers' Milk and Cream Testing ..	4
Milk and Cream Testing	57
Milk and Cream Grading	54
Buttermaking	27
Cheesemaking	16

The numbers of certificates issued on completion of the practical examinations were:—

Teachers' Milk and Cream Testing ..	Nil.
Milk and Cream Testing and Grading	37
Buttermaking	18
Cheesemaking	6

Restriction of the Use of Cream.—The Cream (Disposal and Use) Order was cancelled by the Commonwealth Government during the year. This Division, which had administered the Order in Queensland, on behalf of the Federal Dairy Controller, was thus relieved of the work.

Competitions.—As in former years, butter and cheese grading competitions were conducted for the Queensland Division of the Australian

Institute of Dairy Factory Managers. This involves the keeping of records for computing the points gained in official grading of butter and cheese.

Summaries of Factory Grading.—Summarised details of grading for both the butter and cheese factories were compiled and published in *The Queensland Agricultural Journal*.

Standardisation of Factory Work.—With the object of assisting in the standardisation of the work of officers of the Field Branch of the Division, outlines of duties to be performed in connection with the butter, cheese, and market milk sections of the industry were prepared and sent to the appropriate officers.

Toowoomba Laboratory.—The new laboratory at Toowoomba was completed during the year. The improved facilities now available in Toowoomba should be of material help to the dairy industry on the Darling Downs, especially the cheese industry.

STAFF.

Many officers with long records of service severed their association with the Division during the year. Messrs. J. R. D. Ogilvie and E. C. Olive, Senior Dairy Advisers; J. R. D. Munro and F. T. Heers, Dairy Officers, and L. F. Andersen, Senior Adviser (Herd Testing), were all retired because of having attained the Public Service age-limit. Mr. O. St. J. Kent, Senior Dairy Technologist, who was in charge of the Dairy Research Branch since its inception in 1935, resigned on being appointed Chief Dairy Research Officer and Principal, School of Dairy Technology, Victoria. Mr. L. A. Burgess resigned to accept employment as Dairy Technologist with the Port Curtis Co-operative Dairy Association, Gladstone. Miss D. Tabrett resigned to join Associated Dairies Ltd., Melbourne, Victoria, as bacteriologist. Miss M. E. Williams also resigned from the Dairy Research Laboratory to enter business on her own account.

Mr. L. E. Nichols was transferred from Toowoomba and promoted as Acting Assistant Director and Senior Dairy Technologist. Mr. W. F. Schubert, formerly of the Nambour Rural School, was appointed Assistant Dairy Technologist. Misses P. M. Nagle and E. M. Cribb were appointed Laboratory Assistants, Dairy Research Branch.

From an examination held during the year five new dairy officers were appointed, and are now undergoing a period of training in Brisbane, after which they will take up duties in country centres.

Mr. F. Treacy was appointed Inspector of Dairy Factory Accounts.

Officers of the Division have given splendid co-operation in the many duties which have been entrusted to them in the period under review.

The report of the Acting Assistant Director of Dairying and Senior Dairy Technologist, on the activities of the Dairy Research Branch, is attached hereto.

E. B. RICE,
Director of Dairying.

PUREBRED DAIRY CATTLE PRODUCTION RECORDING SCHEME.

Breed Production Averages for Registered Herd Book Stock which completed Lactation Records of 273 days during the year ending 30th June, 1947.

	Ages of Groups.							All Ages.
	J2.	S2.	J3.	S3.	J4.	S4.	M.	
A.I.S.—								
Number of Cows ..	41	34	23	16	4	6	38	162
Lb. Milk ..	6,959.97	6,433.6	8,188.38	8,528.37	8,855.85	8,948.33	8,360.63	7,775.45
Lb. Butterfat ..	284.296	300.571	339.732	334.328	371.586	343.021	368.563	324.621
Test Per cent. ..	4.08	4.67	4.15	3.92	4.20	3.83	4.41	4.17
Jersey—								
Number of Cows ..	97	32	28	17	15	12	63	264
Lb. Milk ..	5,322.07	5,016.43	5,514.71	6,293.13	7,063.49	6,475.59	7,320.97	5,996.37
Lb. Butterfat ..	280.776	305.304	332.578	330.220	367.461	341.735	348.462	324.867
Test Per cent. ..	5.28	6.09	6.03	5.25	5.2	5.28	5.25	5.42
Ayrshire—								
Number of Cows ..	Nil	1	1	2	Nil	Nil	2	6
Lb. Milk ..	..	5,770.85	7,357.9	8,750.3	..	..	9,365.73	8,226.8
Lb. Butterfat ..	..	273.439	306.027	338.726	..	..	412.221	346.893
Test Per cent. ..	..	4.74	4.16	3.87	..	..	4.4	4.25
Guernsey—								
Number of Cows ..	3	2	4	1	Nil	1	1	12
Lb. Milk ..	6,740.17	5,373.77	5,893.75	5,677.75	..	10,312.5	10,606.25	6,761.76
Lb. Butterfat ..	344.633	272.347	320.425	303.805	..	497.771	511.715	347.798
Test Per cent. ..	5.11	5.0	5.44	5.35	..	4.83	4.82	5.14
Friesian—								
Number of Cows ..	2	Nil	Nil	Nil	Nil	Nil	Nil	2
Lb. Milk ..	8,670.33	..	..	..	..	..	..	8,670.33
Lb. Butterfat ..	308.389	..	..	..	..	..	..	308.389
Test Per cent. ..	3.56	..	..	..	..	..	..	3.56

All Ages and All Breeds.—Number of Cows, 446; Lb. Milk, 6,580.06; Lb. Butterfat, 325.617; Test Per cent., 4.84.

DAIRY RESEARCH BRANCH.

ANNUAL REPORT FOR YEAR 1ST JULY, 1946,
TO 30TH JUNE, 1947.

I have the honour to submit the following report of this Branch's activities over the past twelve months.

The three laboratories at Brisbane, Hamilton, and Toowoomba have continued to give service to the dairying industry throughout the year. The programme of work has included:—

- A. Research projects.
- B. Routine laboratory control—
 1. Market milk for the Brisbane Milk Board, and other towns;
 2. Butter Improvement Service;
 3. Cheese quality.
- C. Chemical Engineering.
- D. Analyses of dairy products for Commonwealth Department of Commerce and Agriculture.
- E. Testing of dairy glassware.
- F. The training of new dairy field officers in the laboratories at Toowoomba, Hamilton, and Brisbane.
- G. Extension work.
- H. General service to the industry.

A. RESEARCH PROJECTS.

A number of investigations have been completed and others are in progress.

MILK.—Investigations into the following milk quality problems were carried out during the year:—

1. *The Effect of Storage on the Pasteurability of Raw Milk.*—This investigation has been completed and a paper is being prepared for publication.

2. *Investigations into the Contamination of Milk on Farms.*—A considerable amount of work has been done on the microscopic appearance of farm milks and the types of organisms contaminating milk from various sources. Already numerous strains of bacteria have been isolated and identified. A paper will be prepared for publication.

3. *A Study of the Thermotolerant Bacteria in Pasteurised Milk.*—Investigations were carried out on bulk milks from country depots and individual suppliers to determine the sources of high bacterial counts after pasteurisation. A number of strains of thermotolerant bacteria have been isolated and are being identified.

4. Investigations which have been continued and which are important in the everyday handling of milk on the farm and at the factory:—

- (a) The effect of bacteria on the reduction of methylene blue in milk.
- (b) Coliform bacteria in pasteurised milk.
- (c) Thermotolerant coliform bacteria in pasteurised milk.
- (d) The methylene blue test as a keeping quality test for pasteurised milk.

5. *A Method for Detecting Sources of Milk Contamination on Farms.*—This investigation was completed and a paper published in *The Queensland Journal of Agricultural Science*, Volume 3, Number 2, by V. R. Smythe and Dawn Tabrett.

6. *The Resazurin Test.*—Following requests from representatives of the dairying industry, a comprehensive survey of the suitability under Queensland conditions of resazurin dye as a rapid method of detecting poor quality milk is being made. Already 500 tests have been

carried out. The test is being compared with the methylene blue test, plate count and direct microscopic examination. On completion of approximately 2,000 tests over twelve months, the data will be collated and a paper prepared for publication. Mr. Schubert and Miss Delaney are carrying out this work, with the assistance of field officers.

7. *Milk Composition*.—In view of the wide variations in the fat content of milk at different periods of the year, and the failure during certain months of much of the morning milk to satisfy the minimum legal fat content, variations in milk composition are being studied. Nine farms on which pasture and feeding practices vary, and with animals of several breeds, have been selected for this purpose. Representative samples of milk are taken monthly by field officers, together with full information on conditions on the farms.

The milks are analysed for fat, solids not fat, total protein, casein, non-casein protein, lactose, total solids, sodium chloride, total ash, calcium, and phosphorus. The survey should provide valuable data on the factors responsible for the variations in milk composition.

This work is being carried out by Mr. Ferricks, in conjunction with field officers of the Brisbane Milk Board and the Division of Dairying.

CHEESE.—

1. *Use of Ultra-Violet Light to Control Bacteriophage*.—Trials are in progress at the Southbrook cheese factory with ultra-violet light in an effort to control bacteriophage. To date the results are not promising under existing factory conditions, but further work will be continued in conjunction with other control measures.

2. *Cheese Mites*.—Complaints have been received concerning mite-infested cheese arriving in the United Kingdom. Factories and cold stores have also sought advice about control of mites. In conjunction with the Entomology Branch of the Division of Plant Industry, trials with dichlorethyl ether for the control of cheese mites at both cheese factories and cold stores were successfully carried out during the year. Dichlorethyl ether was found most toxic to mites, in as low a concentration as 0.45 mg. per litre.

Liquid application of dichlorethyl ether applied as an atomised spray at a dosage rate of 1 lb. per 1,000 cubic feet of curing-room space ensured a complete kill of mites at all stages of the life cycle, including eggs, nymphs, and adults, where exposed to the effects of the fumigant. The successful trials have been carried out at Murgon and Goomeri cheese factories, as well as the Hamilton Cold Stores, Brisbane. A degree of immunity from reinfestation as a result of treatment was also effected. There was no effect on the flavour of the cheese.

Treatment for control is simple and cheaply applied and will prove worth while, economical, and practicable for all cheese factories in Queensland. Two to three applications per annum may be necessary. Curing-room hygiene must receive attention at the same time.

The degree of immunity created by the treatment is also being observed following transport overseas. Further reports of treated

consignments for export are now awaited from England. The Hamilton Cold Stores authorities and the South Burnett Co-operative Dairy Association have been very appreciative of the successful results of the experiments to date, and enquiries have been received from other associations and cold stores in Queensland and Southern States which are experiencing difficulty in mite control.

A preliminary report just received from London on the experimental consignment of treated cheese states:—"Pipiriki" experimental shipment reveals very satisfactory conditions as regards control of mites and mould. Consider it by far the most attractive consignment of cheese seen since arrival. Full report follows."

A paper is to be prepared for publication.

3. *The Reconstitution of Milk for the Manufacture of a Non-Fat Leaking Cheddar Cheese*.—This investigation was completed during the year, and a paper for factory managers published in *The Queensland Agricultural Journal*. A technical paper is being prepared for publication in *The Queensland Journal of Agricultural Science*.

BUTTER.—

1. *Texture of Butter*.—Preliminary studies have been made on the relationship between the texture of butter, bacterial growth, and subsequent deterioration in quality. Microscopic examinations have revealed the size of the moisture globules to be largely responsible for rapid bacterial development and quality decline in butter. This investigation, on which one officer will be fully occupied, aims at improving the texture of Queensland butter.

2. *Bacterial Flora of Butter*.—A study of the bacterial flora of Queensland butter has been commenced, and already eighteen cultures have been isolated. These are now being identified.

EGGS.—

1. *Watery Whiteness of Eggs*.—A paper by V. R. Smythe and P. Rumball was published in *The Queensland Journal of Agricultural Science*, Volume 3, Number 2.

B. ROUTINE LABORATORY CONTROL.

1. *Market Milk for the Brisbane Milk Board and other Towns*.—

The laboratory and field advisory services were continued on behalf of the Brisbane Milk Board.

(a) *Raw Milk* supplied to Brisbane was under the constant supervision of the laboratory. Eighty-four thousand six hundred and seventy methylene blue and 26,110 fat tests have been performed by depot testers working in collaboration with the Dairy Research Laboratory. The average fat content was 3.7 per cent., but variations from 2.6 to 4.5 occurred over individual months. Twenty-four per cent. of all methylene blue tests were less than the desired standard of 4 hours. However, sub-standard methylene blue tests varied from as low as 0.5 per cent. in winter to as high as 47.2 per cent. in summer; the necessity for cooling of milk on the farm is thus emphasised.

In the laboratory 7,570 low quality milks were microscopically examined and advice notes forwarded to producers. Despite a marked increase in the number of suppliers, the results indicate an improvement in the quality of raw milk compared with the previous year.

To detect the quality of raw milk more rapidly on the receiving platform, the resazurin test has been given trials. This may provide a more suitable test for both suppliers' and factories' benefit.

Water cooling towers and a farm refrigerator unit have been installed on farms to improve the quality of milk. Milk cooling has been stressed by field officers.

One thousand and four methylene blue tests were performed for wholesale vendors.

One thousand five hundred and ninety-five bulk raw milks supplied to pasteurising depots were examined, involving 3,155 tests. Twenty-six per cent. of these gave methylene blue tests of less than the desired standard of 4 hours.

Two thousand nine hundred and fifty-three visits were made to dairy farms by field and laboratory officers.

Fifty-four consistently low quality suppliers were suspended from supplying milk for a period of three days pending improvement in milk quality. Invariably, the penalty had the desired effect.

(b) *Pasteurised Milk*.—Bottled pasteurised milk in Brisbane has been examined daily. One thousand one hundred and sixty-six samples were submitted to 3,381 tests for total bacterial count, coliform organisms, phosphatase test, and fat percentage.

In addition, 23 laboratory line run surveys and 282 visits to milk plants and depots were carried out by laboratory and field officers. Factory surveys by field and laboratory staffs revealed 60 per cent. of bottled pasteurised milk with a total bacterial count of less than 50,000 per ml.; 98 per cent. showed a negative or satisfactory phosphatase test, whilst 45 per cent. were coliform negative in 1 ml. samples. The average fat content was 3.9 per cent.

Including raw and pasteurised milk examinations, a grand total of 121,052 samples, involving 126,196 tests, were examined by depots and the Department.

Line Run Surveys at depots have aided the further improvement of pasteurised milk quality by isolating points of contamination in the process.

Low Butter Fat Contents.—A matter of considerable concern for both factories and producers is the widely variable fat content of milk in certain months of the year, particularly spring and summer. Although aggravated by

the effects of drought from August to January, in certain months from 20 per cent. up to as high as 65.8 per cent. of fat tests were less than 3.3 per cent.

A survey to ascertain variations in milk composition is at present being carried out, from which it is hoped to determine responsible factors. Preliminary investigations to date on factors affecting the composition of milk indicate that the problem is associated with breed of cows, type of pasture and feeding practices, intervals between milking and calving periods.

(c) *Pasteurised Cream*.—In an effort to improve pasteurised cream quality and evolve standards, routine examinations for total bacterial counts, coliform tests, and phosphatase tests were made on samples of cream collected from the various depots; 92 samples were examined, involving 362 tests. Seventy per cent. gave plate counts of less than 100,000 organisms per ml., 99 per cent. a negative or satisfactory phosphatase test, and 30 per cent. a negative coliform test in 1 ml. The average fat content was 39.7 per cent.

(d) *Miscellaneous*.—One hundred and fifty miscellaneous samples were examined. These included individual cows' milk for mastitis detection, bulk milks from depots, cream, and farm waters.

Toowoomba and Warwick milk pasteurising plants have also received service from time to time during the year.

The travelling laboratory was used for farm and factory investigations on milk quality improvement.

Planned calving times in herds and better winter feeding need to receive consideration on milk supply farms to maintain more balanced milk production.

The present acute shortage of detergents and chemical sterilisers has also made milk quality control more difficult, both on farms and in factories. A possible substitute non-alkaline detergent has been tested in an effort to assist suppliers and factories.

There is a growing appreciation by producers of the need to improve milk quality, and consumers, too, are becoming quality conscious.

2. *Butter Improvement Service*.—

At the Hamilton laboratory 2,405 churnings of butter from 44 factories were examined bacteriologically and chemically. Sixteen thousand eight hundred and thirty-five tests were made and results, together with advice, forwarded to factories and field officers.

The following table illustrates the progressive decline in the bacteriological quality index numbers consistent with the marked reduction in the percentage of choice grade butter manufactured in recent years.

	1941-42.	1942-43.	1943-44.	1944-45.	1945-46.	1946-47.
Bacteriological Quality Index	260	258	254	266	232	180
Per cent Choice Butter	53	54	52	45	36	31

The results indicate the urgent need for—

1. Replacement of poor-conditioned factory equipment, particularly churns.
2. Reducing after-contamination.
3. A chlorinated water supply for butter washing and general factory purposes,

4. A more uniform texture in Queensland butter.

5. A more uniform moisture and salt content,

There has also been a failure on the part of some factories to appreciate the need for modifications in manufacture according to seasonal conditions. As a result texture defects, such as streak and mottle in butter, have been prevalent.

Composition of Butter.—Although some improvement has been effected, there is still room for improvement and greater uniformity in the composition of Queensland butter. Seven years ago the average composition was: Water 14.9 per cent., salt 1 per cent., curd 0.8 per cent., and fat 83.3 per cent. Last year it was: Water 15.5 per cent., salt 1.3 per cent., curd 0.8 per cent., and fat 82.4 per cent.

These figures indicate that the farmers of Queensland are approximately £30,000 a year better off than they were seven years ago as a result of improved butter composition. In the seven years during which the Butter Improvement Service has been operating, improved butter composition has been worth approximately £200,000 more to the dairy farmers of the State. However, some factories have not given this important economic aspect of manufacture the attention warranted. The objective of 15.7 to 15.8 per cent. moisture and 1.2 to 1.3 per cent. salt should be capable of achievement by all factories.

The industry should strive for butter of uniform composition, texture, and bacteriological quality.

Several butter factories were visited by laboratory officers during the year, when surveys and special examinations were carried out.

3. Cheese Quality.—

(a) *Bacteriophage.*—Cheese starter culture “failures” due to the effects of bacteriophage have continued throughout the year. Single and mixed strain cultures are both being phaged. Control in mother and bulk starters has been possible by using an isolated starter room at the Yargullen factory. However, a build up of phage within the factory and in the milk supply has still been found on occasions to cause “slow vats” or partial failure.

The following measures are recommended to minimise bacteriophage in factories:—

1. A reasonably isolated starter culture room.
2. Culture of the bulk starters in cans fitted with water-seal lids and modified air inlets.
3. Daily rotation of single strain culture to prevent build up of specific phage strains.
4. The use of a pipette to inoculate from the mother culture flasks to the bulk starter cans.
5. Pasteurisation of whey to minimise phage infection of milk from whey cans.
6. Daily rinsing of factory equipment, floors, and drains with a chlorine solution prior to cheese manufacture.

(b) *The Oil Seal Technique* for control of phage is also being tested at one factory. The technique consists of protecting the mother and bulk starters with a thin layer of odourless and tasteless paraffin.

(c) *Rindless Cheese.*—Efforts have been made to develop a rindless cheese. This has been possible by the use of an improved type of cheese

covering known as “Pliofilm,” a synthetic rubber preparation. Promising results have been obtained in packaging cheese in square and cylindrical shapes.

(d) *Rennet.*—Several batches of rennet were examined for strength, pH, and bacteriological quality. The quality of rennet was found most variable.

(e) *Cheese Starters.*—Six hundred and ten cultures of lactic acid starters were distributed by the laboratory. When phage-infected starters have been received from factories, tests have been made to determine the most suitable strains to overcome the problem at the respective factories.

It is hoped in the early future to distribute starter cultures for Downs cheese factories from the new Toowoomba laboratory. The Toowoomba laboratory and field officers on the Downs are giving special attention to starter troubles at factories.

(f) *Fancy Cheese.*—To assist factories making fancy cheeses, special starter cultures have been distributed.

Brown Discolouration in Condensed Milk.—The Government Analyst sought information as to the cause of brown discolouration in a large consignment of condensed milk. The defect was found to be not of bacteriological origin, but due to chemical interaction between the lactose and protein. The defect was caused by prolonged storage at high temperatures.

(C) CHEMICAL ENGINEERING.

A complete chemical engineering survey of four butter factories not visited previously was carried out during the year. One milk depot in the metropolitan area was also surveyed at the request of the management for the purpose of giving advice on contemplated future plant extensions. Subsequent to each visit complete details of each factory have been recorded, and, finally, a comprehensive report dealing with relevant engineering aspects at the factory has been written in each case for the benefit of managers, &c., and for future divisional reference. Problems which have been given attention throughout the year are as follows:—

1. *Farm Refrigerator Units.*—Quite a number of visits to the Queensland Butter Board, Hamilton, were made during the year. The purpose was various conferences to discuss fully all aspects of this important problem. One result was the decision to make a unit suitable for farms supplying whole milk, the earlier plans being drawn up solely in accordance with the requirements for cream suppliers. An outcome of these investigations was the construction of an immersion type refrigerator. Where refrigerators for milk and cream cooling have been installed preliminary tests have been carried out, and further tests are contemplated during the summer months.

2. At the request of the Railway Department a report was written on the practicability of railing milk from Malanda to Townsville.

3. Water cooling towers for cheese factories were designed. Promising results in effectively cooling pasteurised milk for cheese manufacture are being obtained by the tower erected. Further observations will be made on these water cooling towers next summer.

4. Brine corrosion problems were further investigated throughout the year and the useful

life period of the active chromate inhibitor determined. This was possible through the co-operation of the Southern Queensland Dairy Co. Ltd., and has enabled the time interval between brine analyses necessary to ensure continued efficiency to be estimated. A particular brine problem at the milk plant of the South Coast Dairy Co., Southport, was investigated, and a visit made to the factory to give detailed instructions as to the necessary operating technique. It is already evident that the wider use of chromate brines for milk and butter factories will prove of considerable economic importance in reducing corrosion.

5. Besides much correspondence in connection with general advisory work on water treatment for factory and farm uses, particular investigations were made on water treatment and reticulation in the case of two cheese factories and three butter factories. A visit was necessary in the case of one butter factory (Esk), and, as a result, work is to be undertaken in the early future to provide this factory with a proper water supply for all requirements.

6. Following a request from the Cheese Board, investigations into a suitable economical method of air conditioning cheese storage rooms were carried out. Two types are now completed and another is awaiting completion. Tests will be carried out during the coming summer at cheese factories. The experiments are aimed at evolving the most practical temperature and humidity control for holding cheese under Queensland conditions.

7. Two practical investigations on the new blower-type of milk cooler for farm uses were made during the year. As a result the principle of operation was proved to be quite sound, but the necessity of carefully standardising for cooling capacity was quite evident.

8. Miscellaneous problems such as the disposal of factory wastes from one factory, &c., were also dealt with. Several sterilisers and farm water-heating equipment were also tested, while suitable drawings for articles by other officers of the Division for publication were made as required.

(D) THE ANALYSIS OF SAMPLES FOR THE DEPARTMENT OF COMMERCE AND AGRICULTURE.

This has included butter, cheddar cheese, processed cheese, egg pulp, ghee, sweetened condensed milk, and frozen milk. The samples tested have been—

Butter.—Two hundred and twenty-one samples (293 determinations, including moisture, fat, salt, and preservative analyses).

Cheese.—Cheddar, 19 samples (38 determinations for moisture and fat). Processed, 49 samples (98 determinations for moisture and fat).

Egg Pulp.—Forty-seven samples (47 determinations for moisture).

Ghee.—Three samples (6 determinations for moisture and salt).

Sweetened Condensed Milk.—Six samples (18 determinations for total solids, fat, and sucrose).

Frozen Milk.—Seventeen samples (34 determinations for total solids and fat).

The total number of samples was 362, necessitating 534 determinations.

General laboratory work for factories and producers and in the course of investigational work has involved chemical and bacteriological examinations. Samples examined in this category have numbered 517, covering 1,406 determinations, and have included milk, cream, waters, butter, farm butter, cheese, rennet, brines, concentrated milk, skim milk, dairy salt, boiler scale, detergents, germicides, and waste water.

(E) THE TESTING OF DAIRY GLASSWARE.

Dairy glassware has been and still is in rather short supply. The drawing up of an Australian standard for Babcock glassware and accessories is strongly urged. Glassware tested was as follows:—

	Approved.	Condemned.	Total Items.
Babcock cream pipettes ..	119	Nil	119
Babcock milk pipettes ..	350	Nil	350
Babcock cream bottles ..	4,741	56	4,797
Babcock milk bottles ..	1,215	11	1,226
9 ml. pipettes ..	582	..	582
Dairy thermometers ..	1,162	428	1,590
			8,664

In addition, standard acid and alkali solutions and miscellaneous preparations, orthotolidine, colour standards, stains, &c., have been made and supplied to officers and factories as required.

(F) LABORATORY TRAINING OF FIELD OFFICERS.

Prior to taking up duties in the field, five dairy officers received instruction and elementary training in the laboratories for varying periods up to several months.

(G) EXTENSION WORK.

The officers of the laboratory participated in (a) field days, (b) radio talks, (c) lectures and addresses to factory managers' conferences and suppliers. Several papers were contributed to *The Queensland Agricultural Journal*. The laboratory staff prepared details for an exhibit at the Royal National Exhibition and other country shows.

New Toowoomba Laboratory.—During the year the new laboratory at Toowoomba was completed. This laboratory will provide a good service to the cheese, butter, and pasteurised milk factories and producers on the Downs.

(H.) GENERAL SERVICE TO THE INDUSTRY.

A general service has been rendered to the industry and the public by the laboratories.

Staff.—The staffs of the laboratories have worked well and enthusiastically throughout the year, and have been eager at all times to give service to the dairy industry.

There is an increasing confidence and appreciation by factories and producers of the services rendered by the laboratories and a readiness to comply with recommendations. A feature of the year's work has been the co-operative spirit which exists within the various sections of the laboratory and between the laboratory and the field staffs, a relationship which has been of mutual benefit.

L. E. NICHOLS,
Senior Dairy Technologist.

REPORT OF THE DIRECTOR OF MARKETING FOR THE YEAR 1946-47.

In accordance with the provisions of "*The Primary Producers' Organisation and Marketing Acts, 1926 to 1946*," I have the honour to submit herewith my annual report for the year ended 30th June, 1947.

The Marketing Branch, one of the Branches comprising the Division of Marketing, is concerned amongst other things with the administration of the following Acts, viz.:—

"*The Primary Producers' Organisation and Marketing Acts, 1926 to 1946*."

"*The Wheat Pool Acts, 1920 to 1930*."

"*The Fruit Marketing Organisation Acts, 1923 to 1945*."

