

1942.
NEW ZEALAND.

DEPARTMENT OF AGRICULTURE.

ANNUAL REPORT FOR 1941-42.

Presented to both Houses of the General Assembly by Command of His Excellency.

Office of Minister of Agriculture,
Wellington, New Zealand, 17th March, 1943.

DEAR SIR,—

I have the honour to forward herewith for your Excellency's information the report of the Department of Agriculture for the financial year ended 31st March, 1942.

This report provides a summary of the principal farming activities of the year and briefly outlines the comprehensive and numerous functions of the Department in its work of maintaining and fostering the growth of the rural industries.

Another year of New Zealand at war has passed, and farmers continue to render outstanding service in supporting the production policy of the Government. The anticipation that we would be unable to ship much of our primary produce was not realized, and we must consider ourselves fortunate in this matter.

Labour problems in farm industry have been difficult, but farmers are to be complimented on the excellent production maintained under present-day conditions.

The National Council of Primary Production, District Councils, and producer organizations have been most helpful in keeping up production and arranging the requirements of various farm commodities.

The accompanying statement by the Director-General of Agriculture and the reports of the Directors of the various Divisions of the Department cover a wide range of subjects.

Plans have been formulated for the approaching season's primary production, and every possible assistance will be given to the farmer in his task of providing New Zealand's share in the requirements of the Allied nations.

I have, &c.,

J. G. BARCLAY,

Minister of Agriculture.

His Excellency the Governor-General.

ANNUAL REPORT OF DIRECTOR-GENERAL.

FARMERS and all others associated with the agricultural and pastoral production of the Dominion have given of their utmost during the past year towards the fulfilment of the Government's agricultural programme. This has not been achieved without considerable difficulty. The problems of labour, shortage of much farm equipment and material, restricted transport, and other difficulties resulting from the war have all been faced and overcome in a spirit of cheerful co-operation.

The carrying-on of the work of the Department to the extent desired has been made difficult by the calling-up of staff for military duties and the restriction on travelling due to petrol rationing. Nevertheless, every endeavour has been made to maintain the Department's wartime work and essential services to the farming community. In particular, all activities relative to the war effort have received special attention.

The wartime planning of agricultural production is no easy task, and grateful appreciation is expressed for the valuable assistance rendered by the National Council of Primary Production, the District Councils, and all producer organizations. The work of these bodies, and of individual members, has done much towards assisting the farmer in his problems and the Government in carrying out its production programme. Particularly has the services of these various organizations proved invaluable in the important matter of farm labour and the apportioning of available farm equipment and supplies.

War conditions have raised difficulties in the supply of fertilizers, necessitating the introduction of rationing, and this system has worked remarkably well. However, prevailing conditions may enforce more stringent rationing in the future.

The policy of the Government is to fulfil, as near as possible, the war requirements of the Allied nations, and the aim of the Department of Agriculture is to assist farmers by every possible means to achieve this object. To this end all the resources of the Department and the services of its officers will be fully extended.

The annual reports of the various Divisions indicate the extensive activities of the Department. Officers have willingly accepted additional duties, recognizing that no effort is too great in this time of national emergency.

A. H. COCKAYNE, Director-General.

ACCOUNTS DIVISION.

REPORT OF L. C. SCOTT, ACCOUNTANT.

Net expenditure for 1941-42 was estimated to require £2,071,122, an increase of £413,948 on the 1940-41 estimated requirement. This was due mainly to the subsidy provision for raw materials to be used in superphosphate-manufacture. The year has been cleared with a net expenditure of £1,880,432, a saving of £190,690. Briefly, this saving is due to delivery of some supplies on order being delayed, conservative usage of available supplies, and a continuation of the preceding year's satisfactory buoyancy in credits. The receipts, from fees based on butterfat output and from sales of farm and station production, are a gratifying indication of the inherent productive capacity of the Dominion.

Undiminished demands for essential advisory aids to agricultural industry have been met, particularly in directions such as seed, cheese, and linen-flax production. Inspectional services to control quality in produce for sale and to ensure healthy conditions in crop and animal life have been maintained to the fullest practical extent. Advisory and inspectional services have also absorbed much of the intangible expense arising not only from conservation in the usage of available essential supplies (particularly fertilizers), but also from expansion in productions (such as cheese, certain seeds, and commodities of medicinal value derived from plants and seeds).

A summary of the vote, with 1940-41 figures in parentheses for comparative purposes, is given below:—

	Expenditure appropriated.		Paid out.		Revenue appropriated.		Received.	
	£	£	£	£	£	£	£	£
Administrative services ..	550,132	(531,553)	513,960	(523,887)	126,635	(116,510)	148,690	(138,163)
Payments under statute ..	108,500	(105,500)	103,131	(102,916)	750	(2,500)	1,284	(1,437)
Miscellaneous advances, &c.	1,562,185	(1,155,641)	1,435,406	(1,148,640)	22,310	(19,510)	22,091	(23,859)
Totals	2,220,817	(1,795,694)	2,052,497	(1,775,443)	149,695	(138,520)	172,065	(163,459)
Less credits-in-aid	149,695		172,065					
Net totals	2,071,122		1,880,432					

Other financial transactions which have received the direct attention of the Department have involved payments and receipts totalling over £500,000. The payments have related to matters such as cool storage, meat-canning, change-over to cheese, medicinal plants, and ergot. The receipts have been in respect to various Acts and deposits. Indirectly there has been association with considerable expenditure for cool-storage and cheese-production purposes directly attended to by other Departments.

LIVE-STOCK DIVISION.

REPORT OF W. C. BARRY, DIRECTOR.

The past year has not been particularly favourable from a production point of view. Although normal conditions prevailed at lambing and calving time, the spring and early summer months were rather cold and wet for maximum dairy production. The undue amount of wet and dull weather in many parts of the Wellington district also retarded production, although there is abundance of feed for the coming winter. In the South Island some heavy snow was experienced last winter, and losses of ewes were unavoidable in Canterbury. Lambs have done well again this season in Canterbury, and there is an abundance of feed with good root crops. Losses of stock from disease or parasitic trouble have not been serious.

HEALTH OF LIVE-STOCK.

Horses.—No serious outbreak of disease has occurred to mar the season's breeding and production. Horses have remained healthy. The subsidy provided under the Remounts Encouragement Act was granted to thirty-nine stallions stationed at convenient centres.

Cattle and Sheep.—No serious disease was reported, and the occurrence of scheduled diseases was dealt with under the Stock Act.

CATTLE.

Scheduled Diseases under the Stock Act.

Tuberculosis.—The number of cattle condemned under the Stock Act for tuberculosis during the year amounted to 5,237 head, 4,855 being condemned on clinical symptoms and 382 reactors to the tuberculin test. The tuberculin test was applied to 9,664 cattle, of which number 382 reacted, giving a percentage of 3.9. At the owner's request 8,155 cattle were tested.

Actinomycosis and Actinobacillosis.—During the year 596 animals were condemned for this disease, and a large number of affected animals were successfully treated.

Malignant Growths.—The number of animals condemned for malignant growths was 260, compensation being paid in accordance with the Stock Act.

Anthrax.—No cases of anthrax have occurred on the two farms in the Bombay district, where the disease was recorded last year. Control measures by vaccination of all stock on these properties is being carried out.

Blackleg. The number of calves vaccinated against this disease in Taranaki was 15,124 and Auckland 31,922, making a total of 47,046. In the Auckland district there were 291 outbreaks, as compared with 292 last year.

Johnes Disease.—Animals affected with this disease have been condemned on a clinical examination. Thirty-five animals have thus been dealt with in the Taranaki district, as compared with twenty-nine last year. Some new farms have been shown to have infected animals.

Non-scheduled Diseases.

Grass Staggers in Cows (Grass Tetany).—Last spring some fairly severe losses occurred. The disease attacked herds of the beef breeds as well as dairy herds, and is being recorded in some districts where it was practically unknown in former years.

Parasitic Disease in Young Cattle.—Parasitic bronchitis and parasitic gastro-enteritis of young stock continue to be reported in the main dairying centres. The change-over from butter to cheese manufacture will no doubt militate against the rearing of calves, many owners preferring the use of skim-milk to whey for calf-rearing.

SHEEP.

Pregnancy Toxæmia (Ante-partum Paralysis) in Ewes.—In the South Island, owing to a severe winter and late spring, a considerable amount of pregnancy toxæmia in ewes was seen in the districts thus affected. Entero-toxæmia in young lambs continues to be well controlled by the use of ewe vaccination, which is now extensively practised on Otago and Southland farms.

Epizootic Icterus.—Apart from a rather heavy loss of sheep due to *Epizootic icterus* in the Te Kuiti and Te Awamutu districts, no serious mortalities of sheep have taken place during the year.

PIGS.

The incidence of disease in pigs remains at about the same level as formerly.

Swinepest Infection.—This disease continues to be the cause of a considerable amount of sickness in pigs, followed by losses on many farms.

Stephanurus Dentatus (Kidney Worm of the Pig).—The finding at time of slaughter of further instances of pigs affected with this disease led to the location of the farm of origin. An amendment to the Stock Regulations was introduced during the year with the view of controlling the further possible introduction of this parasitic disease of pigs from Australia.

Swine Husbandry.

The report of Mr. M. J. Scott, Superintendent of the Pig Industry, is submitted herewith:—

"The year just finished has been one of further adjustment to pig-production. Following the instructions received early in the year that no more bacon was to be exported, advice was first received that 5,000 tons of bacon, and later, 11,000 tons, would be accepted by Great Britain. This later advice, accompanied by permission to include porkers for shipment along with other meats, made normal production reasonably possible. This year's killings, 998,172, exceeded last year by 16,000, but the weight of pig-meat killed decreased by about 4,700 tons, this balance being struck on a decrease of 10,400 tons of baconers and choppers and an increase of 5,700 tons of porkers.

"The grading of baconers has been maintained at about the same level as last year. There has been a big reduction in the number of pedigree sows recorded, and a general disinterest in the other pig-improvement schemes that were in operation. Arising from the increase of the levy on pigs killed from 2d. to 3d. per head, the District Pig Councils are now financially independent, and have maintained their advisory service where possible."

MEAT INSPECTION AND SLAUGHTER OF STOCK.

The standard of inspection of all meat and meat products has been maintained throughout the year, although the reduction of trained personnel necessitated some war-time replacements.

The numbers of stock slaughtered at meat export slaughterhouses were: Sheep, 3,078,956; lambs, 11,095,784; cattle, 384,729; calves, 984,539; swine, 775,057; and, at abattoirs, sheep, 763,844; lambs 152,537; cattle, 173,106; calves, 51,546; swine, 177,984.

IMPORTATION OF STOCK.

The following stock were imported during the year: Cattle, 21; sheep, 203; pigs, 1; horses, 7 (not including the movement of thoroughbreds between here and Australia). Of the above animals the following were placed in quarantine for the respective periods required: Cattle, 21; pigs, 1.

EXPORTATION OF STOCK.

During the year the following animals were exported: Cattle, 22; sheep, 5,217; pigs, 3; horses, 31. The horse item includes the movement of thoroughbred horses to Australia.

DAIRY INSPECTION.

The supervision of the production of milk from registered dairy premises for town-supply purposes has been maintained. Labour shortage on many farms is a factor of serious importance in maintaining a high standard of production on the farm. The supervision of the milk-supply to Air Force and Army camps has also been undertaken in several centres at the request of the Marketing Department.

The dry autumn season in the Auckland district reduced production from the herds considerably, and other sources of supply had to be found to meet the emergency. In other districts it is apparent that some difficulty is going to be experienced in maintaining the normal winter milk supply, especially to towns in the vicinity of which military and other camps are established.

POULTRY.

Mr. F. C. Bobby, Superintendent of Poultry Husbandry, comments as follows:

"The poultry industry has been seriously affected by the war situation. Shortage of labour, difficulties in obtaining food-supplies, and increased cost of production have been among the major difficulties. A number of poultry-farms have been closed down, due to the owners being called for military service, while many commercial poultry-keepers, through labour shortage, have reduced the number of birds kept. This has led to an acute shortage of eggs, since the demand by the public and military forces has increased rather than decreased. Egg-prices have been controlled, and have remained substantially the same as for 1939, despite the rising cost of production."

