1925.

NEW ZEALAND.

DEPARTMENT OF AGRICULTURE.

ANNUAL REPORT FOR 1924-25.

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

SIR,— Department of Agriculture, Wellington, 25th June, 1925.

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

I have, &c.,

W. NOSWORTHY,

His Excellency the Governor-General. Minister of Agriculture.

MINISTER'S REPORT.

IT IS with satisfaction that another good-all-round year may be recorded for the land industries of the Dominion. Production of our primary staples was well maintained, and producers obtained remunerative average returns. Weather conditions, on the whole, were favourable, a mild open winter being followed by a main season which fairly upheld the good reputation of the New Zealand climate in relation to agriculture.

The group of products conveniently summarized by the term " meat and wool " have maintained a leading position in the rural wealth production of the Dominion. A feature of the season was the remarkably steady market at excellent values which ruled for freezer sheep and lambs. Killings at the meat-works were well maintained in point of numbers. As regards wool, a start at abnormally high values, followed by steadily falling prices, brought the market more or less under a cloud. However, the average price per bale realized by the clip for the whole season showed a substantial advance over that of the preceding wool year. The world statistical position of wool is still sound on the producer's side, and, given a fairly normal consumptive demand, it is hoped that the position will now stabilize. It is pleasing to observe that increasing attention, where required, is being given to quality by our wool-growers.

The beef-market substantially improved during the year, largely as a result of movements in the Argentine trade, and a greatly increased demand from the Continent of Europe. Beef exports from the Dominion showed a corresponding rise in volume. Apart from the prime-quality trade, it is worthy of note that a satisfactory overseas market exists for beef of secondary quality, a matter of considerable importance in relation to our steadily increasing dairy herds. The importance of cattle is so great in connection with the breaking-in and management of our rougher hill-country and grass-lands that any economic factor promoting the use of this class of stock must be specially welcome.

It is significant that animal products (apart from dairy-produce) provided between 50 and 60 per cent. of the Dominion's exports for the financial year. In addition to meat and wool, such lines as skins and hides, tallow, casings, &c., figure, of course, for large amounts in this group.

The great dairy industry of New Zealand has scored a further advance, the past season showing a record high level in butterfat-production. On this occasion butter-manufacture took the lead in comparative output, cheese registering a moderate decrease. The cheese-market, as it turned out, has given the better return to producers; the butter branch of the industry, however, has averaged what may be regarded as satisfactory prices. The position occupied by the dairy industry in the Dominion's economy is well demonstrated by the fact that in the year under review it provided (including milk-powder, casein, &c.) over one-third of the value of our exports. This was accomplished, moreover, notwithstanding our steadily growing domestic consumption of dairy-products, due to increase in population. As regards the future, the remarkable expansion in herd-testing for yield and kindred movements recorded for the year, together with increased care given to feeding, and more intensive working generally, are factors full of promise for continued large-scale development of the industry. A local dairy-laboratory scheme in Taranaki is to be subsidized; and in order to assist in further improving the quality of our milk-products and to deal with the manifold more or less obscure problems met with in manufacture, a central dairy laboratory, together with an attached experimental factory, is now being established by the Department. Another important proposal bearing on quality is that of the compulsory grading of cream for butter-manufacture involving the licensing of competent graders for this duty.

The live-stock statistics of 1924 showed satisfactory increases in sheep, cattle (including dairy cows), and pigs, while horses remained practically stationary. Especially welcome was the large increment in the sheep stocks. Preliminary returns for 1925 indicate another substantial increase in sheep, which will bring the addition to our flocks for the two years to well over a million head. Quality, as well as quantity, is receiving attention, and the reputation acquired by New Zealand stud stock has caused an increase in overseas shipments of both sheep and dairy cattle. As regards the health of live-stock, New Zealand is fortunate in maintaining its freedom from so many of the serious animal-diseases prevalent in other lands. A further precautionary tightening-up of the regulations governing importation of live-stock or related material from overseas was effected during the year. In respect to our own herds, special veterinary investigations are proceeding with the object of eliminating or minimizing certain troubles now present.

Turning to arable farming, it is regrettable to have to record a further shrinkage in the area under wheat for the past season. Fortunately an excellent yield compensated for the decline in acreage, but importations of wheat have had to be made during the year, and this position will continue during the ensuing months. In view of the desirability of the Dominion being self-contained as regards essential breadstuffs, earnest efforts have been made to bring about conditions under which wheat-growing would be promoted, while according fair treatment to the milling industry and without increasing the present price of bread. An agreement satisfactory to all interests concerned has been effected in connection with the past season's crop, and it is hoped that a sequel will be the production of sufficient wheat next season to meet the country's requirements without recourse to overseas supplies. The oat crop showed a satisfactory increase in area, and the

yield per acre was above average. We should therefore be again independent of auxiliary importations of this important product. Official statistics regarding other arable crops for the past season are not available at date of writing.

The leading feature of rural New Zealand to-day is perhaps its grass-land farming, for which nature has peculiarly fitted the country. Increasing attention is being given to this great phase of agriculture as regards both pasture constituents and pasture management, together with promotion of fertility by means of manurial top-dressing. The agrostologist, the live-stock agriculturist, the chemist, and the field experimentalist all have their share in the work of improvement along these lines. Problems are being better apprehended, and valuable light thrown on various points of difficulty. In regard to artificial fertilizers, New Zealand is fortunate in having an assured and ample supply of all-important phosphates, through our share in the Nauru and Ocean Island deposits.

The fruitgrowing industry, after a somewhat prolonged period of depression, now appears to be really on its feet and steadily gaining in strength and resources. The apple-export trade for the current year has so far been attended with success, and indications are that the average returns will prove to be the highest yet attained by our shippers. Local trade in the main fruits has also shown improvement, and better results are being obtained in the cool storing of keeping varieties for the late demand. State assistance rendered at various points has proved of great benefit to the industry generally. Viticulture, and various lesser lines of horticultural production, are quietly prospering.

The poultry industry continues to hold its own, notwithstanding admitted difficulties caused chiefly by the comparatively high prices of the standard feeding-stuffs. The egg-export trade to the British market, established in the preceding season, was successfully followed up in the year under review with increased shipments, payable prices being secured for all consignments of standard-weight goods. There seems to be considerable room for greater adaptation and elasticity in the feeding of poultry, so as to secure less dependence on wheat and its by-products. Experiments carried out by the Department some time ago, and duly recorded, indicated the possibilities in this direction. The claims of the poultry industry for sympathetic State co-operation, as a very considerable source of food-supply and income, are duly recognized. The Poultry Act, introduced and passed during last year's session of Parliament, should prove of distinct benefit to the industry.

The hemp (phormium-fibre) industry has experienced quite a good year. The overseas markets for this product remained at a remunerative level during the period under review, and production showed a substantial increase. It is a pity, however, from all points of view, that more of the mills are not turning out a higher average quality of fibre. Bearing on this matter, there appears to be a decided lack of organized training in the more skilled positions of milling, and an undue persistence of the casual element in connection with the industry generally. In venturing this observation the efficient operation of the industry in many directions is not lost sight of.

By the passing of the Fruit Control and the Honey-export Control Acts, the year has seen an extension of the policy of control as applied to the Dominion's overseas trade. The first-named measure also embodied local control, but only the export section was adopted at the poll of producers. Export Control Boards under both Acts were duly elected. The Dairy-produce Export Control Board, constituted in 1923, has now, after due consideration, formulated its policy, and may be trusted to use its best efforts for the welfare of the industry. The Board has already done good service in connection with marine insurance on dairy-produce, and in other respects. The Meat-producers' Board has continued to do excellent work for our frozen-meat trade, both in New Zealand and in London. A measure of co-operation between the Board and the newly constituted Food Council in England appears likely to be brought about in the near future.

With a view to formulating definite measures for the advancement of agricultural education in the Dominion, the Board of Agriculture was requested during the year to undertake an inquiry into the several phases of this question. The Board—to which was attached a representative each of the Departments of Agri-

culture and Education—took a great deal of evidence of a varying character in different districts, and is now preparing a report for the Government. It is hoped that this focussing of opinion will clear the way for early action, in improving our educational system as regards agricultural science. Appreciative reference may be suitably made here to the continued general work of the Board of Agriculture, under the chairmanship of Sir James Wilson, who has presided since the constitution of the Board in 1913.

For some time past the Department of Agriculture has been investigating the deterioration of grass-lands, chiefly on hilly bush country, in the mid-western districts of the North Island. The problem is one closely related to the settlement of Crown lands in the large area referred to, and during the year a special Committee appointed by my colleague the Minister of Lands conducted an exhaustive inquiry into all phases of the subject. The Committee (on which this Department was represented by its Agrostologist) has since presented a valuable report. It is proposed to take early steps dealing with this important matter in the interests of settlement and production, both Departments co-operating in the work. Another present point of co-ordination with the Lands Department is in connection with the development of the gum-land areas of North Auckland. The Agriculture Department, again, is acting in close touch with the Public Works Department regarding irrigation in Central Otago. Officers are now investigating irrigation systems in North America, with a view to applying the latest knowledge and practice to New Zealand conditions. The pumice and swamp-drainage areas are similarly providing useful points of liaison between this and other branches of the Service.

Although the present position in connection with the realization of our great staple exports is satisfactory generally, prudence, foresight, and economy on the part of the farming community are none the less called for. The necessity for studying quality of produce and reducing costs of production (including those caused by inflated land-values where such exist) is as great as ever. Surplus income in good times should be applied to reducing liabilities. Only in this way can lean years be met with comparative security.

The accompanying reports of the Director-General and heads of the various branches of the Department afford a comprehensive review of the work of the Department in its many ramifications. Excellent service has been rendered by the staff—admittedly often with limited resources and over-extensive districts. The officers engaged in instructional and research work, no less than the farming community, will welcome the strengthening of these services which it is the intention of the Government to effect in the immediate future.

W. Nosworthy, Minister of Agriculture.

REPORT OF THE DIRECTOR-GENERAL.

THE HON. THE MINISTER OF AGRICULTURE. Wellington, 15th May, 1925.

In submitting this report upon the Department's operations during the past year I must express my appreciation of the assistance rendered me by the Assistant Director-General and by the Divisional Directors. In the case of each Division the work allocated to it has been carried out efficiently and thoroughly, all officers showing an evident desire to assist in rendering the Department a useful section of the State service.

The development of the instructional side of the Department's activities has continued, and it is satisfactory to note that producers have extensively availed themselves of these services, and have been able thereby to overcome working difficulties on the land in their occupation or among their live-stock, and to generally increase their output capacity.

During the year Mr. A. R. Young, who had held the position of Director of the Live-stock Division since 1918, retired from the service on superannuation. Through this the Department has sustained a decided loss, Mr. Young having been a capable administrator, very thorough and definite in his methods, and always actuated by a desire to carry out his duties to the very best advantage. Steps are now in hand for appointing a successor. Mr. J. L. Bruce, Superintendent of Experimental Farms, also retired on superannuation after a long period of faithful service.

AGRICULTURAL INSTRUCTION.