"*The Primary Producers' Co-operative Associations Acts, 1923 to 1934*."

"*The Dairy Products Stabilisation Acts, 1933 to 1936*."

"*The Second-hand Fruit Cases Act of 1940*."

The marketing boards, the activities of which are hereinafter reviewed and which are producer-controlled, with the Director of Marketing as a member *ex officio* operate, unless otherwise indicated, under "*The Primary Producers' Organisation and Marketing Acts, 1926 to 1946*."

During the five-year period 1942-43 to 1946-47 produce of an approximate average annual value of £12,345,207 has been subject to the operations of marketing boards, including the State Wheat Board (constituted under "*The Wheat Pool Acts, 1920 to 1930*") and the Committee of Direction of Fruit Marketing (constituted under "*The Fruit Marketing Organisation Acts, 1923 to 1945*").

COUNCIL OF AGRICULTURE.

The constitution of the Council of Agriculture comprises the Minister for Agriculture and Stock, the Director of Marketing, and representatives elected by the several commodity boards, including the Committee of Direction of Fruit Marketing, the Queensland Cane Growers' Council, and the Queensland Dairymen's State Council.

The Council of Agriculture meets annually (except for emergency meetings), and between annual meetings the business of the Council is carried on by an Executive Committee consisting of the President, the Deputy President, the Director of Marketing, and three other members appointed by the Council.

During the year the Council's Secretary, Mr. K. Hack, resigned to accept an appointment with a farmers' organisation in another State. He was succeeded by Mr. J. Jones on 11th November, 1946. Since that date the services of Mr. Jones have been made available by the Council for the greater part of the time to act as an Investigating Officer for the Joint Dairying Industry Advisory Committee, a body consisting of four representatives of producers in the dairying industry and four Commonwealth Government representatives, which was set up by the Commonwealth Government to conduct cost and

other surveys on dairy farms. The Council had been directly and actively associated with work of this nature in the past for a Committee set up by various branches of the Dairying Industry at the suggestion of the Commissioner of Prices. It was therefore decided to place the Council's data and experience at the disposal of the new Government-appointed Committee.

At the invitation of the sponsors for a Pig Marketing Board for Central Queensland representatives of the Council visited the area concerned and addressed meetings of pig raisers.

The Council has in addition dealt with many matters of common interest to commodity boards and their growers.

CANE GROWERS' COUNCIL.

The Queensland Cane Growers' Council has the status of a non-marketing board for the commodity sugar-cane. It is the central body of a canegrowers' organisation comprising mill suppliers' committees and district canegrowers' executives with elected representatives from the latter constituting the Cane Growers' Council.

The Council and its subsidiary bodies exercise a variety of non-marketing functions associated with the development of the sugar industry, including co-operation within the industry, research—agricultural and economic—and generally doing things for the protection and advancement of the industry and of the growers engaged in the industry.

There are 7,750 growers engaged in the industry and the average annual value of sugar-cane produced in the period of five years from 1942-43 to 1946-47 is £9,118,581.

DAIRYMEN'S STATE COUNCIL.

By Order in Council made on 15th November, 1945, section 30 of *The Primary Producers' Organisation and Marketing Acts*, which provides for a field organisation for the sugar-cane growing industry, was extended with modifications to the dairying industry.

The Order in Council provided for the setting up of the component units of the organisation in three stages, viz.:—

- (1) The election by dairymen of a District Dairymen's Council of seven members for each of nine districts.
- (2) The election by each District Dairymen's Council of one of its members as a member of the Queensland Dairymen's State Council.
- (3) The definition by the Queensland Dairymen's State Council of the boundaries of Local Dairymen's Committees.

The election of the nine District Dairymen's Councils was completed towards the end of June, 1946, and the Queensland Dairymen's State Council held its first meeting in August, 1947, after its personnel had been elected by the District Dairymen's Councils.

The funds necessary for the administration of the various units of the organisation during the year 1946-47 were obtained by means of a levy by the Queensland Dairymen's State Council on dairymen throughout the State at the rate of 16s. per head.

Early in 1947 provision was made for the election by the Eastern Downs District Dairymen's Council of a second representative on the State Council, and Regulations were gazetted which made provision for the method of conducting future elections of District Dairymen's Councils as well as other matters such as procedure for the conduct of meetings of the various components of the organisation.

THE ARROWROOT MARKETING BOARD.

The Arrowroot Marketing Board, which functions in respect of both arrowroot bulbs and arrowroot flour, was originally constituted on 1st December, 1922.

1946 Crop.—The quantity of flour received by the Board amounted to 357 tons, which was manufactured from 3,584 tons of bulbs.

The advances paid by the Board to growers on bulbs delivered to the mills totalled £2 10s. per ton, after deducting the Board's administrative levy of 9d. per ton. Millers have received £13 per ton on flour manufactured.

The total realisations from sales of arrowroot flour amounted to £14,637 at the fixed rate of £41 per ton.

The following table shows the Board's intake of arrowroot flour over a number of years together with selling prices and the net returns to growers per ton of bulbs.

ARROWROOT.

SOURCE—AUDIT REPORTS.

Year.	Arrowroot Flour.		Arrowroot Bulbs.
	Delivered to Board.	Selling Price per Ton.	Net Return to Growers per Ton Bulbs.
	Tons.	£ s. d.	£ s. d.
1930	953	37 8 9	1 14 0
1931	753	36 4 7	1 18 7
1932	582	33 2 6	1 10 8
Average for 3 years	763	35 11 11	1 14 5
1933	707	28 4 6	1 4 6
1934	721	23 10 0	19 6
1935	627	22 12 5	19 6
Average for 3 years	685	24 15 8	1 1 2
1936	653	23 3 6	1 0 0
1937	346	29 5 0	1 11 7
1938	487	40 4 10	2 7 5
Average for 3 years	495	30 17 9	1 13 0
1939	528	38 12 5	2 3 8
1940	755	33 10 0	1 13 7
1941	645	32 9 4	1 11 6
Average for 3 years	643	34 17 3	1 16 3
1942	1,089	36 10 11	2 5 3
1943	542	38 0 0	2 7 2
1944	592	41 0 0	2 9 7
1945	681	41 0 0	2 9 11
1946	357	41 0 0	2 10 0

THE ATHERTON TABLELAND MAIZE MARKETING BOARD.

The Board was originally constituted on 31st August, 1923.

1945-46 Season.—A final payment of £3 5s. per ton on the season's crop of 4,433 tons was made on 2nd October, 1946, which, added to previous advances of £10 per ton, made the total payment to growers at the rate of £13 5s. per ton. The actual amount available for final distribution approximated £3 4s. 11d. and a fraction of a penny. Distribution Account was thus overdrawn £13 4s. 7d., which amount was transferred to the 1946-47 pool.

1946-47 Season.—

STOCK TRANSACTIONS.

	Tons.	Tons.
Maize received from growers	12,338	
Less maize returned to growers	380	
Less deductions for moisture	422	
		802
		<u>11,536</u>
Sales of Maize	11,560	
Sales of Offal	133	
		11,693
Less weight of bags	166	
		<u>11,527</u>
Under run		9

Marketing.—Sales of maize, including subsidy of £27,440 4s. 2d. and surpluses from sales of poultry, pig and cattle foods, totalled £176,554 7s. 9d. The maize used in such poultry foods, mashes, &c., amounted to 1,163 tons.

The guaranteed price under the Atherton Tableland Maize Guarantee and Subsidy Scheme was fixed at £14 per ton and sales to essential feeders were made possible at £9 10s. per ton (4s. 9d. per bushel) by a subsidy of £4 10s. per ton. With the approval of the Prices Commissioner, sales to unessential users were made at £14 per ton.

Distribution.—Six advances have already been made to date totalling £12 per ton. This, together with an anticipated final payment of £1 4s. 3d. per ton to be made in September, will provide a total return of £13 4s. 3d. per ton as compared with £13 5s. per ton paid for 1945-46.

Bran and Pollard Purchases.—In order to maintain supplies of poultry and stock food, 625 tons of bran and pollard were purchased towards the end of 1946 by the Board in Adelaide. The Commonwealth Government undertook to subsidise the freight from Adelaide to Atherton to the extent of the difference between—

1. The total cost of 625 tons of bran and pollard at Adelaide prices plus freight from Adelaide to Atherton; and
2. The cost of 625 tons of bran and pollard at Atherton "on rail" prices, had it been available there.

It is estimated that the subsidy will amount to £1,180.

General.—The following table gives comparative production data in respect of the Atherton Tableland Maize Marketing Board area and the rest of the State.

QUEENSLAND MAIZE INDUSTRY.

Atherton Maize Board Area and Rest of State.

Table comparing the acreage, production, and yield per acre in averages for successive three-year periods from 1924-25 to 1938-39 and for seasons 1939-40 to 1945-46.

Year.	Acreage.		Production.		Yield Per Acre.	
	Maize Board's Area.	Rest of State.	Maize Board's Area.	Rest of State.	Maize Board's Area.	Rest of State.
	Acres.	Acres.	Bushels.	Bushels.	Bushels.	Busncls.
1924-25 to 1926-27 ..	15,642	158,009	607,801	3,850,161	38.9	24.4
1927-28 to 1929-30 ..	20,794	178,472	699,698	4,705,481	33.6	26.4
1930-31 to 1932-33 ..	17,597	121,847	674,508	2,658,925	38.3	21.8
1933-34 to 1935-36 ..	18,452	143,190	498,985	3,288,311	27.0	23.0
1936-37 to 1938-39 ..	22,919	156,722	893,106	2,277,126	39.0	14.5
1939-40	25,685	151,159	660,731	2,684,122	25.7	17.8
1940-41	29,953	175,357	663,099	3,781,375	22.1	21.6
1941-42	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1942-43	22,208	151,608	545,976	3,252,096	24.6	21.5
1943-44	20,775	151,947	709,146	3,802,608	34.1	25.0
1944-45	20,397	137,773	750,534	3,108,120	36.8	22.6
1945-46	19,834	116,611	259,500	2,600,628	13.1	22.3

(N.A.—Not available.)

Source—Government Statistician.

ATHERTON TABLELAND MAIZE GUARANTEE AND SUBSIDY SCHEME.

For the 1946-47 season the Guarantee and Subsidy Scheme was continued with certain modifications. Subsidised sales by the Board were limited to those made direct to the essential feeder or his co-operative association, in a minimum truck load of 6 tons. The freight subsidy was limited to a maximum concession of 4d. per bushel in truck lots of 6 tons. The scheme was approved by the Commonwealth on the basis of a guaranteed price of 7s. per bushel (£14 per ton) with a subsidised price to essential feeders of pigs, poultry, and dairy cattle at 4s. 9d. per bushel (£9 10s. per ton).

The scheme applied to an area, the southern limit of which is at Rungo, with an extension to meet a special set of circumstances at Townsville.

Owing to the very heavy demand for maize, particularly from Tableland Dairy Associations, stocks began to decline very rapidly towards the end of 1946. It was consequently necessary to provide a more rigid quota scheme of delivery with a view to conserving grain for essential feeders until the 1947 harvest commenced. This scheme was successfully operated with the co-operation of the Maize Board.

It is expected that the subsidy scheme will be renewed for the 1947-48 season on a basis somewhat similar to that outlined above, although the price basis of the new scheme has not yet been finally determined by the Commonwealth Government.

BARLEY MARKETING BOARD.

The Board was originally constituted on 24th April, 1930.

1945-46 Season.—The total quantity of barley received into the pool for the season was

114,127 bushels 41 lb., for which growers received £27,473 3s. 1d.

Sales of barley aggregated 114,175 bushels 42 lb., from which an amount of £29,612 15s. 11d. was realised. The gain in weight of barley received totalled 48 bushels 1 lb.

A summary of payments to growers is as follows:—

—	—	First Advance.		Final Advance.		Total.	
		s.	d.	s.	d.	£	s. d.
	Bus. lb.						
Chevalier Malting ..	92,952 48	4	6	0	6	23,238	3 3
Chevalier Feed	10,031 22	3	0	0	9	2,006	5 10
		to		to			
		3	3	1	0		
Cape ..	11,143 21	3	6	0	6	2,228	14 0
	114,127 41					27,473	3 1

The first and final payments made to growers brought the total payments to 5s. per bushel for Chevalier Malting barley and 4s. per bushel for Cape Malting barley and feed barley.

The working expenses of the pool amounted to £863 9s. 10d., leaving a balance in the Realisation Account of £1,276 3s., which was transferred to the Hail Insurance Reserve Account. From this account, a first advance of 3s. per bushel and a final advance of 6d. per bushel were paid to growers in respect of 7,139 bushels 34 lb. damaged by hail. The total compensation paid amounted to £1,249 9s., and £20 2s. 6d. was incurred for assessment expenses leaving a credit balance in the Hail Insurance Reserve Account of £576 19s. 5d. This amount was transferred to the 1946-47 Pool Account.

1946-47 Season.—Deliveries for the season to date total 3,854 bushels 45 lb., on which

growers received a first advance of £831 6s. A summary of receivals showing the first advance is as follows:—

	Delivered.		Price per bushel.	Total.		
	Bus.	lb.	s. d.	£	s.	d.
Chevalier	3,264	44	4 6	734	11	11
Chevalier	328	4	3 6	57	8	3
Chevalier	261	47	3 0	39	5	10
	3,854	45		831	6	0

Deliveries were materially affected by the drought conditions which prevailed during the latter part of the growing period. With the exception of 590 bushels 1 lb. of inferior barley, which was sold at 4s. 6d. per bushel for feed purposes, the whole of the intake was sold as seed for the planting of the 1947-48 crop. Sales of seed barley to 30th June, 1947, were 2,337 bushels 34 lb., valued at £864 3s. 1d., being at the rate of 8s. per bushel for graded seed barley and 7s. per bushel for ungraded seed, with the exception of 132 bushels 8 lb., which realised 7s. 6d. per bushel.

THE BROOM MILLET MARKETING BOARD.

The Board was originally constituted on 11th March, 1926.

1945-46 Season.—During this season, which covered the period 1st November, 1945 to 31st

October, 1946, 97 tons 14 cwt. 1 qr. 9 lb. of broom millet was received and sold. This quantity realised £7,169 19s., an average of £73 7s. 6d. per ton. The maximum price realised was at the rate of £84 per ton and the minimum price was at the rate of £30 per ton.

This quantity was insufficient for local requirements, and supplies were obtained by some manufacturers from the Northern Rivers District of New South Wales.

1946-47 Season.—During the period 1st November, 1946, to 30th June, 1947, 47 tons 0 cwt. 1 qr. 20 lb. of broom millet was received and sold, realisations being £3,192 7s. 2d., or an average of £67 18s. 3d. per ton. The maximum price realised was at the rate of £84 per ton and the minimum price was at the rate of £15 per ton. It is expected that further deliveries for the season will total at least 30 tons.

Because of transport difficulties in the southern States, broom manufacturers in those States are now unable to send supplies of brooms to Queensland. This has had the effect of stimulating local manufacture, with a consequent increase in the local demand for broom millet.

The following table, showing receivals by the Board, realisations, maximum, minimum, and average prices for the ten-year period 1936-37 to 1945-46, is given for purposes of comparison:—

Year.	Receivals.	Realisations.	Maximum Price.	Minimum Price.	Average Price.
			Per ton.	Per ton.	Per ton.
	Tons.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1936-37	92	4,224 12 8	80 0 0	25 0 0	45 13 6
1937-38	72	3,219 13 9	57 10 0	15 0 0	44 16 8
1938-39	133	5,907 4 1	65 0 0	10 0 0	44 8 3
1939-40	86	4,312 19 4	57 10 0	30 0 0	50 2 6
1940-41	99	3,631 14 9	62 10 0	20 0 0	36 16 8
1941-42	39	2,229 13 11	75 0 0	35 0 0	57 3 5
1942-43	45	3,232 3 10	81 4 0	45 0 0	71 0 7
1943-44	89	6,672 12 1	81 4 0	50 0 0	75 7 6
1944-45	96	7,113 8 1	84 0 0	50 0 0	73 18 4
1945-46	98	7,169 19 0	84 0 0	30 0 0	73 7 6

THE BUTTER MARKETING BOARD.

The Board was originally constituted on 19th February, 1925.

Members of the Butter Marketing Board (other than the Director of Marketing) are elected by the butter factories or the co-operative associations owning the factories. Voting is on the basis of the quantity of butter manufactured during the year ended on the 30th June immediately preceding the date on which the election is to be held. The following scale applies:—

Under 26 tons—Ineligible to vote.

At least 26 tons—One vote.

Over 26 tons but not exceeding 100 tons—Two votes.

Over 100 tons—Then in addition to two votes in respect of the first 100 tons so manufactured, one vote in respect of every 100 tons or part thereof in excess of the first 100 tons.

Except for the butter requirements of the city of Brisbane, to which reference is made hereunder, the Board does not take possession or assume ownership of the commodity, but licenses agents, through which the various factories may dispose of their product. Agents are licensed by the Board subject to conditions in regard to selling prices and to the rate of commission payable to them by the factories. The operations of the Board are closely integrated with those of the State Dairy Products Stabilisation Board and the Commonwealth Dairy Produce Equalisation Committee Limited.

Production and Sales.—Butter manufactured and taken into account for Equalisation purposes for the season 1946-47 and the markets in which it was sold are shown, month by month, also annually in comparison with past years, in the following tables:—

MANUFACTURE AND SALES OF QUEENSLAND BUTTER TAKEN INTO ACCOUNT FOR EQUALISATION PURPOSES FOR YEAR ENDED 30TH JUNE, 1947.

Month.	Manufacture.	Commonwealth Sales.		Exports.			Grand Total Sales.
		Queensland.	Interstate.	Ships' Stores and Countries other than Great Britain.	Great Britain.	Total.	
1946.	Boxes.	Boxes.	Boxes.	Boxes.	Boxes.	Boxes.	Boxes.
July	62,145	40,595	5,775	252	18,424	18,676	65,046
August	56,912	37,589	3,827	480	17,610	18,090	59,506
September	50,001	33,417	3,560	1,789	11,948	13,737	50,714
October	63,216	34,559	3,963	2,829	22,080	24,909	63,431
November	83,426	36,139	6,667	559	35,218	35,777	78,583
December	118,510	37,086	7,498	405	67,991	68,396	112,980
1947.							
January	124,344	35,359	6,658	1,112	82,214	83,326	125,343
February	174,173	34,550	18,775	1,901	108,225	110,126	163,451
March	200,660	50,195	19,239	1,643	162,778	164,421	233,855
April	157,343	24,095	30,835	847	72,722	73,569	128,499
May	125,806	32,817	20,939	2,414	68,038	70,452	124,208
June	106,178	32,010	26,444	5,673	40,185	45,858	104,312
Totals	1,322,714	428,411	154,180	19,904	707,433	727,337	1,309,928

NOTE.—This Table is subject to revision, as the figures in respect of the months January to June, 1947, are taken from interim returns only.

COMPARISON OF MANUFACTURE AND SALES OF QUEENSLAND BUTTER TAKEN INTO ACCOUNT FOR EQUALISATION PURPOSES FOR YEARS 1935-36 TO 1946-47.

Year.	Manufacture.	Commonwealth Sales.		Exports.			Grand Total Sales.
		Queensland.	Interstate.	Ships' Stores and Countries other than Great Britain.	Great Britain.	Total.	
	Boxes.	Boxes.	Boxes.	Boxes.	Boxes.	Boxes.	Boxes.
1935-36	2,008,784	505,510	104,140	74,626	1,327,371	1,401,997	2,011,647
1936-37	1,507,544	516,546	51,699	33,090	882,983	916,073	1,484,318
1937-38	2,052,544	525,519	108,476	54,269	1,344,844	1,399,113	2,033,108
1938-39	2,756,657	525,915	81,269	64,710	2,103,317	2,168,027	2,775,211
1939-40	2,496,350	534,067	101,075	82,989	1,795,034	1,878,023	2,513,165
1940-41	2,090,677	547,912	161,579	84,517	1,292,224	1,376,741	2,086,232
1941-42	1,708,311	558,812	279,539	123,410	724,816	848,226	1,686,577
1942-43	1,992,079	769,738	437,823	58,429	759,336	817,765	2,025,326
1943-44	1,811,016	912,712	160,665	14,757	726,726	741,483	1,814,860
1944-45	1,696,637	807,420	119,634	3,715	761,726	765,441	1,692,495
1945-46	1,807,881	603,768	156,707	26,071	1,022,708	1,048,779	1,809,254
*1946-47	1,322,714	428,411	154,180	19,904	707,433	727,337	1,309,928

* Interim figures only.

It will be noted from the foregoing table that the production for 1946-47 is lower than for any of the preceding years to 1935-36, and is actually the lowest since 1928-29. This figure is a reflection of the effect of the very serious drought conditions obtaining during the first half of the current season. Intrastate sales for the year totalled 428,411 boxes. It should be noted here that from and inclusive of the year 1942-43 to 1944-45, the figures for Queensland sales embrace heavy quantities sold to Commonwealth Food Control for Australian and United States Forces operating in South-western Pacific areas outside Australia. The figure for 1945-46 also includes

butter sold for a like purpose, but the quantity was much below the levels of the preceding three years.

Values returned to Manufacturers.—Sales of butter totalling 1,309,928 boxes for the season yielded to factories for bulk butter an average net value of 1s. 7.86d. per lb. The values in the following table represent net returns at agents' floors, Queensland ports of shipment or other recognised centres of distribution, and only local transport charges require to be deducted to establish net returns to manufacturers.

The following table shows a comparison of the net returns of the various seasons since 1929-30:—

COMPARISON OF NET PRICES RETURNED TO FACTORIES FOR BULK BUTTER AS AT AGENTS' FLOORS QUEENSLAND PORTS OF SHIPMENT, ON BASIS OF EQUALISATION FIGURES, YEARS 1929-30 TO 1945-46.

Year.	Quantity Sold.	Total Net Value.		Net Value	Net Value	
		Boxes.	£	s.	d.	per Box.	per Lb. (Approx.).
1929-30	1,348,839	5,371,058	8	1	3.98198629	1 5.07
1930-31	1,665,489	5,653,443	10	4	3.39446464	1 2.55
1931-32	1,694,241	5,108,917	9	6	3.01546089	1 0.92
1932-33	1,787,044	4,277,219	8	5	2.39346061	0 10.26
1933-34	2,199,468	4,904,319	15	11	2.22977547	0 9.56
1934-35	2,337,700	5,928,787	6	2	2.5361626	0 10.87
1935-36	2,011,647	5,926,694	14	0	2.94619021	1 0.63
1936-37	1,484,318	4,644,371	7	1	3.1289598	1 1.41
1937-38	2,033,108	6,992,797	2	0	3.4394617	1 2.74
1938-39	2,775,211	9,468,530	11	0	3.41182366	1 2.62
1939-40	2,513,165	8,941,479	15	6	3.55785624	1 3.25
1940-41	2,086,232	7,469,744	11	3	3.58049563	1 3.34
1941-42	1,686,577	6,186,649	4	4	3.66816885	1 3.72
1942-43	2,025,326	7,725,042	1	5	3.81422547	1 4.35
1943-44	1,814,860	6,950,723	12	10	3.8298952	1 4.41
1944-45	1,692,495	6,695,887	7	8	3.9562228	1 4.96
*1945-46	1,809,254	7,774,722	11	0	4.297198	1 6.42
*1946-47	1,309,928	6,069,327	14	1	4.6333292	1 7.86

* Interim figures only.

Dairy Industry Subsidy.—April, 1946, to March, 1947:—It was stated in the last annual report that the interim subsidy rate for the equalisation-subsidy period 1946-47 was 31s. 8d. per cwt., representing the difference between the interim price of the Commonwealth Dairy Produce Equalisation Committee Limited, namely 169s. per cwt., and the objective return to manufacturers of 200s. 8d. per cwt., this being the overall figure recognised by the Government as necessary to return an average of 1s. 7.5d. per lb. (commercial butter) to the producer at factory door.

The position indicated was altered by the increase in the export value as from 1st July, 1946, thus permitting of the raising of the interim equalisation value to 185s. 1d. per cwt. At the same time, the Commonwealth Government, whilst continuing to recognise 200s. 8d. per cwt. as the official objective return to manufacturers, agreed that that part of the new export value in excess of the f.o.b. figure necessary to cover such recognised objective return should be passed on to the industry without a corresponding reduction in subsidy, thus permitting of the raising of the objective rate by the Commonwealth Dairy Produce Equalisation Committee Limited for its own purposes to 205s. 1d. per cwt. and establishing a new interim subsidy rate for the period of 20s. per cwt.

The fact is stressed that the increasing of the objective return to manufacturers, as out-

lined, was effected to facilitate the equitable distribution to manufacturers of the additional export value referred to. This action on the part of the Commonwealth Dairy Produce Equalisation Committee Limited did not commit the Government to the recognition of the new objective figure, nor did it commit the Government to higher subsidy payments, as the passing of such extra export value through equalisation has a corresponding effect on the average market or equalisation return.

The final subsidy rate to be paid in respect of this year is not yet available for publication.

April, 1947 to March, 1948:—The interim subsidy rate operating at date for this equalisation-subsidy period is 20s. 5d. per cwt., representing the margin as between the current interim equalisation value of 186s. per cwt. and the objective return to manufacturers of 206s. 5d. per cwt. Here again it is pointed out that the objective return to manufacturers as recognised by the Government, namely 200s. 8d. per cwt., was increased by the Commonwealth Dairy Produce Equalisation Committee Limited to facilitate the distribution by it of export funds in excess of the f.o.b. figure necessary to cover the officially recognised objective price.

It is possible that, before the close of the period, the figures of values stated may be varied as a result of the survey now being made in relation to costs of production of butter.

Rates of subsidy on which payments to Queensland butter manufacturers were based in respect of the period 1st July, 1942, to 30th June, 1947, are as follows:—

Period.	Type of Subsidy.	Rate of Subsidy.
July, 1942, to March, 1943	General	8s. 1d. per cwt.
April, 1943, to March, 1944	General	35s. 5.575d. per cwt.
April to May, 1944,	General	6.379453d. per lb. butterfat
June to November, 1944	General	6.375d. per lb. butterfat
December, 1944, to March, 1945	General	4.25d. per lb. butterfat
April, 1945	General Seasonal	18s. 0d. (approx.) per cwt. 2.66d. per lb. butterfat.
May to August, 1945	General Seasonal and Special	18s. 0d. (approx.) per cwt. 5.0914d. per lb. butterfat
September, 1945	General Seasonal and Special	18s. 0d. (approx.) per cwt. 3.8757d. per lb. butterfat
October, 1945	General Special	18s. 0d. (approx.) per cwt. 1.2157d. per lb. butterfat
November, 1945, to February, 1946	General Special	18s. 0d. (approx.) per cwt. 0.5349d. per lb butterfat
March, 1946	General Seasonal and Special	18s. 0d. (approx.) per cwt. 3.1949d. per lb. butterfat
April, 1946, to March, 1947	General	20s. 0d. per cwt.
April to June, 1947	General	20s. 5d. per cwt.