WOOL.

Mr. J. P. E. Duncan, Wool Supervisor, submits the following:—

"There has been no marked change in the state of the wool industry. The Appraisal Scheme continues to function smoothly and efficiently, and farmers and brokers are reasonably well satisfied. The farmer is receiving what is in effect a guaranteed price for his wool for the duration of the war and one season thereafter, and he is in the singularly fortunate position that he will be paid for his clip whether it is shipped or not.

"Although New Zealand's total production of wool for the 1940-41 season was an all-time record of 331,500,000 lb., the production for last season may well equal or even exceed this figure if present indications are fulfilled. The wool was longer and better grown. Many clips were also coarser in quality, and sometimes heavier in condition, due no doubt to the favourable season with abundant feed, and style and character were good. Preparation of the clip was not up to the previous year's standard, in spite of the marked premium for well-skirted wools. The reason was probably increasing labour difficulties."

RABBIT NUISANCE.

In the South Island climatic conditions favoured an increase in the rabbit pest, which, added to the prevailing shortage of labour, increased difficulties in control. Nevertheless, the subsidy on wages provided by the National Service Department (Employment Division) for men employed on rabbit-destruction during the late spring and summer greatly assisted in rabbit-destruction work during this important period.

The position in the Otago district is giving some concern, labour difficulties and shortage of rabbit poisons contributing to the spread of the pest. Ways and means of dealing with the position are under consideration.

NOXIOUS WEEDS.

Government assistance to local bodies in controlling noxious weeds, particularly ragwort, was continued, and, in spite of labour difficulties and definite shortage of chemical weed-killers, good work was done in maintaining control. Allocations amounting to £36,650 to cover wages and material costs were made. After deducting recoveries from farmers the net cost was £23,988.

As a substitute for sodium chlorate and atlacide, coarse salt has been used in several districts with excellent results.

ANIMAL RESEARCH DIVISION.

REPORT OF J. F. FILMER, DIRECTOR.

The work of the Animal Research Division has had to be considerably curtailed due to staff shortage. Part of the time of some of our staff is already being devoted to problems arising from the war, which are not always directly associated with animal research, and it is certain that this will increase. It is hoped, however, that it will be possible to continue work on some of the projects of greatest economic importance to the animal industries of New Zealand.

DIAGNOSTIC WORK AT WALLACEVILLE.

The diagnostic section of the Animal Research Station, Wallaceville, continues to render valuable service, and during the year a large number of specimens have been submitted by officers of the Live-stock Division for pathological, bacteriological, and chemical examination.

RESEARCH WORK.

Facial Eczema and Photosensitization.—A fairly widespread outbreak of short duration occurred in the Gisborne district early in April, 1942, but the percentage of sheep affected was not high and many of the cases were not very seriously affected. A number of small, scattered outbreaks were also reported in the Waikato.

Grazing Trials.—Unfortunately, chemical difficulties were encountered in the preparation of suitable extracts from pasture collected during last year's outbreak, and this prevented any further advance in the discovery of the liver toxin. No clinical cases occurred this year in the paddocks from which pasture was being collected, but considerable experience has been gained in the methods of preservation and the chemical fractionation of pasture.

Pathology.—Further study of liver pathology has been made. The bile ducts and veins of livers from animals affected with facial eczema and other forms of photosensitization have been injected with celloidin, and the surrounding tissue digested away so that the effect of the diseases on the size and distribution of these vessels can be studied.

Alkaloids in Rye-grass.—Further investigations of these interesting compounds have been conducted with a view to determining their significance in plant physiology and their possible effect on the health of grazing animals. Although no evidence has been obtained which would incriminate them as the cause of any important stock troubles, it is essential that the significance of any unusual substance in prominent pasture species should be understood, and the investigations are proceeding with this end in view.

Photosensitization other than Facial Eczema.—An area of St. John's wort has been established at Wallaceville to assist in the study of the disease caused by this plant. It has been experimentally shown that ngaio can cause photosensitization associated with liver damage. It is, of course, not suggested that this is the cause of facial eczema.

A series of papers by officers of this Division and of the Department of Scientific and Industrial Research, dealing with the investigations into facial eczema, have been prepared for publication in the *New Zealand Journal of Science and Technology*.

Sheep Mortality, Canterbury.—The work in Canterbury has been continued and further valuable data have been obtained concerning problems of sheep husbandry. Although a considerable amount of rain fell during the late summer and early autumn, no unusual mortality was experienced either on the experimental farm or in the district generally.

Mastitis.—The milking-machine experiments at Wallaceville and the segregation experiments at Ruakura have been continued. Experimental treatment has included the study of colloidal silver preparation reported on favourably in America, which has been shown to have some value in the treatment of chronic streptococcal mastitis, but it is doubtful if it will prove more effective than the antiseptic dye preparations which are already in use.

Milking-machine Research at Wallaceville.—This work has been actively continued. Manufacturers of milking-machines are making use of the laboratory's facilities, discussing their problems with the research officer and submitting experimental accessories for trial before marketing. The rubber shortage has led to an intensive study of milking-machine rubberware, and it has been possible to make recommendations on which emergency standards have been based, which is it believed will result in a twenty-five per cent. saving of rubber without any material loss of efficiency.

Investigation of Non-stripping. The shortage of farm labour has resulted in a further marked increase in the number of dairy-farmers abandoning stripping. In collaboration with the New Zealand Dairy Board, a careful examination was made of a number of dairy herds in which stripping had not been practised for periods of up to twenty-five years. The investigations indicated that, provided the milking-machine is kept in good condition and reasonable care is exercised in milking the cows, the abandonment of stripping does not result in any significant decline in production or increase in mastitis. A full account of the investigation was published in the *Journal of Agriculture*. The controlled experiments at Ruakura are being continued.

Semen-testing Service.—This work was again carried on at Ruakura, and samples were submitted from seventy-eight bulls, of which eight proved to be sterile, while a further fourteen were of low fertility.

Artificial Insemination.—Artificial insemination was again used entirely in one herd at Ruakura, and further valuable data have been acquired concerning technique. Two bulls were used and the cows were divided into three groups to test different methods of insemination.

Conceptions resulted from 61 per cent. of the inseminations from one bull, and from 53 per cent. from the other; eight cows out of one hundred and four remained empty. It is now certain that the use of proven sires can be widely extended in New Zealand by means of artificial insemination as soon as suitable organization can be provided.

Contagious Abortion.—After a year's experience in handling the cultures and studying the effect of vaccination with the best strains of the contagious abortion organism obtained from overseas, some four hundred heifer calves were vaccinated this year. If staff and travelling facilities are available it is hoped to extend this work next season to a further number of herds in which serious trouble is experienced from contagious abortion.

Toxæmic Jaundice of Sheep.—An experiment has been commenced on a property in which this disease causes serious mortality, and regular observations are being made to determine the factors concerned in its development.

Parasitology.—The effect on lambs of pure infestations with *Ostertagia* and *Trichostrongylus* have been studied at Wallaceville. The comparative response to internal parasites of some of the commoner crossbred lambs is being studied in Canterbury. A survey of the seasonal incidence of parasites in lambs and calves, and a study of the best methods of control, is being made in several districts.

Nutrition Experiments at Ruakura.—The experiments dealing with the nutrition of dairy cows, calves, beef cattle, and pigs have been actively continued, and some of the results have been reported in the *Journal of Agriculture* and the *New Zealand Journal of Science and Technology*.

Cobalt Deficiency.—The shortage in superphosphate made it necessary to seek for substitutes for cobaltized super. Experiments have shown that the cobalt status of pasture can be satisfactorily maintained when 6 oz. of cobalt sulphate per acre is applied annually, mixed with lime, lime and super, serpentine super, sand, or dissolved in water. All of these treatments give results comparable with those obtained from cobaltized super.

Miscellaneous.—The study of fish-liver oils, bone-diseases, poison plants, and zinc poisoning in pigs have been continued.

FIELDS DIVISION.

REPORT OF R. B. TENNENT, DIRECTOR.

An excellent production year has been experienced, the climatic conditions for the year ended 31st March, 1942, being in most localities good for grass and crops. In several areas, particularly Central Hawke's Bay and Central Otago, dry periods were experienced which seriously checked growth, and in the main agricultural districts of the South Island wet conditions in early autumn resulted in delayed harvests.

ARABLE CROPS.

Wheat.—The increased acreage sown in wheat during 1940 made possible the reduction of importations during the calendar year 1941 to approximately 1,000,000 bushels. However, the acreage was scarcely maintained for 1941-42 season, and, although the yield in most districts has been above the average, the total production is still below Dominion requirements. An intensive drive has been made in all the recognized wheatgrowing areas for an increased acreage to be sown in 1942, aiming if possible at 350,000 acres, which would be more than sufficient for all domestic requirements.

Oats.—The acreage sown in oats for 1941-42 season was approximately 20 per cent. below that of the previous year, but this was offset to a considerable extent by the better yields recorded in most districts. On account of the war situation, oat-millers were asked to produce substantial requirements of oatmeal for export, and it is expected that this production will continue to be necessary for the duration of the war.

Malting Barley.—The acreage sown in barley continues to increase, contracts for malting barley being approximately 50 per cent. greater than in the 1939-40 season, and it is expected that the crops harvested this year will be sufficient for a full year's malting requirements.

Maize.—As the result of the activities of Production Councils in Poverty Bay and Bay of Plenty districts, a large increase was recorded in the acreage sown in maize for harvest in 1941. The yield was substantially above the average in both districts, the supply of this grain proving more than sufficient for local demands. The area sown in 1941 showed some reduction on that of the previous year, and late frosts, followed by unfavourable growing conditions, have reduced the yield. The 1942 crop will probably be 40 per cent. lower than the 1941 crop.

Potatoes.—In the main potato-growing areas both the acreage planted and the yield were below that of 1940, with the result that prices advanced very sharply and reached phenomenally high levels before the end of the main-crop season. New potato crops in the North Island were both late and low in yield, and the high prices were maintained until February, 1942. The acreage planted has again suffered a decline for the 1942 digging season, but it is expected that the yields in Canterbury will be a good deal higher on the average than those of the previous year.

Onions.—The 1941 crops proved disappointing in yield in the Marshlands district, but the keeping-quality was particularly good, and sufficient supplies were stored to last throughout the year without the necessity to import during the spring months. Approximately 1,100 tons were exported to Australia, the onions being principally of a non-keeping variety. The average prices obtained by growers have made this crop a most remunerative one, and it is expected that a further expansion in acreage will take place to meet the increased demand brought about by war conditions.

COUNCILS OF PRIMARY PRODUCTION.

There are thirty-two District Councils of Primary Production in operation throughout New Zealand, linked up to the National Council of Primary Production.

The Councils were originally set up to increase the production of primary products required by Britain in the pursuance of the war. Difficulties in obtaining shipping, however, have curtailed the activities in this direction, and the Councils, besides still aiming at an increase of certain products, have had to take part in actions of a regulatory nature.

Some of the matters which have received attention are:—

- (1) The formulation of a primary production policy;
- (2) The distribution of fertilizers and lime;
- (3) Farm labour difficulties—the call up of men for army service;
- (4) Management of soldiers' farms;
- (5) Farm supplies.

A tribute is due to the many farmers, business men, and others who have rendered service on the Councils and on committees set up for various purposes, such as the conduct of appeals for key men called up for army service, and in increasing the production of commodities such as wheat, linen flax, and small seeds.

FERTILIZERS.

Superphosphate.—During the past year the shortage of fertilizers, which was beginning to become apparent with the progress of the war, has become even more acute. From the 1st July, 1941, it became necessary to introduce measures of control over the distribution of phosphatic fertilizers. The Phosphatic Fertilizer Control Notice was accordingly introduced, under which farmers were entitled to obtain for top-dressing purposes 40 per cent. of the average annual amount used for top-dressing during the

two-year period ended the 31st May, 1941. For purposes of obtaining supplies of phosphatic fertilizer for cropping a special schedule of rates, based on the quantity of superphosphate obtainable per acre of crop grown, was drawn up. Although it was anticipated that considerable difficulty would be experienced in rationing fertilizers, in reality the system worked remarkably well. For the next rationing period commencing on the 1st July, 1942, it is obvious that even more stringent regulations must be introduced.