The instructional services of the Fields Division are fully dealt with in the report of its Director, which follows. The officers of this Division are doing excellent work, and it is quite obvious that the staff will need to be still further increased in order to meet the demands upon it. The great extent of settlement which has occurred during the last ten years has brought a quantity of previously unoccupied land into use, while a very considerable number of men have gone on the land possessing only a limited knowledge and experience of successful farming practice. The provision of an instructional and advisory service enables settlers of this type, as well as others of longer experience, to have available capable and highly trained instructors from whom they can at all times seek advice regarding any matters arising in the course of their farm operations in connection with which they desire more information or assistance.

As the result of the gift of the late Sir Walter Buchanan to Victoria College, Wellington, for the purpose of establishing a Chair of Agriculture, the College Council during the year appointed Professor G. S. Peren to the position, and a beginning in a course of agriculture has already been made with a class of twelve students. The Department is assisting by providing lecturers from among its staff, and a feeling of cordial co-operation has been established, which it is hoped will also be evinced when shortly a Professor of Agriculture takes up his position at the Auckland University College.

The whole question of agricultural education has been given special attention, and at the request of the Government the Board of Agriculture has undertaken a special inquiry into the subject, one representative from the Education Department and this Department respectively being associated with the Board. The report should prove a valuable one.

THE STATE FARMS.

The Moumahaki Farm has been subdivided for the purpose of placing settlers upon it, and the Department's own farming operations there will shortly come to an end. It was decided that the income derived from the settlement of the farm should be utilized for the purposes of agricultural instruction in the area lying, roughly speaking, between Wanganui and New Plymouth, and legislation in this connection was enacted during last session. The Moumahaki Farm during its earlier operation by the Department served an exceedingly useful purpose. In view, however, of the great improvement in general farming conditions in that portion of New Zealand its usefulness has largely disappeared, and there can be no doubt that the new order of things will have the effect of conferring a greater benefit upon the Wanganui-New Plymouth district than could have been the case had the farm continued to be operated by the Department.

The whole trend of present-day experience indicates that a greater benefit can be conferred upon settlers by an expansion of instructional services, combined with small demonstration or experimental areas, than by the continued operation, or the expansion, of the State-farm system. The practical demonstration farms established at Stratford and Manaia by local effort, and subsidized by the Department, are doing excellent work, and it seems evident that it is with farms of this type in suitable areas, rather than large State farms, that the best work for the future can be done.

The Ruakura Farm has had a good year. The permanent farm-school established there in 1923 is progressing satisfactorily, there being now some forty students in residence. Taking the figures as shown on the estimates (which do not include the cost involved by the salaries of permanent officers) the total expenditure at Ruakura for the year was £10,909, and the total receipts £9,706. The expenditure includes the cost of maintenance of the farm school and of board and lodging of the students. The figures as a whole show an improvement over the preceding year, which in turn showed better financial results than the previous year.

The Weraroa Farm also had a good year. The expenditure (not including permanent officers' salaries) being £8,289, while the receipts were £9,603. As previously, this establishment was operated largely on commercial lines, though a certain amount of instructional work was done, and the question of what is to be the future of the farm requires consideration. The present Manager, who took up his duty in November, 1923, is doing very good work.

Live-stock.

Early in 1924 the Live-stock Division commenced a special investigation into those troublesome and expensive diseases of dairy cows—contagious abortion, sterility, and vaginitis—selected veterinary officers being detailed for this duty. Respecting the diseases in question, a great deal of investigation work has been done both in Europe and America, without sufficiently satisfactory results accruing, and the question of how best to combat them, particularly by preventive measures, still needs a great deal of research and investigational work. Having regard to the great importance of the dairy industry to New Zealand, it was felt that, while taking the fullest advantage of all information derived from the work of scientists in other countries, we should do all that is possible ourselves to carry out research work in the Dominion. While it cannot yet be stated that any definite results have been obtained, it is satisfactory to note that in some respects an advance upon our previous knowledge has resulted. The work is carried on by three officers doing field-work, in association with the Officer in Charge at the Veterinary Laboratory at Wallaceville, and when a point has been reached where information of use to farmers can be put together from the results of the investigation an interim report will be made public. It must be realized that in the case of diseases which have so far baffled investigators throughout the world, a quick and easy way of coping with them is not likely to be secured, but anything which will advance us and put us a step further ahead in dealing with these troubles to the best advantage will be of distinct value.

Another troublesome disease in dairy cows—contagious mammitis—has been the subject of a good deal of discussion of late, largely as the result of vaccines for preventive purposes having been put on the market. Experimental tests of these vaccines are being carried out at the Wallaceville Laboratory and also at the Ruakura Farm, but no definite pronouncement regarding them can be made pending completion of the tests.

Quite apart from these special investigations, both the veterinary and live-stock officers of the Department have dealt with many cases of specific disease affecting stock, and have always been available for advising stockowners whenever they have had difficulty in the shape of preventable sickness among their farm-animals, or in animal management generally.

New Zealand is fortunate in being free from many serious diseases which cause losses to farmers in other countries, and the necessity for doing all that is possible to maintain this freedom renders warrantable the very thorough, and in some cases extreme, measures adopted in order to obviate the risk of introduction of disease.

As the result of foot-and-mouth disease breaking out in the State of California and later in Texas, severe restrictions were placed upon the importation from the United States of produce derived from the land, these being supplementary to the already existing prohibition of the importation of live-stock other than horses from that country. Foot-and-mouth disease is, unfortunately, still prevalent in Britain, consequently the prohibition of the importation thence of cattle, sheep, and pigs has been continued, while the general quarantine regulations have been enforced strictly.

It is proposed to strengthen the scientific staff at the Wallaceville Laboratory, and to still further extend the activities of that institution in dealing with the various animal troubles which already exist in the Dominion.

Bush Sickness.

The bush-sickness investigation has been continued, and Mr. Aston, the Department's Chemist, has done a considerable amount of work in connection with it. Fairly extensive trials are being made of the application of top-dressings containing iron to pastures at the Mamaku Demonstration Farm, and the continuance of the feeding experiments with forage to which an iron preparation has been added. Arrangements are also in hand under which settlers in the affected area can obtain from the Department supplies of citrate of iron and ammonia for the treatment of their stock. This drug has proved quite effective not only as a cure for animals which have developed the trouble, but also, when given judiciously at proper periods, as a very material aid in preventing its onset.

It is also a matter for consideration whether steps should not now be taken to endeavour to arrange for supplies of top-dressing material for pastures to be obtained by settlers at as low a cost as can be arranged, there being no doubt that the application of suitable top-dressing is of great assistance in farming the class of country in question. It cannot be said that with our present knowledge this form of treating the soil will completely prevent the development of bush sickness among stock grazing upon it, but it certainly enables them to continue in good health and vigour for a considerably longer period.

Plans are also in hand for extending the scientific investigation work on the spot; this to be done in conjunction with the principal local officers of the Live-stock Division and the Chemist.

Rabbits.

Taking the Dominion as a whole the position as regards rabbit-infestation has shown a distinct improvement over last year.

In that portion of the Auckland Province lying north of Auckland City, rabbits, though in no way numerous, show a tendency to widen and extend their area of occupation. Inspecting officers are exercising vigilance and care there with a view to not only preventing further spread of the rabbits, but also getting them eradicated as far as possible. In the North Island generally rabbit-destruction work has been well carried out, and it is satisfactory to note that, practically without exception, small Rabbit Boards which have been formed in different districts in both the Auckland and Wellington Provinces are doing very good work. The same applies to the two large Rabbit Boards in Hawke's Bay and Poverty Bay respectively.

In the South Island good work has been done in Marlborough, while a marked improvement has taken palce in Canterbury, where landholders have in a large number of cases settled down vigorously to rabbit-destruction, and, moreover, the use of rabbit-netting fences has considerably extended.

In Otago the commercialization of the rabbit is proving a great deterrent to the efficient and thorough carrying-out of rabbit-destruction methods in a properly systematic and effective manner. While appreciating the fact that the rabbit-skin export trade has attained dimensions which enable it to be a means of bringing a considerable amount of money into the Dominion, it must be stated that it has the effect of hampering the work of the Department in carrying out the requirements of the Rabbit Nuisance Act. Viewed as a proposition in economics it must be realized that the damage done by rabbits really entails a loss to the farming community as a whole, seeing that, without the pest, returns from properly-carried-out farming operations would be greatly increased and would in the aggregate amount to a far greater sum than that received from the rabbit-skin trade. The question is one of great importance to the agricultural and pastoral community in Otago and Southland, and it should be tackled in a common-sense and businesslike way. The Department can carry out its restrictive methods up to a point, even in the face of what often proves to be strong though passive opposition; but if rabbits are to be effectively got under control and systematically reduced in numbers to as near vanishing-point as is practicably possible it can only be done through the complete and hearty co-operation of settlers with our officers. It seems evident that the matter should be taken in hand, and as a first step it would be of very great advantage if farmers' organizations in the form of agricultural and pastoral associations and branches of the Farmers' Union would discuss the matter thoroughly among themselves, and appoint a representative committee to confer with responsible officers of the Department on the whole question. Rabbits are further referred to in the report of the Live-stock Division which follows.

Noxious Weeds.

The administration of the Noxious Weeds Act has been carried out as effectively as conditions permit, and it may be said that the principal difficulties which have had to be faced have been those created by the prevalence of blackberry, ragwort in certain districts, and of Californian thistle in the agricultural areas of the South Island.

Blackberry has received special attention, and certainly a great deal more work has been done in connection with it during the year than at any previous period. Wherever the plough can be used this pest does not present a serious difficulty, seeing that it can be thus eradicated at not unreasonable cost, but on unploughable country it certainly does constitute a practical problem. A good deal of experimental work has been carried out in the endeavour to find a safe blight or other pest which will destroy blackberry, but so far it cannot be said that anything sufficiently satisfactory has been discovered. The Department at the present time is also experimenting extensively with poisons to be applied by means of a spraying-apparatus, but the forms of such treatment so far tried only destroy the growing plant for the season, and do not prevent recurrent growth. Whether any chemical treatment can be discovered which will completely eradicate the plant at a sufficiently reasonable cost is problematical, but having regard to the seriousness of the pest no effort is being spared in endeavouring to discover better means of dealing with it which at the same time are not so costly as to be prohibitive. The Government has offered a bonus of £10,000 for an effective, practical, and not too costly method of eradicating blackberry, which may bring results.

Ragwort is very troublesome in some districts, and the Department itself has on occasions had to deal with it on properties whose owners have "walked off," this being necessary for safeguarding the interests of adjacent settlers. On country where sheep can be grazed this weed may be kept from being troublesome, but on dairy farms where cattle only are kept it requires regular attention on the part of the occupiers to keep it in check and to do what is possible to eradicate it.

As regards Californian thistle, few settlers look upon this weed as being troublesome in pastoral areas, and a number of local authorities have removed it from the schedule so far as their districts are concerned. In agricultural areas, however, it is a serious nuisance.

It is satisfactory to note that a greater desire on the part of the settlers to deal with noxious weeds has been observed, and a continuance of this feeling will be of material assistance to the Department's officers in carrying out their duties of inspection. Noxious weeds are further referred to in the report of the Live-stock Division.

The staff of the Live-stock Division has done good work throughout, and its advisory and instructional activities have developed considerably.

The Dairy Industry.

The work of the Dairy Division has steadily increased, and the Division's already high standard of efficiency has been fully maintained. The year has been a good one for the industry, though prices did not reach so high a level as in the preceding period. The total value of all dairy-products exported reached £18,834,302, an increase of £266,828 over the previous year, this increase being due to increased production.