For the equalisation subsidy year April, 1945, to March, 1946, subsidy was actually paid at the rate of 22s. 3d. per cwt., but was finally adjusted between the Commonwealth Dairy Produce Equalisation Committee Limited and the Commonwealth Government to the figure shown above as a result of an increase of 4s. 3.30864d. per cwt., in the final equalisation price for the period.

For the months April to December, 1946, subsidy was initially paid at the rate of 31s. 8d. per cwt., but by means of a retrospective adjustment was subsequently reduced to 20s. per cwt., because of increase in the contract price.

The following are the total amounts paid during the subsidy period to Queensland butter and cheese manufacturers:—

Year.	Butter Subsidy.	Cheese Subsidy.	Total Subsidy.
	£	£	£
1942-43 ..	588,786	83,849	672,635
1943-44 ..	1,734,828	185,229	1,920,057
1944-45 ..	1,762,790	194,191	1,956,981
1945-46 ..	1,394,098	196,159	1,590,257
1946-47 ..	665,006	71,564	736,570
Total ..	6,145,508	730,992	6,876,500

Consumption.—Excepting for the years 1942-43 to 1944-45, and to a lesser extent 1945-46, where the totals include butter sold to Commonwealth Food Control for Australian and United States forces operating in South-western Pacific areas outside Australia, the State butter consumption is indicated by the following table, which shows annual consumption for the years

1936-37 to 1946-47, and average consumption for the decades ended 1935-36 and 1945-46:—

Year.	Consumption Inclusive of Imports from Other States (Boxes.)
Average 1926-27 to 1935-36	437,368
1936-37	535,784
1937-38	537,519
1938-39	537,915
1939-40	546,067
1940-41	560,000
1941-42	570,812
1942-43	789,932
1943-44	912,308
1944-45	812,420
1945-46	604,674
Average 1936-37 to 1945-46	640,743
1946-47	435,911

In considering butter consumption figures, regard should be had to the fact that butter was rationed throughout the Commonwealth to 8 oz. per capita per week in June, 1943. The weekly ration was reduced to 6 oz. in June, 1944, and still stands at that figure.

Butter Supplies for City of Brisbane.—Butter for the local needs of Brisbane and for contiguous areas is selected by the Butter Marketing Board from butter submitted for grading for export at the Hamilton Cold Stores, Brisbane.

Such butter is patted by the Board and sold to retailers. Profits are returned to and shared by all factories. The Board's operations during the year resulted in a saving to the dairy farmers of Queensland of £30,819 19s. 5d. The amount is well below the figures of immediately preced-

ing years, factors responsible for this being as follows:—

- (i.) Cessation of Military orders following upon the termination of the war;
- (ii.) Continuance of butter rationing; and
- (iii.) Increased cost of parchment paper, boxes, wages, fuel, &c.

Production Costs Survey.—A committee known as the Joint Dairying Industry Advisory Committee, embracing representatives of the Government and the industry, is at present engaged in surveying butter production costs throughout the Commonwealth.

The survey is now well advanced and the committee should be in a position to report its findings to the Government at an early date.

Butter Concentrate (for Hot Climates).—Samples of butter concentrate, which the Board has now held without refrigeration for two and a-half years, are opening up in first-class condition. This product has already made an impression on markets in tropical areas, and it would seem that if the demand is to be met there must be a substantial step-up in our butter production.

THE CHEESE MARKETING BOARD.

The Board was originally constituted on 31st August, 1923.

Cheese Production.—As a result of the disastrous drought during the first seven months, production for the year under review was the lowest since 1941-42, and represented a decrease of almost 36 per cent. compared with 1945-46.

The quantity of cheese manufactured in Queensland in each of the years 1937-38 to 1946-47 is shown below in pounds and tons:—

Year.	Lb.	Tons.
1937-38	11,947,771	5,334
1938-39	15,774,947	7,042
1939-40	13,845,131	6,181
1940-41	11,736,848	5,240
1941-42	16,350,560	7,299
1942-43	28,501,265	12,724
1943-44	24,030,545	10,728
1944-45	22,628,095	10,102
1945-46	26,942,810	12,028
1946-47	17,316,208	7,730

The only new manufacturer's license issued during the year was to Queensland Farmers' Co-operative Association Limited, which Association installed a cheese-manufacturing plant at Booval, mainly for the purpose of manufacturing into cheese during the flush months, the milk intake in excess of its requirements for the liquid trade.

Variety of Cheese Manufactured.—Although the great bulk of cheese manufactured during 1946-47 was again of the cheddar variety, there was a tendency on the part of some manufacturers to turn their attention to other varieties, whilst there was also a tendency to increase the number of fancy sizes of cheddar cheese manufactured.

The following table sets out the quantities of each variety manufactured in the last four years:—

Variety.	1943-44.	1944-45.	1945-46.	1946-47.
	Lb.	Lb.	Lb.	Lb.
Cheddar	23,373,281	22,159,435	26,181,098	16,595,724
Malling Red	534,194	375,625	653,627	365,068
Malling Roman	..	..	..	10,501
Malling Gruyere	52,522	9,019	29,747	14,734
Maclagan Red	..	..	11,930	231,596
Pittsworth Victory	59,209	67,808	39,564	67,354
Pittsworth Gouda	..	..	..	2,417
Pittsworth Cottage	8,468	12,048	2,848	1,401
S. B. D. Homeo	2,871	4,160	23,996	27,413
	24,030,545	22,628,095	26,942,810	17,316,208
Percentages—	Per cent.	Per cent.	Per cent.	Per cent.
Cheddar	97.3	97.9	97.2	95.8
Other	2.7	2.1	2.8	4.2

Production in other States.—The figures in the following table, showing production in all States, have been furnished by the Commonwealth Dairy Produce Equalisation Committee Limited.

State.	1942-43.	1943-44.	1944-45.	1945-46.	1946-47.
	Lb.	Lb.	Lb.	Lb.	Lb.
Queensland	28,501,265	24,030,545	22,628,095	26,301,496	16,959,936
New South Wales	5,241,734	5,582,557	4,395,320	4,890,671	4,555,871
Victoria	25,568,184	27,790,925	28,706,982	34,877,052	40,762,079
South Australia	18,056,920	19,821,646	18,536,260	22,553,091	28,257,243
Tasmania	716,944	910,571	1,169,328	1,027,994	1,004,953
Western Australia	(n)	1,624,982	1,831,254	1,854,514	2,262,614

(n) Not available. Western Australia came under the Equalisation Plan from 1st January, 1947.

It will be noted that in the above table Queensland production for 1946-47 is shown at 16,959,936 as against 17,316,208 recorded by the Board. The discrepancy is accounted for by the fact that the Equalisation Committee's figures exclude the production of one Queens-

land factory and include the production of a New South Wales factory close to the Queensland border.

Disposals.—Particulars of disposals of cheese for the past nine years are tabulated below:—

Year.	Local.	Process.	Overseas.	Total.
	Lb.	Lb.	Lb.	Lb.
1938-39	3,138,277	1,754,309	9,581,748	14,474,334
1939-40	3,246,497	1,294,500	9,272,131	13,813,128
1940-41	3,422,167	1,438,345	6,559,707	11,420,219
1941-42	4,891,061	2,114,875	7,590,116	14,596,052
1942-43	9,700,120	2,586,350	15,786,040	28,072,510
1943-44	10,114,077	3,569,607	9,706,388	23,390,072
1944-45	10,055,833	4,021,228	7,271,449	21,348,510
1945-46	10,313,188	4,170,740	9,514,867	23,998,795
1946-47	7,614,113	4,606,560	4,907,243	17,127,916

A better indication of the actual destination of the cheese sold will be gained from the following table, in which the figures for the last five years have been further dissected:—

Market.	1942-43.	1943-44.	1944-45.	1945-46.	1946-47.
	Lb.	Lb.	Lb.	Lb.	Lb.
Sold Locally	6,258,385	5,839,332	5,293,560	4,991,580	4,430,785
Interstate (under permit)	3,441,735	4,274,745	4,762,273	5,321,608	3,183,328
Processed for Australian Market	2,586,350	3,569,607	4,021,228	4,170,740	4,606,560
*Processed for Forces Overseas	12,685,441	7,031,465	6,282,314	2,734,064	1,210,260
Exported to United Kingdom	3,065,935	2,642,636	948,233	6,596,165	3,644,382
Exported to Other Countries	34,664	32,287	40,902	184,638	52,601
	28,072,510	23,390,072	21,348,510	23,998,795	17,127,916

* NOTE.—The figures from 1942-43 to 1945-46 represent only sales of processed cheese to Forces overseas, but the 1946-47 figure includes both ordinary overseas sales of processed cheese as well as sales to overseas Forces.

Prices.—In accordance with the Commonwealth Government policy of price fixation and subsidies, local market rates for mild cheese have remained at 1s. per lb. for medium sizes and 1s. 1d. per lb. for loaf sizes since 6th March, 1942, whilst the price for cheese sold to processors for their Australian trade has remained at 10½ per lb. since that date.

As from 1st July, 1946, the Commonwealth Government decided to pay the full contract price received from the United Kingdom (126s. 3d. per cwt. Australian currency) direct to manufacturers in the form of price, and this increase of 18s. 9d. per cwt., when applied for the full equalisation year, April, 1946, to March, 1947, increased the interim average equalisation price to 110s. per cwt., on which a subsidy of 10s. 2.75d. per cwt. was paid, bringing the gross return to manufacturers to 120s. 2.75d. per cwt. From April, 1947, the equalisation price remained at 110s. per cwt., whilst the interim subsidy rate was increased to 10s. 10.35d. per cwt., a total return of 120s. 10.35d. per cwt.

The average equalisation prices for all cheese sold over the past ten years are as shown hereunder:—

Year.	Average Equalisation Price.
	Pence per lb.
1937-38	8.046
1938-39	7.675
1939-40	8.166
1940-41	8.296
1941-42	9.109
1942-43	9.906
1943-44	10.164
1944-45	10.103
1945-46	10.854
1946-47	11.786

The figure for the last year is an interim one only, whilst it must also be borne in mind that from 1942-43 onwards subsidy must be added to the average equalisation prices in establishing the gross return to the Industry.

Subsidy.—The Commonwealth Dairy Produce Equalisation Committee Limited continued to distribute Commonwealth Government subsidy throughout the year, during which the total payments to Queensland cheese manufacturers amounted to £71,563 11s. 4d., or an average rate of approximately .992d. per lb. of cheese produced.

The following is a summary of all subsidy rates paid to cheese manufacturers since the commencement of this form of assistance on 1st July, 1942:—

Period.	Type of Subsidy.	Rate of Subsidy.
July, 1942, to March, 1943	General	4s. 10d. per cwt. cheese (a)
April, 1943, to March, 1944	General	16s. 6.147d. per cwt. cheese (a)
April to May, 1944	General	6.379453d. per lb. butterfat
June to November, 1944	General	6.375d. per lb. butterfat
December, 1944, to March, 1945	General	4.25d. per lb. butterfat
April, 1945	General Seasonal	11s. 11.44d. per cwt. cheese (b) 2.66d. per lb. butterfat
May to August, 1945	General Seasonal and Special	11s. 11.44d. per cwt. cheese (b) 5.0914d. per lb. butterfat
September, 1945	General Seasonal and Special	11s. 11.44d. per cwt. cheese (b) 3.8757d. per lb. butterfat
October, 1945	General Special	11s. 11.44d. per cwt. cheese (b) 1.2157d. per lb. butterfat
November, 1945, to February, 1946	General Special (representing increase of 0.44d. Commercial Butter)	11s. 11.44d. per cwt. cheese (b) 0.5349d. per lb. butterfat
March, 1946	General Seasonal Special (representing increase of 0.44d. Commercial Butter)	11s. 11.44d. per cwt. cheese (b) 2.66d. per lb. butterfat 0.5349d. per lb. butterfat
April, 1946, to March, 1947	General	10s. 2.75d. per cwt. cheese (b)
April to June, 1947	General	10s. 10.35d. per cwt. cheese (b)

(a) Paid on actual green weight of cheese manufactured by factories.

(b) Cheese weights calculated from butterfat content of milk received at factories, using the conversion factor 1 lb. butterfat = 2.55 lb. cheese.

For the equalisation year, April, 1945, to March, 1946, subsidy was actually paid at the rate of 10s. 3.25d. per cwt., but was finally adjusted between the Equalisation Committee and the Commonwealth Government to the figure shown above as a result of a corresponding decrease of 1s. 8.19324d. per cwt. in the final equalisation price for the period.

For the months of April to December, 1946, subsidy was initially paid at the rate of 16s. 7.5d. per cwt., but by means of a retrospective adjustment was subsequently reduced to 10s. 2.75d. per cwt. because of the increase in the contract price which more than offset the subsidy reduction.

The total amount of Commonwealth Government subsidy so far paid to Queensland cheese manufacturers is set out hereunder:—

	£	s.	d.
1942-43	83,849	4	9
1943-44	185,229	6	8
1944-45	194,190	13	7
1945-46	196,159	9	0
1946-47	71,563	11	4
Total	£730,992	5	4

Value of Production.—Set out in the following tables are figures showing the approximate annual value of all cheese produced in Queensland over the past nine years. They have been arrived at by applying to the green weight of cheese produced (less 4 per cent. to cover shrinkage) the net average equalisation prices and, in

the case of the last five years, adding subsidy payments:—

	Approximate Value.
	£
1938-39	484,291
1939-40	452,237
1940-41	389,476
1941-42	602,539
1942-43	1,213,183
1943-44	1,162,215
1944-45	1,108,637
1945-46	1,365,909
1946-47	887,919

DAIRY PRODUCTS STABILISATION BOARD.

The Board was originally constituted in January, 1933.

The principal function of the Board, which operates under the authority of "The Dairy Products Stabilisation Acts, 1933 to 1936," is to determine, for promulgation by the Minister, quotas of butter and cheese which may be sold by manufacturers in the course of their intra-state trade in these commodities.

The Board, which is composed of the members from time to time of the Butter and Cheese Marketing Boards and the Director of Marketing, is one link in the chain of the Commonwealth-wide stabilisation plan for dairy products,

Because of the constitutional inability of the Commonwealth Government to enact complementary legislation, the plan is completed by the operation of The Commonwealth Dairy Produce Equalisation Committee Limited (with its associated State Equalisation Committees), a body representative of the butter and cheese manufacturers in the various States. The committee is registered as a company under *The Companies Acts* of New South Wales.

The monthly quotas as promulgated for the intrastate trade in butter and cheese are shown in the following table:—

QUOTAS OF BUTTER AND CHEESE FOR SALE WITHIN THE STATE.

Month.	Percentage of Quantity Manufactured.	
	Butter.	Cheese.
1946.		
July	69.60	86.70
August	68.75	78.05
September	57.29	52.94
October	40.74	36.36
November	40.44	35.86
December	43.65	40.91
1947.		
January	44.35	57.14
February	61.36	60.00
March	64.29	58.62
April	76.47	68.55
May	78.79	80.95
June	78.79	89.19

During the year Western Australia, which formerly participated in the equalisation scheme only for butter, came into the Cheese Equalisation Scheme also; so that now the Equalisation Committee has achieved unification of the butter and cheese marketing of all Australian States.

THE COTTON MARKETING BOARD.

The Board was originally constituted on 11th March, 1926.

1945-46 Season.—Because weather conditions were favourable for early planting and reserves of subsoil moisture were at a high level, this season's cotton crop made better growth and yielded heavier than for some years past. The dry conditions which were experienced from March, 1945, onwards resulted in the production of excellent grades and qualities of fibre, while the average yield of 482 lb. of seed cotton per acre harvested was almost double that for the 1944-45 season (256 lb.).

Due to the continued shortage of labour, the area under cotton in 1945-46 was the smallest since the revival of the industry in 1921. The total plantings amounted to only 6,700 acres, of which 6,644 were harvested. However, growers who marketed seed cotton in 1945-46 numbered 688, an increase of 42 over the previous year.

Total production of seed cotton was 3,202,161 lb., which produced 1,138,734 lb. of raw cotton, equivalent to 2,372 bales. The whole of the crop was sold to Australian spinners and manufacturers.

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The following table gives a record of production since 1939:—

Season.	Production.	
	Seed Cotton.	Raw Cotton Lint.
	Lb.	Lb.
1939-40	12,108,491	4,127,823
1940-41	15,869,159	5,631,374
1941-42	14,057,690	4,924,816
1942-43	9,539,697	3,345,622
1943-44	8,515,581	2,946,478
1944-45	1,820,246	650,749
1945-46	3,202,161	1,138,734

Commonwealth Bounty.—Under the provisions of the Commonwealth Raw Cotton Bounty Act, as amended in 1941, growers were guaranteed an average net return of 15d. per lb. of raw cotton of or above a stipulated grade, for the duration of the war and one year thereafter. In 1945-46 the Commonwealth bounty under this Act amounted to £5,731 0s. 1d., equivalent to 1.20901d. per lb. of high-grade raw cotton. No bounty was paid on 1,075 lb. of Strict Good Ordinary grade of raw cotton. However, the net average return to growers was 15.019d. per lb. of raw cotton, equivalent to 5.341d. per lb. of seed cotton, as the receipts from sale of cotton were slightly augmented by the treatment of peanut kernels at the Board's oil-mill, although these were considerably less than the previous year, when the average net return to growers was 16.583d. per lb.

The following table shows the net returns to buyers and payments of bounties made by the Commonwealth Government since 1939. The return to growers shown in the table includes profits on milling and pressing of oil-bearing seed other than cotton:—

Season.	Commonwealth Bounty Paid per lb. Raw Cotton Lint.	Returns to Growers (including Bounty).	
		Per lb. Raw Cotton Lint.	Per lb. Seed Cotton.
	d.	d.	d.
1939-40	2.46	11.47	3.91
1940-41	3.15	12.51	4.44
1941-42	4.54	15.07	5.28
1942-43	Nil	15.53	5.45
1943-44	Nil	15.48	5.36
1944-45	4.38	16.58	5.93
1945-46	1.21	15.02	5.34

The Commonwealth Raw Cotton Bounty Act was further amended on the 9th August, 1946. The Act, as now amended, guarantees to cotton growers a minimum average return of 15d. per lb. of raw cotton, equivalent to 5½d. per lb. of seed cotton for a period of five years, commencing on the 1st June, 1947.

Revolving Fund.—The sum of £1,260 17s. 2d., representing 0.27d. per lb. of raw cotton, was deducted from growers' accounts during 1945-46 season and placed to their credit in the Working Account Reserve Revolving Fund. The sum of £569 8s. was refunded to the estates of deceased growers, leaving a credit balance of £41,289 5s. 8d. in the fund at 30th June, 1947. The Board's Order in Council does not permit the distribution of any moneys from the fund if the amount standing to the credit of the latter is less than £40,000.

1946-47 Season.—Seed sufficient to plant 18,000 acres was distributed to 1,098 growers, and until the 30th June, 1947, returns had been received from 588 growers, indicating that 7,723 acres had been planted. Further crop returns have yet to be received. The discrepancy between the seed distributed and the acreage planted is due entirely to the severe drought conditions which prevailed throughout the State during the main cotton-planting period, no rain having been received before the end of November.

The quantity of seed cotton received to 30th June, 1947, was 840,266 lb. The estimated production for the season is 1,500 bales raw cotton or a little more than 60 per cent. of the 1945-46 production. As in the case of the falling-off in the plantings during the current season, this sharp drop in production is attributable solely to drought.

THE EGG MARKETING BOARD (SOUTH QUEENSLAND).

The Board was originally constituted on 19th June, 1923.

Extension of Board's Territory.—By an Order in Council dated 28th November, 1946, issued under the Primary Producers' Organisation and Marketing Acts, the territory within the jurisdiction of the Board was extended to include the Shires of Mundubbera, Chinchilla, and Murilla, and those parts of the Shires of Gooburru, Kolan, Perry, Biggenden, Gayndah, Wondai, Kingaroy, Wambo, Tara, and Waggamba lying west of the Board's former boundary. The Board's territory has, in effect, thus been extended to include the area in Queensland—with the exception of the Shires of Eidsvold and Monto—at present controlled by the Commonwealth in respect to the egg industry.

Name of Board.—By an amendment to the Primary Producers' Organisation and Marketing Acts, passed during the 1946 session of Parliament, every Commodity Board which has marketing powers and functions is required to include the word "Marketing" as part of its name, and the name of the Egg Board was accordingly changed to "The Egg Marketing Board."

Commonwealth Control.—By virtue of an order issued under the National Security (Egg Industry) Regulations, the Commonwealth Government, as from the 5th July, 1943, assumed control of egg supplies in that portion of Queensland comprising the whole of the territory then under the jurisdiction of the Queensland Egg Board, together with the remainder of the Shires of Gooburru, Kolan, Perry, Gayndah, Wondai, Kingaroy, Wambo, Tara, and Waggamba, and the Shires of Murilla, Chinchilla, Mundubbera, Eidsvold, and Monto.

The Board is handling eggs produced in the area described above, as agent for the Commonwealth Controller of Egg Supplies, through the Deputy Controller in Queensland.

Controlled producers are not permitted to sell eggs except to the Controller, unless they have obtained the authority of the Controller to otherwise dispose of them. The Controller actually purchases the eggs from producers and sells them to consumers, whereas, previously, the Board received and marketed eggs on growers' behalf.

The qualities and grades of eggs for sale within Australia are now prescribed by the Controller of Egg Supplies and provide for two qualities of fowl eggs—viz., "first quality" and "second quality"—each being divided into two grades according to weight, designated "hen" and "medium." There is only one quality and one grade for duck eggs.

The wholesale selling prices of eggs are fixed by the Commonwealth Prices Commissioner. Prices are uniform throughout the Commonwealth, with the exception of that part of Queensland north of the Tropic of Capricorn (but not inclusive of Rockhampton), where a 2d. per dozen higher rate is allowed.

The prices paid to the producer by the Controller through his agents are the current wholesale selling prices for the various grades less (a) handling and selling commission, and (b) Commonwealth Control Fund charges.

During the period under review the control charge remained at 1d. per dozen. Handling and selling charges were increased as from 27th January, 1947, from 1½d. to 2½d. per dozen, to conform with an increase granted in the commission paid to agents of the Controller (including the Board) due to rises in wages and other handling costs.

It was originally intended that Commonwealth control should terminate on 30th June, 1946, but circumstances have resulted in Commonwealth control being continued—firstly until 31st December, 1946, and subsequently, by six-monthly extensions to 30th June, 1947, and 31st December, 1947, respectively.

The operations of the National Security Act actually ceased to have effect after 31st December, 1946, but Commonwealth legislation in the form of the Defence (Transitional Provisions) Act authorised the continuance of the Egg Industry Regulations, together with a number of other war-time controls, for a period up to twelve months thereafter.

Country Depot and Agents.—The Board has its own depot at Toowoomba and has appointed agents to handle eggs on its behalf at Ipswich, Warwick, Maryborough, Bundaberg, Gympie, and Murgon. Candling, grading, and selling operations are carried out at the Toowoomba depot and at the country agencies, from which eggs surplus to local requirements are transferred to the Board's floors at Brisbane for disposal as eggs-in-shell or for manufacture into egg pulp.

The quantities of eggs handled at the Board's depot at Toowoomba during the year were as follows:—

	Dozens.
Receivals (from growers)	550,408
Disposals—	
Sales (eggs-in-shell)	*217,519
Sales (as pulp)	518
Transferred to Brisbane Floor—	
Graded	281,202
Ungraded	51,282

* Includes 300 dozen ex Brisbane.

Supplies.—The acute feed shortages suffered by Queensland poultry farmers during this and the preceding year have naturally had an effect on egg production, and whereas it was anticipated that production in 1946-47 would exceed the record established in the previous year, production in the Board's territory suffered a

heavy decline. Receipts by the Board for the year, 8,777,249 dozens, were 2,308,451 dozens— or 20.8 per cent.—less than in the previous year.

Annual Receipts by the Board and its Agents from 1941-42 to 1946-47.

	Dozens.	
1941-42	7,044,029	
1942-43	7,223,676	Increase on previous year by 2.5 per cent.
1943-44	6,419,554	Decrease on previous year by 11.2 per cent.
1944-45	8,862,842	Increase on previous year by 38.1 per cent.
1945-46	11,085,700	Increase on previous year by 25.1 per cent.
1946-47	8,777,249	Decrease on previous year by 20.8 per cent.

In connection with the above table, it should be noted that, from 1943-44 onwards, supplies were drawn from a somewhat larger area than in previous years, due to the inclusion by the Controller of the additional territory mentioned at the beginning of this report.

Grading.—The results of grading for size and quality during the 1945-46 and 1946-47 seasons were as follows:—

	Receipts 1945-46.		Receipts 1946-47.	
	Dozens.	Percentage.	Dozens.	Percentage.
1st hen ..	7,729,047	69.72	6,627,238	75.50
1st medium ..	746,076	6.73	701,065	7.99
2nd hen ..	2,369,068	21.37	1,197,397	13.64
2nd medium ..	140,987	1.27	216,252	2.47
Duck ..	21,516	.20	13,957	.16
Broken ..	2,614	.02	1,778	.02
Bad ..	76,392	.69	19,562	.22
	11,085,700	100.0	8,777,249	100.0

The following comparisons for the years 1945-46 and 1946-47 show the percentages of the various grades received as between metropolitan and country suppliers:—

1945-46.									
	First Quality Hen.		First Quality Medium.		Second Quality Hen.		Second Quality Medium.		
	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage	
Metropolitan ..	4,668,831	79.05	477,267	8.08	665,820	11.27	69,613	1.18	
Country ..	3,060,216	59.08	268,809	5.19	1,703,248	32.88	71,374	1.38	
Total ..	7,729,047	69.72	746,076	6.73	2,369,068	21.37	140,987	1.27	

1946-47.									
	First Quality Hen.		First Quality Medium.		Second Quality Hen.		Second Quality Medium.		
	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage	
Metropolitan ..	4,042,004	80.40	443,919	8.83	406,961	8.09	121,267	2.41	
Country ..	2,585,234	68.94	257,147	6.86	790,436	21.08	94,984	2.53	
Total ..	6,627,238	75.50	701,065	7.99	1,197,397	13.64	216,252	2.47	

Disposals.—Disposals of eggs during 1946-47 were as under, figures for the previous year being quoted for comparison:—

As Eggs in Shell.	1945-46.	Percentage.	1946-47.	Percentage.
Civilians ..	4,963,573	44.50	4,622,454	52.48
Services ..	2,880,677	25.83	119,482	1.36
Export ..	266,520	2.39	2,644,710	30.02
Manufactured into pulp ..	2,178,082	19.53	1,400,362	15.9
Broken and bad or useless ..	79,005	.71	21,338	.24
Manufactured into powder N.S.W. ..	753,861	6.76	..	..
Manufactured into pulp N.S.W. ..	31,200	.28	..	..
Totals ..	11,152,918	100.0	8,808,346	100.0

The figures for 1946-47 include 43,200 dozens which were imported from New South Wales.