Organic Fertilizers.—In order to make provision for supplies of organic fertilizer to market gardeners, the Organic Fertilizer Control Notice 1942 was introduced. Under this regulation manufacturers of blood and bone, bone-dust, &c., are prohibited from selling other than to market gardeners or to householders for use in small quantities.

Serpentine Superphosphate.—Work on the production of serpentine superphosphate has continued, and investigations to determine the degree of reversion have been made. Chemical analyses involved were carried out by the Chemistry Section. A quantity in excess of 15,000 tons of serpentine rock has been delivered to manufacturers for conversion into serpentine superphosphate.

Importations. The negotiations as mentioned in the 1941 annual report for the importation of potash were successfully concluded, and as a result 2,000 tons of muriate of potash were brought in, followed by 500 tons of sulphate of potash. During the year supplies of sulphate of ammonia have become almost completely exhausted, and although 1,000 tons has been imported for use by the Public Works Department no importations for ordinary use have been made. Consequently it became necessary to restrict sales of sulphate of ammonia to market gardeners and to those industries in which its use is considered essential. It is anticipated that a shipment of 1,000 tons of sulphate of ammonia will be obtained in the near future.

SEED CERTIFICATION.

Seed-certification activities have proceeded along the usual lines in the past season, and, despite difficulties created owing to staff shortages and the essential nature of other work, it has been found possible to carry the year's operations to a successful conclusion. In all instances the quantities of the various seeds being certified show an increase on previous years.

BRASSICA-SEED PRODUCTION.

On the outbreak of war it became necessary for New Zealand to make her own arrangements for the production of turnip, swede, rape, chou moellier, kale, and mangel seeds, formerly imported from Great Britain. The first year's activities were carried out on a limited scale, but the quantity of seed produced in association with the carry-over of seed from the previous years' sowings was sufficient to supply all requirements for the 1941 season's sowing operations. For the 1942 season's sowings it has been necessary to make arrangements for the production of all these seeds within the Dominion, and the present estimates indicate that there will be no shortage of seed in any of the lines mentioned. In some instances there is actually available seed for export overseas. In regard to some of the above-mentioned seeds the great bulk of the material is produced under departmental supervision, and is given the official approval of the Department, while in other lines there is a considerable quantity which does not come under this scheme. Results to date on the seeds grown under supervision are very gratifying, and indicate not only high and speedy germination, but also a very good standard in regard to purity and type.

LINEN FLAX.

The Fields Division has again been responsible, under the direction of the Linen Flax Management Committee, for the growing of the necessary acreage of linen flax. A total of 21,000 acres was sown out last spring, and the harvesting of this area is almost completed. The results have been much more successful than in the first year's large-scale operations, due probably to a combination of several points—(a) experience gained by both farmer and instructor; (b) the selection of more suitable land for the purpose; and (c) a longer period to give attention to the proper cultivation of the soil. Results in most districts are quite promising, and in the South Canterbury area, in particular, the question is now arising as to how the acreage to be devoted to linen flax can be limited to an area which might be handled by the factories.

MEDICINAL HERBS.

Following upon reports received regarding the doubtful nature of the supply of certain medicinal herbs required for the manufacture of essential drugs, the Division undertook to grow approximately 25 acres of various plants, and to operate a drier which was being built expressly for the processing of these herbs. This drier was located in Hastings, and a satisfactory arrangement was made with the Patriotic Committee of the Hastings Borough Council under which this committee carried out the detailed procedure in regard to the growing of the herbs. Some material produced in this enterprise has been tested and measures up to the standard set by the British Pharmaceutical Society and is now available for marketing. The first call on this material will be to supply local requirements, but there will be available a considerable surplus for export overseas.

SEED-TESTING STATION.

Over 50,000 seed samples were received for test and analysis, with a marked increase in the use of all services pertaining to export. In certification, both in numbers of lines and quantities of seed passed and rejected, significant increases were shown.

The overseas demand, especially that of the United Kingdom, for certain grass and clover seeds was particularly heavy and could not be satisfied in full. For the year ended December, 1941, the total value of seeds exported amounted to £563,000, an easy record for the Dominion.

Seeds for Government Departments were purchased, especially seeds of grasses to meet the needs of the numerous aerodromes.

YOUNG FARMERS' CLUBS.

Since the beginning of the war it has been necessary to curtail many of the activities of the Y.F.C. organization, particularly those held on a national scale. Depletion of membership through overseas service, labour shortage, and transport difficulties arising from petrol restrictions have made it increasingly difficult for many clubs to hold successful meetings. As a consequence many clubs have gone into recess for the war period.

FIELD EXPERIMENTAL WORK.

Outstanding features in the various activities in the period under review may be briefly summarized as follows:—

- (1) A marked decrease in the number of observational top-dressing trials:
- (2) The closing-down of a number of trials with subterranean clover:
- (3) The laying-down of a number of small-scale pasture and crop trials by members of Young Farmers' clubs and pupils of district high and correspondence schools.

In spite of the fact that so many of the standard trials were finalized after providing the necessary information, or on account of staff shortage and difficulty of working under present conditions, the total number for the year was 935 compared with 901 at this time in 1941.

Pasture Trials.—Investigations into the effect of top-dressing with various fertilizers are being continued under both the observational and mowing technique, the latter now principally under the "enclosure" technique, which is proving highly satisfactory. The production from new strains of rye-grass, simple and complex pasture mixtures, and effect of liquid-manure applications are also under investigation by this method.

Crop Trials.—Manurial trials with various crops (in which varying rates of manuring and also the value of serpentine superphosphate were investigated) were carried out during the year. Results are indicative of the fact that in the case of wheat, potatoes, and linen flax additional work is required to ascertain whether present phosphate applications are warranted. This is of obvious importance under present conditions of fertilizer shortage.

Trials with wheat and linen-flax varieties were continued and provided useful information, much of which will be incorporated into farm practice in the coming season. This work will be repeated wherever possible.

In the North Island a total of thirty-five "pilot" areas in linen flax, both autumn and spring sown, were laid down during the year, and the information secured was not favourable to the extension of commercial growing in the selected districts. Failures were due to unfavourable weather conditions at sowing and harvest time, weed competition, and the effect of diseases.

Miscellaneous Trials.—Those under way last year in connection with pampas grass, control of ragwort and other weeds, and observations on transplanted worm colonies and their effect on pastures were continued. New work on blind seed of rye-grass, renovation of pastures on marine silts, trials with new lines of rape and lucerne and pasture sowings to overcome effect of *Porina* and *Odontria* damage was commenced during the year. Comparisons between production from commercial, sweet blue, and sweet yellow lupins were also conducted.

Survey of Linen-flax Crops.—A comprehensive survey covering over eight hundred linen-flax crops grown commercially during the season was carried out, and the results and recommendations were published. This work is being continued on a reduced scale, and information of great practical value is becoming available.

Publications.—In the period under review the results from three long-term mowing and grazing trials describing respectively the effect of liming at various rates, a comparison between hard and soft, coarse and fine limes, and the response from various phosphatic top-dressings, were written up for publication in the *Journal of Agriculture* and *Journal of Science and Technology*. In addition, the recommendations from the linen-flax survey, results from trials with serpentine superphosphate, and irrigation trials with wheat were published in the *Journal of Agriculture*. Work on the grassland maps was completed, but publication has been delayed owing to paper shortage.

General.—All investigational work is being drastically reduced, and only trials in connection with urgent fertilizer and crop problems will be continued. These will deal with the reduction in phosphate applications with crops, the use of serpentine superphosphate, and variety trials of linen flax.

DAIRY DIVISION.

REPORT OF W. M. SINGLETON, DIRECTOR.

The earlier months of the 1941-42 dairying season were poor for production, the weather being cold and wet in all districts. Autumn conditions, however, were very much better, and, with the exception of portions of the Auckland province, where the autumn conditions were rather dry, production was very well maintained during the final quarter of the financial year.

Quantities graded for Export.—Creamery butter received for grading amounted to 109,707 tons and cheese to 148,331 tons, as compared with 138,745 tons butter and 114,355 tons cheese for 1940-41, a decrease of 29,038 tons butter, or 20.92 per cent, and an increase of 33,976 tons cheese, or 29.71 per cent. In terms of butterfat, a decrease of 10,874 tons, or 6.77 per cent., is shown when compared with the total butterfat represented in butter and cheese graded during the preceding financial year.

Export Values.—Dairy-produce exported from this country during the past financial year was valued for Customs purposes at £25,464,651, a decrease of £2,235,138 from the 1940-41 figure of £27,759,789. All dairy-produce is included under this heading—namely, butter, cheese, casein, dried milk, sugar-of-milk, and condensed milk and cream.

Taking the two principal commodities separately, butter exported during 1940–41 was valued at £17,824,120, while for 1941–42 the value was £13,887,046, a decrease of £3,937,074. For cheese the corresponding figures were £9,421,004 and £10,692,295 respectively, an increase of £1,271,291, or a decrease of £2,665,783 for butter and cheese combined.

Creamery Butter.—The quality of butter has been maintained at approximately the same standard as for last season. The average grade of butter graded for export during the year ended 31st March, 1942, was 93·335 points, as compared with 93·253 points for 1940–41. Of the 109,707 tons butter received for grading, 90,201 tons, or 82·22 per cent., was classed as finest grade; 19,149 tons, or 17·45 per cent., as first grade; and 357 tons, or 0·32 per cent., as under first grade.

pH Testing of Butter.—The pH testing of butter, which is a test for determining the addition of excessive neutralizer to cream, was continued at the various grading stores, the number of tests made being—Auckland, 2,566; New Plymouth, 478; Wanganui, 196; Wellington, 685; Lyttelton, 62; Bluff, 39, a total of 4,026, as compared with 4,461 for the previous year.

Some 3,569 samples of butter were submitted to bacteriological and chemical examinations during the year, as compared with 3,545 for the previous year. As with the pH test, most of this work is done at Auckland, where 2,276 examinations were made. Numbers for the other ports were—New Plymouth, 432; Wellington, 724; and Lyttelton, 137.

Testing Butter for Moisture and Salt.—Moisture tests made at grading ports during the year covered 118,443 churnings, of which only 0·28 per cent. were found to exceed the legal limit of 16 per cent. allowed by the Dairy Industry Act and were returned to the companies for reworking. The average moisture content of the churnings below 16 per cent. was 15·651 per cent.

Salt tests number 114,272 samples, of which only 0·02 per cent. did not comply with the regulations.

Whey Butter.—Due to the increased quantity of cheese manufactured, whey butter graded for export increased from 2,766 tons in 1940–41 to 3,078 tons in 1941–42. Some 94·57 per cent. was classified as first grade, compared with 96·05 per cent. for the 1940–41 financial year.

Cheese.—The following statistics indicate the quantity and quality of cheese sent forward for grading during the year, figures for the previous year being given in brackets: Total quantity received for grading, 148,331 tons (114,355), of which 31,327 tons (23,367), or 21·11 per cent. (20·43) was graded as finest; 105,314 tons (85,505), or 71·00 per cent. (74·77) as first; and 11,690 tons (5,483), or 7·88 per cent. (4·79) below first. The average points for all cheese graded was 91·839, as compared with 92·048 for the year ended 31st March, 1941. Cheese-quality in all districts, with the exception of a portion of the Waikato, was well maintained.