The quality of the butter and cheese manufactured has continued good, but with increasing competition in the world's markets, and improved methods of manufacture in other exporting countries, it is continuously necessary to do all that is possible to still further raise the standard and quality of our dairy-products, and the efforts of the Department are very definitely aimed in this direction. The cordial co-operation existing between officers of the Dairy Division and factory-managers constitutes a material aid in this direction.

Some two years ago complaints were received from Great Britain regarding the presence of excess water in New Zealand butter, and steps were at once taken to institute a system of testing butter for water content here before shipment. This action has had the result of preventing a continuance of the trouble, and no complaints regarding excess of water in butter have been received during the year.

One measure taken with the full co-operation and assistance of the Dairy Control Board, the National Dairy Association, and factory directors and managers, was the establishment of a higher standard of minimum points for first-grade butter and cheese. This was brought into operation with very little difficulty or friction, and an improvement in the quality of both butter and cheese is already noticeable as a result.

Expansion of the system of farm-dairy instruction carried out in co-operation with individual dairy factories or groups of factories has taken place, and there can be no doubt that this work is proving of great advantage to the industry. It enables faults in milk or cream which are discovered at a factory to be investigated by the instructor on the farm of origin, and the cause dealt with and eliminated, and thereby has the effect of raising the standard of quality of raw material delivered at the factory. The cost of each of these instructors is borne partly by the dairy factories and partly by the Department, and the system is working well. Side by side with the work of the farm-dairy instructors, factories have in a large number of cases established a system of cream-grading. Suppliers of cream of good quality are thus enabled to receive the full value of their product, while

those who do not supply cream of sufficiently good quality are paid accordingly, a reduced payment naturally having the effect of inducing them to get to work and remove the cause of the trouble. In this they are aided by the farm-dairy instructor if one be associated with their factory. Cream grading is undoubtedly a very valuable practice, and it is satisfactory to note that it is extending on its present voluntary basis. The question of making it wholly compulsory is expected to be discussed at the coming meetings of the leading organizations of the dairy industry, and in connection with these discussions no doubt the question of the cost involved and the organization which would be necessary to carry out the work will be given very full attention.

For some time past the need for a dairy laboratory well equipped for both bacteriological and chemical work has been felt. Much useful work has been done for the Dairy Division by the existing Bacteriological Laboratory at Wallaceville and the Chemical Laboratory in Wellington, but the needs of the Dairy Division are such that a special establishment is more than warranted. It is satisfactory to note that authority has been given for the erection of a dairy laboratory at Wallaceville, and also a small experimental factory to be operated in direct association with it.

Horticulture.

The work of the Horticulture Division is gradually expanding in accordance with the growing needs of the industries coming within its scope. These fully tax the energies of the divisional staff, the members of which have continued to carry out their duties efficiently and well.

The fruitgrowing industry has experienced a better year, and growers have been much encouraged by the improved marketing conditions and returns in Great Britain. The quantity of fruit (almost entirely apples) exported in the 1924 season constituted a record, and the bulk of it was shipped under the Government guarantee of 1d. per pound net return for growers.

So far as regards fruit sold in Great Britain, the results were so generally satisfactory that the guaranteed payment had only to be made to a very small amount. Regarding South America, however, the marketing conditions were not so good, this being largely due to the fact that much of the fruit underwent deterioration during the voyage. Most shipments to South America were not made in cool chambers, and it would seem from the experience gained that risk is taken in shipping in this way, even with a comparatively short voyage. It is hoped that as a result of the experience gained this year, and, further, of the valuable report furnished by Mr. Rice, Orchard Instructor, who was sent on a mission to South America to inquire into marketing conditions, much better results may be obtained during the present season.

The packing and grading of export fruit was carried out on good lines, and, with a maintenance of thoroughness and care in selection, packing, and grading, there is very good reason to hope that our fruit-export trade has got over its initial troubles and is in a way of becoming premanently established on a satisfactory basis.

A fruitgrower in New Zealand, as in other countries having a similar range of climate, has to be continuously on the alert to combat pests and diseases. Some of these are particularly troublesome, and the Horticulture Division, assisted by the expert advice of the Biological Laboratory staff, is doing its best to assist fruitgrowers in combating them. Special investigations have been carried out, and more are in hand for dealing with some of the worst troubles, every effort being made for progress in this direction.

New Zealand Wool Committee.

The committee which had functioned for some years past went out of office on the 15th January last, it being considered that as the whole of the Imperial stocks of wool had been liquidated the necessity for a committee containing Government representation had disappeared. It was gratifying that the Government expressed to the members of the committee its high appreciation of the very excellent work they had done throughout without any emolument of any kind, but I would desire to further express here recognition of the assistance rendered by the committee through its advice and its general jurisdiction over matters associated with wool-sales, &c. Wool-growers throughout the Dominion owe a debt of gratitude to those gentlemen who voluntarily gave their services for this very valuable work. Apart from Government representation, the committee consisted of Messrs. O. Hawken and L. Rutherford, representing North and South Island sheep-farmers respectively, and Messrs. W. S. Bennett and A. E. Mabin, representing the wool-brokers.

A new committee was subsequently formed consisting wholly of representatives of producers and wool-brokers. Its personnel is—Mr. W. Perry (chairman) with Messrs. R. Lilburn and Bernard

Tripp, representing wool-growers; and Messrs. W. S. Bennett and A. E. Mabin, representing wool-brokers. The regulations dealing with the functions of the old committee were rescinded, the liquidation of the B.A.W.R.A. stocks rendering a great portion of them no longer necessary, and new regulations were made setting out the functions of the committee in connection with the limitation of wool-sale catalogues.

Nauru and Ocean Islands Phosphate.

The production and sale of phosphate from Nauru and Ocean Islands is conducted by the British Phosphate Commission, acting for the Governments of the United Kingdom, Australia, and New Zealand. The New Zealand Government provided 16 per cent. of the capital, the other partner Governments having each furnished 42 per cent. For the first five years the partner countries are entitled to phosphate in proportion to the capital invested, production in excess of the partner countries' requirements being sold to other countries on the best terms obtainable. Each year an f.o.b. price is fixed for sales to partner countries. At the conclusion of the first period of five years the allotment to partner countries will be based on their actual requirements, the allotment being reviewed at the end of each five-yearly period. The partner countries receive interest at 6 per cent. on their capital invested in the business, and a sinking fund provides for redemption of capital within fifty years.

The fourth year of the Commission's operations ended on the 30th June, 1924. During the four years almost one and a half million tons of phosphate was shipped. Of this quantity 450,924 tons was sold during the fourth year, this being about 25 per cent. in excess of any previous year's shipments. It is expected that the fifth year's output will equal that of the fourth year.

Owing to distance and adverse exchange rates the United Kingdom has so far been unable to purchase much Nauru and Ocean Islands phosphate, present British requirements being largely filled from low-grade deposits in North Africa. During the first four years the quantities and destination of phosphate rock shipped from the two islands have been as follows:—

Year ended 30th June.	United Kingdom.		Australia.		New Zealand.		Other Countries.	
	Tons.	Per Cent.	Tons.	Per Cent.	Tons.	Per Cent.	Tons.	Per Cent.
1920–21	16,750	4·60	265,914	72·97	17,100	4·69	64,660	17·74
1921–22	15,550	4·30	171,286	47·39	38,500	10·65	136,150	37·66
1922–23	..	..	203,446	64·84	51,550	16·43	58,762	18·73
1923–24	..	..	320,031	70·81	60,850	13·47	71,028	15·72
1924–25 (9 months) ..	..	..	252,605	71·90	80,165	22·82	18,575	5·28

The requirements of the partner countries continue to absorb an increasing percentage of output, and present indications suggest that the whole of the product available by means of the existing equipment will soon be needed for the requirements of these countries. Additions to the equipment at each island are under consideration, and when provided it will be possible to largely increase the output.

Owing to the importation of phosphate from Makatea, New Zealand did not absorb its full allotment of 16 per cent. from Nauru and Ocean Islands during the first four years. Present requirements are being filled entirely from the latter islands, and during the fifth year New Zealand will absorb considerably more than its allotment.

Under the Nauru agreement the administration of the two islands was entrusted to one officer, whose tenure of office was limited to five years. It was further provided that the first Administrator should be appointed by Australia, and the post was given to General Griffiths, who has done good service. Both the British and New Zealand Governments have advised the Commonwealth Government that they would be agreeable to General Griffiths's reappointment after the expiration of his first term on the 30th June, 1925.

The reports of the Divisional Directors and the Chemist are appended hereto.

C. J. Reakes, D.V.Sc., M.R.C.V.S.,
Director-General.

LIVE-STOCK DIVISION.

REPORT OF THE DIRECTOR.

Stock Conditions generally.

Generally speaking the year has been a favourable one for stock, the winter having passed without any serious difficulty in regard to general conditions and health arising. Little is still done, however, in finding additional winter feed for dairy cows, which too often enter upon their lactation period in a poor condition, thus requiring to use for the building-up of their bodies food which should be utilized for increased milk-production. The intelligent provision of winter feed is a sound business proposition for the dairy-farmer, as the maintenance of the general health and constitution of the dairy cows is necessary for enabling them to give the best milk-yield of which they are capable. The rearing of heifer calves also can still be largely improved upon.

Stock Diseases.

The Dominion still remains free from the more serious diseases, such as rinderpest, foot-and-mouth disease, pleuro-pneumonia, glanders, anthrax, swine-fever, &c. A very careful watch is kept as regards the possibility of disease gaining entry into New Zealand, and the importance of maintaining our restrictions on the entry of stock from countries (including the United Kingdom) where outbreaks of foot-and-mouth disease in particular occur cannot be too strongly emphasized.

Blackleg.—The position as regards this disease continues to be satisfactory, and no cases have been discovered outside the known areas. The inoculation of calves has been continued in the Taranaki District, and has also been carried out on farms in the Auckland District where the presence of the disease has been confirmed, or where there were reasonable grounds for suspecting that blackleg existed. The number of calves inoculated for blackleg in the Taranaki area was 29,261, which number shows a decrease of 16,179 on the previous year's figures.

Contagious Mammitis.—This disease affecting cows has again been prevalent, more especially in the North Island, and, owing to the prominence given to alleged curative remedies and to certain vaccines prepared in the Dominion reported to have prophylactic properties, it has received much more attention at the hands of the dairy-farmer than hitherto. With regard to curative remedies, farmers should exercise great caution before accepting all statements of the wonderful results of these so-called cures. Two vaccines prepared in the Dominion and said to possess prophylactic value came into prominence during the year, and it was arranged that they be given exhaustive tests by the Department at the Veterinary Laboratory and in the field, with a view to ascertaining their value. These experiments will naturally take some time, and results cannot be ascertained at once, but at the same time farmers will be well advised not to expend money on these vaccines until such time as an authoritative statement can be made. Very great risk is taken in accepting unofficial statements regarding such vaccines, the use of which may bring about a condition of false security to the user and render him liable to neglect ordinary preventive measures. During the year 1,613 specimens—more than double those of last year—were received at the Veterinary Laboratory for examination for contagious mammitis. Of these, 648, equal to 40·2 per cent., were found to be from cases of contagious mammitis; 266, or 16·4 per cent., not definitely of the contagious form; and the remainder, 699, were normal.