The quantities of pulp disposed of during the past two years were as follows:—

	1945-46.	1946-47.
	Lb.	Lb.
Exported ..	..	626,400
Local Sales ..	1,623,640	1,894,234
	1,623,640	2,520,634

Because of the depletion of flocks resulting from the drought, combined with the normal seasonal decline in production, the Queensland market was under-supplied with eggs from 20th January until the 28th June, and supplies to retailers were allocated in accordance with instructions issued by the Controller of Egg Supplies.

Exports.—Export of eggs to the United Kingdom was resumed in 1945-46, but owing to the small quantities of eggs available—due to the heavy demands of the Services coupled with the shortage of refrigerated shipping space—8,884 cases (266,520 dozens) only were shipped. With greater supplies available for export last year, despite decreased production, 88,157 cases (2,644,710 dozens) were shipped. The quantity packed for export represented 48.5 per cent. of the total receipts by the Board during the export packing season. The Board also exported 15,660 tins each 40 lb. (approximately 280 tons) of egg pulp, which absorbed 511,364 dozen eggs. Exports were made on behalf of the Controller of Egg Supplies, being purchased by the British Ministry of Food under arrangements made with the Commonwealth Government. Contract prices were as follows:—

Eggs-in-shell—1s. 8d. (Australian Currency) per dozen f.o.b. Australian ports for a 15-lb. pack with proportionate adjustments for heavier and lighter packs.

Egg pulp—1s. 5d. (Australian Currency) per lb. f.o.b. Australian ports.

Return to Producers.—The average price per dozen eggs, including all grades, received by producers for eggs delivered to the Board during 1946-47 was 20.29d. gross and 17.46d. net (i.e., after deduction of Controller's charges), as compared with an average return for 1945-46 of 19.74d. gross and 17.03d. net. The improvement in the average return is due to two factors—(1) the increase in the wholesale selling price to 2s. 3d. per dozen for 3½ months, and (2) the higher percentage of eggs of first quality received by the Board. The wholesale selling price for first quality hen eggs ranged from 1s. 7d. to 2s. 3d. The full range of prices is tabulated hereunder—

	First Quality.		Second Quality.		Duck.
	Hen.	Medium.	Hen.	Medium.	
	s. d.	s. d.	s. d.	s. d.	s. d.
At 1-7-46	2 0	1 9	1 8	1 6	1 8
From—					
12-8-46	1 9	1 6	1 5	1 3	1 7
19-8-46	1 7	1 4	1 3	1 1	1 5
30-12-46	1 9	1 6	1 5	1 3	1 6
27-1-47	2 0	1 9	1 6	1 4	1 9
17-3-47	2 3	2 0	1 8	1 6	2 0

Premises.—Construction of the additions to the Board's Makerston street premises was completed in August, 1946. Modern pulping and refrigeration equipment has been installed in this building which will meet the requirements of the Commonwealth Department of Commerce as an export pulping establishment. The refrigeration plant and freezing chambers have been in use since August, 1946, while pulping operations with the new plant were commenced in December of that year.

The premises acquired by the Board at Normanby were brought into use for egg-handling activities at the commencement of the season under review. At the outset, all local eggs were diverted there for grading, while country eggs were continued to be handled at the Makerston street building. As production declined during the season, it was found possible to handle all eggs at Normanby, and all grading operations have been performed there since November, 1946.

Marketing Stabilisation Proposals.—The Egg Marketing Boards in the various States have been giving attention for some considerable time to the formulation of plans for the establishment of a Commonwealth-wide organisation for the stabilisation of egg marketing, to operate when the existing Commonwealth Government control ceases. The original proposal, which entailed the formation of a company to purchase the total Australian production, proved unacceptable to large sections of the industry in the Southern States. The State Boards continued their efforts to devise a workable scheme to deal with surplus production only, and plans were developed for the formation of a company to be designated "The Australian Egg Equalisation Committee Ltd." Legislation is necessary in Victoria and New South Wales and has still to be enacted to enable their respective State Boards to participate in the scheme. Enthusiasm for the proposal seems to have

waned in some States in recent months, and further development appears somewhat indefinite.

It was originally announced that Commonwealth Government control of egg marketing would cease on 30th June, 1946, and after several six-monthly extensions it has now been decided that Commonwealth control be continued to 31st December, 1947. The various extensions of control were sought by Egg Boards in some other States when it became apparent that the proposals for the establishment of a Commonwealth Producer-controlled organisation would not be advanced sufficiently to enable its operations to be commenced at the intended dates for the relinquishment of Commonwealth Government control.

The South Queensland Board has not been favourable to the continuation of Commonwealth Government control, as it considers preferable a return to the Board's pre-war status as a State marketing authority, irrespective of any action that eventually may be decided upon in regard to the establishment of an Australian-wide marketing organisation.

THE CENTRAL QUEENSLAND EGG MARKETING BOARD.

The move to set up a board for the marketing of eggs in Central Queensland began in 1945, when poultry farmers, through their various associations, expressed dissatisfaction with the prices being realised for their commodity.

In January, 1946, a conference of delegates from poultry raisers' associations in the Central areas was held in Rockhampton, and at that meeting a Central Queensland Egg and Poultry Producers' Association was formed. The executive of the association met the Director of Marketing at Rockhampton in February, 1946, and following the discussions at that meeting a petition was received from 97 egg producers in Central Queensland requesting that a Board be set up under the Primary Producers' Organisation and Marketing Acts.

After further discussions on the area to be covered by the proposed Board and its proposed method of operation, a notice of intention was issued in September, 1946, and the Board was constituted by Order in Council on 9th January, 1947. The Board consists of four producer-elected members and one Government representative.

The Board's territory, as set out in the Order in Council, comprises the following Local Authority Areas:—Rockhampton, Mackay, Gladstone, Proserpine, Pioneer, Mirani, Sarina, Broadsound, Livingstone, Fitzroy, Mount Morgan, Banana, Calliope, Monto, Miriam Vale, Duaringa, Bauhinia, Peak Downs, Emerald, the Theodore Irrigation Area, and that portion of the shire of Belyando which is east of the Drummond Range.

The Board has arranged to take control of the commodity as from 1st July, 1947, and is negotiating an agency agreement with the Central Queensland Meat Export Co. Ltd., Lakes Creek, to receive, candle, grade, and distribute the eggs, and carry out the necessary pulping operations.

THE FRUIT INDUSTRY.

(1) THE COMMITTEE OF DIRECTION OF FRUIT MARKETING.

The Committee of Direction of Fruit Marketing, comprising growers' representatives elected by the six Sectional Group Committees provided for under the Act for pineapples, bananas, citrus, deciduous, "other fruits," and vegetables with the Director of Marketing as Government representative, has been established under "The Fruit Marketing Organisation Acts, 1923 to 1945."

In August, 1946, an election of Sectional Group Committees was completed. The 1945 amendment to the Fruit Marketing Organisation Act included provision for the tenure of office of Sectional Group Committees to be extended from two years to three so that the Committees elected in August, 1946, will hold office until the completion of the next election of Sectional Group Committees in August, 1949.

At the 1946 elections there was, for the first time, an election of a Vegetable Sectional Group Committee, the Act having been extended to vegetables in November, 1945. A Provisional Vegetable Sectional Group Committee appointed by the Minister for Agriculture on the recommendation of the C.O.D. held office from March until August, 1946.

Each of the Sectional Group Committees, at its first meeting, elected two of its members to form the Committee of Direction. Each Committee elected the same two representatives who had held office previously, so that the personnel of the Committee for the period 1946-49 is exactly the same as that of the 1944-46 Committee, except for the addition of the Vegetable Sectional Group Committee representatives.

PINEAPPLE SECTION.

Harvested production during the period 1st May, 1946, to 30th April, 1947, totalled 1,117,973 cases, a decrease of 204,354 cases or 15.45 per cent. less than the 1945-46 total of 1,322,327. This temporary decline in production was due to severe frost damage to pineapple plantations during June and July, 1946. Many thousands of cases were a total loss.

Fresh Fruit Markets.—Queensland and interstate markets received 846,590 cases, compared with 929,381 cases for the previous year. The average interstate selling price was 20s. 3d., compared with 19s. for the previous year. The wholesale ceiling prices were raised by $\frac{1}{2}$ d. per lb. on the 15th October, 1946, and a further rise of $\frac{1}{2}$ d. per lb. was granted on the 28th January, 1947, making the ceiling prices for the various capital cities as follows:—Brisbane 4d., Sydney 4 $\frac{1}{2}$ d., Melbourne 5 $\frac{1}{4}$ d., and Adelaide 5 $\frac{1}{2}$ d. Price ceilings were removed as from the 1st July, 1947.

The distribution to and the calculated per capita consumption of the various States were as follows:—

State.	Cases.	Per Capita Consumption.
Queensland	191,832	Lb. 10.52
New South Wales	367,416	7.53
Victoria	231,217	6.81
South Australia	39,168	3.68
Tasmania	14,877	3.54

Shipments to New Zealand ex the Sydney market were 2,080 cases.

Cannery Deliveries.—Canners received 271,383 cases, compared with 392,946 cases for the previous year. Of this quantity, 84,747 cases, representing 31.23 per cent. were "Smalls" grade. This grade included over 30,000 cases of fruit which had been damaged by frost. Production of canned pineapple products was as follows:—

	30 oz. Equiv. Dozen
Canned pineapple	252,547
Tropical Fruit Salad	75,158
Pineapple juice	81,872

The 1946-47 pack of pineapple products was distributed as follows:—

	Canned Pine 30 oz. Eq.	Fruit Salad 30 oz. Eq.	Pine Juice 30 oz. Eq.
	Dozen.	Dozen.	Dozen.
Service Orders	15,298	11,164	5,502
Queensland	21,682	8,375	24,211
New South Wales	66,581	20,764	13,988
Victoria and Tasmania	98,334	18,539	14,660
South Australia	29,182	10,372	5,396
Western Australia	21,470	5,944	4,782
Export to Great Britain .. .. .	..	..	13,333
	252,547	75,158	81,872

Diversion to Canneries.—A voluntary diversion to cannery scheme was adopted for both the winter and summer crops. The diversion scheme was introduced to regulate interstate and factory loadings, and also to build up cannery intake prior to the peak of the crop, thereby giving the canneries an opportunity to train staff to handle the heavy factory loadings expected during the peak. The regulating of interstate loadings during the peak weeks had the effect of stabilising prices.

Factory Prices.—The Fruit Industry Sugar Concession Committee agreed to a continuance of the factory price of £15 per ton f.o.r. growers' station for large fruit (4 inches in diameter and 5 inches in length). The price paid for "Smalls" grade (less than 4 inches in diameter) was £8 per ton for the winter crop, but this price was reduced to £6 15s. per ton f.o.r. growers' station for the summer crop.

Cannery Labour.—An advertising drive by the C.O.D. was successful in securing all female labour required by all factories during the peak weeks. No difficulty was experienced in obtaining all male labour required.

Stabilisation Fund.—For the purpose of building up a stabilisation fund for use when anticipated marketing difficulties are encountered as a result of the increased production due to recent heavy plantings, the pineapple levy was increased from 1d. to 3d. per case on the Smoothleaf variety, and from $\frac{1}{2}$ d. to 1d. per case on the Ripley and Rough varieties. These increases applied as from 1st July, 1946. A levy of 5s. per ton for this purpose was also imposed on direct deliveries to factories.

Cool Storage Experiments.—The cool storage experiments with factory pineapples, which were commenced during the 1946 summer crop in co-operation with officers of the Department of Agriculture under the supervision of Dr. S. A. Trout, Assistant Director of Horticulture, were

continued during the 1947 crop. The trials were on a much larger scale and covered different periods up to five weeks; cold storage temperatures ranged from 35 to 50 degrees. Results showed that factory pineapples can be held satisfactorily for processing, without affecting yield and quality, for periods up to three weeks at temperatures of 45 to 50 degrees.

Water Blister Research.—During the summer crop the C.O.D. co-operated with officers of the Department of Agriculture in continuing investigations on the water blister disease of pineapples. Investigations and trials were carried out in the field, in growers' packing sheds, at factories, and for a holding period under market conditions such as prevailed in Sydney. Results demonstrated that the incidence of water blister can be largely controlled by growers carrying out harvesting practices, plantation and packing shed hygiene as recommended by the Department.

Queensland Canneries Pty. Ltd.—In accordance with the terms of the Queensland Cannery Agreement, the C.O.D. exercised its right and withdrew from the link-up with the Victoria Cross Manufacturing Co. on the 31st December, 1946. The financial statement for the year ended 30th June, 1946, showed a loss of £15,633 7s. 6d. For the period 1st July until 24th August, when V.C. Company took over, the loss amounted to £7,460 19s. 11d. Growers' contributions through the C.O.D. for the purchase of a half share in Q.C. Company have been refunded to growers in full.

C.O.D. Cannery, Northgate.—During the year considerable progress was made with the establishment of the cannery at Northgate: in fact, the construction, which was commenced on 12th August, 1946, was sufficiently advanced to enable operations to commence on 9th June, 1947. It was originally hoped to begin operations in February, but considerable delays were experienced in securing machinery as a result of the protracted engineering strike in Victoria, where most of the equipment was constructed.

The project has received considerable support from fruitgrowers generally and pineapple-growers in particular. Altogether, fruitgrowers have committed themselves to provide £125,000 to meet capital redemption charges. To finance the cost of establishment, the C.O.D. borrowed £330,000 from the A.M.P. Society on a debenture issue of 3½ per cent. per annum. Working capital required has been provided by an overdraft of £250,000 from the E.S. & A. Bank. Both these amounts have been guaranteed by the State Government.

Freight Rebate.—For the purpose of equalising interstate price ceilings, an arrangement was entered into with the Prices Branch whereby the C.O.D. rail freight to Melbourne was increased by 5d. per case. The fund so created amounted to £4,816. This was rebated to all interstate consignors on the basis of 1.85d. per case.

Production Trend.—Annual production figures supplied by growers south of Bundaberg indicate that pineapple production will increase considerably during the next few years. Com-

parative planting figures furnished by factory suppliers are as follows:—

	Acres.
1941	988
1942	781
1943	869
1944	1,283
1945	1,568
1946	1,714

BANANA SECTION.

In many ways the year under review has been a disastrous one for banana-growers. A sequence of prolonged droughts, floods, cyclones, followed again by dry conditions at the latter end of the year, resulted in an anticipated substantial all-over increase in production being turned into a decrease of 29.2 per cent. as compared with the figures for the previous year. However, some compensation was received through the Prices Branch granting, as from 5th December, 1946, an increase in the banana ceiling price of ½d. per lb. As a result of this increase the price, taken over both bunches and cases, rose from an average of 4.41d. per lb. for the year 1945-46 to 4.97d. per lb. for 1946-47.

During the year simultaneous action by the growers' organisations of Queensland and New South Wales resulted in the old heavy "Tropical" case previously used for marketing bananas, being replaced by the new smaller "Standard" banana case. This change, which was made only after wide investigation of all angles of transport and handling, has proved very beneficial. One of the most noticeable results has been the much smaller percentage of broken and damaged cases arriving on the market. Comparative production figures are:—

	1945-46.	1946-47.	Decrease.
			Per cent.
Cases (equivalent 1½ bushel case) ..	467,837	337,437	29.2

Brisbane Ripe Department.—The lower total production in 1946-47 is reflected in the quantities handled by the Case and Bunch Departments compared with the previous year. Cases handled by the Ripe Department decreased by 11.6 per cent., the average price per case being 39s. 9d. as against 35s. 8d. for 1945-46, using the "Tropical" case as a basis for comparison.

	1945-46.	1946-47.	Decrease.
			Per cent.
Cases handled ..	105,473	93,232	11.6
Value	£187,827	£162,400	13.53

Bunch quantities handled by this Section were 9.38 per cent. less than the previous year.

	1945-46.	1946-47.	Decrease.
			Per cent.
Bunches handled ..	210,376	190,642	9.38
Value	£97,621	£74,324	23.86

Banana Ripening.—It is being realised more and more, that the main factor in increased banana consumption is the maintenance of high standards of ripening. With this object in view, the Department of Agriculture has undertaken experimental work in conjunction with the C.O.D. to obtain the necessary data to make

possible the drafting of a regulation defining ripening standards to which the trade will be asked to adhere.

Banana Rooms, Brisbane.—Comparative figures are as follows:—

—	1945-46.	1946-47.	—
Cases ripened . .	110,298	105,030	Per cent. Decrease 4.77
Bunches ripened	224,227	249,753	Increase 11.38

Diseases.—Rust has been more prevalent and widely spread than for some years. Experimental work on this disease undertaken by the Department of Agriculture has reached an advanced stage and it is hoped that effective control measures will be released at an early date.

The proportion of “rubbery” bananas coming on to the market has again been high. The C.O.D. has evolved ripening methods which have proved fairly effective in the control of this trouble. It is realised, however, that the problem should be attacked from the angle of prevention rather than cure, and the Department of Agriculture is working on the problem with this end in view.

CITRUS SECTION.

Queensland was again represented at the Australian Citrus Industry Conference which was held in Sydney in May, 1947.

The proposal for the formation of an Australian citrus organisation was further discussed. The New South Wales Citrus Growers' Council has now expressed its willingness to join such an association, and it is hoped that at a later meeting of representatives of the New South Wales citrus growers' organisation and the Federal Citrus Council an acceptable constitution will be drawn up for presentation to the next industry conference.

Representatives from Prices Branch discussed with industry representatives the question of re-imposing ceiling prices on citrus. As all States were opposed to the application of ceiling prices, however, the conference adhered to its previous decision, and no action was taken to reimpose ceiling prices.

The main item for discussion at the conference was the question of expansion as far as it related to the citrus industry. The industry was concerned at the prospect of unlimited plantings of citrus, and was of the opinion that private growers, as well as the Government, should be warned of the danger of over-planting.

The 1946 orange crop was heavy, but, as a result of the prolonged drought, there was a very large proportion of small fruit available. With low prices ruling on the fresh fruit market, it was necessary for an adjustment to be made in the factory price, which was reduced from £26 5s. to £18 per ton, delivered canner's station. Difficulty was experienced in placing factory oranges as the factory capacity was limited by the inability of processors to secure containers. As the 1947 orange crop was much lighter, negotiations were conducted with processors for a higher price, and an increase was obtained to £21 5s. for first grade fruit and £15 5s. for second grade fruit.

The quantity of lemons handled during the 1946 season was not as great as during the previous season, and it was possible to maintain the price of £21 5s. per ton. This price also obtained for the 1947 crop.

Prior to the 31st June, 1946, all grapefruit received for factory was placed with juice processors at a price of £28 15s. per ton, but for the remainder of this season it was necessary to place the grapefruit for jam purposes at the reduced price of £21 5s. per ton. There was no juice outlet available during the 1947 season, and all factory grapefruit was used for the manufacture of marmalade, the price paid again being £21 5s. per ton.

No difficulty has been experienced in having factories accept all Seville oranges available at a price of £21 5s. per ton.

As a result of the unsatisfactory experiences with factories over a number of years, the Citrus Sectional Group Committee has decided in favour of the establishment of citrus processing facilities at the Northgate Cannery. At the present time investigations are being carried out regarding the best methods of achieving this objective. It is estimated that an amount of not less than £50,000 will be required for the purpose and it is proposed to approach citrus-growers for subscriptions towards the necessary capital, in the same manner as pineapple growers subscribed. In order to build up citrus funds for administration, stabilisation, and other purposes, the Citrus Sectional Group Committee at its May meeting decided to increase the citrus levy from 1½d. per bushel to 3d. per bushel, 1½d. per half bushel, and 10s. per ton on factory fruit.

The following quantities of citrus fruits were handled by factories during the 1946 season:—

Lemons	554
Oranges	744
Grapefruit	119
Sevilles	97
Poorman's (oranges)	19
Citrons	3
Bush lemons	3
	1,539

Early in 1947 the Citrus Sectional Group Committee, at the request of northern growers, applied to the Department of Agriculture for an amendment of the Regulations to provide for an additional representative from North Queensland. The necessary amendment was gazetted in March and a representative was elected to the committee from the Charters Towers area. Growers in this district were anxious to secure direct representation on the Committee as they contended that as theirs was an inland area, where citrus was grown under irrigation, conditions there were totally different from those in the coastal areas of North Queensland and warranted separate representation.

OTHER FRUITS.

(i.) *Tomatoes.*—Throughout the year progress was made with the modernisation of the premises in Sussex street, Sydney, including the installation of tomato-ripening rooms, and towards the end of the financial year two ripening rooms were completed in readiness for the 1947 Bowen season.

Each season, for years past, the Sydney trade has entered into an agreement with Redlands tomato-growers prohibiting canvassing for tomatoes in this area during a specified period. Redlands growers believe that they have benefited greatly from these agreements. Without the urge from agents' canvassers, who naturally were interested in securing maximum quantity, the quality of the fruit marketed has shown a general improvement; in addition, growers' time has not been taken up by the large number of canvassers which periodically visited the district. For the 1946 season, however, the Sydney trade refused to enter into an agreement. It was claimed by the agents that it was not possible to police canvassing agreements as a certain amount of "underhand" canvassing was engaged in by growers, but they did admit that the agreements which had been entered into with Queensland growers had been more strictly observed than those concluded elsewhere. The claim was also made that the C.O.D. section was placed at an advantage by the presence of C.O.D. loaders in the main growing areas. The lack of an agreement did not seriously affect the orderly marketing of the crop, however, as very few canvassers entered the area.

Interstate loadings of tomatoes for the last eight years have been as follows:—

	Half-bushel Cases.
1939-40	606,653
1940-41	695,862
1941-42	513,385
1942-43	496,647
1943-44	435,975
1944-45	717,785
1945-46	773,844
1946-47	761,136

(ii.) *Papaws*.—During 1946, 629 tons of papaws were handled by factories, as compared with 338 tons the previous year. Of this quantity, 114 tons consisted of green papaws for chutney and 515 tons of ripe papaws.

For the 1947 season the factory price paid for green and ripe papaws was increased to £14 per ton. The previous price of £12 per ton had operated for factory papaws since 1942.

The big increase in interstate marketing evidenced in 1945-46 was maintained, the figures showing a further rise on the previous year. Comparative interstate loadings over the last five years are as follows:—

	Melbourne.	Sydney.	Newcastle.	Total.
	Cases	Cases	Cases	Cases
1942-43	7,791	23,227	241	31,259
1943-44	4,818	20,778	174	25,770
1944-45	6,385	26,495	263	33,143
1945-46	10,965	50,510	1,119	62,594
1946-47	12,727	50,284	1,345	64,356

Recognising the necessity for advertising to step-up demand to meet increased production, the Other Fruits Sectional Group Committee recently placed an order for the printing of 40,000 papaw window strips.

(iii.) *Strawberries*.—Although the estimates for the 1946 strawberry crop showed an increase of 71 per cent. on the 1945 crop, continued drought conditions had a serious effect on the yield obtained and only 30 tons were

placed with factories. Planting figures for the 1947 crop, as submitted by growers, were 97 acres, compared with 60 acres planted in 1946, indicating a 50 per cent. increase in the crop.

Discussions between the Strawberry Subcommittee and interested canners prior to the commencement of the 1946 crop resulted in an increased price for factory berries of 9d. per lb., on the condition that the quality standard for factory strawberries determined at that meeting should be strictly enforced. Previously two grades had applied to factory fruit, but canners claimed that the quality of factory berries had deteriorated and that for some time supplies of the lower grade only had been received. It was, therefore, decided that there should be one grade only for factory fruit.

Due to the greatly reduced crop through drought, the discussions with A.N.A. for air transport of strawberries interstate were not followed up. With the exception of berries forwarded to a Melbourne retailer by air by one large grower, the majority of interstate consignments went through by passenger train.

With the prospect of a larger crop in 1947, discussions again took place with airways companies and just prior to the commencement of the crop big reductions were made in strawberry freight rates to all airports. As a result of these reductions, and with the inducement offered by attractive prices on the Sydney and Melbourne markets, the majority of the berries for the Southern markets in the early part of the 1947 crop went forward by air.

(iv.) *Figs*.—At a meeting between fig growers' representatives, interested canners, and the C.O.D. an increased factory price for figs of 3½d. per lb. for 1946-47 was agreed upon.

The crop was a much heavier one than that of the previous year, 89 tons being placed with factories. This was a considerable increase on the 22 tons handled by factories the previous year, when the crop had been seriously reduced by a severe hail storm.

In order to stabilise the fresh fruit market, a minimum market price of 15s. per dozen boxes or 6d. per lb. was determined, and arrangements were entered into with the Brisbane Chamber of Fruit and Vegetable Industries for a daily clearance from the market to factory of any figs not realising the minimum price.

(v.) *Passionfruit*.—Factory passionfruit deliveries during 1946 showed a slight increase on the previous year, amounting to 28 tons as compared with 22 tons in 1945.

For the 1947 season canners agreed to pay an increased price of 5d. per lb. for factory passionfruit, the previous price of 3½d. per lb. having been in operation since 1940.

VEGETABLE SECTION.

The first Vegetable Sectional Group Committee elected by growers was constituted in August, 1946, and comprised twelve delegates from producing areas throughout the State, thereby giving widespread representation to Queensland vegetable growers.

At its first meeting the committee accepted the recommendation of the Provisional Vegetable Sectional Group Committee that the qualification of a vegetable grower should be determined as one annually devoting not less than one acre of ground to the production of those vegetables coming under the jurisdiction of the Fruit Marketing Organisation Acts.

A levy of 2d. in the £ or part thereof was imposed by the committee on all vegetables marketed in Queensland; this levy became operative in December, 1946. After a few months of operation, however, it was found that discrepancies arose through the deduction of the levy on amounts less than 10s., and in June, 1947, the committee decided on an alteration of the levy to 2d. in the £, deductions to be made to the nearest £.

One of the first decisions of the committee was to agree in principle to the use of a smaller bag for the marketing of cabbages. This proved of benefit to all those engaged in the handling of cabbages. Previously, most cabbages had been marketed in chaff bags, but these bags could not be handled carefully because of their weight, with the result cabbages were often damaged in transit. Test weighings by the Department of Agriculture showed that chaff bags packed with cabbages ranged in weight from 137 lb. to 153 lb., whereas the smaller bag recommended—measuring 30 inches by 40 inches—weighed approximately 111 lb. Reports were subsequently received from carriers, railway employees, and C.O.D. cartage employees, and after consideration of these it was decided that the C.O.D. should do its utmost to popularise the use of the smaller bag for the marketing of cabbages.

During the war years the production of vegetables was stimulated to meet the increased demand, and many primary producers entered this field of production. The aftermath of these years has been felt during the past financial year, when all markets from Cairns to Brisbane experienced periodic gluts, particularly in beans, cabbages, and tomatoes.