Diversion from Butter to Cheese Production.—Much time and effort has been devoted to the endeavour to produce for export during the current season the 160,000 tons of cheese requested by the British Government, and while this may not be fully attained this season, the organization which now has been built up should ensure that, given normal climatic conditions, it will be exceeded during the 1942–43 dairying year. During the present season, some 3,916 milk-suppliers, representing 180,091 cows, were transferred from butter to cheese manufacture. On account of the quantity of milk being received daily, seventy-two North Island cheese-factories found it necessary to work day and night shifts. The following closed cheese-factories were reopened—namely, Springhead (Maungatapere Dairy Co.), Waiaroa (New Zealand Co-operative Dairy Co.), Kaimiro (Moa Farmers' Dairy Co.), Tuna (Midhurst Dairy Co.), Rua Roa (Tamaki Dairy Co.), Cam (Canterbury Central and Tai Tapu Dairy Coys.), and Tamahere (Cambridge Dairy Co.). The Waitoititi, Uruti, and Tikorangi butter-factories were converted to cheese, and Kuku-Manakau, Dairy Union and Waitara Road butter-factories went partly over to cheese. The closed butter-factories at Otorohanga and Frankton were reopened and converted to cheese, while the New Zealand Co-operative Dairy Co.'s closed casein stations at Karapiro, Buckland, Drury, and Mangatawhiri were also converted to cheese. The Huirangi (Waitara Road) and Skinner Road (Stratford) casein stations were converted to cheese-manufacture during the previous season. It should be placed on record that in only 134 cases, representing 3·35 per cent. of the total number of suppliers changed over, was it necessary to issue orders to dairy-farmers for the transfer of their milk-supply.

Early in the season the Department took control of the distribution of milk-cans to dairy companies, and credit is due to manufacturers for their wonderful effort in raising the normal annual output of 2,500 cans up to 13,000. Fortunately, most of the material for the purpose was available in New Zealand or came to hand in time for the purpose required. The making of milk-vats and other cheese-factory equipment also placed a strain on manufacturers, which was met in a splendid spirit. The smooth and prompt filling of orders was largely the outcome of a meeting arranged by the Dairy Division and held on the 8th April, 1941, when representatives of all the principal dairy-plant manufacturers of the Dominion met in Wellington and discussed in a most friendly and co-operative manner ways and means of providing the plant required to cope with the diversion to cheese.

Butter-boxes and Cheese-crates.—The difficulty of obtaining adequate stocks of seasoned timber has continued to be the greatest problem under this heading, and experiments with fibre-board butter boxes have been continued with encouraging results. Shortage of wire for wiring cheese-crates prompted experiments in the omission of the centre wire. Results, however, were not altogether satisfactory, but the retention of the centre wire and the omission of the two end wires may prove more practicable.

Casein, Milk-powder, &c.—Customs returns give the quantities of casein exported during the past three years as 378, 910, and 2,270 tons, the Customs valuation being £20,004, £44,585, and £86,581. Both casein and milk-powder interests have made requests to the Government for permission to increase the quantity of these products manufactured, but the desire of the Imperial Government appears to be that New Zealand should concentrate on the manufacture of cheese and dried butterfat.

Dried Butterfat.—Experimental work on the production of dried butterfat was continued at the Dairy Research Institute during the year. The shipment by the Marketing Department of sample lots resulted in orders being received from the British Government for 200 tons of first- and second-grade creamery and whey butter, 600 tons in all, which was prepared in the experimental plant at the Institute. Most of this fat has now been shipped as ordinary cargo and arrangements have been entered into for orders totalling 10,000 tons for shipment to Great Britain. While it is not suggested that this product will take the place of butter in normal times, it will, no doubt, be found to be a useful substitute for it in certain directions under war conditions, and it may even continue to find favour for some purposes after the conclusion of hostilities. Started in the first instance as an outlet for second-grade creamery and all whey butter, which was not included in the quantity sold to the British Government, it will, if produced in the quantities named, give a considerable amount of relief to cold storage and refrigerated shipping space.

A factory with an estimated capacity of 10,000 tons per year is at present being equipped at Auckland and will be controlled by the Internal Division of the Marketing Department for the Export Division.

Regrading of Butter and Cheese after Storage.—For the purpose of checking up the effects of long storage, 185 churnings of butter and 140 vats of cheese were regraded at various grading stores after having been kept for a lengthy period.

Check Testing of Milk and Cream Samples.—Officers of the Division checked the factory testing of milk and cream on 819 occasions, as compared with 1,180 check tests in 1940-41.

Farm Dairy Instruction.—Reduced staff has made difficult the carrying-on of this work to the extent considered desirable. Programmes have been re-adjusted so that the more urgent cases could be dealt with and the general service maintained as far as possible. The unavoidable reduction in the number of inspections carried out has emphasized the necessity for a strict farm dairy instruction service, and there is more than a suspicion that the real origin of many faults attributed to feed flavours and other causes is to be found in the milking-shed.

During the year 1,230 new milking-sheds have been built and 1,345 sheds substantially reconstructed.

Inspection of Milking-machines and Separators.—During the past financial year 2,856 milking-machine installations were made, as compared with 3,046 during the previous twelve months.

Prohibiting the replacement of farm separators without the prior approval of a responsible officer of the Division has been continued, while provision for extending this restriction to milking-machines and milking-machine rubberware is under discussion.

Dairy-factory Managers' Registration Board.—The Board dealt with 70 applications for registration, 48 certificates being granted. There are now 774 certificated managers on the register.

Inspection of New Zealand Dairy-produce in Britain.—This work has been continued by Mr. F. H. Taylor with the assistance of Mr. G. V. Were. Routine examinations were carried out where possible, and special examinations related principally to experiments connected with the carriage of produce, more particularly cheese at higher temperatures than those considered normal in peacetime, and to butter-boxes designed with the object of saving shipping space and wood or finding a substitute for wood. Certain types of fibre-board containers for butter have shown promise. Messrs. Taylor and Were have also been able to render assistance to the British Ministry of Food and through other avenues linked up with Britain's wartime requirements of butter and cheese.

Dairy Laboratory, Wallaceville.—The principal bacteriological work related to starters for cheesemaking, bacterial count of butter, cream and buttermilk samples, and the bacteriological testing of water samples. Chemical work related mainly to copper content of butter, "oiling-off" of milk samples, chemical tests of dairy-factory water-supplies, and investigation of cleanser mixtures.

Legislation.—An amendment to the Dairy-produce Regulations 1938 was brought into operation towards the end of the present financial year, the main purpose of which varies the method of weighing, testing, and recording the weight and test for butterfat content of milk or cream delivered for the manufacture of dairy-produce in order to ensure that, as far as possible, suppliers to dairy-factories are credited with and paid for all the butterfat contained in supplies so delivered.

Certificate-of-record and Government Official Herd-testing.—First-class certificates-of-record issued during the calendar year 1941 numbered 550, as compared with 499 in 1940, 460 cows being in the yearly test division and the remaining 90 in the 305-day division. The average production represented by first-class certificates in the yearly division was 525.68 lb. fat, a decrease of 9.23 lb. over the 1940 figure of 534.91 lb. fat. An increase in average production was shown in the 305-day division, the average production represented by the 90 first-class certificates issued in this division being 459.82 lb. fat, as compared with 440.23 lb. fat for 68 certificates issued during 1940. Second-class certificates issued in both divisions during 1941 number 99, as compared with 80 for the previous calendar year.

The number of cows tested under the Government official herd-test during the year was 3,137, as compared with 2,797 for the preceding period.

The number of breeders who tested cows under the C.O.R. system during the year was 320, of whom 257 tested cows under the Government official herd-test. The corresponding figures for 1940 were 280 and 230 respectively.

Association own-sample testing was carried out for 13 small herds in 3 districts, the number of cows being 196.

HORTICULTURE DIVISION.

REPORT OF W. K. DALLAS, DIRECTOR.

Weather conditions have been generally adverse both for fruit production and the production of vegetables. After a fairly fine autumn, wet and prolonged winter conditions were experienced, and a very late spring. Prolonged spells of cold, wet weather, and late frosts in the spring adversely affected market-garden production, and this contributed towards a fall in production and high prices being recorded for vegetables. Hailstorms and high winds from November until January had a detrimental effect on pip-fruit crops, although conditions improved later, and welcome rains in March did much towards assisting in the sizing of fruit.

HORTICULTURAL DISEASES.

Black-spot has again been more than usually severe this year, due to insufficient attention to trees, brought about by inadequate labour, shortage of spray materials, and inclement spring weather making difficult the application at the proper times of the earlier sprays.

Codling-moth was more in evidence in the Nelson district; but the incidence in Delicious apples in the Auckland district was noticeably reduced.

Other insect pests generally have been less troublesome this year.

Citrus canker continued to spread in the Otumotai area at Tauranga in the earlier part of the year, although prompt eradication measures have since confined it to four orchards. In the Kerikeri district the eradication measures appear to have been successful.

ORCHARD AND NURSERY INSPECTION.

Inspection work in nurseries and orchards has been somewhat curtailed. Inspections for citrus canker have been maintained, and officers from other districts were sent to Tauranga and Kerikeri for a period to carry out a systematic inspection there.

FRUIT AND VEGETABLE INSTRUCTION SERVICE.

Instructional services have of necessity been reduced to the barest minimum so that essential inspectional functions connected with the war effort could be maintained. To some extent it has been possible to combine instructional work with inspection, and instruction by correspondence has been given wherever possible. Vegetable-culture instruction, as being more closely associated with the war effort, has been increased.

EXPERIMENTAL WORK.

This has been restricted, and only existing experiments and long-term projects have been continued. Experiments inaugurated during the war (for which arrangements were already matured) were for the growing of peanuts, castor beans, and olives under New Zealand conditions. Experiments with the cool storage of Granny Smith apples and with gas storage of fruit were carried out in co-operation with the Department of Scientific and Industrial Research.

THE FRUITGROWING INDUSTRY.

Owing to war conditions and the cessation of export, the fruitgrowing industry experienced a difficult year. The production of fruit for the 1941 season was as follows:—

Apples	..	..	..	2,500,487 cases (bushel).
Pears	..	..	..	440,154 "
Quinees	..	..	..	15,878 "
Stone-fruits	..	..	..	440,198 "

No apples were exported during the season. Indications are that the crop for the 1942 season will be smaller than that for the previous season, owing to a combination of factors, the chief of which being the inclement season.

During the year the general condition of orchards has shown a deterioration. This is attributable to a number of factors, which may be briefly summarized as follows:—

- (1) The unsettled outlook for the fruitgrowing industry as a result of cessation of exports:
- (2) The shortage of labour brought about by the calling-up for military service of skilled personnel, both from orchardists' own families and from permanent hands employed, and by the greater inducements offered by industrial employment to casual hands and female labour which in the past has been procurable in the harvesting season:
- (3) Rising costs of maintenance and harvesting owing to the employment of unskilled labour and the need to compete for such:
- (4) Shortage of fertilizers causing loss of vigour to the trees.

With the exception of apples, the average price-level for fruit showed an increase over the previous season. Grapes reached a very high price.

STANDARDIZATION.

Grading standards for stone-fruit which were to have become compulsory during the 1942 season were suspended until 1947.

During the 1942 season apples and pears accepted for marketing by the Internal Marketing Division have been confined to two grades—Fancy and Commercial—the Fancy grade including both Extra Fancy and Fancy, as set out in the New-Zealand-grown Fruit Regulations 1940.

COOL STORAGE.

Refrigerated storage space available for fruit storage in the Dominion in the 1941 season amounted to accommodation for 900,000 bushels. New cool stores completed during the year for the Internal Marketing Division were at Auckland (capacity 35,000 cases), at Hastings (capacity 70,000 cases), and at Port Nelson (capacity 30,000 cases). Knowledge of the cool-storage behaviour of New Zealand varieties is becoming more general, and losses in cool store should be reduced during ensuing seasons.

FRUIT PROCESSING (DRYING AND CANNING).

Fruit processing has been given every encouragement during the past year. Fruit-drying factories at Roxburgh and Alexandra have operated to full capacity during the 1941 season. Fruit-processing factories in the Nelson district have also worked to full capacity.

NURSERIES.

During the year 605 nurseries were registered throughout the Dominion, a decrease of 6 registrations compared with last year.

MARKET GARDENING INDUSTRY.

The past year has been an adverse one, and the production of vegetables has not been equal to former years. This, combined with other factors such as reduced man-power and an increase in the consuming public, has brought about a period of unprecedented high prices for vegetables. The weather has contributed to the decrease in production, and the reduction in the quantity of vegetables grown by home gardeners has caused an additional drain on the already over-burdened market. The outlook in regard to vegetable-production appears unsettled. Representatives of the industry continue to advocate registration as a means of stabilizing the position.