Tuberculosis.—The number of cattle condemned during the year by Stock Inspectors on clinical examination in the field was 4,881, the Inspectors being thorough and active in their work. The distribution of the condemned stock was as follows: Auckland District, 3,021; Wellington, 1,242; Canterbury-West Coast, 408; Otago-Southland, 210. During the year considerable use was made of tuberculin for diagnostic purposes, and this is a very encouraging sign, as it has been recognized for many years as the most valuable and reliable agent for detecting tubercular animals which do not show definite clinical symptoms. It is being largely used in connection with cows supplying milk for human consumption, and every encouragement is given by the Department to extend it and make its use available to every owner by carrying out the test free of cost. In the results of the examination of carcases on slaughter at freezing-works and abattoirs the percentage of tubercular animals shows a slight decrease. The number of cattle (excluding calves) examined was 397,432, of which 21,527, or 5·41 per cent., were found to be affected in varying degrees, a considerable number only very slightly. The position of the Dominion as a whole in respect of bovine tuberculosis seems to show some improvement when all collateral circumstances are taken into consideration. Generally speaking, it is most prevalent in low-lying wet or swampy areas, particularly in the Auckland Province. Drainage and better farming methods, combined with careful inspection and the observance of all possible preventive measures, will, it is hoped, bring about improvements as time goes on. As regards swine tuberculosis the position remains about the same as last year.

Actinomycosis.—The number of cattle condemned for this disease throughout the Dominion was 851, the condemnations being distributed as follows: Otago-Southland, 79; Canterbury-West Coast, 105; Wellington, 287; Auckland, 380. Actinomycosis in its earlier stages is amenable to potassium-iodide treatment, and a supply of this drug put up in tabloid form in a suitable strength was obtained during the year, and is available for sale at cost price. In lieu of condemnation, suitable cases are advised to be put under this treatment, and numerous cases have as a result recovered.

Parasitic Diseases.—Parasitic gastritis, which in past years has caused considerable loss either through pulling down in condition or by death among hoggets and occasionally calves, still causes considerable trouble, though less than in some previous seasons. The extent of its prevalence is largely influenced by climatic and resultant feed conditions, wet weather in autumn and winter being favourable to its spread. Fluke is still met with in Hawke's Bay, though no serious mortality caused by it came under notice. It is among sheep grazing in wet swampy areas that this trouble usually occurs. Sheep-maggot fly was in evidence to a slight extent in Marlborough, but these parasites are not generally troublesome in New Zealand.

Pasteurellosis.—This disease was demonstrated to have occurred among pigs on three farms in the Feilding district, where some mortality took place as a result. The outbreaks were taken in hand, and by a process of isolation and disinfection of the sties the outbreaks were checked and no further trouble was experienced.

Ragwort Poisoning.—Deaths of cows attributed to ragwort poisoning occurred in Southland and also in some parts of Otago, and it is the opinion of Mr. Blair, Veterinarian, supported by that of the District Superintendent, Dunedin, that considerable mortality takes place yearly in these ragwort-infested districts through the ingestion of this weed. Wherever possible, dairy-farmers should run some sheep to keep this and other weeds in check, as well as taking other more energetic measures to control the weed on their properties. Mr. Blair remarks that few cases of the acute form of ragwort poisoning came under notice—practically all the cases assumed the chronic form.

Ticks affecting Cattle.

Auckland District.—While this pest has not shown much, if any, diminution in the districts known as A area, no apparent increase has taken place in B area, and on the whole fewer ticks were in evidence. In Matamata and Cambridge districts, where ticks were in previous years known to exist, no evidence of their presence was found during the past season. In all cases where ticks were found in B area, and on two farms immediately south of the boundary where ticks were reported, control methods were carried out with the willing co-operation of the settlers concerned. The control of the tick within the A area is a difficult proposition owing to the conditions and the difficulty there would be in any attempt at weekly dipping or spraying of other than dairy cattle. Settlers in this area do a great deal of tick-destruction, but more individual and collective action is needed in order to effectively combat these parasites. Means additional to dipping and spraying are within the power of settlers, and if practised systematically would materially assist to reduce the pest. It is very noticeable that in open country where ground-cover is not afforded by long coarse grass, rushes, &c., ticks are not present at all, or, if occasionally seen, do not increase. This applies also to the North Auckland area, while in the Waikato the tendency is to diminution.

Wellington District.—Unfortunately, the presence of ticks was reported from Waitara district in December last, having been found on a cow owned by a small settler there. Investigations were immediately instituted, with the result that ticks were found on other small properties all in close proximity to the area where they were first discovered. A comprehensive examination of all stock within a radius of from two to three miles was made, with the result that a single tick was found on an animal distant about half a mile from the original outbreak, but it is satisfactory to record that, although a strict examination of stock has been carried out, no further ticks have been discovered. With a view to eradicating the ticks from the district the small areas involved have been unstocked, and wherever possible all cover has been destroyed and burnt. An area embracing the Waitara borough and surrounding properties has also been proclaimed a quarantine area within which the movements of all stock are controlled.

The indications are that these ticks are not likely to be troublesome outside those portions of the northern area where hot-weather and plenty of ground-cover conditions are suitable for them. Notwithstanding this, the restrictions against their spread are being thoroughly enforced.

So-called "Bush Sickness," or Soil Deficiency.

Good progress has been made with the experiments being carried out at Mamaku, and these have now reached a stage when they can be given practical application by farmers located on what has in the past—for want of a better name—been known as "bush-sick country." Full particulars of the work that has been carried on have recently been consolidated by Mr. B. C. Aston, Chemist to the Department, who has for some years past been actively associated in the work, and these have been published in the Department's *Journal*. It is therefore unnecessary to cover the same ground here, but the following report of the Farm Overseer is of interest as showing some of the results of the year's operations:—

Experiments: Paddocks No. 2 and part of No. 5 have been treated with a top-dressing of finely ground sulphate of iron at the rate of ½ cwt. per acre. It was decided that two yearling steers which have been reared on the farm should be grazed on these paddocks for the purpose of testing the effect of the soil treatment. At the time of writing, these steers, which are now eighteen months old, are in excellent condition. Paddocks 2A and 2B, from which hay has been taken for the past three years, have been top-dressed with finely ground Nauru phosphate dust. This was applied to these paddocks in August last, and has proved very beneficial—the grass responding quickly to treatment, and a great improvement in the pasture is noticeable. This is the first year since the farm was taken over by the Department of Agriculture that we were successful in rearing all the calves. Twelve were born in the months of September and October, 1923, and are still in first-rate condition. At various times some of them have shown signs of the sickness, but these quickly responded to a little medicinal treatment by citrate of iron and ammonia. On one of the dairy cows a new method of treatment was administered—that of subcutaneous administration of sodium iron citrate; but after twenty-five days' treatment practically no improvement was noticeable

As she did not respond to this treatment the administration of medicine by the mouth was commenced, and after twenty-three days' treatment a marked improvement was noticeable.

Dairy cows: Quite a fair proportion of the cows now milking have successfully gone through two seasons without special treatment, receiving just hay and turnips. Any that showed any symptoms of the bush sickness were quickly brought around by dosing with citrate of iron and ammonia. If the cows are allowed to go on without treatment until the sickness is in an advanced stage it will take much longer to effect a complete recovery.

Crops: During the season 20 tons of meadow hay was made, this being in first-rate order. This hay, at the time of stacking, was treated with a solution of iron ammonium citrate and molasses, which liquid was sprayed on with a Vermorel knapsack sprayer. A small quantity of hay treated as above was fed out to three head of cattle last season, with satisfactory results. If this method proves a success in the ensuing season it will be quite a satisfactory method for any farmer to follow.

Experiments are being continued in the direction of ascertaining the manner in which the iron deficiency can be remedied under ordinary farm conditions, so that the stock may obtain the benefits to be derived from its use in a manner within the means of the dairy-farmer or grazier. As mentioned in the report of the Overseer, the spraying of the hay with a solution of iron and ammonia citrate has been tried and gives very promising results, and if the further trials continue to be effective a means of overcoming one of the great difficulties will have been discovered. Such treatment, combined with top-dressing of the pastures judiciously with sulphate of iron, may considerably reduce the loss now experienced in the affected country and bring into profitable use country now unproductive.

Live-stock Statistics.

Sheep.—The statistical returns as at the 30th April, 1924, again indicated a further improvement in the sheep position, an increase of 694,337 sheep being recorded, bringing the total to 23,775,776. The increase in the number of breeding-ewes was not, however, in the same proportion as in the previous year, when the increase was the very substantial one of 566,180, but it is satisfactory that this increase was not only maintained but added to by 13,094. With the high prices ruling for mutton and lamb during the past few years, there is always a tendency to send in for slaughter animals that should be retained for breeding purposes to maintain the flocks, and it is a matter for congratulation that the temptation has been resisted to the extent it has. No doubt, however, the high price of wool has had a counteracting affect. The figures for the past five years are shown in the table hereunder:—

Year.	Stud and Flock Rams (Two-tooth and over).	Breeding-ewes.	Other Sheep.	Lambs.	Total.
1920	306,583	11,568,549	5,723,459	6,315,915	23,914,506
1921	322,144	12,147,788	4,980,618	5,834,481	23,285,031
1922	322,072	12,496,054	3,687,672	5,716,461	22,222,259
1923	330,055	13,063,003	3,369,559	6,318,822	23,081,439
1924	322,814	13,076,097	3,853,482	6,513,386	23,775,776

Cattle.—A further increase in the number of dairy cows and heifers, and also in the numbers of other cattle, as compared with the previous year, is revealed in the statistics collected in January, 1924. The numbers if the respective classes are shown in the following table:—

Year.	Bulls.	Dairy Cows.	Other Cattle.	Total.
1920	57,999	893,454	2,150,492	3,101,945
1921	59,348	1,004,666	2,075,209	3,139,223
1922	59,086	1,137,055	2,127,082	3,323,223
1923	60,154	1,248,643	2,171,897	3,480,694
1924	58,934	1,312,589	2,192,074	3,563,497

Swine.—A further increase has taken place in the numbers of swine in the Dominion as at January, 1924, the figures being 414,271—an increase of 13,382 on the previous year.

Horses.—The enumeration of horses as taken in January, 1924, shows a further small decrease of 388 on the previous year's figures. The 1924 figures show 330,430 horses in the Dominion, the decrease being indicative of the further utilization of motor traction in place of the horse.

Slaughter of Stock for Export.

The export season opened early, with prospects exceedingly bright for both mutton and lamb, and also more promising for beef, and conditions have continued favourable, with the result that, excepting lambs, which show a decrease of 286,488, the number of stock coming forward for slaughter has exceeded that of the previous year.

The following table, showing the stock slaughtered at freezing establishments alone during the year, with the previous year's figures shown for comparison, indicates the increase that has taken place over the twelve-months period :—

——	Year ended 31st March, 1925.	Year ended 31st March, 1924.	Increase.	Decrease.
Cattle	247,883	184,848	63,035	..
Sheep	2,564,530	1,932,259	632,271	..
Lambs	4,832,493	5,118,981	..	286,488
Calves	22,775	18,776	3,999	..
Swine	142,168	113,200	28,968	..