BEANS SECTION.

The annual conference of bean representatives was held in October, 1946, at which the continuation of canvassing agreements with the Southern Trade was strongly favoured. Prior to this, the New South Wales Chamber of Fruit and Vegetable Industries had rejected the agreement with Redlands tomato growers, and it was recommended to the conference that early negotiations should be conducted with the New South Wales Chamber.

A petition was circularised amongst growers which had previously been signed by those growers present at the conference favouring canvassing agreements and who agreed, in the event of the Sydney Trade refusing to enter into an agreement for 1947, not to consign to any agent canvassing for beans after a specified date.

Eventually this petition was signed by 333 bean growers. Representatives of the industry met members of the Vegetable Section of the New South Wales Chamber for further discussions on the matter, but advice was later received that these agents had refused to sign a bean canvassing agreement for the 1947 season.

A further conference of delegates was called in Gympie in March to consider the decision of the Sydney agents. Growers were emphatic that there should be no canvassing for beans during the harvesting period. The New South Wales Chamber was advised of this decision and was asked to request their members to refrain from canvassing between 1st May and 31st October.

Advice was subsequently received that, at the request of its Vegetable Section, the New South Wales Chamber had entered into an agreement with these members prohibiting canvassing during the period 17th May to 31st October. Although the commencing date for the agreement was somewhat later than desired by the conference, the effect of the delay on the industry was not serious, since picking began later than usual. Growers feel that because of this agreement they will be in a much stronger position to negotiate future agreements with the Sydney Trade than if no agreement had operated during the 1947 season.

A written agreement was again entered into with the Melbourne Trade through the Victorian Chamber of Fruit and Vegetable Industries and the Vegetable Merchants Association, with the same commencing date as the New South Wales agreement.

Continued representation to the Prices Branch for an increased price for certified Brown Beauty bean seed produced in Queensland under the supervision of the Department of Agriculture resulted in a notice in writing being issued by the Prices Branch authorising the sale of such seed grown in Queensland at 97s. 6d. per bushel retail. The grower is paid this amount less a handling fee of 10s. per bushel. This price compares very favourably with the prices fixed for certified seed grown in Southern States, which are 55s. per bushel wholesale and 87s. 6d. per bushel retail.

Interstate bean loadings over the past five years have been as follows:—

—	Melbourne.	Sydney.	Newcastle.	Total.
	Packages	Packages	Packages	Packages
1942-43	39,588	29,198	569	69,355
1943-44	26,155	27,309	220	53,684
1944-45	50,435	36,407	709	87,551
1945-46	33,936	54,716	2,774	91,426
1946-47	36,086	25,469	1,247	62,802

The 1946 crop showed a considerable decrease on that of the previous year. The early plantings were affected by torrential rains, while heavy losses were suffered in late plantings from drought and frost.

DECIDUOUS FRUITS SECTION.

The 1946-47 crop proved to be of average size. The following summary shows the tonnages despatched over the past four years:—

—	1943-44.	1944-45.	1945-46.	1946-47.
Brisbane (including Factory)	25,328	18,688	21,722	18,842
New South Wales	426	1,212	2,866	2,394
North Queensland	3,009	1,687	1,841	1,325
	28,763	21,587	26,429	22,561

Generally speaking, the realisations for most varieties of fruit were reasonably good. Light supplies of apples from the Southern States greatly assisted in keeping apple prices at satisfactory levels.

A feature of the season was the resumption of export to the East. Granny Smiths were the main variety shipped, and very satisfactory realisations were obtained. The supply of export quality Granny Smiths was not equal to the demand. The C.O.D. handled the export on a pool basis and the final return to growers will approximate 21s. 3d. per bushel f.o.r. for Granny Smiths and 22s. per bushel f.o.r. for Delicious. These realisations are much higher than those offered by other exporters. During the period when buyers were negotiating with growers there was a considerable degree of uncertainty owing to the varying offers made. The C.O.D. stabilised the position by offering an advance of 18s. per case f.o.r., to which price all exporters advanced their offers.

Throughout the season vegetable realisations on the Queensland market fluctuated, the average realisations being much lower than during the past seven years.

The Cottonvale district suffered a very severe hail storm. It was estimated that this storm destroyed 113,000 bushels of fruit. The total damage in the whole of the Stanthorpe district was assessed at £18,115.

Cases again proved a serious problem and only the widespread use of second-hand cases prevented a big loss of fruit.

During the season iced wagons containing plums, peaches, cabbage, beans, grapes, and pears were despatched weekly to Townsville and Cairns for a period of five weeks. A test consignment was also despatched to Charleville. Results from forwarding iced wagons to Northern centres were very satisfactory. The consignment to Charleville also arrived in very good order.

The cold store being erected at Thulimbah was not completed in time for use in the past season, but it is now certain that it will be available for the 1947-48 season.

The D.S.G.C. has decided to erect a packing shed at Passmore, and arrangements are proceeding in an endeavour to have this shed available for next season.

(a) SYDNEY.

Although the consignment turnover of £531,600 showed a decrease of approximately £2,000 on the consignment turnover for 1945-46, the combined trading turnover of £585,061 was in excess of the combined turnover of £564,440 for the previous twelve months.

Not only was there a record established in the combined turnover, but also in the total number of packages handled, which was 671,049 in comparison with 646,806 in 1945-46. Additionally the quantities of pineapples, papaws, oranges,

cucumbers, and avocados handled were higher than in the previous year. Comparative totals of the main fruit and vegetables handled were:—

	1945-46. Packages	1946-47. Packages
Pineapples	187,115	191,245
Papaws	32,445	34,129
Oranges	55,932	93,896
Cucumbers	14,978	15,177
Avocados	2,097	2,255

There was a falling away in the quantities of tomatoes and beans handled, the comparative totals being—

	1945-46. Packages	1946-47. Packages
Tomatoes	142,966	112,696
Beans	16,466	11,187

Drought conditions, which prevailed throughout the whole of 1946, were responsible for the reduced quantities of tomatoes and beans sent to C.O.D. Sydney.

Of Queensland deliveries, the Branch handled the following percentages:—

	Per cent.		Per cent.
Custard Apples	71.24	Beans	47.3
Papaws	69.4	Cucumbers ..	29.9
Avocados	93.5	Tomatoes ..	16.1
Pineapples ..	58.4	Bananas	17.7

For the twelve months 1,181,979 packages were delivered to the Sydney market on the C.O.D. train, of which the C.O.D. Sydney floor received 418,644 representing 35.4 per cent.

The continued progress made by the Sydney Branch is clearly indicated by the following schedule showing total turnover and the number of packages handled over the last five years:—

	Combined Turnover. £	Packages Handled.
1942-43	318,680	386,983
1943-44	418,999	459,119
1944-45	518,753	579,299
1945-46	564,440	646,806
1946-47	585,061	671,049

Throughout the year efforts were continued to alleviate the congested conditions under which the branch has operated for some time. The building purchased in Sussex street has been reconstructed in conformity with the Sydney City Council's requirements. In it is located the Country Order Department and, in addition, ripening rooms have been installed, which were ready for operation during the marketing of Bowen tomatoes.

A section of the Sydney branch's activities which had to be relinquished in the war years because of shortage of staff was the Country Order Department. In the new premises, this Department is now building up a most valuable service in distributing Queensland fruit and vegetables to areas where buyers are unable to frequent the markets and, consequently, are compelled to entrust their buying to others. Staff members operating the country distribution department are fully aware of the importance of rendering a service to retailers in areas too small to justify the opening of a C.O.D. wholesale branch. Through this section Tasmanian wholesalers and retailers are finding a service which must be giving satisfaction, judging by the increased orders being received from them.

With the resumption of near-normal shipping, the New Zealand market is again proving an outlet for Queensland pineapples, and regular shipments are being made by this branch. The New Zealand Government, because of fear of fruit fly, has determined a standard of "absolutely green" for pineapples entering the country. It is considered that such a standard will militate against the development of the market, as the fruit at that stage is not sufficiently palatable.

With the co-operation of the Queensland Department of Agriculture, a series of trial shipments is being made to New Zealand with fruit showing varying degrees of slight colour. As a result of these trials it is hoped that the New Zealand Government will permit the entry of fruit at a more advanced stage of maturity, thus leading to an extension of the New Zealand market for pineapples.

This comparatively new section of the C.O.D. Sydney branch, which is concentrating on overseas trade, gave a demonstration of its value to the Queensland industry in the handling of Granite Belt apples for export. The establishment of this far-reaching arm of distribution may eventually prove of some worth in the disposal of processed Queensland products.

(b) NEWCASTLE.

The Newcastle branch, established in February, 1945, continues to prove an excellent distributing point for Queensland fruits. Consignment turnover for the year was £114,000 in comparison with £124,700 for 1945-46. During 1946-47 the Branch handled approximately 148,000 packages, which was a very slight increase on the number of packages handled in the previous year, when the total was 147,263.

The branch has continued to attract direct consignments of the main Queensland fruits. The following table shows the number of packages of the different fruits consigned to the C.O.D. and the percentage in relation to the total quantities on the Newcastle market:—

	Packages to C.O.D.	Per- centage.
Bananas	7,703	79
Pineapples	17,776	70
Papaws	1,200	82
Custard Apples	426	98
Strawberries	1,637	100
Apples	33,326	84
Grapes	3,193	39
Tomatoes	30,298	55
Beans	3,148	88
Marrows	1,829	64

With the exception of bananas and papaws the percentage of all fruits increased. Particularly was this noticeable with Queensland grapes, very few being handled in 1945-46, while in 1946-47 39 per cent. of the Newcastle marketings being entrusted to the C.O.D. Generally speaking values returned to growers were comparable with those ruling on the Sydney market. During times of heavy supply, however, growers consigning to Newcastle received higher than the Sydney price, provided their brand was already known to local buyers. Possibly the reason for this is that growers carefully watch the Newcastle market and regulate quantities accordingly.

The experimental depot at Cessnock was not financially successful, and it was closed in May, 1947, but the outlet established has been retained and is being profitably serviced from Newcastle.

(c) ALBURY.

The C.O.D. branch at Albury was established on 1st September, 1946, and at the end of the financial year had completed nine months of operation. Consignment turnover for this period was £16,300.

The branch has set itself out to encourage direct consignment lines. These have proved popular in this district, mainly due to the fact that the fruit has opened up in attractive condition. This has been particularly noticeable in the case of bananas. Trading operations have however, consisted mainly of purchases from both Sydney and Melbourne markets.

In maintaining direct consignments of pineapples, price has presented some difficulty. Being situated between two main markets of Sydney and Melbourne it is essential to return to growers a price that is equal to the higher market to avoid dissatisfaction. The buyers' reaction to such a policy is that they are able to land fruit from Melbourne or Sydney at a cheaper rate, depending upon which market is selling at the lower level.

The aim of this branch is to increase the distribution of tropical fruits in the border areas of New South Wales and Victoria.

The following table shows the quantities of Queensland fruits which have been received by the branch on consignment for the nine months period ended 30th June, 1947:—

	Packages.
Bananas	1,191
Pineapples	2,981
Citrus	99
Cucumbers	86

(d) BRISBANE.

As was expected, the turnover for the year 1946-47 showed a decline on that of the previous twelve months. During the year supplies of fruit and vegetables were well maintained and the percentage handled was possibly in excess of the previous year, but the lower prices which generally ruled are reflected in the reduced turnover figures.

Consignment turnover since 1942-43 has been as follows:—

	£
1942-43	307,200
1943-44	445,300
1944-45	523,900
1945-46	446,400
1946-47	392,000

Although the C.O.D. wholesale activities in Brisbane cover five sections in the Municipal Markets and three sections in the Turbot Street Markets, shortage of space was apparent frequently throughout the year. Until further space is secured, it will not be possible to extend activities in Brisbane.

For the first time since the war years, marketing operations were characterised by periods of oversupply of some fruits and vegetables, particularly tomatoes and beans. During these

times it was clearly demonstrated that growers must pay more attention to maturity, grading, and packing. Mediocre and poor quality lines frequently sold at prices that would show a loss to the growers.

All other C.O.D. wholesale branches engage in the sale of bananas, but in Brisbane this is a separate activity. Combining banana sales of £236,700 with the general fruit and vegetable floors, the Brisbane branch had a turnover for 1946-47 of £628,700.

(e) ROCKHAMPTON.

The consignment turnover figures for the Rockhampton branch were adversely affected by the severe drought experienced in the district during 1946-47.

Two fruits which normally assist in the branch's operations were in very light supply, namely citrus and bananas. As a result of reduced local crops, it was necessary for the branch to purchase from other centres, particularly Brisbane. In addition to the shortage of locally grown fruits and vegetables, prices generally were back to the level of pre-war days.

In the circumstances, the combined turnover of £112,582, representing £81,900 consignment sales, and £30,682 direct purchase sales is highly creditable. Comparative consignment turnover figures for the last five years are—

	£
1942-43	92,300
1943-44	186,600
1944-45	89,000
1945-46	97,800
1946-47	81,900

The two retail shops conducted in Rockhampton are a particularly satisfactory phase of the operations of this branch. Despite keener and increased competition, sales through these two shops during the past year totalled almost £25,000. Apart from the value of the Retail Department in assisting in the clearance from the wholesale floor of many lines which might otherwise have had to be dumped, the two shops act as a check on those retailers and hawkers who are prone to overcharge.

Plans have been approved for the alteration and improvement of the Rockhampton premises and also for the modernising of the banana-ripening rooms, and it is expected that work will commence early in the next financial year.

(f) BOWEN.

Good growing conditions resulted in excellent crops being marketed from the Bowen district. Market returns in the main were satisfactory. For the year ended 30th June, 1947, loadings on the C.O.D. transport system totalled 379,481 packages, of which tomatoes comprised the biggest proportion. The main varieties constituting the loadings were—

	Packages.
Tomatoes	331,203
Cucumbers	16,802
Mangoes	15,256
Pumpkins	6,013
Pineapples	4,157
Rockmelons	3,723

Tomatoes showed a considerable increase on the railings for the previous year, which were 285,769 cases, but all other varieties showed a decrease, particularly cucumbers, railings dropping 55,915 cases from the 72,717 cases despatched in 1945-46. Actually there was a heavy cucumber crop in April-May-June, 1947, but an Australia-wide glut in this vegetable caused the biggest proportion of the Bowen crop to be ploughed in.

It is expected that production figures for tomatoes will continue high, for the reason that farmers who made increased profits from this crop during the war period used the extra money to acquire new implements and equipment and to improve and restore the fertility of their farms by applying heavier dressings of fertiliser.

Furthermore, pest control is no longer a worry, because farmers have learned to use the latest insecticides, which have proved highly satisfactory.

The turnover of the retail section of the C.O.D. Bowen branch improved considerably during the year and totalled more than £11,000. The object of this section is to improve distribution of fruit and vegetables rather than to make profits, and in pursuance of this policy it has built up a steady connection with hotels, hospitals, tourist resorts, &c.

(g) MACKAY.

The Mackay branch opened on 31st March, 1947, for wholesale distribution purposes and the retail department commenced to function on the following day. From the first day business transactions on the wholesale selling floor have shown steady improvement. Supplies have been drawn, when available, from growers in Mackay and surrounding districts and have been supplemented by purchases from Rockhampton, Townsville, and Brisbane sections. The turnover of £9,369 for the three months period ended 30th June includes £3,985 from consignment stocks and £5,384 from purchases.

The branch provides a market for growers from Mackay and surrounding districts, including Koumala, Carmila, Bloomsbury, Proserpine, St. Lawrence, Ayr, Eungella, and many other centres of production.

The retail shop has met with a most encouraging reception from the purchasing public, sales totalling just on £2,000 for the three months period. In assisting in a wider distribution of first quality fruit, this section at the same time serves to maintain a retail price level within the district which represents the lowest possible margin between what the public pays and what the grower receives.

(h) TOWNSVILLE.

The consignment turnover of £66,900 for the year ended 30th June, 1947, reflects the reduced production in North Queensland as a result of

severe flood rains and cyclones early in 1946 followed by the continuous drought conditions which prevailed until the rainy season of 1947. Consignment turnover for the last five years has been as follows:—

	£
1942-43	115,100
1943-44	143,400
1944-45	163,400
1945-46	101,115
1946-47	66,879

The following statistics, showing the comparative quantities of the various fruits consigned to the Townsville floor for sale, are indicative of the reduced production:—

	1945-46	1946-47.
	Cases	Cases
Oranges	12,020	7,968
Mandarins	8,579	5,066
Pineapples	12,716	4,796
Bananas	7,667	4,673

The lesser production is most noticeable in citrus, pineapples, and bananas, which are the main fruits produced in the North. Vegetable production was also severely affected as a result of the drought, and lesser quantities were consigned for sale than in the previous year. An additional factor in the reduced turnover in 1946-47 is that this was the first full year of operation without stimulus being given to demand as a result of troop concentrations.

A satisfactory feature of the operations of the branch during 1946-47 has been the greatly increased country order business, sales totalling £25,300, in comparison with £18,600 the previous year.

Growers in North Queensland have for some considerable time been seeking an extension of the C.O.D. Merchandise Department to this area. Three allotments of land have now been purchased for this purpose, and Treasury approval of the purchase price is being awaited. The ground is situated within 100 yards of the wholesale floor and will prove ideal for the establishment of the Merchandise Department. The ground is being filled in, in readiness to commence building as soon as Treasury approval of the purchase price is secured.

(i) CAIRNS.

Normal peace-time trading, together with reduced production, are reflected in the lower consignment turnover of £59,300 for the Cairns branch. Comparative consignment turnover for the last five years is as follows:—

	£
1942-43 (7 months only)	34,000
1943-44	129,200
1944-45	142,600
1945-46	84,300
1946-47	59,300

A number of factors contributed to the lower production of fruit and vegetables. With the general exodus of troops from Northern Queensland, growers reduced their acreage, and production from this reduced acreage was still further depleted by the ravages of cyclones, floods, frosts, and drought.

Over the twelve months period a total of 103,650 packages was handled on the wholesale floor. Support for the branch was well maintained both from local growers and those in

South Queensland, particularly deciduous growers. During the running of the C.O.D. fruit train for the 1946-47 season, over 90 per cent. of the fruit and vegetables sent to Cairns from the Granite Belt "on consignment" was entrusted to the C.O.D. for sale.

To ensure maximum distribution of fruit and vegetables, the Cairns branch concentrated largely on its Country Order and Distribution Departments, a feature of the latter department being the despatch of a continually increasing number of "mixed" cases of fruit. By the use of air transport, distribution was effected well into Cape York Peninsular and the Gulf country.

With the opening of the Innisfail branch the road delivery service to that town and Tully was discontinued, but a road service is still operating to Babinda with satisfactory results.

CONSIGNMENT TURNOVER.

Comparative consignment turnover of all wholesale floors for the last three years was:—

	1944-45.	1945-46.	1946-47.
	£	£	£
Albury (9 months, 1946-47) .. .. .	..	..	16,300
Sydney	459,600	533,400	531,600
Newcastle (4 months, 1945)	37,000	124,700	114,000
Brisbane	523,900	446,400	392,000
Bananas (Brisbane)	262,300	285,400	236,700
Rockhampton	89,000	97,800	81,900
Mackay (3 months, 1947) .. .. .	..	..	4,000
Townsville	163,400	101,100	66,900
Cairns	142,600	84,300	59,300
£	1,677,800	1,673,100	1,502,700

BONUS DISTRIBUTION (WHOLESALE SECTIONS).

In November, 1946, a bonus distribution of 25 per cent. of commissions on consignments to the C.O.D. floors for 1945-46 was made. The amount distributed was £25,889 as compared with £35,647 the previous year at the rate of 33½ per cent.

MERCHANDISE DEPARTMENT.

Despite difficulties in securing supplies, turnover again increased, being £170,459 in 1946-47 as compared with £166,600 in 1945-46. This increase in turnover must be attributed to the fact that growers are becoming more and more co-operatively minded so far as their own organisation is concerned, and appreciate both the service given and the bonus, which has been paid yearly since 1939. In November, 1946, a bonus at the rate of 4 per cent. was paid to growers on their previous year's purchases. This bonus absorbed £5,002.

COUNTRY ORDER DEPARTMENT.

The following table shows the comparative railings by the Country Order Department for the last five years:—

	1942-43.	1943-44.	1944-45.	1945-46.	1946-47.
Packages	57,042	125,876	214,429	203,974	236,121
F.O.R. Value	£50,666	109,600	198,296	182,198	187,287

Purchases from the C.O.D. wholesale floors represented 45.3 per cent. of the 1946-47 total.

RETAIL DISTRIBUTION.

During the year further progress was made in the establishment of a chain of retail branches in Queensland country districts.

A shop was opened in Roma in September, 1946, and the installation of two cool rooms has materially assisted in the successful operation of this branch.

The Mackay branch was opened on 31st March, 1947—for wholesale business on 31st March, 1947, and for retail business on the following day. From the outset this branch has shown satisfactory progress and, as is the case with all C.O.D. retail shops established in fruit-growing areas, the retail section of the Mackay branch assists considerably in the distribution of locally grown fruits and vegetables.

The Innisfail store, opened in June, 1946, as a wholesale-retail unit, met with a mixed reception. Results continued to be unsatisfactory, and in May, 1947, it was decided to close the wholesale section of this branch and to concentrate on the retail. This move has been very favourably received, with the result that in recent months turnover in the retail section has shown a profit each month.

The Innisfail retail shop has proved a useful adjunct to both the Cairns and Townsville wholesale floors in assisting to get into consumption lines of fruit and vegetables coming on the market in glut proportions.

The three retail shops first opened—namely, Nambour in July, 1945; Charleville in April, 1946; and Gympie in May, 1946—have continued to render service and show satisfactory results.

Operations in Gympie have been handicapped by the branch not being in the heart of the business centre. A more central position has now been obtained and it is anticipated that the Gympie shop will be transferred to this new site very early in the next financial year. The new premises will be equipped with a large cool room.

Fruit displays were made at shows held at Roma, Gympie, and Nambour at the request of the various show societies. These displays proved to be a medium of bringing the C.O.D. generally, and the local retail shop particularly, more prominently before the general public.

The proposed opening at Longreach is still under consideration. A contract has been let for the erection of a building, but construction has not yet commenced as the contractor is experiencing difficulty in obtaining materials.

Periodic surveys in all districts where C.O.D. retail shops are operating have provided proof that the establishment of these units has resulted in vigorous competition. Natural results of this competition have been brighter displays, improved service, and reasonable profit margins.

ARMY SERVICING.

The arrangement for the C.O.D. to carry on Army Servicing on the basis of current market rates plus 2½ per cent. commission on all purchases from other than C.O.D. sections was

extended to the 31st December, 1946. Army then decided to revert to the contract system for one month to ascertain how such system compared with the C.O.D. service. The C.O.D. did not submit a tender. The Army subsequently advised that it had decided not to accept any of the tenders submitted, but would carry on with the C.O.D. service. This position still obtains, and the C.O.D. is continuing to supply Army and R.A.A.F. installations in Brisbane.

The Army igloo at North Quay, Brisbane, which was specially built for the C.O.D. for its work of Army servicing, was vacated early in 1947, when Army handed the installation over to the Commonwealth Disposals Commission. Quantities now required are naturally very small and the C.O.D. is able to handle the business through its Country Order Department.

INTERSTATE TRANSPORT.

During the year shortage of New South Wales wagons and shortage of labour have proved a source of worry in the handling of interstate consignments. Saturday transshipping is objected to and requests were received for all transshipping to be done in daylight on Tuesday and Friday. To agree to this would mean loading at South Queensland stations, Monday and Thursday only, causing an additional 24 hours in transit for the Sydney market. To date the C.O.D. has been successful in maintaining its present schedule.

As a means of relieving transshipping at Clapham in the week-end, Thursday loading in Southern Queensland for Melbourne has been encouraged. These loadings have proved successful, arriving Melbourne Tuesday morning in place of Wednesday as previously. Melbourne agents would like the whole of the fruit for that market to come forward on this train, but such arrangements are not possible without incurring extra transit time from most centres for Sydney consignments.

Twelve months ago, to help relieve the tonnage ex Clapham in the week-end, the C.O.D. arranged for Bowen growers to make two loadings weekly—Tuesday and Friday—in place of one only—Tuesday. This additional Friday train was arriving at Clapham on Tuesday and at Sydney Thursday morning. Recently, however, Sunday running in Queensland has been arranged, and the train now arrives at Clapham on Monday and at Sydney on Wednesday morning, resulting in a 24 hours saving in transit time compared with Tuesday loading at Bowen. It has been difficult to maintain this train, as very poor support has been received from growers at Bowen.

NORTHERN FRUIT TRAINS.

Two Northern trains were maintained over the past year, departing ex Roma Street Tuesday and Friday. Tuesday trains clear at noon, allowing the fruit to arrive Cairns early Friday morning instead of Friday night as previously. This has proved a great boon to the week-end trade in the North.

During the 1947 flood season, as is the case every year, difficulty was again experienced in the running of the trains to the North, necessitating diversion via the Winton route.

During the summer months a refrigerated truck ran to North Queensland with combined loadings for Townsville, Innisfail, and Cairns. These trucks were first despatched from Applethorpe, but subsequently left from Roma Street. The fruit and vegetables sent in these wagons arrived in excellent condition. Consumption, however, did not warrant 10-ton loadings (the minimum tonnage for these wagons) to any one of the centres named. Consignments were also sent by refrigerated wagon to Mount Isa and, generally, gave satisfaction. The difficulty experienced in the early stages of the running of the wagon to Mount Isa was principally with tomatoes. Green tomatoes did not arrive in a satisfactory condition and it was the degree of ripeness which governed what was sent forward to this centre. A trial run was also made to Bowen, but as the extent of the requirements for that town necessitated a four-wheel wagon, the consignment did not arrive in as satisfactory a condition as would have been the case had the large refrigerated van been used.

All the Northern centres named contemplate using refrigerated wagons next summer, but the difficulty will be the tonnage capable of being absorbed by each. Should the loadings be under the minimum tonnage, a heavy freight per ton will be incurred, as the Railway Department insists upon the minimum being charged.

During the hold-up on the Main North line through floods the Railway Commissioner stated that no ice was available for refrigerated wagons on the Winton route. Consequently, the use of these had to be discontinued for approximately a fortnight. It was eventually ascertained that ice could be obtained at Winton, and for the last week that fruit and vegetables were sent via the Winton route wagons were re-iced at that centre.

FACTORY ACTIVITIES FOR 12 MONTHS ENDED 30TH JUNE, 1947.

The following quantities of the various fruits have been handled for factory:—

	Tons.	Tons.
Stanthorpe fruits		629
Citrus fruits		1,539
Figs		89
Papaws		629
Passionfruit		28
Metropolitan tomatoes		168
Strawberries		30
Pineapples—		
Winter crop, 1946	2,876	
Summer crop, 1947	3,908	
		6,784
Total		9,896

INTERSTATE TRANSPORT.