VITICULTURE.

Wine and Cider making.—The industries associated with grape-growing continue to make steady progress, although some slowing up has been experienced in the number of glasshouses being built for indoor grape-production. The replanting of a number of the older vineyards has also been postponed owing to labour difficulties and the generally unsettled conditions. Crops of grapes, of both table and wine sorts, were good, and growers with heated houses were able to produce grapes for the market as late as August. Pests and diseases of vines and grapes have been effectively controlled and have caused no loss of crops.

A number of winemakers have added to and brought up to date their premises during the year, and have installed modern machinery for winemaking. Three further distillation licenses were issued.

Te Kauwhata Horticultural Station.—The new distillery at the Te Kauwhata Horticultural Station has now been completed and is in operation. Work is progressing well on the fermentation block, which will bring the project to completion. Modern winemaking machinery is being installed and should be in operation for next vintage.

The crop of grapes this season was 37 tons.

Another successful year was experienced in the sale of wines from the Station, and the demand at times exceeded the matured wine available.

TOBACCO INDUSTRY.

The tobacco industry made marked progress in the 1940–41 season. The acreage grown was 2,963, which yielded a crop of 3,143,355 lb. Efforts have been made to secure an increased acreage to provide for a larger usage of New Zealand leaf in manufactured tobacco in the future, and, despite difficulties, an increase of 92 acres has been planted. The season has not been favourable for tobacco-growing, and some frost damage has occurred.

HOP-GROWING.

The rather cold season has resulted in a decrease in the production of hops from 3,560 bales last season to 3,000 bales this season, from a stable area of 650 acres.

THE BEEKEEPING INDUSTRY.

Owing to weather conditions adversely affecting nectar secretion, the past honey season has been an unprofitable one for beekeepers, with the exception of the Canterbury district and parts of the Auckland area, where the crops were a little below normal. Crops of honey made available for marketing purposes are of excellent quality.

Although some curtailment in the disease-inspection service has been necessary, a high standard of cleanliness has been maintained by the industry.

Approximate Cost of Paper.—Preparation, not given; printing (553 copies), £20.

1943.

NEW ZEALAND

DEPARTMENT OF AGRICULTURE

ANNUAL REPORT FOR 1942-43

*Presented to both Houses of the General Assembly by Command of His Excellency*Office of Minister of Agriculture,
Wellington, New Zealand, 27th April, 1943.

SIR,—

I have the honour to forward herewith for Your Excellency's information the report of the Department of Agriculture for the financial year ended 31st March, 1943.

This report provides a summary of the principal farming activities of the year, and briefly outlines the comprehensive and numerous functions of the Department in its work of maintaining and fostering the growth of the rural industries to the full extent demanded by our wartime commitments. It details the organization of our drive for increased production and reveals the success achieved in this direction.

Exploratory work carried out by the Government and the British Phosphate Commissioners has shown the practicability of exploiting the Clarendon phosphate deposits in Otago, and it is anticipated that considerable quantities of high- and low-grade rock will be delivered during the next twelve months. The steps taken by the British Phosphate Commissioners and the Government to exploit these deposits to the fullest will be of considerable value to the farmers of the Dominion and will have a bearing on the Dominion's wartime production economy, as the material so gained is urgently needed to augment deliveries from overseas.

To meet the demands of the armed forces for fresh vegetables, the Department's Services' Vegetable Production Scheme was inaugurated during the year, and projects have been established in many parts of the Dominion. Regular deliveries of fresh vegetables are now being made to the armed Services within the Dominion, and supplies are also being shipped to the United Nations forces in the South Pacific.

The National Council of Primary Production, together with District Councils and producer organizations, continue to render valuable assistance on practical farm problems, particularly on matters relative to man-power and fertilizer rationing.

The accompanying statement by the Director-General of Agriculture and the reports of the Directors of the Divisions cover all phases of the Department's work.

While circumstances have necessitated a curtailment of many of the normal activities of the Department, every effort has been made to maintain essential services to the farming community consistent with the Dominion's wartime production plan.

I have, &c.,

J. G. BARCLAY,

Minister of Agriculture.

His Excellency the Governor-General.

ANNUAL REPORT OF THE DIRECTOR-GENERAL

THE varying influences of war tend to create new and unexpected difficulties. Despite the problems that have arisen during the year under review, the main objective of the Department—increased production—has been steadfastly pursued, and commendable results have been achieved.

The area sown in arable crops, particularly wheat, oats, and barley, has been maintained at a reasonable level, and in view of the excellent growing season, the estimated high yield from these crops should materially assist the stock position. Although slight decreases have been recorded in the actual acreage of some crops, this has, in the main, been substantially offset by yields higher than the average.

A gratifying increase has been shown in potatoes, which have arisen from 15,200 acres to approximately 22,000 acres. It is anticipated that the resulting crop from this area will be sufficient to meet all Dominion requirements and allow considerable quantities for overseas forces.

The sowings of linen flax reached a new level during the year, the area having increased from 15,000 acres to 22,000 acres, thus enabling New Zealand to ship 180 tons of linen-flax fibre monthly to Great Britain.

The Services' Vegetable Production Scheme, inaugurated to meet the demands of the armed forces for fresh vegetables, involved considerable organization. Projects were established in various parts of the Dominion, and arrangements were also made with private contractors to provide supplies. Deliveries to the armed forces commenced in December, 1942, and in the four months ended March, 1943, over 6,000,000 lb. of fresh vegetables were delivered from these projects. From private contractors a further 2,000,000 lb. were obtained. Of the above, over 2,000,000 lb. have been shipped to the United Nations forces in the South Pacific.

The greatly-increased demand for eggs has necessitated a close investigation of the poultry industry. Steps have been taken to build up the poultry flocks of the Dominion and to provide practical assistance to the industry. A drive to increase the number of backyard poultry-keepers and to influence the keeping of larger flocks of birds on general farms has also been undertaken.

The request from Great Britain for increased supplies of butter involved further changes in the dairy industry. During the 1941–42 season four thousand three hundred dairies were changed from cream to milk delivery. Practically the whole of this number have now reverted from milk to cream supply to meet the United Kingdom requirements.

Circumstances have necessitated further rationing in fertilizer during the past year. Organic fertilizers have been brought under the rationing regulations, and special reserves have been set aside for market-gardeners. In conjunction with the British Phosphate Commissioners, the Government has explored the possibilities of the Clarendon phosphate deposits, and arrangements have been made with the British Phosphate Commissioners for the quarrying of high-grade rock at Clarendon. Deliveries of this rock are now being made to South Island manufacturers, and the Commissioners anticipate a delivery of some 12,000 tons during the ensuing year. There is a further possibility of low-grade rock to the extent of 20,000 tons being available during the next twelve months. The possibilities of securing large quantities of both high- and low-grade phosphate from the Clarendon deposits appear excellent, and this should materially assist the fertilizer position in the Dominion.

The National Council of Primary Production, District Councils, and other producer organizations continue to render invaluable assistance to the Government. Their close contact with the farmer has been of practical assistance in the administering of the fertilizer-rationing scheme. They have given helpful reports on matters affecting manpower, and generally assisted the production policy of the Government.

The wartime requirements in agricultural products continue to increase. The maintenance of supplies to Great Britain, the necessity to fulfil our obligations to the United Nations forces in the South Pacific, and growing consumption within the Dominion represents increasingly heavy commitments. Nevertheless, the farmers of the Dominion realize that a policy of expanding production is vital in many commodities. The co-operation existing between the Department of Agriculture and producers is to a large extent responsible for the results achieved during the past year, and is an assurance that the demands of the future will be met to the fullest possible extent.

Mr. A. H. Cockayne, who has occupied the position of Director-General since 1936, retired on the 31st March, 1943.

The following reports of the Directors of the respective Divisions indicate the wide range of departmental activities in greater detail.

E. J. FAWCETT, Director-General.

ACCOUNTS DIVISION

REPORT OF L. C. SCOTT, ACCOUNTANT

A revision in charging incidences caused the estimate of net expenditure for 1942-43 to be £936,000. This was a decrease of £1,135,122 on the 1941-42 estimated requirement, and, in the main, was attributable to subsidies relating to superphosphate raw materials, butter-boxes, and sodium chlorate being diverted to War Expenses Account.

The year has been cleared with a net expenditure of £896,364. Thus there is a favourable balance of approximately £40,000. Of this, a buoyancy in credits yielded just on £10,000, and the remaining £30,000 arises from factors relating to expenditure. As the Department has continued to experience keen demands for essential advisory aids to agricultural industry, with seed, butterfat, and linen-flax productions again in the vital category, the fact that it shouldered vegetable-production, not in advisory-aid capacity but as an actual aid to production, is noteworthy. Also, as the major portion of the administrative and supervisory vegetable-production costs have been absorbed in "vote" expenditure, the ability of the Department's personnel to perform production functions, whilst still maintaining advisory services, has been demonstrated. Inspectional services to control quality in produce for sale and to ensure healthy conditions in crop and animal life have been maintained.

A summary of the vote, with 1941-42 figures in parentheses for comparative purposes, is given below:—

	Appropriated. £	Expenditure. Paid Out. £	Appropriated. £	Revenue. Received. £
Administrative services..	524,087 (550,132)	501,351 (513,960)	137,605 (126,635)	144,580 (148,690)
Payments under statute	102,360 (108,500)	105,283 (103,131)	1,000 (750)	1,616 (1,284)
Miscellaneous advances, &c.	471,363 (1,562,185)	460,893 (1,435,406)	23,205 (22,310)	24,967 (22,091)
Totals	1,097,810 (2,220,817)	1,067,527 (2,052,497)	161,810 (149,695)	171,163 (172,065)
Less credits-in-aid	161,810	171,163		
Net totals	936,000	896,364		

The relieving effects to the vote brought about by revision in charging incidences have been offset by the receipts and payments concerned becoming "other financial transactions" for the direct attention of the Department. Whereas in 1941-42 the total of payments and receipts was in the vicinity of £500,000, in this year amounts to slightly under £1,500,000, and but for certain expenditure lags, coupled with an "all-in" flat rate quantitative basis of arriving at certain credit values, the latter designed to economize in staff unit strength, would have been nearer £1,750,000. The payments have related to provision of cool-storage space, expansion of meat-canning units, development and working expenses respectively of vegetable-production, subsidies on primary-production activities, and the usual clearances of deposit accounts. The receipts have been mainly from Act and deposit sources, but War Expenses Account activities yielded about £20,000. This last-mentioned figure would be nearer £200,000 if normal accountancy clearance had been applied to the vegetable-production activity; but that action would have accentuated the difficulties only too frequently being experienced in respect to availability of suitable clerical units in recent years. Indirectly there has been association with considerable expenditure directly brought to charge by other Departments.

LIVE-STOCK DIVISION

REPORT OF W. C. BARRY, DIRECTOR

The past year has been favourable, in that a very mild winter enabled sheep to be carried through this period with a minimum of loss. The lambing percentage was a good one. Although stock wintered well, the spring was cold and wet. This affected the growth and fattening of lambs, and also retarded dairy production. The lamb-killing season was later than usual, particularly in the South Island, where it is possible that more than the usual number of lambs will require to be finished off on rape or other feed. The feed position is good in the South Island, and losses of stock from disease have been small.

HEALTH OF LIVE-STOCK

Horses.—Horses have remained healthy during the year. The subsidy formerly provided under the Remounts Encouragement Act was allowed to lapse during the year.

Cattle and Sheep.—No serious disease in cattle and sheep has been reported, scheduled diseases being dealt with under the Stock Act.

Scheduled Diseases in Cattle

Tuberculosis.—The number of cattle condemned under the Stock Act for tuberculosis during the year ended 31st December, 1942, amounted to 4,244 head, 3,784 being condemned on clinical symptoms and 460 reactors to the tuberculin test. The tuberculin test was applied to 10,463 cattle, of which number 460 reacted, giving a percentage of 4.4. At the owner's request 10,051 cattle were tested.

Actinomyces and Actinobacillosis.—The number of animals condemned for this disease totalled 513. A large number of slightly-affected animals were successfully treated.

Malignant Growth.—The number of animals condemned for malignant growth was 224. In all cases compensation was paid in accordance with the Stock Act.