For comparison purposes the following table is given, showing the killings of sheep and lambs over four periods, 1st October to 31st March in each year, as indicative of the slaughterings from the beginning of each season to the 31st March :—

——	1921–22.	1922–23.	1923–24.	1924–25.
Sheep	2,091,840	1,244,490	1,462,128	1,821,901
Lambs	3,011,695	3,128,415	3,492,004	3,360,761

These figures indicate that an increased number of sheep were slaughtered during the period named, which covers part only of the 1924–25 season, and that a decreased number of lambs were slaughtered. The increase in sheep for the 1924–25 period, however, more than balances the respective totals. The decrease in lamb slaughterings over the period, if not counterbalanced during April slaughterings, will be reflected in an increased number of sheep as at the 30th April, 1925.

Inspection of Meat.

The inspection of all animals slaughtered at meat-export works, abattoirs, and bacon-factories combined was carried out satisfactorily during the year, but owing to the large increase in slaughterings the available experienced staff was somewhat below requirements, and the necessity of strengthening the personnel, with a view to maintaining an adequate trained staff to meet all emergencies, must be given attention before another season comes round.

The following are the numbers of each class of animal slaughtered under direct inspection during the year ended 31st March, 1925 :—

Cattle	397,432
Calves	63,996
Sheep	3,106,209
Lambs	4,903,831
Swine	279,925

The following table indicates the respective class of premises at which these animals were slaughtered, those going through abattoirs being almost wholly for local consumption, except perhaps in the case of swine, and those slaughtered at meat-export slaughterhouses being intended principally for export :—

——	Abattoirs.	Meat-export Slaughterhouses.	Bacon-factories.
Cattle	149,549	247,883	..
Calves	41,221	22,775	..
Sheep	541,679	2,564,530	..
Lambs	71,338	4,832,493	..
Swine	100,043	142,168	37,714

At ordinary slaughterhouses the stock slaughtered was as follows :—

Cattle	90,706
Calves	3,311
Sheep	248,091
Lambs	19,542
Swine	27,849

In addition, 37,848 carcases of pork killed and dressed by farmers and sent in to butchers' shops were examined by departmental officers.

In connection with the animals shown in the table as slaughtered at meat-export slaughterhouses, the following numbers of the respective classes are returned as having gone into consumption within the Dominion : Cattle, 41,099 ; calves, 5,937 ; sheep, 151,490 ; lambs, 50, 975 ; swine, 19,760.

Compensation paid for Stock and Meat Condemned.

Compensation to the amount of £15,091 was paid out during the year for 5,872 animals condemned in the field for disease under the Stock Act, and £13,391 for carcases or parts of carcases condemned for disease on examination at time of slaughter at abattoirs and meat-export slaughterhouses, &c., under the provisions of the Slaughtering and Inspection Act.

Importation of Stud Stock from Abroad.

Owing to the continuance of outbreaks of foot-and-mouth disease in Great Britain, the prohibition on cattle, sheep, and swine from there was continued, but considerable numbers of sheep and swine were imported from those Australian States from which the importation of stock is not absolutely prohibited. All these importations were allowed only on the precedent consent of the Hon. Minister having been obtained, and subject to compliance with such conditions as were from time to time thought necessary in order that the introduction of disease might be guarded against.

Destruction of the Kea.

The subsidy of 5s. per beak which has been paid for the destruction of the kea for some years past was continued during the year, and a total of 2,916 beaks were paid for, a decrease of 1,107 on the previous year.

Inspection of Dairy Premises Supplying Milk for Direct Consumption.

The inspection of all premises licensed by the Department, under the provisions of the Dairy Industry Act and regulations, to retail milk for human consumption has been carried out with energy during the year, and improvements necessary have been effected on the instructions of the Inspectors. Generally speaking, the premises and herds are in a satisfactory condition. Particularly does this apply to the dairies supplying the large centres of population, where the farms are concentrated within a more or less defined radius and subjected to regular and thorough inspection under expert guidance and supervision.

The tuberculin testing of individual herds and selected members of the respective herds has been greatly extended during the year, and it is expected that this will continue to expand.

During the year new patent sediment testers were supplied to all Inspectors carrying out inspection of dairies in the chief centres, and these have been found of considerable value to them in their work.

Importation of Animal-manures.

The work of supervising the sterilization of all animal-manures for New Zealand prepared in Australia and India in premises specially licensed for that purpose under the requirements of the New Zealand regulations, for the purpose of preventing the introduction of anthrax by means of bone-dust, &c., has been efficiently carried out during the year. Owing to various causes the quantity shipped to New Zealand was less than usual, but indications point to a considerable increase during the coming season.

Poultry Industry.

The poultry industry has continued to make steady, if slow, progress, but it continues to be very considerably affected by the high price and scarcity of foodstuffs, particularly wheat, pollard, and bran. Pollard is not only difficult to obtain in sufficient quantity, but has of late years often proved to be of very inferior quality, consequently not possessing the feeding-value required for heavy egg-production. Given sufficient food material at reasonable prices the poultry industry is capable of adding considerably to the Dominion's exports. As with all our other exports, however, it is necessary that the highest standard be maintained, otherwise the price obtained abroad will be an unpayable one and the industry will suffer. The export eggs have been well received and realized good prices when landed at the proper time, but nevertheless sufficient indication was given that the same reception would not be given a lower standard egg, and it is advisable that only first-grade eggs be exported. A tendency to get the standard lowered has been exhibited, but it is a mistake.

Following are extracts from the report of the Chief Poultry Instructor, who, with the other Instructors, are deserving of commendation for the work they have performed during the year :—

The poultry industry continues to make sound progress, and now that an export trade in eggs has been established on the London market greater and more rapid progress may safely be anticipated. The export trade in eggs has given the industry a decided fillip and placed it on a firmer footing than ever before.

It is gratifying to be able to report that there was a general improvement in the quality of eggs received at the export grading-stores as compared to the previous year.

During the year 6,670 cases of 30 dozen each were shipped to the United Kingdom, an increase of 85 per cent. over the previous year. The outstanding quality of New Zealand's first-grade eggs has again been demonstrated by the fact that some of the lines shipped during the earliest part of the season commanded a higher price than eggs of all other competitive countries, a price exceeding even that of fresh eggs produced on English soil. Excellent prices were secured for all large-sized eggs which reached the Home market not later than the end of December, but unfortunately eggs of a second-grade size did not fare so well generally. With some of these lines there was a difference of 16s. per case of 30 dozen. There was a considerable reduction in price for all grades of eggs that reached the Home market after the Christmas season. The foregoing is sufficient to indicate that the best possible returns which the export trade offers can be secured only with eggs weighing not less than 2 oz. which are shipped to reach the Home market before or during the Christmas season. The question of making larger shipments of nothing else but a high-grade product, and at the right season, is a matter calling for the earnest consideration of those concerned in the export trade.

A notable feature of last season's export trade was a trial shipment of duck-eggs. The experiment proved highly satisfactory—indeed, far beyond expectations—especially in view of the fact that it was generally concluded that duck-eggs could not be shipped overseas to advantage.

The Poultry Act which was placed on the statute-book last session should give gratifying results and tend towards the uplifting and protection of the poultry industry. The Act provides for the framing of regulations relative to the compulsory grading of eggs and poultry for export, also the marketing of eggs and table poultry for the local trade. It also provides for the prevention of live poultry being kept under insanitary conditions and for the prevention of cruelty.

The chief weakness of the industry continues to be the want of better organization among producers. If the industry is to expand as it is capable of doing it is imperative that producers realize the necessity for co-operation and the centralization of poultry products on the chief marketing centres. Such combined effort would not only have the effect of eliminating the present unnecessary marketing-costs between the producer and the consumer, but would also tend towards placing both the export and local trade on a more sound commercial footing.

The marketing of table poultry in a prime condition is unfortunately little practised throughout the Dominion. What is wanted in this connection is intermediate fattening-farms between the producer and consumer under co-operative control, whereby store birds could be primed, dressed, and marketed according to their weight, direct to the consumer.

There is every reason to regard the future outlook of the industry with confidence, yet if advanced methods of production are to be brought about to enable us to continue to successfully compete on the oversea market, and if the knowledge of the instructional staff is to be expanded and passed on to the producers, then it is of the first importance that breeding, research, and experimental work be undertaken by the Department.

During the year the four Poultry Instructors have been kept exceptionally busy by way of visiting plants and giving practical advice on the spot, delivering lectures, giving demonstrations, answering correspondence, judging birds and eggs at egg-laying competitions, and supervising the grading of eggs for export, &c. Owing to the limited staff, so great was the demand for the Instructors' services that all requests for visits, &c., could not possibly be complied with, and this quite irrespective of a disregard for hours of duty. In view of this and the increasing development of the industry I would recommend for favourable consideration the appointment of at least one additional Instructor.

Veterinary Laboratory.

The work at the Department's Veterinary Laboratory at Wallaceville has been carried out during the year by Mr. C. S. M. Hopkirk, B.V.Sc. (Melb.), as Acting Officer in Charge (in the absence of Mr. H. A. Reid, F.R.C.V.S., Officer in Charge, on extended furlough in England), with the assistance of the permanent Laboratory staff. Mr. W. T. Collins, M.R.C.V.S., District Superintendent, has kept in close touch.

The general work of the Laboratory has shown a very considerable increase, and a great amount of research work into various troubles affecting stock, particularly into abortion, sterility of dairy cows, vaginitis, and contagious mammitis of cows, has also been carried out. The number of specimens and samples received for examination during the year was 2,649, as against 1,522 for the previous year.

The following report by the Acting Officer in Charge gives in detail the scope of the work carried out:—

Milk Samples.—Contagious mastitis: Samples numbering 1,613 were examined. Of these, 648, or 40·2 per cent. of the whole number, or 71 per cent. of affected quarters, were positively streptococcic in origin. 266, or 16·4 per cent. of the whole number, or 29 per cent. of affected udders, were not definitely streptococcic or were from cases of staphylococcic or coliform infection. 699 were normal. An explanation of the large number of normal cases can be given in the fact that a number of herds were examined where possibly only 5 to 10 per cent. of the cows showed abnormality of the quarters. Farmers have been encouraged to send forward milk-samples so that the position of mastitis in the dairy herds of the country could be judged more accurately. From the fact that the samples doubled in number, it would indicate that the farmer is awake to the usefulness of correct diagnosis, and also awake to the danger and prevalence of this disease in the Dominion.

Tuberculosis: Composite milk-samples from town-supply herds were received to the number of 285 during the colder months of the year. None of the guinea-pigs inoculated from these milk-samples developed tuberculosis. Tuberculin to the amount of 1,600 c.c. sufficient to test 5,333 cattle was distributed. This showed an increase of 600 c.c. over last year.

Contagious Abortion in Routine Work.—Blood samples from cases of suspected contagious abortion have been received regularly during the year to the number of 329, an increase of 88 over last year. Positive reactions to the agglutination test were obtained in 188 cases (57·1 per cent.). Several of these positive cases were from bulls. More attention will be given to this phase of the question in consideration of sterility work.

Anthrax.—Blood samples received were at all times negative.

Blackleg.—That the vaccine prepared at this Laboratory is pure has been demonstrated during the year by cultural and biological methods. As regards vaccine, a substantial decrease in the number of doses supplied has taken place. 37,000 doses were sent out, as against 71,250 of the previous year. One fresh batch of vaccine was made. A machine has recently been imported to turn out the blackleg vaccine material in tabloid form, so reducing work in this direction to a minimum. Credit for this innovation must be given to Mr. Kidd, Laboratory Assistant.