Overall interstate railings via Clapham and via Wallangarra decreased as follows:—

	1945-46.	1946-47.
	Packages.	Packages.
To—		
Victoria	565,089	477,353
New South Wales	1,660,788	1,599,530
	2,225,877	2,076,883

Increases were most marked in:—

Custard Apples	5,391 cases
Cabbage	9,041 sacks
Mangoes	8,482 cases
Rock Melons	24,194 cases

Decreases were most marked in:—

Bananas	29,790 cases
Pineapples	46,943 cases
Beetroot	30,124 sacks
Beans	28,624 sacks
Cucumbers	18,449 cases
Peanuts	16,261 sacks
Pumpkins	26,189 sacks
Tomatoes	12,708 cases

Strawberry consignments interstate by passenger train during the last two years were:—

	1945-46.	1946-47.
To—	Equiv. Pint Boxes.	
New South Wales	291,926	136,416

DIRECTIONS.

The following fruits have been under the control of the Committee of Direction for the year ended 30th June, 1947, by direction:—

For factory purposes—	Extended to.
Deciduous	21-1-48
Fig	10-2-48
Papaw	30-3-48
Citrus	12-6-48
Tomatoes	26-5-48
Pineapple	12-6-48
Strawberries	23-7-48
Passion Fruit	30-11-47
For market—	
Tomato restriction	10-2-48

LEVIES.

The following levies have been in operation during the year ended 30th June, 1947:—

Banana Levy.—South of Proserpine: 1d. for every £1 or part thereof of the gross proceeds realised from sales in Queensland of bunch bananas and ½d. per 1½ bushel case of bananas. Extended to 31st December, 1947.

Proserpine and Northwards: 4d. for every £1 or part thereof of the gross proceeds realised from sales in Queensland of bunch bananas and 3½d. per 1½ bushel case of bananas. Extended to 31st December, 1947.

Note.—Proserpine and Northwards Levy was discontinued as from July, 1947, one levy then in operation, viz.:—1d. for every £1 or part thereof of the gross proceeds realised from sales in Queensland of bunch bananas and ½d. per 1½ bushel case of bananas. Extended to 31st December, 1947.

Citrus Levy.—1d. per case (irrespective of size) to be expended in the interests of the citrus section. Extended to 31st December, 1947.

Note.—Levy was increased to 3d. per bushel case and 1½d. per ½ bushel case as from July, 1947.

Pineapple Levy.—(a) Fresh Fruit: 3d. per case or 21 loose on smooths and 1d. per case or 42 loose on Rough and Ripley varieties, the moneys collected to be for advertising, administrative, and stabilisation purposes. Extended to 31st December, 1947.

(b) Factory Fruit: 6s. 8d. per ton. Extended to 31st December, 1947.

(c) Cannery Revolving Fund: Levy 10s. per ton or 3d. per case on factory fruit only, for the purchase of half-interest in Queensland canneries. The purchase has been completed and this fund will commence to revolve when the amount available is sufficient to refund to all growers the total levies for the first year of contribution. Discontinued 31st December, 1946.

Stanthorpe Levy.—5s. per ton on all fruit and vegetables marketed from the Stanthorpe district, the fund so created to be for administrative purposes. Extended to 31st December, 1947.

Hail Insurance Levy.—7s. 6d. per ton in the instance of apples and 6s. 8d. per ton on fruit, other than apples, grown only in the northern portion of the Granite Belt, being the contributions of the growers concerned to a hail insurance fund. Continuous subject to demand for a ballot by growers.

Papaw Levy.—At the rate of 1d. per every two cases or part thereof, half the fund so created (with a minimum of £124 and maximum of £175 per annum) to be used to subsidise the appointment by the Department of Agriculture and Stock of a papaw research officer, the balance of the funds to be used for advertising purposes. Extended to 31st December, 1947.

Tomato Levy.— $\frac{1}{4}$ d. per case, but no levy on consignments of less than four cases, to be used for administrative purposes. Extended to 31st December, 1947.

Avocado Levy.—1d. per case, gazetted 15th July, 1941, the funds to be expended in advertising. No specified time for termination.

Vegetable Levy.—Gazetted on 23rd November, 1946: 2d. for every £1 or part thereof of the gross amount realised, excluding Granite Belt consignments. Amendment of levy as from July, 1947: 2d. for every £1 of the gross amount realised, deductions to be made to the nearest £1, 10s. to be treated as the next succeeding £1. No specified time for termination.

REFUNDS TO GROWERS.

Refunds to growers under various systems of finance during the period of twelve months ended 30th June, 1947, were:—

FREIGHT REBATES.

(1) *Citrus.*—A rebate at the rate of 1d. per case on interstate consignments during the year ended 30th June, 1946, absorbed £187 14s.

(2) *Deciduous—Northern and Interstate.*—A rebate at 17s. per ton on Northern consignments and at the rate of 7s. per ton on interstate consignments was made to growers. This rebate was paid in February, 1947, and amounted to £2,532 7s. 5d.

(3) *Bowen.*—A rebate on consignments forwarded during the season 1945-46 was paid at the following rates:—

Half bushel	2d. per case
Bushel	3d. per case
1½ bushel	4d. per case
Pumpkins	4d. per bag

The total so rebated was £4,062 8s. 5d.

STANTHORPE CO-OPERATIVE HAIL INSURANCE FUND.

Claims for the 1946-47 season totalled £18,175 18s. 6d. on 121,500 bushels. An advance payment of £4,544 0s. 8d. was made in June, 1947.

SUMMARY OF MONEYS RETURNED TO GROWERS DURING 1946-47.

Freights—	£	£
Citrus	188	
Deciduous	2,532	
Bowen	4,062	
		6,782
Fruit Sections		25,889
Merchandise		5,002
Hail Claims		4,544
		£42,217

FRUIT CASES.

Over the last six years the supply of cases to the fruit and vegetable industry has been a problem which has become increasingly acute. Only through the co-operation of all bodies concerned in the distribution of case timber has a major hold-up been averted in the marketing of fruit and vegetables.

The C.O.D. has entered on a long-range plan to assist in alleviating the timber shortage in future years by inaugurating an afforestation scheme with its growers. In this campaign the C.O.D. has the full co-operation of the Forestry Department. Regular publicity is given to the proposal through "The Fruitgrowers' Gazette," the official organ of the C.O.D., growers being urged to utilise any idle acre or half-acre in the planting of quick-growing trees. During the six months that the campaign has been in operation there has been a very satisfactory response, a total of 176 growers nominating 425 acres for this purpose. The following summary of applications shows that the proposal is finding favour throughout all Queensland fruitgrowing districts:—

District.	Number of Growers.	Proposed Acreage.
Stanthorpe	62	187
Metropolitan	3	7
South Coast	4	5½
Redlands	8	9½
North Coast	82	172
Central Queensland	9	22
North Queensland	8	22
	176	425

It is particularly gratifying to note the response from the Granite Belt, in which district the supply of case timber is a recurring problem each season. This is indicative of the desire of growers to assist themselves in a matter vital to their interests.

(2) APPLE AND PEAR MARKETING BOARD.

From 1943-44 onwards, the acquisition of apples and pears has applied only to crops produced in Western Australia and Tasmania. Queensland growers have been free to dispose of their fruit on the open market.

Sales in Queensland by the Apple and Pear Marketing Board for the twelve months ended 30th June, 1946, were as follows:—

	Cases.
Apples from Western Australia ..	44,528
Apples from Tasmania	216,249
Total	260,777
Pears from Tasmania	12,122

(3) SECOND-HAND FRUIT CASES.

The Second-hand Fruit Cases Committee was constituted under "The Second-Hand Fruit Cases Act of 1940."

The personnel of the Committee has been reappointed for a period of three years from 13th December, 1946.

In the period from 1st July, 1946, to 30th June, 1947, the Committee was responsible for the distribution of 1,244,687 second-hand cases.

As indicated by the following table, showing annual sales of second-hand cases under the supervision of the Committee since the commencement of operations on 31st March, 1941, sales for 1946-47 were slightly lower than the previous year:—

SALES OF SECOND-HAND FRUIT CASES.	
Year ending 30th June—	Cases Sold.
*1941	172,863
1942	679,832
1943	1,007,303
1944	1,448,545
1945	1,274,953
1946	1,300,472
1947	1,244,687

*From 31st March only.

However, it will be noted that sales to the Stanthorpe district, as shown in the next table, in which sales have been dissected on a district basis, amounted to 266,135 cases. This figure exceeds the total for last year by 55,158, and although it is gratifying to know that the Committee was able to give such substantial aid to the Stanthorpe growers, it is also true that the increased supplies of second-hand cases to this area meant that a smaller proportion of new cases reached the Brisbane market from Stanthorpe. This is perhaps an unfavourable development in the trade, because a constant influx of new cases is essential to the maintenance of a vigorous circulation of second-hand cases.

SALES of second-hand cases for 1946-47:
Dissected on a basis of districts—

District.	Number of Cases.
Brisbane Metropolitan	573,875
Stanthorpe	266,135
Cleveland	143,267
Ipswich	29,783
Manly	42,723
Woombye	46,415
Islands	50,544
Toowoomba	23,559
North Coast	24,422
South Coast	13,640
Bowen	9,576
Charleville	2,103
Roma	200
Dirranbandi	564
Permits	17,881
Total	1,244,687

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Very few cases were released by the Committee during the year for use outside the fruit and vegetable industries. However, some fruit cases from the South, such as cherry trays and pear flats, are not very popular in Queensland; and consequently releases of small numbers of these types were allowed from time to time to relieve the congestion of dealers' premises and enable them more effectively to handle those cases which were in ready demand.

At the close of the year there were 16 licensed dealers—11 in Brisbane, 2 in Toowoomba, and one each in Ipswich, Warwick, and Oakey.

THE GINGER MARKETING BOARD.

The Board was originally constituted on 16th July, 1942.

1945-46 Season.—Deliveries totalled 576 tons 18 cwt. 3 qr. of green ginger from 151 growers, on which payments were made at the rate of 4d. per lb.

1946-47 Season.—The Board received from 177 growers 727 tons 4 cwt. 2 qr. 17 lb. of green ginger and 14 tons 5 cwt. 3 qr. 8 lb. of recovery ginger, making a total of 741 tons 10 cwt. 1 qr. 25 lb. Advances were made to growers on delivery at the rate of 3d. per lb. for green ginger and 1d. per lb. for recovery ginger. A parcel of cargo ginger and a parcel of ground ginger remain to be disposed of before the pool is complete.

1947-48 Season.—Deliveries to 30th June, 1947, totalled approximately 450 tons. Droughty conditions and the effect of sunburn in November and December, 1946, upset anticipations of an increase in yield over that of the previous season.

General.—Deliveries of ginger to the Board since its inception are as follows:—

	Tons.
1941-42	14
1942-43	83
1943-44	180
1944-45	297
1945-46	576
1946-47	741

The Board has continued to employ The Buderim Ginger Growers Co-operative Association Limited as its agent to receive and handle ginger on its behalf and to engage in the pre-treatment. The association has provided additional factory and storage space, which has enabled the 1947-48 crop to be handled without the congestion experienced in the previous season.

Sales and distribution have improved since the appointment of Messrs. Gollin and Co. Pty. Ltd. as the Board's selling and distributing agents.

THE HONEY MARKETING BOARD.

The Board was originally constituted on 7th March, 1929.

On 20th December, 1946, notice of intention to extend the operations of the Board from 9th March, 1947, to 8th March, 1950, was published. Within the prescribed time a petition signed by

the requisite number of growers was received, requesting that a poll be taken on the question of the continuance or otherwise of the Board. The referendum was taken on 5th March, 1947, and resulted as follows:—

For	144
Against	73
Informal	16

Following this favourable vote, the operations of the Board were accordingly extended to 8th March, 1950.

The Board has continued its arrangement of marketing honey and beeswax through agents, two of whom are in Brisbane and one in Maryborough. Sales made by these agents for the year 1946-47 totalled 17,851 (60 lb.) tins of honey, and 13,227 lb. of beeswax. Sales for the previous year were 27,473 tins of honey and 10,674 lb. of beeswax.

The maximum selling price for honey fixed by the Commissioner of Prices remained throughout the year at 7½d. per lb. Most sales of choice and first-grade honey were made at this price, with lesser prices obtaining for lower grades. The bulk of the beeswax sold at the ceiling price of 2s. 6d. per lb. The Board has maintained its policy of advancing to growers 50 per cent. of the graded value of their honey immediately the commodity is received by their agents.

The following table sets out the quantity of honey and beeswax sold by the Board's agents during each of the last ten years:—

Year.	Honey.	Beeswax.
	Lb.	Lb.
1937-38	202,920	6,095
1938-39	752,340	7,315
1939-40	1,499,220	14,034
1940-41	1,482,300	23,480
1941-42	456,000	19,337
1942-43	491,400	13,415
1943-44	1,536,780	10,518
1944-45	1,081,380	13,092
1945-46	1,648,380	10,674
1946-47	1,071,060	13,227

Permits have been granted to producers exempting them, in respect of small quantities of honey for sale locally, from the requirement to deliver their product to the Board.

The Board has levied growers for administrative purposes at the rate of 1 per cent. of the proceeds of sales. This levy is payable on local sales by exempted growers, in the same way as sales made through the Board's agents.

THE NAVY BEAN MARKETING BOARD.

The Board was constituted on 7th November, 1946.

Prior to the war navy beans were not produced as a commercial crop in Australia, but were imported from Canada, United States of America, and Japan. Subsequent to the outbreak of the war with Japan the Commonwealth Government, at the request of the United States Army, embarked on a programme designed to encourage the production of this commodity in Australia with a view to meeting the needs of the Forces victualled from Australia.

The areas which have been found suitable for the production of this crop have been the Northern Tablelands of New South Wales and the South Burnett and Darling Downs in Queensland, and up to the present commercial plantings have been confined to these districts. In Queensland 100 acres of this crop were planted in 1942, but by 1945 this had increased to 2,800 acres.

The following table sets out the details of plantings, &c., since 1943, the first year in which any appreciable quantity was produced in Queensland.

Year.	District.	Number of Growers.	Acreage.	Total Yield of Canning Grade Beans.	Price—Based on 98 per cent. Yield.
1943 ..	South Burnett	92	650	Bushels.	<i>s. d.</i>
	Darling Downs	33	290	4,025	25 0
1944 ..	South Burnett	96	1,170	2,250	25 0
	Darling Downs	16	270	7,903	28 0
1945 ..	South Burnett	120	2,450	1,640	28 0
	Darling Downs	15	320	9,050*	28 0
1946 ..	South Burnett	24	680	2,650	28 0
	Darling Downs	26	740	4,800	28 0
				6,550	28 0

* An additional 5,000 bushels (approximately) were damaged by exceptionally heavy rain during harvesting. These were sold at reduced rates for purposes other than canning.

Selected seed was imported from the United States in 1942, and to encourage plantings the Commonwealth Government entered into contracts with growers to purchase all the resultant crop of canning grade beans. Further assistance was rendered to growers by making harvesting machinery available. Special bean-cleaning machines were imported from the United States by the Commonwealth Government. These machines were installed at Guyra (New South Wales) and at Brisbane on the premises of the State Produce Agency Pty. Limited.

The control of the production and sale of canning beans exercised by the Commonwealth Government, under the Food Control Regulations of the National Security Act, ceased with the harvesting and distribution of the 1946 crop. Both in Queensland and New South Wales the growers sought and obtained the formation of Marketing Boards in each State under the marketing legislation of the respective States, to supervise the handling of the crop and to ensure the orderly marketing thereof.

In Queensland the Navy Bean Marketing Board has been functioning since November, 1946. The Board takes delivery of the beans and has contracted with the State Produce Agency Pty. Limited, Brisbane, for that firm, which had purchased the cleaning machinery referred to above from the Commonwealth Government, to clean and treat the beans before they are distributed by the Board to the canners. Under the contract the beans are cleaned and brought up to canning or merchantable grade at a cost of 1s. 9d. per bushel.

The two marketing Boards established in New South Wales and Queensland are confronted with many problems of mutual interest, and recognising the need for close co-operation a joint meeting of the two Boards was held in Warwick soon after the constitution of the Board. Further meetings of this kind will be to the mutual advantage of the two organisations.

Harvesting of the 1947 crop has now been satisfactorily completed, but as the total quantity harvested has not yet been received by the

Board final figures are not available. However, receipts by the Board up to 30th June, 1947, amounted to 10,100 bushels, and indications are that the total production will be approximately 15,000 bushels.

For the current season the selling price to canners for A1 grade (98 per cent. sound beans) will be 34s. per bushel. The price of merchantable grade will be 31s. per bushel. These prices are expected to give an average net return to growers of approximately 29s. per bushel.

THE NORTHERN PIG MARKETING BOARD.

The Board was originally constituted on 18th July, 1923.

The following table shows the number of pigs handled by the Board during the 1946-47 season. For purposes of comparison, the figures for the previous two years are also shown.

	1944-45.		1945-46.		1946-47.	
	No.	Lb.	No.	Lb.	No.	Lb.
Sold to North Queensland Co-operative Bacon Association ..	12,953	1,985,839	11,802	1,468,714	6,586	817,142
Sales of Weaners	170	4,150	165	6,205	72	580
Sales of Porkers to Butchers ..	..	..	..	..	2,260	216,107
Losses in Transit (paid from Insurance Fund)	48	9,252	31	5,144	21	2,482
Total	13,171	1,999,241	11,998	1,480,063	8,939	1,036,311

It will be noted that the figures for the year 1946-47 show a decrease of 3,059 in number and 443,752 lb. in weight. Since the lifting of the ban on the sales of pigs to butchers for conversion to pork, as from January, 1947, the sales of live pigs for this purpose have taken a large proportion of the production. Lack of feed and disposal of breeders have largely influenced the decrease in production, as also has the drop in the average weight of pigs handled (123 lb. in 1945-46 and 116 lb. in 1946-47).

Purchases and sales for the last three years were as follows:—

	1944-45.	1945-46.	1946-47.	Decrease in Last Year.
	£	£	£	£
Purchases	66,414	50,240	36,522	13,718
Sales ..	67,067	50,846	37,723	13,123

Pigs purchased from growers are sold with the undermentioned margins per lb. dressed weight:—

To North Queensland Bacon Association—
at cost price.

To grower butchers—plus ½d. per lb.

To other butchers—plus 1d. per lb.

Until the end of February, 1947, sales to the North Queensland Co-operative Bacon Association were surcharged a further 1s. per pig.

This was done in order to provide funds for the Board's operations, but as it was considered that the Board had sufficient working funds and the profit from sales to butchers would cover future working expenses, this surcharge was discontinued as from 1st March, 1947.

PLYWOOD AND VENEER MARKETING BOARDS.

(NORTHERN AND SOUTHERN.)

The Southern Board was originally constituted on 3rd May, 1934, and the Northern Board on 18th April, 1935.

Deliveries of plywood for the year show a total increase of 10,399,629 square feet over the previous year, an increase of 3,679,211 square feet being delivered through the Northern Board and 6,720,418 square feet through the Southern Board. The increase has been made possible mainly through the use of a greater quantity of secondary timber.

Deliveries of plywood through the Southern Board were 48,018,725 square feet, valued at £432,168, and through the Northern Board 26,483,453, valued at £238,350, giving a combined total of 74,502,178 square feet, valued at £670,518.

The following table sets out the quantity and value of plywood delivered to both Boards in each of the five years from 1942-43 to 1946-47:—

Year.	Southern Board.		Northern Board.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Sq. ft.	£	Sq. ft.	£	Sq. ft.	£
1942-43	47,571,965	392,468	18,110,984	149,416	65,682,949	541,884
1943-44	46,896,337	381,033	18,504,317	150,347	65,400,654	531,380
1944-45	50,773,381	412,533	17,495,866	142,154	68,269,247	554,687
1945-46	44,339,514	369,496	19,763,035	164,692	64,102,549	534,188
1946-47	48,018,725	432,168	26,483,453	238,350	74,502,178	670,518

Distribution of sales in each of the years 1942-43 to 1946-47 is tabulated hereunder.

Year.	Southern Board...		Northern Board.		Total.	
	Queensland.	Interstate.	Queensland.	Interstate.	Queensland.	Interstate.
	sq. ft.	sq. ft.	sq. ft.	sq. ft.	sq. ft.	sq. ft.
*1942-43	17,048,380	30,229,028	8,932,701	9,030,374	25,981,081	39,259,402
1943-44	21,719,113	25,177,224	9,208,774	9,295,543	30,927,887	34,472,767
1944-45	21,096,622	29,676,759	6,219,667	11,276,199	27,316,289	40,952,958
1945-46	17,186,790	27,152,724	8,679,889	11,083,146	25,866,679	38,235,870
1946-47	21,906,272	26,112,453	8,199,373	18,284,080	30,105,645	44,396,533

* During 1942-43 quantities of plywood was also exported overseas as follows:—

Southern Board	Sq. ft.	294,557
Northern Board		147,909
Total		441,466

The Board's administrative levy was at the rate of 1d. per 100 square feet from July to April, and $\frac{3}{4}$ d. for May and June. The cost of administration for the year averaged .77d. per 100 square feet.

Figures in all cases are based on the equivalent of $\frac{3}{16}$ inch thickness.

THE PEANUT MARKETING BOARD

The Board was originally constituted on 22nd August, 1924.

1945 Season.—Transactions in respect to the 1945 season pool were finalised on 21st November, 1946, by the payment of 1.73d. per lb. to growers for all grades and varieties of peanuts received into the pool.

Receipts were—Virginia, 19,931,803 lb.; Spanish, &c., 5,435,270 lb.; total, 25,367,073 lb., equivalent to 11,324.59 tons. This was a record production for Queensland.

The crop was disposed of in the following manner:—

—	Virginia.	Spanish &c.	Total.
	lb.	lb.	lb.
Sales in shell	132		132
Sales of kernels	11,777,387	3,560,571	15,337,958
—Trade			
Sales of kernels	1,265,257	507,403	1,772,660
—Oil			
Loss in deshelling	6,889,027	1,367,296	8,256,323
Total ..	19,931,803	5,435,270	25,367,073

The loss in deshelling represents 34.56 per cent. of the weight of Virginia Bunch nuts deshelled, and 25.15 per cent. of Spanish nuts deshelled. In comparison, the deshelling losses of Virginia Bunch and Spanish for 1944 season were 35.9 per cent. and 24.2 per cent. respectively.

Sales.—The 1945 season crop realised a total of £507,212 5s. 11d., an average of 4.799d. per lb. on receipts.

Proceeds of the sales were distributed as shown hereunder:—

—	£ s. d.		Per lb. on receipts.
			d.
Payments to growers—			
First Advance	237,816	9 9	2.25
Final Payment	182,854	5 6	1.73
Levy collected	26,422	4 4	0.25
Expenses	59,597	4 3	0.564
Transferred to Reserve Account	522	2 1	0.005
Total	507,212	5 11	4.799

Additional revenue of £6,493 9s. 1d. was derived from the sale of sacks and £130 7s. 7d. from deshelling.

1946 Season.—Receipts into the 1946 pool up to 30th June, 1947, were:—Virginia Bunch, 22,688,248 lb., including 2,444 lb. of inferior nuts; Spanish, 7,287,119 lb., including 2,031 lb. of inferior nuts; Valencia, 7,505 lb.; San Jose, 40,171 lb.; giving a total of 30,023,043 lb.; equivalent to 13,403.14 tons.

First advances have been made to growers at a flat rate of 2.5d. per lb. in shell on the better quality nuts, and 1d. per lb. on the small quantity of inferior nuts, irrespective of variety, from which has been deducted a levy at the rate of .25d. per lb.

Sales.—The value of sales of the 1946 season peanut crop, to the 30th June, 1947, amounted to £555,840 2s. 5d.

1947 Season.—Up to the 30th June, 1947, the total quantity of peanuts received by the Board, and against which advances had been made, amounted to 4,979,738 lb., equivalent to 2,223.1 tons, made up as follows:—

Virginia	3,943,075
Spanish	1,015,135
Valencia	1,465
Valroy	1,245
San Jose	18,818
Total	4,979,738

The total area planted for the 1947 crop was 52,800 acres. Owing to seasonal conditions, harvesting of the crop was much later than usual, with consequent later delivery to the silos. It is estimated that the crop will yield over 20,000 tons as growing conditions, following a late planting season, have been fairly good.

Sales.—The value of sales of the 1947 season crop to 30th June, 1947, amounted to £62,290 19s. 4d. Again, this year the crop will be insufficient to meet Australian needs and is being rationed to all manufacturers and other users in an endeavour to provide an equitable distribution of the supplies available.

Revolving Levy Fund.—By Regulation 158A dated 28th January, 1943, the Board was empowered to increase the levy of $\frac{1}{4}$ d. per lb. to $\frac{1}{2}$ d. per lb. on all peanuts received. The object of increasing the levy was to create a revolving fund for the purpose of enabling the Board to repay to growers the money contributed by them by way of levy, and used by the Board for the payment of interest and redemption on capital sums raised by the Board to provide silos, treatment plant, and other assets.

The levy of $\frac{1}{4}$ d. per lb. has been collected from the proceeds of the 1942 and subsequent seasons' crops. The moneys which have now been collected and transferred to the fund amount to £39,399 6s., made up as follows:—

Season	£	s.	d.
1942	6,091	11	4
1943	9,107	17	10
1944	10,988	14	8
1945	13,211	2	2
	<u>£39,399</u>	<u>6</u>	<u>0</u>

Repayments have been made from the fund to growers who in or in respect of the years 1929, 1930, 1931, and 1932 paid levies made by the Board. Many growers have forfeited their rights to such repayments due to their failure to surrender or transfer their shares or right to apply for shares in the Association to the Board within the period of six months.

A summary of the transactions in this fund since inception, together with the amounts of levies collected during the years on which repayments have been made, is shown below:—

Transfers from Levy Account, seasons 1942-1945		£	s.	d.
		39,399	6	0
Season.	Levies		Repayments.	
	£	s. d.	£	s. d.
1927 ..	5,561	10 11	4,902	6 5
1928 ..	7,006	5 4	6,014	17 10
1929 ..	8,494	5 11	5,749	14 0
1930 ..	1,736	14 8	1,094	18 10
1931 ..	6,238	7 6	4,284	9 3
1932 ..	1,287	2 0	599	6 5
	<u>£30,324</u>	<u>6 4</u>	<u>£22,645</u>	<u>12 9</u>
Less cheques not yet drawn			2	4 7
			<u>22,643</u>	<u>8 2</u>
Balance, 30th April, 1947			<u>£16,755</u>	<u>17 10</u>

A further amount of £15,635 18s. 6d. has yet to be transferred to the revolving levy fund from levies collected during the 1946 season.