Anthrax.—The vaccination of animals on farms in the Bombay district, where this disease appeared two years ago, is being carried out with satisfactory results.

Blackleg.—The number of calves vaccinated against this disease in Taranaki was 15,505, and in Auckland 24,383, making a total of 39,888. In the Auckland district there were 161 outbreaks of blackleg, as compared with 291 last year.

John's Disease.—In the Taranaki district 36 animals affected with this disease have been dealt with during the year.

Non-scheduled Diseases

Grass Staggers in Cows (Grass Tetany).—The incidence of this disease was low compared with some previous years.

Milk-fever disease of dairy cows was also lower than in previous years.

Parasitic Disease in Young Cattle.—This disease is a continuous source of worry to dairy-farmers, and advice as to the best methods of prevention and treatment is being freely given by field officers in dairying districts.

Sheep

Owing to a mild winter, pregnancy toxæmia was much less prevalent than in former years. The disease of entero-toxæmia in lambs is now well controlled by vaccination of the ewes, which is common practice in the districts formerly seriously affected. Three outbreaks of congenital goitre in lambs occurred, involving the loss of about 350 lambs. The disease has been controlled by the use of iodized salt.

Pigs

The incidence of disease in pigs remains unchanged. A heavy mortality in pigs fed on mangels was investigated during the year, and some interesting information was obtained in regard to the use of mangels in the feeding of pigs.

Swine Husbandry

The report of Mr. H. M. Peirson, Acting Superintendent of the Pig Industry, is submitted herewith:—

“The main feature of this year's pig-production is the decrease in killings recorded since the 1941-42 season. Approximately twelve months must elapse before the results of any disturbance in pig-production becomes evident in the killings. It seems probable that one of the causes of this decline was the change-over to cheese last year.

“The recent change back to butter-manufacture found the country with short supplies of stores and weaners, and incapable of immediate response to the increased feed-supplies, except by increasing the weight at which pigs were killed. Advice was given to increase the slaughter weight of all pigs as a means of increasing the output of pig-meat.

“As a consequence of the reduced killings and increased supplies required for the armed forces, our exports will naturally be a diminishing factor.”

MEAT INSPECTION AND SLAUGHTER OF STOCK

The standard of inspection of all meat and meat products has been maintained throughout the year. The marked increase in the processing of meat at several centres necessitated an increase in staff for check-inspection purposes.

The numbers of stock slaughtered at meat-export slaughterhouses were 2,629,588 sheep, 10,972,447 lambs, 507,295 cattle, 987,105 calves, and 605,535 swine; and at abattoirs 890,810 sheep, 184,726 lambs, 178,987 cattle, 52,707 calves, and 185,035 swine.

IMPORTATION OF STOCK

The following stock were imported during the year: Cattle, 18; sheep, 54; horses, 13 (not including the usual movement of thoroughbreds between here and Australia).

Of the above animals, the 18 cattle were placed in quarantine for the period required.

EXPORTATION OF STOCK

During the year the following animals were exported: Cattle, 8; sheep, 201; horses, 4.

DAIRY INSPECTION

Every endeavour has been made to maintain the supervision of the production of milk from registered dairy premises for town-supply purposes. The increased demand for milk for armed forces' camps, together with local supply requirements, has brought about difficulties in the maintenance of a supply in some districts. Owing to feed conditions and scarcity of milk, many vendors have had to go further afield in order to obtain their requirements. Mainly owing to the present dry season in the Auckland district, the milk-supply has fallen below that of other seasons. The scarcity of milk is likely to be experienced in other districts during the coming winter.

POULTRY

Mr. F. C. Bobby, Superintendent of Poultry Husbandry, comments as follows:—

“The outstanding feature of the past year in the poultry industry has been the greatly increased demand for eggs, and the inability of the industry to meet this demand. Largely due to difficulties in obtaining adequate labour, there is evidence that the poultry flocks of the Dominion have decreased. Measures are now being taken to encourage increased egg-production by the granting of Government loans, release of building material, and the retention on their farms of flock-owners with military obligations.

“An increase in the wholesale price of 2d. per dozen for eggs during the flush season of September-December inclusive was granted for 1942, and is being continued during 1943. This increase in price came at a time when it was urgently needed, and has done much to encourage poultry-keepers to keep up their flocks.

“There are indications of possible increased egg-production in the North Island, while the decrease in the number of birds in the South Island which took place during 1942 now appears to have stopped. There has been a limited number of newcomers to the industry, who should give some help to the egg position in the near future.”

Wool.

Mr. J. P. E. Duncan, Wool Supervisor, submits the following:—

“The clip was generally well grown and fairly sound throughout, with perhaps some increase in the quantity of dust present, due to the prolonged period of dry weather. The appraisal scheme continues to function smoothly. The premium on well-skirted wools remains the same, so that there is no question that adequate preparation of the clip for sale is financially well worth while.

“Sufficient information on sheep-rugging trials has already been collected to show that under appropriate conditions the rugging of sheep during the winter months is a sound economic proposition.”

RABBIT NUISANCE

Consequent on the man-power position, and unfortunately during latter months on the scarcity of certain essential materials, particularly strychnine, the rabbit population has shown a more or less general increase, especially in areas not controlled by Rabbit Boards.

This position has created concern, and in conjunction with the Rabbit-skins Levy Committee every endeavour to encourage the killing of rabbits by the payment of subsidies on skins has been made, with some success, but nevertheless the pest is still in much greater numbers than for years past, and in the interests of production must be dealt with by any and every means that will bring about a reduction. Insufficient attention is given to the destruction of the pest during the spring, summer, and autumn months, and it is in this period that more intensive work must be directed.

NOXIOUS WEEDS

Although financial assistance to local bodies in controlling noxious weeds, particularly ragwort, was continued, and considerable work was carried out in an endeavour to retain the benefit of the good work achieved in the past, the continued absence of sodium chlorate and atlacide has been severely felt. Every endeavour was made to locate supplies, but with practically no success, and the result of the inquiries made indicates little prospect of any of these agents being obtainable, even at a considerably higher price. If the position is to be maintained, a greater use of sheep is indicated.

ANIMAL RESEARCH DIVISION

REPORT OF J. F. FILMER, DIRECTOR

Shortage of staff, combined with the demands of special war projects, have limited the amount of animal research which could be conducted during the year. However, by personally undertaking work usually allotted to less-skilled assistants, the professional and technical staff have made valuable investigations into a number of the more important problems of animal industry.

DIAGNOSTIC SECTION AT WALLACEVILLE

This section has continued to render valuable assistance in the control of animal diseases. During the year over 7,000 specimens have been examined, and 70,000 doses of blackleg vaccine and 15,500 doses of scabby-mouth vaccine have been prepared and issued.

RESEARCH WORK

Facial Eczema.—During the first half of March, 1943, the disease was fairly widespread in the Gisborne district, but only a small percentage of sheep were affected. Scattered outbreaks occurred also in the Wairoa area and in the Auckland Land District. Only a very small number of cases occurred on the experimental areas at Wairoa and Ruakura, and this has limited the material available for investigation by the chemists. However, the technique of pasture collection and preservation has been considerably improved, and this should be of valuable assistance in future investigations. Biochemical assays and experimental tests have confirmed the belief that phylloerythrin is the photosensitizing agent responsible for the skin lesions. The investigation of rye-grass alkaloids has been continued, and new knowledge has been obtained.

Southdown Photosensitization.—The breeding experiments at Ruakura have been continued, and this year it has been possible to use an affected ram, which should greatly assist in elucidating the mode of inheritance of this disease.

Sheep Unthriftness: Canterbury.—Summer rains resulted in an unusually prolific growth of pasture during December. Lambs, however, did not grow well, and a number of deaths occurred. After weaning, the mortality ceased, but growth on rape was at first very poor. Internal parasites were more in evidence than during previous years, and this afforded an opportunity to study the effects of medicinal treatment and various methods of feeding and management. These studies have been extended to the Wairoa area in association with the facial-eczema experiments, as weaned lambs do not thrive well when grazed solely on the highly-fertile flats in that district.

Mastitis.—In collaboration with the Dairy Board's consulting officers, a three-years' project has been initiated with a view to establishing any possible correlation between the incidence of mastitis and such environmental factors as climate, diet, shed hygiene, and milking-machines. Already forty herds reported to have both good and bad histories in regard to mastitis, and all of which are testing members of herd-improvement associations, have been examined in the Bay of Plenty, Manawatu, and Canterbury districts.

Trials have been continued with curative agents, including entozon, sulphanilamide in oil, sulphonamide E.O.S., and “novoxil.” These drugs have some value, but under New Zealand conditions they seldom result in the return of an affected quarter to full lactation.

Some preliminary tests have been made in the use of electric conductivity in the diagnosis of mastitis.

Milking-machine Research at Wallaceville.—During the year work has been largely directed towards devising methods for economizing rubber used in milking-machines. Emergency standards prepared by the Division were accepted with some small modifications

by a conference fully representative of rubber-manufacturers, the milking-machine industry, the Dairy Board, and Government Departments concerned, and they have now been made mandatory. Laboratory and field tests have indicated that, when made in accordance with the specifications and used intelligently, the standard rubberware performs satisfactorily. Investigations are being continued with a view to effecting further saving, and every effort is being made to assist both manufacturers and dairy-farmers to achieve the greatest possible rubber economy consistent with efficient milking.

Bull Sterility.—The semen-testing service was again available at Ruakura. Samples were received from eighty bulls, of which thirteen proved to be sterile and a further twenty-three were of low fertility. Preliminary investigations were made in connection with the assessment of vitamin C in the blood and semen from bulls of low fertility in view of American results which indicate that this is an important factor in some cases.

Artificial Insemination.—In one herd at Ruakura, two yearling bulls were used, and, as might have been expected, the percentage of conceptions was rather low. In the other herd, using a mature bull, fifty-seven out of eighty-six cows (66 per cent.) held to the first insemination, and only seven remained empty after the third insemination. As indicated in last year's report, when the dairy industry is ready to organize artificial insemination, a satisfactory technique will be available.

Contagious Abortion.—This year free vaccination of calves with the strain which has proved so successful in America was made available to dairy-farmers, of whom 1,150 availed themselves of the Department's offer, and approximately 20,000 calves were vaccinated. The vaccination was carried out by officers of the Live-stock Division and veterinarians employed by dairy-farmers' organizations using vaccine prepared at Wallaceville. The importance of this problem is indicated by the abortions which occurred last year in the herds applying for vaccination. These averaged 25 per cent. in two-year-old heifers and 9 per cent. in cows three years and over.

Parasitology.—Investigations into the relative susceptibility to internal parasites of various sheep breeds and crosses have been continued, as have the experiments with pure artificial infestations of two of the more important parasite species. Phenothiazine is being tested in a number of field trials. Various aspects of the hydatid problem are being investigated in collaboration with the Hydatid Research Officer of the Otago Medical School.

Nutrition Experiment at Ruakura.—Investigations into the nutrition of dairy cattle and pigs have been actively continued. A special technique has been devised for studying intake and digestibility in grazing cows and sows. Preliminary trials have been made with the chromium-oxide method of measuring digestibility in these animals.

Ergot.—Experiments have shown milk and flesh from cows fed ergot in toxic doses to be free from alkaloids, and no ill effects were produced when they were fed to rats or pigs. No importance need therefore be attached to propaganda suggesting that New Zealand animal produce is dangerous on account of ergot consumed by grazing stock.

Copper Deficiency in Peat Areas.—Investigations have been commenced in areas where "peat scours" in cattle and ataxia in lambs occur. Preliminary work has revealed a deficiency of copper in the pasture, and experiments have been initiated to determine the best methods of correcting this deficiency.

Red Cell Characters in Dairy Cattle.—The study has been commenced of inherited red cell characters in dairy cattle, recently reported from America, where it is suggested that this work may prove of considerable importance to breeders.