Pasteurellosis.—There have been several outbreaks of this disease in pigs in the Feilding district. In some of the outbreaks the organism has been quite virulent, but in others the virulence has been so low that most of the animals have been able to recover. The diagnosis was made on biological testing of materials on rabbits, mice, and fowls, together with cultural work for confirmation.

Actinomycosis.—A representative number of specimens was received of this disease, principally from tongues of cattle.

Botriomycosis.—Two specimens of this disease were received from horses, there being little doubt that these were positive cases.

Xanthosis and Ragwort.—Mr. Danskin, Government Veterinarian, Invercargill, is forwarding specimens from definite cases of xanthosis with a view to establishing a link between ragwort poisoning and xanthin deposition. The supposition that this is the case is reasonable, but specimens only commenced coming forward late in the year. Suspected ragwort-poisoning specimens have come to hand on several occasions from widely separated districts.

Parasites.—Numerous parasites have been forwarded for examination and identification, most of which were easily identified and did not require the further assistance of the Entomologist.

Tumours.—An increase in the number of specimens examined has taken place from 119 of last year to 219 of this. 193 of these specimens were epitheliomatous in character, while the remaining 26 were representative of endothelioma, carcinoma, adeno-carcinoma, hypernephroma, sarcoma, melanoma, papilloma, fibroma, chondroma, and osteoma.

Work for the Dairy Division.—A good deal of work has been done for this Division. All of it has been in the nature of cultural examination of "starters" from factories, foreign dry-starter cultures, cheese and butter specimens, and water-supplies from factories. Wherever possible we have been of assistance to the Dairy Division, recognizing the immense amount of work which it requires done to maintain the supremacy of New Zealand produce. One great drawback had been the absence of a low-temperature incubator (22°C.). This has now come to hand, and it will be put into use as soon as possible.

Wool.

As was anticipated after such a good winter, the season's clip as a whole turned out to be in excellent condition. A few of the late-shorn clips—delayed through prolonged spells of wet weather—were heavy in condition and seedy, consequently the price was affected. A further improvement in the manner in which the wool has been skirted and classed was manifest when the wool was opened up for buyers' inspection, and growers are no doubt realizing the advantage of presenting their wool in a manner best calculated to bring them the highest price ruling for the particular class in question. No opportunity has been lost by the Wool Instructor, Mr. Cook, in stressing the advantage to be gained by a good skirting and classing, and it is gratifying to note that it is meeting with such success. Much remains to be done in order to present clips showing an even quality of wool by improved methods of breeding, and more strict attention to culling and mating is required. The Department's demonstration carried out on the Wallaceville Laboratory farm flock, showing the rapid improvement that can be effected in a line of inferior ewes by a system of mating and careful culling to eliminate defects, is a valuable object-lesson to all wool-growers, but particularly to small growers, as it is in the small flocks that the variations and defects are most pronounced.

The quality of wool offered for sale at the local sales was again a marked feature of the 1924–25 season, and an indication of the growing popularity of the Dominion sales. The wool offered for sale locally is shown as 517,572 bales, of which 450,587 were sold. The high reserves put on by some growers were responsible for a considerable quantity of the wool offered being passed and resubmitted at subsequent sales or held for shipping overseas. The opening sales were conspicuous for high prices, which were not maintained at subsequent offerings, and as a consequence disappointment was freely exhibited, but the position was nevertheless quite a satisfactory one when compared with the previous year's figures, and the average price realized is estimated to be slightly above 19d. per pound over the season, as compared with 16d. for the previous year.

The prospects for the 1925–26 season are good, as, owing to good autumn rains, feed is abundant, and sheep should enter on the winter in good condition to go through it well.

The services of the Wool Instructor are in great demand for lectures, demonstrations of classing, &c., and good work is undoubtedly attending the instruction given.

Swine Husbandry.

The pork and bacon industry did not show very much advance on the previous year so far as exports were concerned, but the position has been fully maintained, and, as is shown in the statistics, the number of swine has increased slightly over the previous year.

A considerable interest is manifest in this industry, and provided a payable export trade can be assured the business will expand. As has been previously pointed out, a too-rapid expansion of this business before a sure footing has been obtained should be avoided, but an excellent opportunity appears to present itself of furthering the export on a steadily increasing and substantial basis, and no opportunity should be lost of getting on to right lines of breeding, feeding, and management, with a view to producing as economically as can be and marketing a suitable carcase.

The Instructor in Swine Husbandry has been kept busy during the year answering and attending to inquirers, delivering lectures, and generally assisting growers. The export of pork, hams, and bacon for the year amounted to 4,511,990 lb., of a value of £151,270.

Rabbit Nuisance.

The administration of the Rabbit Nuisance Act has been carried on with considerable energy throughout the year, but as time goes on the difficulties do not diminish. In the North Island, where the commercial aspect does not obtrude itself, the chief difficulty to contend with is the natural elusiveness of the rabbit to respond to the various devices employed for its destruction, consequently we know exactly what we are up against; but unfortunately this is not so in the South, particularly in Otago-Southland districts. The position of the pest in the North Island is generally satisfactory, and excellent work is being performed, both individually and collectively, by settlers and Boards respectively. Rabbits in the North Auckland district, where they have been present for some years, but not numerous, now show a tendency to extend into clean country, and will require close attention.

As regards the position in the South Island, Canterbury shows a considerable diminution in the pest, brought about by constant vigilance during the summer months; but in Southland, and South Otago in particular, rabbits showed up during the summer in increased numbers. Favourable seasonal conditions contributed to this increase, but inaction on the part of settlers following the winter operations is the chief reason for the unsatisfactory condition of the pest. The season was a good one for work had owners been desirous of carrying out continuous and combined action, but, while all are not apathetic, a number, unfortunately, are. During the winter, when rabbit-skins command a high price, rabbits are killed in very large numbers without any pressure on the part of the Department; but, unfortunately, in a large number of cases the destruction of the pest is discontinued immediately the winter operations are over, consequently the breeding propensities of the rabbit are responsible for a further considerable increase, which if neglected quickly assumes large dimensions.

When the provisions of the Rabbit Nuisance Act pertaining to the formation of Rabbit Boards were originally drafted a very excellent principle was inserted, but a serious weakness lay in the fact that the provisions were not wide enough to allow of small workable areas as Rabbit Board districts being formed under its provisions, and until the amendments of 1918 removed this disability no ratepayers' Boards were in existence. On the passing of the amendment the advocacy of the formation of such Boards immediately became a part of the policy of the Department, and as a result thirty-two Boards have since been constituted, and practically all those in the North Island afford

an object lesson of what can be effected by such Boards to assist in the cleaning-up of the areas under their control. The principle of the Act is right if the intention to carry out its provisions is sincere, and therein lies the secret of the success of these Boards. It is regretted that the reference to the few Boards formed in Otago-Southland districts has still to be one of disappointment.

A large number of prosecutions were instituted during the year, these being taken only after all other efforts had failed.

Noxious Weeds.

The work of dealing with noxious weeds still constitutes a very difficult problem. this referring particularly to blackberry, which has such a hold over a large area of country. The West Coast district of the South Island, and portions of the North Lsland, lend themselves admirably to the spread of such a plant owing to its habit of establishing itself on wet, undrained, or partially drained swamp areas, and on partially cleared broken and poor lands. The carrying-out of permanent work on such areas presents a difficult proposition owing to its cost, but work carried out on the better and more highly improved areas has met with considerable success, and a continuance of this will materially assist towards freeing these lands of the blackberry pest.

Crown lands have been given a considerable amount of attention during the year, the larger grant provided by the Lands Department having allowed of this. A grant has also now been provided by the Native Department for the purpose of dealing to some extent with the large areas of unindividualized Native lands, and this money will be expended as authorized to the best advantage.

Ragwort was not so prominent this year as last, but it nevertheless has a considerable hold on some of the dairying lands in Taranaki, Waikato, and the King-country, as well as Southland, &c., and requires considerable attention during the year. Other noxious weeds, such as Californian thistle, gorse, sweet brier, &c., have been given attention where required. Advantage has been taken by a number of local authorities of the provisions of the Amendment Act of 1923, to have Californian thistle removed from the list of noxious weeds within their jurisdiction. Experience has shown that an amendment to the Act in regard to the definition of "clear," which is too restricted in its application, is required.

The Government offer of a bonus of £10,000 for an agency to destroy blackberry was announced during the year, and the conditions pertaining to it were duly gazetted. Although several alleged specifics have been brought forward as a result, none of them have been able to comply with the conditions.

Shearers' Accommodation.

The inspection of shearers' accommodation under the Shearers' Accommodation Act, 1919, which has now become a part of the duties of this Division, has been carried out during the year, and in order that all sheds might come under inspection it was deemed necessary to appoint additional officers of the Department as Inspectors under the Act, thus enabling us to more effectively ensure that the reasonable requirements of the Act are carried out. Inspectors have already been able to effect considerable improvements, and every effort will be made before the next season to have further work which has been found advisable carried out. The accommodation provided is in a number of cases not everything it might be, but improved conditions have been brought about in a number of instances, and these will be added to as time goes on.

Staff.

It is satisfactory to be able to advise that the staff of the Division has reached a high level, and that very good work has been accomplished generally.

During the year two of the Division's officers—viz., Mr. H. Munro, Principal Inspector, Auckland, and R. W. Carter, Wanganui—have been absent on loan to the Falkland Islands Administration. The permanent staff of the Division (not including clerical officers) as at the 31st March, 1925, showed 237 officers, comprising District Superintendents, Principal Inspectors, Veternarians, Stock Inspectors, Meat Inspectors, Instructors in Poultry, Wool, and Swine respectively, caretakers of quarantine stations, Veterinary Laboratory staff, farm Overseers, farm hands, rabbiters, &c.

DAIRY DIVISION.

REPORT OF W. M. SINGLETON, DIRECTOR.

The Season.

The dairying districts of the Dominion, with few exceptions, have experienced a finer season than has been enjoyed for many years. The autumn was particularly propitious, and dairy cattle entered the winter in good condition. The comparatively mild winter and spring, in addition to the favourable feeding conditions resulting, ensured the cows being in good condition at the beginning of their lactation period. With the exception of Southland and Otago, practically all dairying districts were favoured with rain and warmth commensurate with a continued growth of suitable feed. It is not surprising, therefore, that the Dominion's high-record butterfat production has been experienced during the year under review.

Production.

Not only has the Dominion's high-record production of butterfat this year been contributed to by favourable conditions respecting climate, feed, and condition of the dairy cows, but the effect of these on total production has been added to by some improvement in the producing quality of herds. More attention is being given to better breeding and to better feeding, and, while the resultant increase due to these factors is difficult to estimate, it is without doubt a fact that the influence is appreciable. The more extended use of artificial fertilizers as top-dressing for pastures is increasing the carrying-capacity of many dairy farms. Many dairy factories have been working beyond their capacity; some have been extended, and others replaced by more commodious buildings with additional plant.

The high record for production has been made despite some reversion from dairying to sheep-grazing, and a decline in cheese-production in Southland owing to insufficient rainfall.

Quality of Butter.

The general consensus of opinion among the Instructors and Graders is that the quality of butter this season has been maintained, and that a considerable number of dairy companies have effected some improvement. This improvement has been more noticeable, as a rule, with companies that have initiated cream-grading with a differential price between grades; that have paid a lower price for cream below a stated minimum butterfat content; or have stiffened up their previous grading standards.