Storage.—An advance of £64,000 was approved by the Commonwealth Bank of Australia, on the guarantee of the State Government, to finance the erection of additional silos and buildings and to provide and install necessary machinery and equipment. When completed the new silos, which will be called No. 3 silos, will consist of 27 bins, with a total storage capacity of 5,200 tons.

Work on the new silos was commenced on 12th August, 1946. It is estimated that construction will be completed in November, 1947. Delay has resulted from shortage of materials, particularly steel.

In addition it is proposed to erect a further 12 bins, with a total capacity of 2,300 tons, to be known as No. 4 silo building. For this project the Commonwealth Bank of Australia has agreed to provide the necessary finance without requiring a guarantee from the State Government. On completion of No. 4 silo the total silo accommodation at Kingaroy will be 14,900 tons. These silos will be erected on the site of the present office adjoining the No. 1 wood and iron silo building.

A new office block is in course of construction.

Stacking.—Owing to the rapid increase in production of peanuts, insufficient space was available for storage of the incoming crop. In an effort to overcome this problem the Board built stacks, each comprising 11,000 to 14,000 bags, at Kingaroy, Wooroolin, and Proston. As space in the silo becomes available the peanuts in these stacks will be cleaned and graded in the usual manner.

Prices and Oil Diversion.—In August, 1946, the Commonwealth Government issued a Diversion Order on the Board, under which approximately half of the 1946 crop would have been used for oil extraction purposes, and, at the same time, downward alterations were made in the selling price of certain grades of peanuts. The Board resisted both these moves with the result that the Orders were withdrawn and the crop marketed in the usual manner at the usual price except for a small quantity for oil extraction purposes.

For the 1947 season the selling price for edible kernels was increased, with the approval of the Commonwealth Government, by $\frac{1}{2}$ d. per lb. to 8d. per lb., and the Board agreed to reserve 25 per cent. of the crop for oil-milling purposes at 4d. per lb.

General.—The production of peanuts continues to expand and the rapidity of the growth of this industry as a result of the increased demand is causing many problems. The storage and intake facilities at Kingaroy have proved inadequate to cope with the heavy crops, and unfortunately shortage of building materials has delayed the completion of building programmes put in hand some time ago. Difficulty is also being experienced in obtaining the necessary plant to enable the Board to handle the increasing quantities of peanuts produced. Further expansion will take place for next year's crop in an endeavour to meet Australia's needs in this commodity, and efforts are being made to increase the Board's equipment with which to receive, clean, shell, and grade the crops which are about to be planted. Consideration will also have to be given to the provision of intake facilities at locations convenient to the centres where expansion is taking place.

THE WHEAT INDUSTRY.

The Wheat Acquisition Regulations under the National Security Act were extended to the 31st December, 1947, by the Defence (Transitional Provisions) Act, 1946, and the Commonwealth Government has, under these regulations, continued to acquire all the wheat produced in Australia. The marketing of the wheat thus acquired has remained the responsibility of the Australian Wheat Board. The State Wheat Board constituted under "The Wheat Pool Acts, 1920 to 1930," has continued to act as the sole receiver and agent in Queensland for the Australian Wheat Board.

Conditions during the planting season for the 1946-47 crop were the worst experienced for many years. Severe drought conditions prevailed throughout the entire wheat belt, and of the 618,332 acres licensed for planting for grain only 179,266 acres were actually sown. An improvement in conditions late in the growing period resulted in a fair return from the area actually harvested, the average yield per acre harvested being approximately eleven bushels.

It is estimated that the total crop did not exceed 1,000,000 bushels, and of this 440,000 bushels have to date been delivered to the Board. A large proportion of this wheat will be required to supplement seed supplies for the coming season's plantings, and the balance is being supplied to mills.

Classification of Wheat.—The Queensland Board has retained its system of classifying the

wheat grown in this State into Q1, Q2, and Q2A grades of milling wheat and feed wheat. Queensland is the only State which has adopted such a classification system, all other States operating on the F.A.Q. standard. The following table sets out the proportion of each crop classified into each grade for the past eight seasons.

CLASSIFICATION OF WHEAT DELIVERED TO QUEENSLAND STATE WHEAT BOARD—1939-40 TO 1946-47.

	Q1.		Q2.		Q2A.		Feed.		Total. Bushels.
	Bushels.	Per cent.	Bushels.	Per cent.	Bushels.	Per cent.	Bushels.	Per cent.	
1939-40	4,871,807	77.88	1,118,187	17.88	225,159	3.66	40,011	0.64	6,255,164
1940-41	4,625,335	87.49	477,947	9.04	167,461	3.17	15,768	0.30	5,286,538
1941-42	2,149,425	80.21	373,988	13.95	147,315	5.50	9,169	0.34	2,679,897
1942-43	2,736,106	62.14	1,093,520	24.84	466,015	10.58	107,204	2.44	4,402,845
1943-44	2,818,025	61.27	1,297,148	28.20	395,040	8.59	88,965	1.94	4,599,178
1944-45	5,448,967	93.50	224,058	3.84	154,753	2.66	..	..	5,827,778
1945-46	6,135,629	81.90	858,486	11.46	452,948	6.05	44,098	0.59	7,491,161
*1946-47	382,290	86.78	38,089	8.64	14,267	3.24	5,897	1.34	440,543

* Subject to revision.

Quality Premiums.—The agreement between the Queensland and Australian Wheat Boards and the Queensland millers, whereby the millers pay to the Queensland Board quality premiums of 3d. per bushel on Q1 and 1½d. per bushel on Q2 milling wheat delivered to them continues to operate. In order to facilitate the calculation of such premiums, the millers, by special arrangement with the Queensland Board, pay the premium at a flat rate of 2¾d. per bushel on all deliveries and an adjustment is later made in order to bring payments into line with the original agreement. Owing to the high percentage of Q1 wheat in the 1946-47 season deliveries, this adjustment will mean the payment by millers of an additional 1d. per bushel on deliveries. The special premium of 2½d. per bushel on Queensland wheat sold as flour on the Downs will also operate.

Particulars of quality premiums and profits paid to growers by the State Wheat Board on wheat delivered since the Commonwealth acquisition in 1939, are tabled below. The premiums shown include, in all cases, a levy of .5d. per bushel for hail insurance.

PREMIUM AND PROFIT PAYMENTS PER BUSHEL ON QUEENSLAND WHEAT.

(Includes Hail Insurance Levies and Appropriations.)

Season.	Pool No.	Q1.	Q2.	Q2A.	Feed.
		d.	d.	d.	d.
1939-40	2	3	1.75	0.5	0.5
1940-41	4	4.5	3	1.5	1.5
1941-42	5	3.75	2.5	2	2
1942-43	6	4.25	2.75	1.25	1.25
1943-44	7	4.25	2.75	0.5	0.5
1944-45	8	4	2.5	0.5	0.5
*1945-46	9	3.5	2	0.5	0.5

* In this year a levy of 1d. was deducted from Australian Wheat Board payments for hail insurance in addition to the .5d. included above.

HAIL INSURANCE SCHEME—SUMMARY OF OPERATIONS, 1939-46.

Season.	Total amount levied.	Levy per bushel.	Amount paid on claims.	Assessment Fees and Expenses, &c.	Balance in Fund at end of season.
	£	d.	£	£	£
1939-40	13,225	½	10,099	221	20,225
1940-41	11,008	½	1,538	35	29,659
1941-42	5,499	½	938	22	34,199
1942-43	9,172	½	10,663	105	32,603
1943-44	9,637	½	13,426	215	28,599
1944-45	12,589	½	340	15	40,834
1945-46	48,511	1½*	54,324	298	34,724

* This rate applied to deliveries and wheat on which compensation was paid, the levy on excess wheat retained on farms being at the rate of 1d. per bushel.

No finality has been reached on the question of a special premium for particular varieties of high quality milling wheats, which was the subject of discussion between the Board and the millers, some time ago.

Hail Insurance.—The State Wheat Board continues to operate an internal hail insurance scheme. This scheme is operated on a compulsory co-operative basis, levy being made on deliveries during the season at a rate (usually ½d. per bushel) determined by the Board. Since the advent of Commonwealth acquisition, it has been the practice of the Queensland Board to appropriate such levy from premiums or profits and commissions earned as receiver and agent for the Australian Board, the only departure from this procedure being for the 1945-46 season (No. 9 pool) when, owing to very heavy hail damage the levy was increased to 1½d. per bushel on deliveries, and the additional 1d. per bushel was deducted from the first advance made by the Australian Wheat Board. The levy is also made on the excess over 20 per cent. of a grower's crop retained for seed and farm use, and on crops damaged by hail for which compensation is paid. The scheme provides cover as prescribed in Hail Insurance Regulations for crops damaged by hail. Hail damage during the 1946-47 season was very slight, only a few small claims having to date been paid. The rate of levy for the season has not yet been declared. The following table shows details of the financial operations of the hail insurance scheme since the 1939-40 season.

Advances to Growers.—During the year payments to Queensland growers, who delivered to Nos. 6, 7, and 8 pools, were completed, and further advances were made on wheat delivered to Nos. 9 and 10 pools. To the 30th June four advances totalling 6s. 4d. had been declared by the Australian Wheat Board for deliveries to No. 9 (1945-46) pool and two advances totalling 5s. 10d. for the No. 10 (1946-47) pool, the

advances in both cases being subject to an average deduction of 4.5d. per bushel for rail-age. In the following table a summary is given of amounts paid to Queensland growers by both the Australian Wheat Board and The State Wheat Board, together with deductions for rail-age and hail insurance levy, since Commonwealth acquisition commenced in 1939.

PAYMENTS TO QUEENSLAND GROWERS FOR Q1 MILLING WHEAT.

	1939-40. No. 2 Pool.	1940-41. No. 4 Pool.	1941-42. No. 5 Pool.	1942-43. No. 6 Pool.	1943-44. No. 7 Pool.	1944-45. No. 8 Pool.	1945-46. No. 9 Pool.	1946-47. No. 10 Pool.
	Complete.	Complete.	Complete.	Complete.	Complete.	Complete.	Not yet Complete.	Not yet Complete.
	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>
Total Advances by Australian Wheat Board	3 7.958	4 0.375	4 0.625	4 8.5	5 6.233	5 0.833	6 4	5 10
Less— Railage Deduction	0 5	0 5	0 5	0 4.8	0 4.4	0 4.43	0 4.5	0 4.5
Less— Special Hail Insurance Deduction ..	..	..	..	..	..	..	0 1	..
	3 2.958	3 7.375	3 7.625	4 3.7	5 1.833	4 8.403	5 10.5	5 5.5
Add— Premium Payments by State Wheat Board on Q1 Milling Wheat ..	0 3	0 4.5	0 3.75	0 4.25	0 4.25	0 4	0 3.5	Not yet declared
	3 5.958	3 11.875	3 11.375	4 7.95	5 6.083	5 0.403	6 2	..
Less— Hail Insurance Levy	0 0.5	0 0.5	0 0.5	0 0.5	0 0.5	0 0.5	0 0.5	Not yet declared
Net return to Grower, Grower's siding, for Q1 Milling Wheat ..	3 5.458	3 11.375	3 10.875	4 7.45	5 5.583	4 11.903	6 1.5	5 5.5

Pools Nos. 1 and 3, which are not shown above, did not apply to Queensland. No. 1 pool contained only wheat from other States not sold at the time of acquisition, and No. 3 pool was set up to handle inferior wheat delivered by other States from the 1940-41 harvest.

During the seasons 1942-43, 1943-44, and 1944-45 (Nos. 6, 7, and 8 pools respectively) a bushelage quota system operated, whereby the Commonwealth Government guaranteed a first advance of 4s. per bushel in 1942-43 and 4s. 1½d. per bushel in 1943-44 and 1944-45 for the first 3,000 bushels of a grower's crop, and for any excess over that quantity no guarantee applied and the grower received a smaller first advance. However, in each of the years concerned the total advances per bushel made by the Australian Board for both quota and non-quota wheat were the same, hence in the above table only the one figure is shown.

Seed Wheat.—The State Wheat Board has continued the practice of selecting wheat for seed, and the demand for this seed for the 1947 planting has been very heavy. The Queensland Government again guaranteed an amount of £5,000 to cover sales of seed wheat on credit to growers in necessitous circumstances. However, owing to the very small harvest from the 1946-47 crop, the amount was later increased to £10,000. In respect to such sales the Board is obliged to make deductions from advances to growers concerned on wheat delivered to subsequent pools until the amount owing is recovered. Interest at the rate of 3 per cent. per annum is charged on balances owing for the first two years, and thereafter 5 per cent. per annum.

Wheat Sacks.—Growers continued to obtain sacks from the Australian Wheat Board through the State Wheat Board, which receives a commission for handling. The price to growers for new sacks as at 30th June was 12s. 7d. per dozen f.o.r. Brisbane with a discount of 2d. per dozen for bale lots. This has since been increased to £1 8s. 1½d. per dozen f.o.r. Brisbane.

On the 19th January, 1947, the Australian Wheat Board adopted a new procedure with regard to the sale of bagged wheat, whereby sales to mills are effected at a net price per bushel for the wheat content plus a charge for bags. At 30th June this charge was £1 3s. 9d. per dozen.

Weight Loss on Deliveries to Queensland Mills.—The arrangement between Queensland milling companies and the Australian and State Wheat Boards, whereby the milling companies bear weight loss to the extent of .64 per cent. of deliveries continues to operate. The balance of weight loss is borne by the Australian Board.

Flour and Mill Offals.—Flour tax as imposed by the Commonwealth Government under the *Flour Tax Act, 1938*, continues to operate, and the rate remains at £2 8s. 10d. per ton of flour.

The present prices of flour and mill offals are as follows:—

Flour f.o.r. Brisbane—£13 8s. per short ton.
Bran at mill—£7 0s. 3d. per short ton.
Pollard at mill—£8 0s. 3d. per short ton.

Consumption of Wheat in Queensland.—Owing to the almost complete failure of the 1946-47 crop in this State, the amount of locally-grown wheat available for distribution during

this season was sufficient to supply only a small proportion of milling requirements, and this necessitated the importation from other States of large quantities of grain, both for milling and for stock feed. The acute position with regard to stock feed was further accentuated by the drought conditions prevailing throughout Queensland during the latter half of 1946; however, during the period from July to November, 1946, approximately 16,200 tons of oats were imported from Victoria and South Australia to alleviate the shortage of feed grains, allowing almost all available wheat to go to mills.

The import of wheat from New South Wales by rail was commenced in June, 1946, and it continued to come forward in small parcels until January, 1947, by which time 1,218,000 bushels had been received from this source. This wheat was at first used for feed purposes, but later,

as stocks declined, it was diverted to mills. The import of wheat by boat from other States was commenced in September, 1946, and by January, 1947, a regular shuttle service was in operation. Approximately 4,680,000 bushels had been received by boat up to 30th June, 1947.

Wheat consumption in Queensland reached a record peak in 1943-44, when 10,643,236 bushels were sold in this State. When this is compared with the 4,845,912 bushels consumed in 1939-40, the full extent of the increase is more apparent. It might at first be thought that this increase could be ascribed solely to the increase in flour supplies necessary to meet the requirements of the Allied Forces then in Queensland; however, an analysis of the following table will reveal that the increase was also due in very large measure to an increase in supplies to the feed trade.

WHEAT CONSUMPTION IN QUEENSLAND, 1939-40 TO 1945-46.

Year.	Milling.	Feed Trade.	Seed.	Sundries.	Total.
(b)	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1939-40	3,843,955	952,550	49,407	(a)	4,845,912
1940-41	4,439,568	969,352	76,185	(a)	5,485,105
1941-42	4,776,533	1,170,165	78,910	(a)	6,025,608
1942-43	5,992,571	1,857,376	81,155	(a)	7,931,102
1943-44	6,794,058	3,722,900	126,278	(a)	10,643,236
1944-45	5,671,124	3,874,011	208,387	61,633	9,815,155
1945-46	5,272,634	2,745,278	127,874	66,412	8,212,198

(a) For these years sundries are included in feed trade.

(b) The year covered is from 1st December to 30th November.

Wheat Industry Stabilisation.—As noted in my last report, because of the continued shortage of grain in the Australian and world markets, a first advance of 4s. 4d. per bushel grower's siding was guaranteed for all bagged wheat delivered to the No. 10 pool.

The following table sets out particulars of licenses issued and acreages licensed for the

seasons 1943-44 to 1946-47 and progressive figures as at 30th June for 1947-48. The Commonwealth Government suspended all bushelage and acreage restrictions under the National Security (Wheat Industry Stabilisation) Regulations for the 1945-46 and 1946-47 seasons. All applications for licenses for wheat planting were granted irrespective of area.

PARTICULARS OF LICENSES AND ACREAGES.

	1943-44.	1944-45.	1945-46.	1946-47.	1947-48.
1. Licenses Issued—					
(a) Original	3,221	3,141	3,013	2,910	2,417
(b) Sharefarming	361	395	430	507	467
(c) Temporary	158	372	781	983	874
Total number licenses issued	3,740	3,908	4,224	4,400	3,758
2. Number of Registered Farms on which Licenses issued—					
(a) Permanent Wheat Farms ..	Not available	Not available	2,993	2,910	2,301
(b) Temporary Wheat Farms ..	Not available	Not available	779	958	857
Total number of registered farms on which licenses issued	Not available	Not available	3,772	3,868	3,158
3. Area licensed for grain (acres)—					
(a) Permanently licensed on Permanent wheat farms	445,891	435,739	385,641	467,782	347,345
(b) Temporarily licensed on Permanent wheat farms	16,043	54,704	67,533	31,987	80,975
Total area licensed on permanent wheat farms	461,934	490,443	453,174	499,769	428,320
(c) Area licensed on temporary wheat farms	12,343	33,193	72,269	118,563	132,302
Total area licensed for grain	474,277	523,636	523,443	618,332	560,622
4. Total area sown for grain ..	296,770	320,507	395,022	179,266 (a)	Not available

(a) Subject to slight revision.

The Commonwealth Parliament has enacted the *Wheat Industry Stabilisation Act*, 1946, the *Wheat Export Charge Act*, 1946, and the *Wheat Tax Act*, 1946, under which Acts it was proposed to administer a "post-war" wheat industry stabilisation plan. However, proposals for the post-war marketing of wheat on a Commonwealth-wide basis are in abeyance following the failure of States other than Queensland and Tasmania to pass the complementary legislation necessary to meet constitutional limitations on Commonwealth powers.

A vote of growers in South Australia rejected the proposed legislation in that State, and as a result of the delays which have occurred from various causes in the implementation of the Commonwealth scheme the question of wheat stabilisation is still a matter for further discussions.

[NOTE. The Premier's Conference held in August, 1947, reaffirmed the need for wheat stabilisation and recommended an early meeting of the Commonwealth and State Ministers of Agriculture for the purpose of working out a plan satisfactory to all Governments and the wheat industry. The conference also recommended that wheatgrowers be given an opportunity to submit their own proposals in writing and to present their views to the Ministers.

In the meantime it is proposed to continue war-time wheat marketing powers for the 1947-48 crop.]

FEED GRAINS DISTRIBUTION.

A Feed Grains Distribution Committee, consisting of representatives of the State Department of Agriculture, the Commonwealth Directorate of Agriculture, the Queensland State Wheat Board and Food Control, with the Director of Marketing as Chairman, was set up early in 1945, with the primary purpose of implementing and administering the Commonwealth Government's plan for the distribution of wheat and other feed grains for stock feeding. This committee functioned until 31st December, 1946.

For the period July to December, 1946, a critical shortage of feeding grains was experienced in Queensland. This was brought about primarily by the disastrous drought, which prevented the growing of fodder crops and severely checked the yields of late summer grain crops such as grain sorghum and maize, thereby increasing the demand for other feed grains. Concurrent with this increased demand, the quota of feed wheat was reduced in Australia in order to permit increased overseas exports of wheat and flour. With the object of replacing the wheat lost to essential feeders by the reduction in feed wheat quotas the Commonwealth Government agreed to make available feed oats from South Australia and Victoria, at a subsidised price of 3s. 3d. per bushel ex wharf Brisbane, with a maximum rail freight concession in Queensland of 4d. per bushel. On 15th November the Commonwealth Prices Commissioner approved of an increase of approximately 6d. per bushel in the selling price of oats of all grades, and the subsidised price as from that date was increased to 3s. 9d. per bushel ex wharf Brisbane.

The committee was charged with the responsibility of allocating these subsidised feed oats to

the various trade channels through which distribution to feeders of dairy cattle, pigs, and poultry was effected.

The last shipment under this arrangement arrived towards the end of November and made the total receipts from 1st July approximately 16,200 tons. This exhausted the oats from the 1945-46 harvest, which had been purchased from growers in southern States by the Commonwealth Government at a guaranteed price of 3s. per bushel. This guarantee continued in operation for the 1946-47 harvest, but, in view of the higher prices ruling, most of the oats went through ordinary channels of trade and were not available for distribution by the Commonwealth Government.

Although these imports of subsidised oats played an important part in assisting dairymen, poultry and pig farmers over a difficult period, the quantity received, which was limited by shipping difficulties, represented only a fraction of the State's feeding grain requirements.

Feeders' difficulties during this period were accentuated by the lag in the delivery of the reduced feed wheat quota. Arrangements had been made for the grain to be imported by rail from New South Wales, but because of a breakdown in rail transport in that State alternative arrangements had to be made for transport by sea, whereupon the same difficulties as were experienced in regard to oats caused further lags in delivery. At times feed wheat quotas were three months behind in deliveries.

Whilst the committee could do little to assist essential feeders who held wheat quotas, apart from constantly urging the responsible authorities to increase quotas and to make available further allocations of shipping space, it was able, by the retention in an emergency pool of a small percentage of deliveries, to make special issues on a month-to-month basis to ex-servicemen who had entered the poultry or pig industries subsequent to 1944 (the year on which wheat quotas were based).

These special issues were undoubtedly the means of assisting many ex-servicemen, who had had no opportunity of establishing a wheat quota, to maintain their position in the industries concerned. On the winding up of the committee, at the end of December, arrangements were made with the State Wheat Board to make provision for the allotment of a regular quota to approved applicants who had been allocated grain under this scheme.

PRODUCTION TREND REPORTS AND FORECASTS.

A monthly production trend and crop-reporting service was initiated during the year by the Production Statistics Officer of the Division, Mr. C. H. P. Defries. The production trend reports, which are in the nature of a general review of prospects for the major rural products, are compiled to a large extent from data supplied by the various Divisions of the Department based upon information secured from field officers.

These reports, which are supplied to farmers' organisations and otherwise disseminated widely to the farming community through the medium of press and radio, have met with a favourable response. There is also a widespread and insistent demand for information of this nature from the many institutions which provide services or

supply commodities to farmers. Government Departments, machinery and fertilizer firms, transport and storage agencies, banks and firms which sell farmers' requirements, produce merchants, seedsmen, case mills, and bag suppliers all find this type of information of great value in the organisation of their business.

The crop-reporting service is confined for a beginning to potatoes, but plans are in hand for its extension in the near future to maize and sorghum. Other crops will be added from time to time as circumstances permit.

The object of the crop-forecasting service is to provide in respect of important agricultural crops authoritative information which would include—

- (1) Details of the acreage farmers intend to plant to the particular crop.
- (2) As soon as practicable after planting, details of the acreage sown and of the conditions at planting time.
- (3) Information concerning the progress of the crop and an estimate of the expected production therefrom.

Great reliance will be placed on honorary crop correspondents and field officers of the Department of Agriculture and Stock for the information necessary to compile these reports. The co-operation will be sought of Commodity Marketing Boards and of other agencies which may be in a position to advise of crop conditions.

It is proposed that in the main the honorary crop correspondents shall be practical farmers who have been recommended by local field officers of the Department of Agriculture.

The first crop to be dealt with in this service was the 1947 autumn potato crop. It is noteworthy that out of 72 growers who were asked to accept appointment as crop correspondents, 56, or 77.8 per cent., have co-operated fully, 9 for various reasons declined appointment, and from only 7 have no replies been received.

Correspondents were asked to complete two forms, one setting out particulars as to plantings, progress, and estimated yields per acre as at 5th April, and the other as at 2nd May. From the encouraging response to these requests it was possible for the Division to issue reports on the progress of the crop, including a detailed analysis of growing conditions in all important centres and estimates of yields on the 18th April and 16th May.

The institution of a forecasting system requires much detailed statistical analysis of previous years' crops, not only in order to obtain the necessary basic data, but also to provide checks to the acceptance of an unduly optimistic or pessimistic estimate of acreage or yield per acre. With the recent additions that have been made to the staff, it has been possible to give work of this nature some attention.

MARKET REPORTING SERVICE.

The Marketing Division has also established a Market Reporting Service covering Brisbane wholesale prices of fruit and vegetables. This service is in the charge of Mr. H. G. Moon, an officer with some years of experience in such work in the Sydney markets. Market price reports are made available daily for the press and radio and for circulation to interested persons, firms and organisations.

OTHER ACTIVITIES.

An amendment to *The Primary Producers' Organisation and Marketing Acts* enacted during the year contained the following provisions:—

- (1) Clarification of the authority of The Northern Pig Marketing Board to control the marketing of pig carcasses in its area, as well as live pigs.
- (2) Clarification of the definition of the territory of The Northern Pig Marketing Board.
- (3) Inclusion of the word "Marketing" in the title of commodity boards having marketing powers.
- (4) Power to enable commodity boards to establish superannuation schemes for the benefit of their employees and dependents.

During the year two new Marketing Boards—The Navy Bean Marketing Board and The Central Queensland Egg Marketing Board—were set up unopposed. Particulars are recorded elsewhere in this report. The proposal for a Central Queensland Pig Marketing Board was defeated. Details of the voting are as follows:—

For the setting up of the Board . . .	319
Against the setting up of the Board	338

A considerable amount of time has been devoted to proposals arising from decisions of the Australian Agricultural Council in connection with the transition from wartime control to organised marketing under peacetime conditions for wheat, eggs, potatoes, and tobacco leaf.

Attention has been given, in co-operation with the Director of Forests and the Committee of Direction of Fruit Marketing, to the problem of fruit case supplies. A scheme was ultimately adopted whereby the Stanthorpe district case millers were guaranteed continuous operation throughout the off season.

Early in 1947 a Wheat Cost of Production Committee was set up by the Commonwealth Government to inquire into the cost of producing wheat in Australia. Evidence prepared by the Production Statistics Officer (Mr. C. H. Defries) outlined the peculiarities of wheat growing in Queensland and made particular reference to the selection of a sample for the compilation of production costs in this State. The basis of selecting a sample as set out in this submission was accepted by the Committee for adoption in Queensland.

A brochure entitled *Empire Preference on Rural Products—What it has meant to Queensland* was compiled by officers of the Marketing Branch. Articles in the *Queensland Agricultural Journal* have included an outline of co-operative marketing in Queensland as well as information on crop forecasting. Notes on marketing subjects are published each month in the Journal.

The reports of the Standards Officer and of the Registrar of Primary Producers' Co-operative Associations are appended.