Projects arising from Conditions created by the War.—To ensure that New Zealand would not be left without supplies, preliminary investigations have been conducted into emergency methods of preparing insulin, adrenalin, liver extract, and thyroid extract. Biological tests have been conducted to determine the best conditions for growth and harvesting of *Digitalis purpurea*, which is being grown in New Zealand for medicinal use. Digestive trials have been conducted with New Zealand dried meat. Samples of poison gas and camouflage paint have been produced for Army use. Chemical assays have been made of rubber-producing plants grown experimentally in New Zealand. The survey of New Zealand fish-liver oils has been intensified with a view to their utilization as a source of vitamins, which are known to be in short supply. At Ruakura a large area has been devoted to vegetable-production for the armed forces, and several senior members of the staff have been released for this work.

Miscellaneous.—Experiments have been continued concerning bone-diseases of sheep, mangel poisoning in pigs, cobalt deficiency, zinc-poisoning, and bacterial preservation. Disinfectant tests have been carried out for the Stores Control Board.

FIELDS DIVISION

REPORT OF P. W. SMALLFIELD, DIRECTOR

Climatic conditions generally during the year ended 31st March, 1943, were in the main favourable from the agriculturist's point of view. The outstanding exceptions were in Southland, where one of the driest summers on record was experienced, and in Canterbury, where an excessive rainfall has caused the harvest to be somewhat late.

ARABLE CROPS

Wheat.—An intensive drive for an increased acreage of wheat for the season 1942-43 was made through the various District Councils of Primary Production in the wheat-growing areas. The objective was set at 300,000 acres, an increase of approximately 50,000 acres on the area grown the previous season. While the objective was not fully attained, information on hand disclosed that approximately 283,000 acres were actually sown. Crops give promise of yielding above average; the estimated yield per acre is 37 bushels, against an actual yield of 33.61 bushels the previous season. Basing calculations on the above estimates, the total yield of wheat for the Dominion should approximate 10,500,000 bushels, compared with an actual yield last season of 8,671,244 bushels.

Oats.—The acreage sown in oats for 1942–43 is estimated at 234,000 acres, an appreciable reduction from the actual area of 282,408 acres sown in 1941–42. In this latter season, however, there was a heavy carry-over, and in consequence the position as regards oats should be satisfactory.

Barley.—The area in barley decreased to an estimated 36,400 acres, compared with an actual area harvested the previous season of 44,431 acres. This decrease is largely accounted for by the fact that quite an appreciable area of the land normally sown in barley was used for the wheat crop.

Potatoes.—It is estimated that for the 1942–43 season an area of 21,500 acres was planted in potatoes. This is a considerable increase on the 15,201 acres actually planted for 1941–42, towards the end of which season there was an acute shortage of potatoes.

FIELD EXPERIMENTS

This class of work has been drastically cut owing to shortage of staff and the need for available men to be employed almost exclusively on work having a close relationship to the Dominion's war effort, and on problems arising out of the war. Experimental work in the main has dealt with the reduction in phosphate applications with crops, the use of serpentine superphosphate, trials with low-grade Clarendon phosphate, and variety trials of linen flax.

SERVICES' VEGETABLE-PRODUCTION

During the year the responsibility for the direct control of the growing of vegetables for the armed forces was placed with the Division. The area to be grown has been increased by a further 3,000 acres to 5,000 acres, and arrangements are in train for securing the requisite land and implements.

COUNCILS OF PRIMARY PRODUCTION

During the year four new Councils were formed at Wellington, Gore, Matamata, and Thames, bringing the total up to thirty-six. In July, 1942, following the appointment of the Minister of Primary Production for War Purposes, money was made available by War Cabinet for the payment of a secretary-organizer for each District Council. At the same time attention was focused on increasing farm production.

While the Councils have no statutory authority, they were asked to use their organization to ensure the best use of farm machinery and labour in their districts and to attend to any farming problem where they could give assistance to farmers. They are now being asked to report on cases of hardship under the fertilizer-rationing scheme.

The Councils took an active part in the drive for increased potatoes, wheat, pig-meat, egg and vegetable production. The potato and wheat campaigns were very successful. Next season the Wheat Committee will be responsible for securing the required wheat acreage, and will call on the Councils to help, if necessary.

The Councils have now four representatives on the National Council, and for the purposes of maintaining better contact with the National Council the chairman and secretaries have been called together in conferences on two different occasions.

FERTILIZERS

Rationing.—Owing to the restricted supplies of rock phosphate now coming to hand, it was further necessary this year to provide a set ration for crops, and to restrict further the amount of fertilizer available for top-dressing purposes. This year farmers are obtaining 70 per cent. of last year's ration for top-dressing purposes, or 28 per cent. of the average amount used during the two-year period ended 31st May, 1941.

During the present season, organic fertilizers have been brought under rationing regulations, being included on a ton-for-ton basis with superphosphate. Reserves for market-gardeners have been set aside, amounting to approximately 10,000 tons, to cover the period 1st January to 31st December, 1943.

Since September the entire output of North Island superphosphate-manufacturers has been in the form of serpentine superphosphate. A start has now been made to manufacture serpentine superphosphate in the South Island.

Imports.—Restricted amounts of muriate of potash, sulphate of potash, and sulphate of ammonia have been imported into the Dominion. While the muriate has been sold to farmers generally, the sulphates of potash and ammonia have been restricted to use by market and home gardeners.

Clarendon Phosphate.—A start has now been made by the British Phosphate Commissioners to deliver rock phosphate from Clarendon of the grade 50 per cent. to 60 per cent. tri-calcic phosphate.

The discovery of large quantities of low-grade phosphatic sandstone (10 per cent. to 12 per cent. P_2O_5) is being further investigated, and arrangements are under way for the quarrying of certain quantities of this material.

General.—In recent months thirty-six official samples of fertilizer have been taken. Although chemical results are not yet to hand, preliminary results indicate a lack of attention by vendors to the provisions of the Fertilizers Act. Action is being taken to correct this position.

SEED CERTIFICATION

The scope of the seed-certification scheme continues to extend, the number of entries into certification of all crops showing an increase. The value of certified seeds has been brought further to the foreground by receipt of cables from Great Britain indicating that the future policy of that country must be to prohibit the importation of uncertified seeds from New Zealand. This must have the effect of concentrating attention on the production of certified seeds in this country, with, it is hoped, the ultimate effect of making the production of poorer strains of seeds practically negligible.

Brassica-seed Production.—The scheme of brassica-seed production introduced shortly after the outbreak of war is fulfilling an extremely useful purpose, and to-day this country is entirely independent of seed-supplies from overseas sources. The quality of the seed being produced is good, and it is considered that with careful supervision it will be possible to establish a permanent industry in most, if not all, of the various seeds now being produced.

Linen Flax.—Supervision of the growing of linen flax in the South Island has been undertaken again by the Fields Division, a total of 22,000 acres being contracted for. With the experience gained by farmers in the growing of this crop, the results achieved are still more successful, and it would seem from the growing side at least that many areas in the South Island are ideally suited for the production of this valuable crop.

Medicinal Plants.—The acreage devoted to the production of dried medicinal plant leaf has been increased to approximately 36 acres, and very successful crops of green leaf are being produced under the auspices of the Patriotic Committee of the Hastings Borough Council. The leaf is being dried by this Division, and in addition to supplies made available for local use, considerable quantities have also been exported to England. No report of the English opinion of this dried leaf is yet to hand.

SEED-TESTING STATION

Increased use continues to be made of the services of the Seed-testing Station, and over and above the work carried out for firms in the seed trade, the number of lines entered for certification shows a significant increase.

DAIRY DIVISION

REPORT OF W. M. SINGLETON, DIRECTOR

Quantities graded for Export.—Creamery butter received for grading for export during the year amounted to 110,542 tons and cheese to 109,955 tons, as compared with 109,707 tons butter and 148,331 tons cheese for the year ending 31st March, 1942, an increase of 835 tons butter, or 0·76 per cent., and a decrease of 38,376 tons cheese, or 25·87 per cent. In terms of butterfat, the decrease is 15,353 tons, or 10·26 per cent.

The decrease is due to several causes. The season now drawing to a close has been, climatically, not altogether favourable to production, while there have been fewer cows milked. Requirements of the armed forces have been responsible for a largely-increased demand for liquid milk, butter, cheese, and other dairy-products. Added to these are the requirements for the United Nations' forces in the South Pacific. Reduction in fertilizer and farm labour are also factors.

The reduction in the quantity of cheese graded for export is due principally to the change back to butter-manufacture at the request of the British Ministry of Food for greater quantities of butter and less of cheese. Most cheese-factories are now back to pre-war outputs.

Export Values.—The total value, for Customs purposes, of all dairy-produce exported from the Dominion was £29,093,760, an increase of £3,629,109 over the 1941-42 value of £25,464,651. Butter, cheese, casein, dried milk, milk sugar, and condensed milk and cream are included under this heading.

Taking butter and cheese separately, butter exported during the year was valued at £17,196,926 and cheese at £11,135,851.

Diversión from Cheese to Butter Production.—The manufacture of 153,000 tons of cheese during the 1941-42 season necessitated the transfer from cream to milk of the supply from 4,300 dairies. As this transfer was made on the understanding that the additional supplies of cheese would be required for the duration of the war and one year thereafter, the return of this supply to butter after, in many cases, less than one season's operations in cheese-manufacture placed a very heavy burden on the dairy-farmers concerned. A wonderfully good response, however, was made, with the result that over 95 per cent. of the supply transferred to cheese in the 1940-41 and 1941-42 seasons have now reverted to butter-manufacture.

Twenty-one cheese-factories which reopened for the purpose of increased cheese-production have now been closed, and the disposal of the redundant plant in these and some of the existing cheese-factories is under action. Arrangements have been made with the National Dairy Association for the dismantling, conditioning, and sale of all redundant cheese plant in the North Island, with the exception of that held by the New Zealand Co-operative Dairy Co., Ltd.

Storage accommodation for such plant has been obtained in various centres. Some sales have already been made, but it is likely to be some time before the whole of this plant is disposed of. The action of the Government has, however, relieved the dairy companies concerned of what might have been, in some instances, a considerable financial loss.

Creamery Butter.—The quality of creamery butter over the Dominion as a whole has been barely maintained, much of the butter produced in the Taranaki and Auckland Provinces having evidenced feed taint for a longer period than usual. Butter graded at the Port of Wellington, however, was of a very satisfactory quality.

The average grade of butter graded for export during the year under review was 93·173 points, as compared with 93·335 points for 1941-42. Of the 110,542 tons received for grading, 86,082 tons, or 77·87 per cent., was classed as finest grade; 23,944 tons, or 21·66 per cent., as first grade; and 516 tons, or 0·46 per cent., as under first grade.

PH Testing of Butter.—This is a test for discovering the addition of excessive neutralizer to cream, the number of tests made during the year at the various grading stores being: Auckland, 1,289; New Plymouth, 572; Wanganui, 382; Wellington, 644; Lyttelton, 103; a total of 2,990, as compared with 4,026 for the previous year.

Samples of butter submitted to bacteriological and chemical examinations number 2,714 (Auckland, 1,147; New Plymouth, 572; Wanganui, 94; Wellington, 657; Lyttelton, 244), in comparison with 3,569 for the previous year.

Testing Butter for Moisture and Salt.—Of the 120,543 churnings of butter tested for moisture at grading ports during the year, only 0.26 per cent. were found to exceed the legal limit of 16 per cent. allowed by the Dairy Industry Act, and were returned to the companies for reworking to bring them within the legal requirement.

Salt tests of 114,689 samples were made, only 0.07 per cent. failing to comply with the regulations.

Whey Butter.—Gradings of whey butter decreased from 3,078 tons in 1941–42 to 2,274 tons in 1942–43. Some 92.74 per cent. was classified as first grade, compared with 94.57 per cent. for the 1941–42 financial year. The smaller quantity manufactured was, of course, the result of reduced cheese output due to reversion to butter. No whey butter was exported during the year, most of it going to the dehydration plant in Auckland for treatment.

Cheese.—Cheese quality in all districts has been well maintained, and while starter troubles have made their appearance at odd times in most districts, the difficulties experienced with starter failures have not been so prevalent as in past seasons. It is pleasing to report a considerable improvement in cheese quality throughout the Auckland Province.