An effort was made to induce managers to take greater care in the partial neutralization of cream for buttermaking. This effort has been successful in some degree, although it is admitted that there is considerable room for further improvement. There yet remains at some factories too much carelessness with respect to the use of the neutralizing agent, and complaints continue to be received to the effect that some butters evidence an objectionable flavour when examined in the United Kingdom, this being variously described as the flavour of "neutralizer" or "preservative."

There is reason to believe that sweeter and cleaner-flavoured cream is necessary in many districts to enable our factory-managers to make that class of butter which will evidence none of these objectionable flavours, and will evidence more of that flavour characteristic of butter made from fresh cream to which no neutralizing agent has been added. Cleaner and colder cream delivered daily to the factories is undoubtedly the desideratum to be aimed at. There has been some improvement in this direction this year. The body of butter evidences a uniformity which was not found some years since. Moisture is well incorporated, as a rule. The factor which now appears to leave most room for improvement is a tendency in some brands to evidence some weakness or to be too salvy. This has doubtless been partially due to the softer grass so prevalent this season. The fault also is probably in part due to a tendency to work a high water content into butters testing comparatively low after a considerable portion of the ordinary working has been completed. This very frequently means getting quantity at the expense of quality.

Whey Butter.

There is room for much improvement in whey butter. The general position appears to be to look on it as a by-product unworthy of much consideration. It is unfortunate that the butter Instructors cannot spare more time for an effort to effect improvement. Whey cream is too frequently neglected by cheese-factory managers, and in this way any attempts of the buttermaker to make a good quality are nullified. To further protect the Dominion's creamery butter a modification in the branding of whey butter was brought into effect this year.

Quality of Cheese.

The quality of cheese as evidenced at the grading-ports justifies a good deal of satisfaction. It is evident that the good season, together with a greater effort on the part of suppliers and factory-managers, has culminated in a noticeable improvement in quality. This statement appears to be applicable to all cheese districts with the exception of Taranaki. In that province a number of the factory-managers have had pressure thrust upon them to make cheese with special regard to high yield, irrespective of quality. Defective cheese was considerably in evidence, some of this being weak, open, and sweet, or showing an excess of acid. This departure from orthodox lines of manufacture was the cause of a considerable increase in the percentage of second-grade cheese for a time. Fortunately, the grading of such cheese as "seconds" was not appreciated by the companies. Better counsels prevailed, and a more general attempt was made later to make a product showing the general characteristics so universally expected in good-quality cheddar cheese. Some of the troubles experienced in preceding seasons, such as slimy milk and milk in which it is difficult to get lactic acid to develop, have been almost conspicuous by their absence during the year under review.

The finish of cheese has improved to a considerable extent. Less cracked rind was in evidence. Manufacturers of cheese plant are making strong efforts to produce an acceptable cheese-hoop such as will enable factory-managers to turn out a cheese devoid of the lip or rim, which is so unsightly in poorly dressed cheese, from the hoop so generally used in New Zealand cheese-factories hitherto.

The retiring president of the Scottish Provision Trade Association in January last made reference to New Zealand cheese in words which give pleasure at this end. He stated, "The quality of New Zealand cheese has generally found favour. Their presence on our market the whole year round is giving them an assured place."

Storage of Cheese and Butter.

Not until this season could it be stated that New Zealand cheese was precooled at all grading-ports. The Otago Producers' Cold Storage Company and the Southland Cool Stores (Limited) have this season introduced cool storage for cheese. The cooling of cheese at these ports makes the general position such that cheese for export is now all in cool storage from the time of grading until shipment. Furthermore, the Patea cheese, when in Wellington awaiting a Home steamer, has this season been placed in cool storage instead of being permitted to remain in a Harbour Board shed with uncontrolled temperature.

Generally speaking, butters have been in cold storage at suitable temperatures prior to shipment. Attention to temperatures at time of shipment is not only being given by the Graders in charge, but the shipping companies are more insistent on butter and cheese being at proper temperatures when going on board. It is pleasing to endorse the fact that exceptionally good work is being accomplished by the Shipping Supervisor of the Dairy-produce Export Control Board towards ensuring conditions still more suitable for the carriage of the Dominion's dairy-produce on the Home steamers.

Quantities of Butter and Cheese forwarded to Grading-stores for Years ended 31st March, 1924 and 1925.

Port.	1924–25.		1923–24.	
	Butter.	Cheese.	Butter.	Cheese.
	Cwt.	Cwt.	Cwt.	Cwt.
Auckland	824,081	191,027	654,337	203,091
Gisborne	18,599	..	17,273	..
Napier	6,714	578	..	..
New Plymouth	117,931	283,697	99,496	257,534
Patea	30,257	340,641	27,868	302,728
Wanganui	92,364	45,836	75,008	26,421
Wellington	205,465	333,534	182,441	341,770
Lyttelton	47,626	30,812	47,026	35,097
Timaru	12,394	6,678	11,303	14,661
Dunedin	31,905	35,572	34,964	42,584
Bluff	19,288	178,861	18,471	203,879
Totals	1,406,625	1,447,236	1,168,187	1,427,765

Value of Exports.

Prices for dairy-produce for the year under review did not reach the level of the previous year. Owing, however, to an increased production, the total value of these products exported shows an increase of £262,686. Including butter, cheese, dried milk, casein, condensed milk, and milk-sugar, a total value of £18,839,160 was reached, as compared with £18,576,474 for the previous year.

Casein.

The grading of casein has been continued through the year at Wanganui and Auckland. There has been improvement in the quality, and the uniformity of such in consignments exported has reflected credit on the manufacturers. Efforts have been made to secure a cleaner skimming, so that the skim-milk from which the casein is made will contain a minimum of butterfat. By improved methods manufacturers are now able to make a rennet casein of good commercial quality, containing not more than 1 per cent. of fat, and this is finding a ready market. During the year the quantities exported represent some 2,363 tons of lactic casein, and 295½ tons of rennet casein, making a total of 2,658½ tons.

Testing Butter for Water Content.

This work has been continued with very satisfactory results. During the year 150,396 churnings for export have been tested, and these have shown an average water content of 15·025 per cent. These figures testify to the fact that the majority of our dairy companies are working as close to the legal limit of 16 per cent. as is practicable. It is pleasing to note that no reports have been received respecting excesses of water in New Zealand butter in the United Kingdom. The number of churnings over the legal limit has been much less this season. The percentage of excesses has been reduced from 1·006 for the August to March period of the preceding season to 0·575 per cent. for the corresponding period this season. The dairy-factory staffs have evidently found it practicable to work on more assured lines.

Increased Minimum Points for First-grade Butter and Cheese.

For over two decades the minimum points for first-grade butter and cheese stood at 88. It was the general consensus of opinion amongst those connected with the industry that it would be in the interests of nearly all concerned if the minimum points were increased. Under the previous standard the percentage of second grade was getting ridiculously low. Resolutions favouring the increase of

the minimum points from 88 to 90 were in many cases carried unanimously, and in all cases strongly supported at the principal conferences, and special meetings where the proposal was discussed. The change has been given effect as from the 1st January last.

Although the higher minimum has been in operation for only three months of the financial year, the grading-figures indicate an improvement in quality which has been pleasing. An exception has obtained in Taranaki, where dairy companies were led to ignore the opinions of the divisional officers for a time, and a considerable amount of inferior cheese was made. A larger percentage of second-grade cheese was the result of attempts to get increased yields, and the inferiority so noticeable at the New Zealand grading-ports has been very much in evidence in the United Kingdom, as indicated by reports of the Inspector of Dairy-products in London. The higher percentage of second-grade cheese in Taranaki has caused some who sent forward more inferior cheese than usual to attribute the increased percentage to the increase in the minimum points. It is undoubtedly a fact that had there been no change in the minimum points Taranaki would have had a much larger percentage of second-grade cheese than usual. There was a marked improvement in cheese-quality during March, and it is hoped that the lesson will not be soon forgotten by those concerned.

Cream-grading.

The grading of cream and the payment of a differential price for different classes has extended on the voluntary basis during the year. While the extension has been considerable, the general position is unsatisfactory in many districts. There has been a considerable increase of cream-grading in the Wellington Province and Gisborne district. A genuine attempt to inaugurate a general system in Otago, Southland, and Canterbury was made last winter and spring. It is reported that much improvement was experienced during the comparatively short period the scheme was in operation. Unfortunately, the grading was discontinued owing to too much competition for quantity irrespective of quality.

The general consensus of opinion amongst the large majority of suppliers and those in control of dairy factories is that the grading should be made compulsory. Voluntary grading would be nearer the ideal, could it be effectively carried out generally. I am of opinion that it will not be so carried out, and that the earlier a compulsory system is approved by the Department the better will it be for all interested in the dairy industry and who have the real interests of the industry at heart. Legislation is, I believe, necessary for providing for a differential payment for second-grade cream, and without this compulsory grading would be useless. Compulsory grading with differential payment would add greatly to the effectiveness of the farm-dairy instruction work.

Farm-dairy Instruction.

The work of farm-dairy instruction continues to increase in popularity. This pertains more particularly to the North Island, where cream-grading is more general than is the case in the South Island. Further appointments of such officers were made on the new basis approved by the Department early in the year. The change in basis has permitted the Department to extend its assistance over a wider area, and the change was carried out with the transfer of only one officer previously employed on behalf of a group of dairy companies. The present indications point to further requests being received during the ensuing winter for similar appointments in districts not yet undertaking this work.

The manner in which officers have carried out this work, and its efficiency, have been favourably commented upon by those in a position to judge. The officers appear to have been successful in winning the confidence of the suppliers, and find much of their time occupied in complying with requests from the dairy-farmers for visits of instruction and help.

Inspection of Dairy Produce in United Kingdom.

This work has been ably carried out by Mr. Walter Wright so far as time would permit. It is recognized, however, that the volume of imports into the United Kingdom from this Dominion has now attained to such huge quantities, and is going to so many different centres, including the Continent, that there is ample work for more than one officer. Reports have been received on the quality of many dairy companies' butter and cheese, and copies of these have been forwarded to the dairy companies concerned. Special reports on subjects of importance to the Division have also been received from time to time. The value of such work as our officer in London is doing is of sufficient importance to necessitate its extension.

Preservatives in Butter.

In September last there appeared the final report of the Departmental Committee on the use of Preservatives and Colouring-matters in Food in the United Kingdom. Evidence given before the committee included the question of preservatives in butter; and, while portions of the evidence were against the use of preservatives in butter, other evidence was in favour of such use. Representations made by this Department to the High Commissioner have been placed before the British Ministry of Health; they were to the effect that it was desirable that the use of preservatives might be left optional.

The report of the committee to the Ministry of Health suggests "that a period of two years' grace should be ample to enable such adjustments of methods to be made as would enable all butter to be produced and sold without preservatives." The Ministry of Health has brought forth draft regulations which would prohibit the use of preservatives in butter, but the Ministry will hear objectors

before arriving at its final determination. In this draft the definition of "preservative" would, it is believed, include bicarbonate of soda, which is so frequently utilized for the partial neutralization of acidity in cream for the manufacture of butter. A protest in this connection from the Department was cabled to the High Commissioner for presentation to the Ministry of Health, and a satisfactory reply has been received to the effect that it is not intended to debar this neutralizing agent. At the time of writing the final decision has not been received.