H. S. HUNTER,
Director of Marketing.

REPORT OF THE STANDARDS BRANCH.

Until 31st December the Staff of the Standards Branch was mainly occupied with the rationing of fertilizers. This function ceased when a quantity of various fertilizer ingredients became available. The normal work of the Branch which had been curtailed during the war years was then resumed.

The following table sets out the work of the year, with comparative figures for the previous two years:—

	1947.					Total.		
	Seeds.	Fertilizers.	Pest De- stroyers.	Veterinary Medicines.	Stock Foods.	1945.	1946.	1947.
Samples received from—								
Inspectors of this Branch	3,029	34	42	1	29	429	950	3,135
Chief Quarantine Officer (Plants) ..	Nil	..	..	..	..	..	1	..
Dealers	1,775	48	173	1	158	1,401	1,798	2,155
Buyers	34	2	2	..	5	42	28	41
Government Departments	631	1	6	..	5	603	1,534	643
For Experimental Tests	261	..	..	..	..	488	838	261
Total samples dealt with	5,730	85	223	2	197	2,963	5,149	6,235
Licenses issued .. .. .	..	258	..	407	..	613	629	665
Registrations effected .. .. .	..	258	224	169	188	322	901	839
Registrations refused .. .. .	..	..	1	15	..	15	25	16
Board meetings and/or Committee meetings	10	..	12	11	..	6	10	33
Number of inspectional visits made to localities other than Brisbane .. ..	..	..	..	..	..	8	..	82
Analyses carried out for this Branch by the Agricultural Chemist .. .. .	..	69	71	..	27	78	29	167
Prosecutions .. .. .	..	..	..	..	..	..	..	..

The 5,730 samples of seed involved 8,525 tests.

SEEDS.

During the year, 5,730 samples were examined at the Seed Testing Station, 3,029 were samples taken by inspectors of the Branch, 78 of these being samples of Navy Beans examined for the Department of Commerce and Agriculture. 1,775 samples were from seed dealers, 34 from farmers, 631 from other Government sources (including 381 from the Vegetable Seeds Committee), and 261 samples for experimental work. The experimental work involved 1,746 tests.

491 extra tests were carried out on Rhodes Grass, *Paspalum dilatatum* and Prairie Grass on account of the seed suffering from lack of maturation. 558 retests were also made.

Of the 5,730 samples examined, 923 samples did not comply with the Regulations because 43 contained *Datura spp.*, 12 *Cuscuta spp.*, 111 excess amount of weed seeds, 143 excess amount of inert matter, 22 were insect infested and 592 failed to germinate up to the prescribed standards.

47 samples contained *Salvia reflexa*, recently included as a prohibited weed in the amended Seed Regulations.

Experiments were carried out on the storage of vegetable seeds in various containers at a high humidity also on soaking and storing tomato seeds and germination tests on *Paspalum scrobiculatum* and *Salvia reflexa*.

In the course of the year 34 farmers who bought seed for their own sowing made use of the free examination test. This small number is regarded as unsatisfactory, for surely more than 34 farmers in the whole of Queensland desire to know something about the seeds for sowing they have purchased. This service is free and enables farmers to obtain information about their purchases and, at the same time, gives the Branch an opportunity of checking up with the seed seller on any seed which is not up to standard. All such checks are made without the grower's name or address being mentioned.

In March, the Seed Regulations were amended in order to bring them into line with the suggested uniform regulations for the whole of Australia and which are the outcome of discussions among the States beginning in November, 1933.

NON-COMPLYING SEEDS FOR SOWING.

Action was taken under supervision in respect of seeds offered for sale as seed for sowing and which did not comply with the standards prescribed because of the following reasons:— Low germination; weevil and other insect infestation; excess of inert matter and weed seeds; containing dodder and datura. Action included destruction when warranted; cleansing; crushing; and diversion to stock food (including bird seed).

The following summary shows a five-yearly comparison of the seeds seized and sealed—awaiting further action—cleaned under supervision of an inspector, destroyed or otherwise disposed of.

	1942-43.	1943-44.	1944-45.	1945-46.	1946-47.
Seized and sealed—					
Vegetable seeds	720 lb.	..	..	360 lb.	..
Farm seeds	4 bags	..	..	305 bags	218 bags
Cleaned under supervision of an inspector—					
Vegetable seeds .. ..	..	..	..	..	..
Farm seeds	134 bags	..	..	..	331 bags
Destroyed—					
Vegetable seeds	1,142 lb.	..	457 lb.	1,662 lb.	1,004 lb.
Farm seeds .. ..	..	..	..	30 lb.	17 bags
Diverted for stock food purposes—					
Vegetable seeds .. ..	..	..	..	..	23 lb.
Farm seeds	107 bags	..	..	..	230 bags
Packet seeds (3d. and 6d.) destroyed	..	..	..	..	6,697 pkts.

6,697 packets of vegetable seeds were destroyed. This large number is because of the fact that many vendors of seeds did not remove from sale packets of seed bearing a time-expired date.

9,530 lb. of miscellaneous vegetable seed, 258 bags Pea seed, 280 bags Sorghum and 5 bags of Rye Grass seed imported from overseas for sowing were examined, also 100 parcels from parcel post.

SEED CERTIFICATION.

An amendment of the *Seeds Act of 1941* provided for the formation of a seed certification committee.

This committee and seed certification sub-committees covering hybrid maize, beans and sorghum have been gazetted.

Regulations covering the production of hybrid maize were gazetted on the 4th October, 1945. In the case of hybrid maize certification, one grower has been approved, and six others have been approved as probationary growers. A probationary period is necessary in the production of hybrid maize, in order to ensure that growers receive adequate instruction in the necessary procedure. The production of enough certified seed to enable it to be placed on the open market is a slow process and it will no doubt be some considerable time before sufficient seed will be available to satisfy demands. The work of producing hybrids is being done at the Queensland Agricultural High School and College, Lawes, in co-operation with the Department.

Twelve seed certification officers have been appointed.

FERTILIZERS.

During the year 258 fertilizers were registered and 258 fertilizer licenses issued. 69 samples of fertilizer were analysed by the Agricultural

Chemist. An increased quantity of fertilizer became available during the year and it was possible to relax rationing. The fertilizer mixtures registered at the beginning of the year have, in the main, resumed normal composition which should give great satisfaction to users.

Supplies of sulphate of ammonia are being made available from the gas works and coke ovens of Australia which have been augmented by the output of nitrogen fixation plants operating in Victoria and New South Wales. This will go towards meeting our large demand for nitrogenous fertilizer from home production. These supplies have had to be supplemented with shipments from the United Kingdom and Canada.

The superphosphate position in Queensland has been placed on a satisfactory footing with the opening of superphosphate works on the river side at Pinkenba, about nine miles from Brisbane. These works are large enough to more than supply all of Queensland's immediate needs. The superphosphate made from Ocean Island and Nauru rock phosphate is back to normal and contains 22 per cent. phosphoric acid, (P_2O_5), of which 20.5 per cent. is water soluble.

The supply of blood and bone (meatworks) and bone dust fertilizer is unfortunately totally inadequate for our needs, and this quantity is being continually reduced owing to the increased manufacture of meat meal and meat and bone meal for use in feeding animals.

During the war period supplies of potash came from Palestine. Since the cessation of hostilities, supplies have been offered from French sources and from Chandler in West Australia. This latter product, sulphate of potash, contains approximately 30 per cent. of potash (K_2O) and it is anticipated that this figure will be improved on in the near future.

The following table sets out the price per ton (2,240 lb.) for which straight fertilizer could be purchased F.O.R. Brisbane for the last ten years.

Name.	1938.		1939.	1940.		1941.
	1st February.	27th July.	11th September.	March.	1st August.	September.
Nitrate of Soda 16 per cent. N. . .	£ s. d. 13 0 0	£ s. d. 13 0 0	£ s. d. 13 0 0	£ s. d. 16 17 6	£ s. d. 16 17 6	£ s. d. 16 12 6b
Sulphate/Ammonia 21 per cent. N.	12 0 0a	12 0 0a	12 11 6a	14 15 6b	16 12 6b	13 0 0b
Superphosphate—						
22 per cent. P ₂ O ₅	5 6 6	5 6 6	5 8 6	5 18 6	6 12 6	6 12 6
18 per cent. P ₂ O ₅ .. ..	..	..	..	..	..	..
Blood	10 15 0	..	11 0 0	11 0 0	11 0 0	11 0 0
Blood and Bone 5/15	7 10 0	7 10 0	7 10 0	7 15 0	7 15 0	7 15 0
Bone 3½/23	7 10 0	7 10 0	7 10 0	7 10 0	7 10 0	7 10 0
Sulphate/Potash 48 per cent. K ₂ O	15 10 0	15 10 0	15 10 0	17 7 6	17 7 6	17 7 6
Muriate/Potash—						
50 per cent. K ₂ O	13 10 0	13 10 0	13 10 0	19 7 6	19 7 6	19 7 6
60 per cent. K ₂ O .. ..	..	..	..	..	..	..

Name.	1942.	1943.	1944.	1945.	1946.	1947.
	22nd September.	1st January.	11th August.	14th September.	March.	January.
Nitrate of Soda 16 per cent. N. . .	£ s. d. 18 10 0c	£ s. d. 18 10 0c	£ s. d. 18 10 0c	£ s. d. 18 10 0c	£ s. d. 18 10 0c	£ s. d. 18 10 0c
Sulphate/Ammonia 21 per cent. N.	13 0 0b	18 10 0b	18 10 0b	18 17 6b	18 17 6b	18 17 6b
Superphosphate—						
22 per cent. P ₂ O ₅	6 19 6	7 19 6	..	..	..	7 4 0c
18 per cent. P ₂ O ₅ .. ..	..	..	6 19 6	6 19 6	6 19 6	6 19 6
Blood	11 0 0	11 0 0	11 0 0	..	..	..
Blood and Bone 5/15	7 15 0	7 15 0	7 15 0	7 15 0	7 15 0	7 15 0
Bone 3½/23	7 10 0	7 10 0	7 10 0	7 10 0	7 10 0	7 10 0
Sulphate/Potash 48 per cent. K ₂ O	21 10 0	21 10 0	..	..	..	..
Muriate/Potash—						
50 per cent. K ₂ O	21 0 0	25 15 0	..	..	..	..
60 per cent. K ₂ O .. ..	..	30 18 0 (Aug. 1943)	30 18 0	30 18 0	30 18 0	30 18 0

a Discount if paid within 30 days, 2½ per cent.

b Less 7s. 6d.

c Less 5s.

Unless otherwise indicated, all prices are nett.

When comparing any of the above prices with those quoted overseas, it is necessary to take into consideration exchange, freights, insurance, and the grade of fertilizer, etc.

Fertilizers as sold in Australia attract several millions of pounds in subsidies paid by the Commonwealth Government to manufacturers or importers otherwise the selling price of all except supplies of organic origin would be much higher.

The maximum prices of mixed fertilizers is ascertained by taking the unit values as set out in the Prices Commissioner's schedule and making a calculation where necessary taking into consideration the degree of fineness, to which should be added per ton, in the case of two ingredients £1 mixing charge, and in the case of three ingredients a mixing charge of 25s. There is also an allowance of 5s. per ton to cover the increased cost of bags.

Any person who desires to make such calculations will be well advised to consult the prices schedule.

It is interesting to note that on the 23rd August, 1918, the maximum price of sulphate of ammonia was fixed at £21 per ton.

PEST DESTROYERS.

In the course of the year 224 pest destroyers were registered and one refused registration; 71 samples analysed by the Agricultural Chemist; and 12 Board meetings held.

D.D.T., an insecticide which was mentioned for the first time in the report for the previous year is now an important factor in the control of agricultural pests; 54 preparations which include this chemical are now registered under the Pest Destroyers Act. The law provides that the active constituents must be indicated on the label of all pest destroyers. This provision has been particularly valuable in the case of D.D.T., for the *para para isomer* has much greater insecticidal action than other *isomers*. Thus the declaration of *para para dichlordiphenyltrichlorethane* as the active constituent has provided a ready means of comparing the various preparations offered for sale.

36 x 10 lb. containers of a dairy preparation containing injurious ingredients were seized.

The registration of so called chemical sterilizers is being considered at length. The main problem is that after the use of such preparations farmers are liable to have a false sense of security, in that they could be under the impression that their equipment had been thoroughly sterilised when in actual fact this may not be the case. A new definition is contemplated under which preparations of this nature will be described as germicides or bactericides.

VETERINARY MEDICINES.

Registrations numbered 169. This small number is explained by the fact that the three-year registration period is nearing its close and

fresh applications for registration will have to be made in January, 1948. Preparations refused registration numbered 15.

The formulae and claims of all preparations mentioned as having been dealt with were reviewed by the Veterinary Medicines Board which held 11 meetings. The number of licenses issued totalled 407, compared with last year's total of 406.

Frequently, organisations placing on the market veterinary medicines and other preparations in the several States complain that because of the variations in the different State laws, they are in a quandary as to how to print their labels. Very often the main difficulty is that the Queensland Veterinary Medicines Board does not permit people to claim that their preparations are "cures" or "specifics" unless they actually are "cures" or "specifics," and the number of preparations coming within such categories is limited.

It is suggested that if the interested parties were concerned with the ultimate effect on their customers' livestock, they would make themselves acquainted with the actual facts relative to the efficacy of their preparations, and where a State insists on the elimination of words such as "cures" and "specifics," they should realize that they are making exaggerated statements which not only cannot be substantiated, but are misleading to the general public.

PEST DESTROYER AND VETERINARY MEDICINE BOARDS.

A revised list of resolutions by both Boards, of which copies are available from the Registrar, has been issued which sets out 54 rulings with reference to the use of various words and expressions and relevant matters appearing on labels and in advertising matter. These have been circulated to kindred boards within the Commonwealth, and will, no doubt, help to ensure a greater degree of uniformity among the States.

Experience indicates the need for the consolidation of the two Boards in order to eliminate overlapping.

STOCK FOODS.

Registrations numbered 188, compared with the previous year's total of 157. Samples were analysed by the Agricultural Chemist. The number of manufacturers of poultry mashes is increasing and most are providing a range of mashes such as chicken mash, growing mash and laying mash. An effort is being made by one manufacturer to place on the market poultry mashes equal in crude protein quality to pre-war standard. Plentiful supplies of sorghum ground as a meal also have been available for inclusion in the mixtures.

A regular supply of good quality grains and concentrates is necessary as fundamental in the provision of uniformly mixed foods for use in the feeding of poultry and other live stock. This unfortunately is not available yet, and many preparations of inferior quality are on the market. Until supplies are back to normal it is not practicable to do much to raise the standard of the poultry mashes offered for sale.

This applies particularly to the shortage of protein concentrates. The increase in production of meat meal, meat-and-bone meals, which

occurred during the war period was not maintained because of the diminished number of killings as a result of the protracted dry season.

Supplies of linseed meal are negligible. Copra cake is a thing of the past. Cotton seed and peanut meals are practically unobtainable.

The need for increasing protein concentrate supplies cannot be too strongly emphasised, as the shortage is having a very serious effect on the live stock of the State.

CORNFLOUR WASTE MATERIAL.

In the process of manufacturing cornflour, a waste material is produced which is fed to cows and pigs. This waste material contains an excessive amount of water, and if it is packed in jute bags a continual draining away of this moisture takes place. The residue of solids can then be fed satisfactorily to dairy cows. Because of the shortage of bags the material was placed in water tight drums with lids and the feeding of this material was alleged to cause the development of a very objectionable taint of the milk. As a result of experiments by the Branch in co-operation with the Division of Dairying, it was found that the only satisfactory way in which this material could be handled was to ensure that the excess water could drain away, and in no circumstances should the material be stored or transported in any container which prevents or retards water drainage.

ITINERANT VENDORS.

Itinerant vending of veterinary medicines is a real problem in effective administration of the relevant legislation. The tactics of itinerant vendors are usually well thought out and make it very difficult to bring a case against them. Unfortunately, many unsuspecting buyers succumb to plausible sales talk and vendors have usually a ready answer for any questions relating to the quality and efficacy of their preparations for which fantastic claims are often made, particularly in respect of vaginitis, mammitis, contagious abortion and other stock diseases. The materials are sold in bottles not labelled in accordance with statutory requirements. Directions for use are invariably given verbally or written on a plain piece of paper. Payment is demanded in cash or open cheque and receipts are never tendered. The difficulty in apprehending these vendors is most acute and action is often impeded through lack of co-operation of the farming community.

It is difficult to understand why, with so many registered medicines prepared by reputable firms with considerable scientific backing available, some farmers still persist in buying quack remedies. Most stockowners, however, are not only willing but anxious to assist the Department in its efforts to prevent the sale of useless concoctions.

With the assistance of the Records Branch of the Department, a ceaseless watch is kept on all advertisements in Queensland publications of commodities coming within the scope of the laws administered by the Standards Branch. Consequently, it has been possible to note breaches of the laws by the sale of unregistered preparations and some of which registration had been refused.

F. B. COLEMAN, Standards Officer,

REPORT OF THE REGISTRAR OF PRIMARY PRODUCERS' CO-OPERATIVE ASSOCIATIONS.

Since the inauguration of the original legislation in 1923, 218 associations and 2 federations have been registered under *The Primary Producers' Co-operative Associations Acts, 1923 to 1934*. Allowing for the winding up of 22 associations since the *Acts* came into operation, 196 associations and two federations remain on the register.

Three new associations were registered in the course of the year, namely:—

The Co-operative Farming Association Limited,

Dundowran Fruit Growers' Co-operative Association Limited,

South Coast Co-operative Dairy Association Limited.

Licensed auditors now number 256, an increase of 6 for the year.

It is provided under the *Primary Producers' Co-operative Associations Acts* that no corporation may use the word "co-operative" as part of its name or engage in trading activities associated with agricultural products unless it is registered as a co-operative association, or is granted exemption from these provisions of the *Acts*.

However, in 1946, the *Co-operative Societies Act*, which provides mainly for the registration of consumers' co-operatives, was enacted, and societies registered under this new measure may now use the word "co-operative" without having to obtain exemption from the provisions of the *Primary Producers' Co-operative Associations Acts*.

A. J. EVERIST,

Registrar of Primary Producers' Co-operative Associations.

REPORT OF THE SPECIAL ADMINISTRATION OFFICER.

FODDER CONSERVATION.

In January, 1947, the Hon. the Minister appointed a Departmental Fodder Conservation Committee comprising Messrs. A. F. Bell (Under Secretary) Chairman, C. J. McKeon (Director of Agriculture), M. White (Agricultural Chemist), E. B. Rice (Director of Dairying), and H. Barnes (Special Administration Officer) executive member. Mr. J. F. F. Reid (Editor of Publications) was subsequently co-opted.

The committee included in its field of operations (a) publicity and education on matters associated with fodder storage, (b) the supply of equipment and materials for the construction of silos, and (c) the importation of modern fodder-harvesting machinery for testing purposes in collaboration with the Commonwealth Government.

One of the first tasks of the committee was to compile a series of important facts relating to fodder storage for the guidance of field officers of the Agricultural and Dairy Branches and these were distributed to them with instructions to stress the importance of conservation on all occasions.

A pamphlet, *The Case for Fodder Conservation*, was prepared for publication and distribution to every dairy farmer in the State.

Wireless talks were arranged and paragraphs published in various newspapers and periodicals. Field days were held at a number of centres, including Warwick, Monto, and Mackay.

The Government has made a material contribution to the cause of fodder conservation by the provision of equipment for the construction of silos. This equipment is available for the free use of farmers, freight paid to and from the nearest railway station.

To enable farmers to build their own silos cheaply and avoid the necessity for having to seek hired labour, the services of an experienced officer were made available to them to superintend the laying of foundations and advise on

preliminary constructional details. Furthermore, to facilitate construction a modern system of building has been introduced, and by means of jacks attached to the moulds it is now possible to complete a concrete silo in one week compared with up to three weeks previously.

It was found that material shortages prevented many farmers from carrying out their plans to build silos. To assist them further, the Government purchased a substantial quantity of steel reinforcement from the Disposals Commission and a small amount of corrugated galvanised iron for roofing. These materials were made available at cost. Arrangements also were made with the Department of the Co-ordinator-General of Public Works for a special allocation of cement for silo building, and by this means silo builders have been assured of early delivery of cement.

In the six months of its existence the committee has enabled farmers to complete the erection of 34 silos. Several more are under construction, while numerous inquiries have been made regarding the facilities available for silo building.

Unfortunately, the scarcity of roofing materials has prevented many farmers from carrying out their intentions to erect sheds for the storage of baled hay, and this has retarded the drive for greater conservation of this type of fodder.

An analysis of the State position revealed that many farmers were prevented from storing fodder because of the shortage of labour for harvesting crops. This problem could be largely overcome by the use of modern fodder-harvesting machines which reduce the labour required to a minimum. As the machines are costly, and it would not be practicable or economic for every farmer to possess a machine of his own, it is planned accordingly to foster the formation of groups of farmers to purchase and operate machines for their joint benefit.

At a conference of representatives of dairying organizations convened by the Minister the problem of labour shortage which prevented farmers from storing fodder was considered. The conference emphasised the importance of introducing all the harvesting machinery possible and its use on a co-operative basis.

AGRICULTURAL RE-ESTABLISHMENT ALLOWANCES.

On the 1st July, 1946, the Department of Agriculture and Stock took over from the Deputy Commissioner for Repatriation the duties connected with the payment of agricultural allowances under the *Commonwealth Re-establishment and Employment Act of 1945*. This legislation provides for the payment of living allowances to eligible discharged members of the Forces who desire to establish or re-establish themselves in an agricultural occupation, either on their own account or as an active member of a partnership, as a share farmer, or contract worker.

(REPORT OF THE EDITOR OF PUBLICATIONS.

An extensive departmental information service was continued throughout the year. Publications, the public press, and radio services were the chief channels of communication.

The Queensland Agricultural Journal.—The *Journal* was first published in July, 1897. Its publication continued without a break until December, 1941, when, because of the war situation at the time, it was temporarily suspended. Publication was resumed in July, 1943. The *Journal* has, therefore, served the land industries of Queensland for practically half a century.

History is seldom recorded at the time it is made. Institutions and movements are usually built up slowly from small beginnings and with uncertain objectives. With a magazine, however, its history is recorded in its bound volumes. From the volumes of the *Queensland Agricultural Journal*, numbering nearly 100, it is possible to see in correct perspective the extent of its services and evaluate its influence on the development of agriculture and stock-raising in this State.

In its initial number the purpose of the *Journal* was adequately expressed. It was to be essentially utilitarian in character as a vehicle of current technical and matter-of-fact information on farming problems and practice. The aim of the Department was to issue a publication of all-round value to the agricultural and pastoral industries of Queensland. Reviewing its monthly issues for the past fifty years, that aim, it is believed, has been accomplished. During all those years, as agriculture was developing into a complex industry, showing at each step the direct influence of science, the *Journal* has been a medium for the dissemination of knowledge newly gained by investigation, invention, and improvement in farming practice in an easily readable and assimilable form.

The *Journal* originated from a series of official pamphlets called *Papers for the People*, which dealt with different branches of primary

In the course of the year ended 30th June, 1947, the following applications for the allowance were received:—

	Qld.	Cwth.
Applications received ..	1,473	(7,771)
Applications approved ..	1,099	(5,977)
Applications rejected or withdrawn	204	(1,038)
Applications not yet finalised	170	(756)
Total amount of allowance paid	£142,301	(£706,639)

(Note.—Commonwealth totals are shown in parentheses.)

The average number of applications received each month is still being maintained, and as an ex-Serviceman is entitled to make application at any time up to five years from the date of his discharge it is apparent that payments will continue for several years.

A staff of nine officers is employed on administration of these allowances, the expenses in connection with which are defrayed by the Commonwealth Government.

H. BARNES,
Special Administration Officer.

production. Later, it was decided to publish a more authoritative series of departmental bulletins. On the establishment of the Department of Agriculture and Stock as a separate ministerial office in 1897, the need of a regular monthly publication was recognized and so the *Journal* came into being. The first editor was my predecessor, the late Major A. J. Boyd, F.R.G.S. (Q.), who continued in the editorial chair until May, 1921.

Advances in the science, practice, and extension of agriculture and animal husbandry in the past fifty years are recorded in *Journal* volumes, which also contain much of the history of the Department and, therefore, of rural industry in Queensland.

The standard set in the early years of the *Queensland Agricultural Journal* by its first editor has never been relaxed. This in itself is evidence of the close collaboration which exists among all those officers of the Department whose interest in and contributions to the *Journal* make it what it is to-day. Regular contributions by officers of the research and field staffs have assured the value of the *Journal* as a link between the Department and every branch of rural industry. Its circulation has been maintained at an annual aggregate distribution of about 115,000 copies.

The Queensland Journal of Agricultural Science.—As a scientific publication, this quarterly continued its useful service under the editorship of Mr. C. W. Winders. Technical papers contributed by officers of the several Divisions are published in the *Journal*, which is circulated among scientific institutions throughout the world.

Bulletin Service.—Considerable additions were made to the bulletin, pamphlet, and advisory leaflet series of publications in the course of the year.

Rural Broadcasts.—Through the co-operation of the Australian Broadcasting Commission, regular broadcast talks on matters of current importance to primary producers were continued

from National and associated Regional Radio Stations. The "Country Hour" broadcasts by departmental officers are a popular institution, judging by the volume of correspondence received from country listeners. In addition, from time to time, broadcasts were delivered by technical officers over the A.B.C. national network system. This form of departmental extension work is proving very effective in its scope for discussion on a diversity of subjects relative to current farming practice and problems.

Photographic Section.—The Photographic Section had another busy year. In addition to routine activities, the services of this Section were made available, as required, to other public departments. The demand for prints for illustrating descriptive press articles remained constant.

Central Library.—Many important publications, including new text-books, were added to the Central Library, which now contains a comprehensive and valuable collection of literature relating to the land industries. In exchange for departmental publications, particularly the monthly and quarterly *Journals*, the Central Library is kept supplied with contemporary literature from other Australian States and from other countries. Through an accession list, which is circulated monthly, all concerned are kept

informed of the availability of the latest literature on the results of research and cognate matters. This list is especially useful to country officers, for whom a regular circulation system has been instituted.

General Information Service.—Conditions of land settlement in Queensland and rural prospects generally were the subjects of numerous requests in compliance with which the knowledge and experience of divisional advisers proved invaluable. Practical notes of seasonal and educational value, and recommendations in respect of specific remedies and their application, have been disseminated regularly in the form of agricultural news. In addition, numerous special articles on farming and related subjects, also material for press contributors and other writers, have been supplied as required. This material included illustrations, as well as authoritative information on the status, progress and prospects of rural industry in Queensland. An important aspect of this service is the assurance of authenticity, accuracy, and suitability of articles eventually published. Other information on the general agricultural situation from time to time has been prepared and circulated through appropriate channels.

J. F. F. REID,
Editor of Publications.