The average grade of cheese graded for export during the year was 92.032 points, as compared with 91.839 points for the year ended 31st March, 1942. Of the 109,955 tons received for grading, 20,559 tons, or 18.69 per cent., was graded as finest; 85,031 tons, or 77.33 per cent., as first grade; and 4,365 tons, or 3.97 per cent., as below first grade.

Dehydrated Butterfat. During the year the production of pure butterfat was placed on a commercial basis by the establishment of a factory for this purpose at King's Wharf, Auckland. Up to the time when this factory became available, the experimental plant at the Dairy Research Institute had produced 1,592 tons of dried fat, and it is now used for experimental work only. The new plant at Auckland has since produced 2,845 tons, most of which has been exported to London.

Butter-boxes and Cheese-crates.—As a result of the change back from cheese to butter, the supply position regarding cheese-crates was good, but the quality was such that when binding-wire became available it was decided to revert to the use of three wires instead of one on each end of the crate.

Butter-boxes, partly for the same reason, were a problem, and many variations from the standard package were resorted to in regard to both the thickness of the timber used and the construction of the boxes in order to eke out supplies. The lack of coastal shipping created difficulties in connection with timber transport from the West Coast of the South Island, and in some instances timber which was not as dry as it should have been had to be used. In order to ease this shortage, twenty thousand fibre-board boxes were imported, and in no case was any creamery prevented from packing the butter as it was made. White pine only was used in all light-weight boxes, and two binding-wires were placed on each box. Rimu timber was used to a considerable extent for ordinary boxes.

Farm Dairy Instruction.—This work has proceeded fairly satisfactorily, though the absence of several officers on military duty has made it necessary to extend the districts of many of the remaining officers, resulting in a somewhat restricted service.

During the year 539 new milking-sheds were built and 804 sheds substantially reconstructed.

Dairy Factory Managers' Registration Board.—The Board dealt with 78 applications for registration, 57 certificates being granted. There are at present 758 holders of certificates on the register.

Inspection of New Zealand Dairy-produce in Britain.—Routine examinations have necessarily been curtailed because of the erratic shipping conditions and the impossibility of obtaining advance information of the port and date of arrival of ships carrying New Zealand dairy-produce. Nevertheless, many reports have been received, while our Inspectors in Britain have also been able to provide much useful information relating to the condition of butter-boxes and cheese-crates on arrival in England, and to dehydrated butterfat, milk-powders, &c. Their assistance to the British Ministry of Food has been continued.

Dairy Laboratory, Wallaceville.—It became necessary during the past year to replace the male assistants by young women. Examinations of starter cultures for purity have been continued. Large numbers of butter samples have been tested for bacterial contamination, and it appears more than ever necessary to give every possible attention to factory hygiene.

The examination of butters for copper contamination has been extended to enable cream and buttermilk samples to be dealt with. For this purpose, improved methods have been devised. By a suitable modification of these methods the copper content of cheese has also proved feasible. As much assistance as could be rendered within the limitations permitted was given towards the provision of the essential chemical control of the dehydrated butter plant in Auckland.

An unusual legal case dealt with was one in which a supplier was adding cream to the milk being delivered to a cheese-factory. After careful preparation of the case, a conviction was obtained. It was submitted that the addition of cream amounted to the removal of skim milk, and the Magistrate agreed that as the milk supplied was not the whole milk it could not be considered "pure milk" as defined by the Act.

In collaboration with the staff of the Animal Research Division, investigations upon milking-machine rubberware have been undertaken to ascertain the extent of fat penetration and methods of checking it in order to prolong the useful life, especially of teat-cup inflations.

Check Testing of Milk and Cream Samples.—During the year 764 visits were made to dairy factories to check the factory testing of milk and cream, as compared with 819 visits in 1941–42.

Inspection of Milking-machines.—Notification of 1,357 milking-machine installations were received, compared with 2,856 for the previous year. Milking-machine installations inspected numbered 820 new and 749 used, a total of 1,242. Considerable extra work was entailed in inspection work relating to the issue of permits for milking-machine parts and rubberware as required by the Milking Machinery Control Order, and figures indicate that officers of the Division made 3,151 visits in connection with the issue of permits and issued 1,949 permits.

The purpose of this work was to conserve the limited available stocks of metal parts and rubberware, and it is estimated that as a result there was a reduction of approximately 50 per cent. in the sales of machines.

Steps have been taken to devise a type of rubberware which will utilize less raw material, and to reduce the quantity supplied to the bare necessities of the dairy-farmer. Efforts towards a more equitable distribution of the available rubberware have, however, not been altogether successful, and plans to meet the position are under action.

Certificate-of-record and Government Official Herd Testing.—First-class certificates-of-record issued during the calendar year 1942 numbered 605, as compared with 550 in 1941. In addition, 106 second-class certificates were issued.

Of the cows which received first-class certificates, 428 were in the yearly division and the remaining 177 in the 305-day division, average production being 520.10 and 445.80 lb. fat respectively. Second-class certificates were accorded 83 cows in the yearly division, and averaged 508.41 lb. fat. The remaining 23 were in the 305-day division, and averaged 415.01 lb. fat.

The number of cows tested under the Government official herd-test during the year was 2,595, as compared with 3,137 for the preceding year.

HORTICULTURE DIVISION

REPORT OF W. K. DALLAS, DIRECTOR

The general activities connected with horticultural affairs have been maintained at a reasonable level. Minor activities of the Division have remained in abeyance, but nothing of an essential nature has been neglected. Officers of this Division have co-operated with the Fields Division in the Services' Vegetable Production Scheme.

CLIMATIC CONDITIONS

Throughout the Dominion the weather on the whole was a distinct improvement on that of the previous year, conditions generally being quite favourable for the production of fruit, vegetables, and most other horticultural crops. There was an absence of damaging frosts and hailstorms in those districts where such have been previously experienced. In most areas an adequate rainfall was experienced. In some districts, however, heavy winds damaged a portion of the crop, while the dry conditions which were experienced had a detrimental effect upon the normal sizing of the crop.

HORTICULTURAL DISEASES

Black-spot has been somewhat in evidence in most fruitgrowing districts, but in comparison with the previous year can be described as only slight. The prevailing seasonal conditions, materials used, together with the attention given by orchardists to the control of this disease, are largely responsible for this satisfactory condition.

Codling-moth has caused some slight damage to apples in the Auckland, Hawke's Bay, and Nelson districts. In other districts it is reasonably under control.

Spotted wilt of tomatoes has caused a more general loss in plants than in past seasons.

Cane wilt in raspberries, particularly in the Wairarapa district, has caused considerable damage during the past season. Measures are being taken to combat this infection.

Citrus canker for the time being appears to be quiescent. No further infection has been reported from Tauranga since June, 1942. In the Kerikeri district eradication measures have apparently proved successful, as no further infections have been recorded.

Fireblight, which has been inactive for a number of years, flared up in several districts this season. Steps are being taken to discover and cut out the "hold-over" cankers of the disease.

ORCHARD AND NURSERY INSPECTION

The inspection of orchards and nurseries has of necessity been curtailed. Inspection for citrus canker has been fully maintained.

FRUIT AND VEGETABLE INSTRUCTION SERVICE

Orchard instruction has had to be reduced. Instruction by correspondence has been given where it was not practical to make personal visits. Vegetable-culture instruction, however, being more closely associated with the war effort, has been increased.

EXPERIMENTAL WORK

Experimental work in the field has been much restricted, and only existing experiments and long-term projects were continued. Experiments in connection with cool storage and gas storage of fruit are still being carried out in co-operation with the Department of Scientific and Industrial Research.

Owing to heavy losses experienced in recent years by onion-growers, the Department undertook a trial in the Canterbury district with dry heat storage of onions under commercial conditions. The experiment proved successful.

MARKETING OF THE APPLE AND PEAR CROP

The Government again this year purchased the major portion of the apple and pear crop at prices agreed upon between the Government and representatives of the industry.

Production of fruit for the 1942 season was as follows:—

Apples	..	..	..	..	2,152,677 cases (bushel).
Pears	..	..	..	..	255,521 „

No apples were exported other than those for the armed forces overseas. The production in the aggregate of apples and pears for the 1943 season is expected to be greater than that of the previous season.

CITRUS FRUIT

The following are the estimated Dominion totals for citrus production for the calendar year 1942: Lemons, 54,900 bushels; New Zealand grapefruit, 34,400 bushels; sweet oranges, 11,200 bushels.

STANDARDIZATION OF GRADES OF APPLES, PEARS, AND LEMONS

Apples and pears, which are being accepted for marketing by the Internal Marketing Division during the current year (1943), as was the case during 1942, are being confined to two grades—viz., “Fancy” and “Commercial”—the “Fancy” grade including both “Extra Fancy” and “Fancy,” as set out in the New-Zealand-grown Fruit Regulations 1940.

In the case of lemons the above statement also applies, except that “Minimum” grade lemons, due to the acute shortage of lemons, were temporarily permitted to be included in “Commercial” grade.

COOL STORAGE

The cool-storage space made available for apples and pears was 765,000 cases capacity, a reduction on the space available during the previous year.

FRUIT PROCESSING (DRYING AND CANNING)

The dehydration of fruit has been given every encouragement, with the result that fruit-drying factories at Roxburgh and Alexandra were extended to cope with an increased programme of stone-fruit drying, and worked to full capacity. Considerably over 100 tons of stone-fruit and pears have been dried at these places. The plant at Motueka worked to full capacity while apples were available. Fruit-canning factories in Nelson, Hawke's Bay, Auckland, and Dunedin have also been kept busy.

NURSERIES

During the year 584 nurseries were registered, a decrease of 21 on last year's total.

MARKET-GARDENING INDUSTRY

The market-gardening industry again faced a difficult year. The labour shortage caused difficulty to growers in maintaining or extending their present areas. Some have not been able to cultivate as much land as formerly. The supply of vegetables, due to this and seasonal conditions, has accordingly been rather restricted, and prices in consequence have been high.

A closer contact is now being made with market-gardeners, especially tomato-growers, in order to encourage production and to deal with problems of diseases affecting crops. Tomato-growing for processing has been stimulated in most districts.

In March of this year the Market Gardens Registration Act, 1943, was passed by Parliament. Steps are now being taken by the representatives of the industry to place the organization of the industry on a better footing than previously.

VITICULTURE

Wine and Cider Making.—The area under grapes has been maintained. No construction of additional glasshouses has been made. The pests and diseases of vines and grapes have been kept satisfactorily under control.

The construction of wineries and the installation of modern plant were continued during the year. It is expected that these improvements will result in a marked improvement in the quality of the wines produced. Two further distillation licenses were issued by the Customs Department.

During the period under review there has been a phenomenal demand for New Zealand wines. A number of inquiries have been received from overseas for shipments of wines of approved quality.

Te Kauwhata Horticultural Station.—This Station has continued to function satisfactorily, and several improvements have been made in the buildings, plant, vinery, and water-supply.

A successful year was experienced in the sale of wines produced at Te Kauwhata, and the demand exceeds the mature wine available.

TOBACCO INDUSTRY

The area is being maintained at about 3,000 acres, which may be regarded as satisfactory. On account of the labour shortage and the large amount of casual labour necessary for harvesting the leaf, expansion has been restricted. Growers are being well served by the tobacco-manufacturing companies, which provide an instructional service to their respective growers, and arrange financial assistance when required. The Tobacco Board has also assisted materially in stabilizing the industry.

HOP-CULTURE

Few changes have taken place in this industry; the area under hop-culture remains at about 650 acres. Production is more or less limited by quotas and the requirements of the trade in the Dominion. The gardens are well maintained. The 1942 yield of 3,000 bales was below normal on account of climatic conditions. The estimated production for 1943 is 3,500 bales (9,375 cwt.).

BEEKEEPING INDUSTRY

Unfavourable weather conditions at critical periods during the past season in the Auckland, Hamilton, Hastings, and Palmerston North districts adversely affected nectar secretion and also the normal flight of bees; consequently, honey crops in these areas are below average. Elsewhere throughout the Dominion good payable crops have been secured.

The crops so far made available for marketing purposes are of excellent quality, but the quantity is far short of requirements. The demand for beeswax for manufacturing purposes greatly exceeds the supply.

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