Dairy-produce Export Control.

The Dairy-produce Export Control Act, passed in August, 1923, set up a control Board which has since duly functioned. During the year a delegation of three of the Board members, consisting of Messrs. Grounds (Chairman), Motion, and Thacker, visited the United Kingdom, Denmark, Canada, the United States of America, and Australia. The delegation furnished a comprehensive report to the Board, which has since decided to adopt complete control so far as its functions may be operative, as provided by the Act. It has been decided by the Board that such control shall commence in August, 1926. The policy of the Board has been outlined by the Board's Chairman to meetings of dairy-farmers in numerous districts, and further meetings are to follow. It would appear that the policy outlined includes factors which are likely to be far-reaching in their effect, and it is believed that some are likely to provide a great stimulus towards the improvement in quality in New Zealand butter and cheese. This should prove to be in the direct interest of milk-producers.

The Board has already done useful work in a number of directions. Reductions in shipping freights and insurance premiums have been secured.

A national brand is now under consideration by the Board—the suggestion being that this shall not be allowed on butter or cheese scoring below first grade. This suggestion includes the instituting of a higher class than first grade for our higher-scoring qualities. There is also the suggestion of a modification of the system of payment to dairy factories, which will attach additional importance to the grading at this end. If these suggestions become operative in practice, the position which will obtain, and the increase in volume of the Dominion's exports, will necessitate the considering of adding to the inspection staff of this Division in the United Kingdom. Mr. Wright, Inspector of Dairy Products in London, has already too much to look after in this connection.

Dairy Laboratory and Experimental Factory.

The suggested erection of a dairy laboratory has been discussed from time to time over a protracted period of many years. The need for such an institution has been continuously growing more urgent as our production of dairy-products increased in such enormous quantities as has been experienced during the last decade. That the Government have approved of the erection of these buildings, and the undertaking of the work for which they are intended is appreciated in all dairy districts. Plans are in course of preparation, and it is understood that the erection of the buildings is to be proceeded with at an early date.

Very great progress has been made in the manufacture of New Zealand dairy-products in the past. A number of factors have contributed to this end, and amongst these should be mentioned the manufacture of improved plant for dairy factories. The art of manufacturing butter and cheese has been studied by those concerned, and the position to-day is that our dairy-products probably represent a greater uniformity than do similar products from any other country working under comparable conditions.

The work of the laboratory and factory will probably, in the first instance, be largely devoted towards the solving of difficulties at present confronting the makers of butter and cheese. There is considerable work awaiting in this connection, and, as such work will be in the direction of increasing the returns to the dairying community, it may be considered as of more immediate importance.

The erection of the miniature factory for the manufacture of butter and cheese was considered essential so that the investigators might see their experiments carried out under satisfactory conditions of control. It is accepted that the best method of attacking our problems is that there should be collaboration between the bacteriologist, chemist, and a trained manufacturer of the product which is the subject of investigation.

Certificate-of-record Testing of Purebred Dairy Cows.

The financial year under review has shown a slight decrease in the number of entries for certificate-of-record testing. The highest number of cows on this test for any one month during the past season was 1,093, which was for the month of November, 1924. This compares with 1,185 for November, 1923, the highest month for the 1923–24 season. The number of cows per breeder was 3·45, as against 3·56 for the previous year. From the 1st April, 1925, the fee for the first cow to be entered on each farm has, with the sanction of the Hon. Minister, been reduced from ten guineas to eight guineas. It is expected that this may have a favourable influence on the number of entries for the approaching season.

Association Testing of Ordinary Herd Cows.

For the season 1923–24 some 151,214 cows were tested under this system. Figures for the 1924–25 season are as yet incomplete, but statistics collected to date show that there is likely to be a marked increase in all branches of the work. Officers of the Division have again carried out a proportion of the testing-work, and returns for thirty-five associations, including 13,748 cows, have been figured in the Division's head office. The total figures for cows tested and returns figured by Dairy Division officers are sixty-two associations, comprising 29,736 cows.

Not only has there been an extension in the original system of association testing of dairy cows for yield, but it is pleasing to record an extension of the "group system." Last season 43,144 cows, or 40·2 per cent. of cows tested by other than Dairy Division officers, were included in "group," associations. It is expected that figures for the season just ended will bring this number to around 95,000 cows.

STAFF.

I desire to acknowledge the hearty co-operation and support of Mr. W. E. Gwillim, Assistant Director, in the direction of the Division's work throughout the year. The Division lost during the year the services of Mr. J. Pedersen, who for many years acted as Instructor in the manufacture of butter and casein. Mr. Pedersen was an officer with a thorough knowledge of the manufacture of these products, and as the Division is understaffed his loss is felt all the more. Mr. Pedersen's position has not yet been filled, although certain adjustments in staff have been made in an endeavour to cope with the work as far as possible. The season has been a particularly heavy one for the staff, and the cordial co-operation, attention, and enthusiasm of all members is gratefully acknowledged.

HORTICULTURE DIVISION.

REPORT OF J. A. CAMPBELL, DIRECTOR.

Every effort has been made to carry out the various phases of operations coming within the scope of the Division of Horticulture as efficiently as possible during the past year.

THE FRUITGROWING INDUSTRY.

A considerable improvement has taken place in the fruitgrowing industry of the Dominion. The satisfactory prices realized on the Home markets last season have greatly encouraged growers to renewed activity, and there is every indication that future prospects will be considerably brighter than has been the case during past years. Good work was done by Mr. T. W. Attwood, ex-President of the New Zealand Fruitgrowers' Federation (Limited), who, on behalf of the Federation, investigated the conditions under which New Zealand fruit was received and distributed on the English and Continental markets during 1924. A comprehensive report received from him indicates that the prospects for New Zealand apples on the Home markets are very favourable. In order to maintain the good name New Zealand fruit has gained on this market, it is very important that nothing but best-quality fruit, well graded and packed, should be exported, and every precaution is being taken in this direction by officers of the Division.

For the purpose of the proper control of the fruit industry of the Dominion the Fruit Control Act was passed last session. Polls of producers taken in December last resulted in the provisions of the first Part of the Act, relating to export control, being carried by a majority of 151 votes. The proposal with respect to provincial control of fruit intended for sale on New Zealand markets was negatived in each province. As a result of a petition signed by not less than 70 per cent. of the producers of the Provincial District of Otago, this district was excluded from the operation of Part I of the Act, in accordance with section 4 thereof. No fruit having been exported from the Canterbury Provincial District during the year ending 31st August, 1924, producers in this district were not entitled to vote in regard to Part I of the Fruit Control Act.

There has been a gradual easing-up during recent years in the area planted in commercial orchards—only some 38 acres being set out during the 1924 planting season. The total area in commercial orchards for the whole of the Dominion stands at approximately 30,000 acres, of which about 75 per cent. consists of apples.

Citrus fruits have given good yields. A good season has been experienced by strawberry-growers, the crop being well above the average. The regulations relating to the packing of strawberries for sale, which were brought into operation in September last, have had a good effect both for the producer and consumer, a much better uniformity in size, maturity, and condition being now in evidence. The tomato crop, generally speaking, was a good one, though fungoid disease was fairly prevalent in some districts.

No serious outbreak of orchard diseases has taken place during the year. The ordinary pests and diseases affecting fruit-trees have been satisfactorily controlled in the bulk of the commercial orchards. Work in connection with the control of fireblight disease has taken up a good deal of the Instructors' time in the Auckland District. It is satisfactory to be able to report that no serious spread of the disease has taken place during the year in the commercial fruit areas. A slight extension is, however, noticeable in the non-commercial areas, the infection being mainly confined to hawthorn hedges. A slight outbreak was discovered in one or two fruit-trees close to Wanganui. Prompt measures were taken to prevent further infection, and it is not considered that any serious trouble will be experienced in this locality.

Brown rot in stone-fruits has again been prevalent, more especially in the Auckland District, where the crops have been largely reduced on account of this disease. The matter of arriving at some efficient method of controlling the disease has been receiving attention for some time past, but so far no satisfactory results have been obtained, mainly on account of orchardists generally not carrying out

the minimum amount of work necessary to give the Division's recommendations a reasonable chance of success. Efforts are still being made, in conjunction with the Biological Laboratory, to find some suitable method for the control of the pear-leaf-rolling midge, which is doing a considerable amount of damage in some localities—chiefly in the Auckland District. In several districts mealy bug continues to give a good deal of trouble. Colonies of the natural enemy of this pest have been distributed from the Biological Laboratory to different infected localities, and the results will be watched with interest. Reports to hand indicate that the natural enemy to the woolly aphis (*Aphelinus mali*), colonies of which have been distributed by the Cawthron Institute to various parts of New Zealand during the past two seasons, is still doing excellent work in the control of this pest.

Export of Fruit.

The 1924 fruit export season was a record one, a total of 243,429 cases being exported, representing nearly double the quantity shipped during the previous year. Of this total 200,643 cases of apples and 1,385 cases pears were shipped to Great Britain ; 39,178 cases apples and 47 cases pears to South America ; and 2,176 cases apples to Honolulu. The bulk of the fruit was shipped under the Government guarantee of 1d. per lb. net return to the growers. The prices obtained on the Home markets were, generally speaking, satisfactory, and little recourse was made on the guarantee. Returns obtained on the South American market were not so good, owing chiefly to the fact that the bulk of the consignments had more or less deteriorated on the voyage. As a result the claims made under the guarantee in respect to these shipments were fairly considerable.

Some valuable information was obtained by Mr. W. H. Rice, of this Division, who was commissioned to proceed to Montevideo at the beginning of last export season and inspect and report on the various New Zealand shipments coming to hand, and also to inquire fully into the conditions prevailing on the South American markets. Amongst other matters Mr. Rice mentions in his report that he is strongly of the opinion that to facilitate fruit arriving in South America in good condition it should be shipped in cool storage and not as ordinary cargo, as has been the custom hitherto.

The Government guarantee has been extended to shipments of apples made during the 1925 export season, the guarantee being restricted to a maximum of 300,000 cases. A feature of the 1925 export arrangements is that several direct shipments will be made from Nelson during the season.

Instructional and Experimental Work.

In addition to their other duties, practical demonstrations and lectures on matters relative to orchard-management generally, pruning, spraying, &c., have been continued during the year by the Orchard Instructors in their respective districts. In addition to these, apple grading and packing classes have been conducted in the main commercial centres. A considerable number of candidates sat for the Department's certificate of competency in pruning and spraying, apple grading and packing—a fair percentage being successful.

Of the co-operative fruit-testing areas originally established by the Department in co-operation with reliable fruitgrowers, only two now remain in operation, the others having fulfilled the requirements for which they were planted. The two still under action are situated at Tanekaha (North Auckland) and Henderson (Auckland). That at Henderson is devoted to citrus-testing, which has reached an interesting point of development. The plot at Tanekaha was planted in mixed fruit-trees in 1922, and at present is only in the initial stage.

Te Kauwhata Horticultural Station.

The usual farming operations were carried out at this station during the year. Exceptionally wet weather experienced during the greater part of the year interfered to a fair extent with outside work. This was ideal for the growth of grass and field crops generally, but detrimental to fruit-growing. The breeding-ewes wintered fairly well and produced a fair percentage of lambs. Gross returns from sheep for the year were : Wool and skins, £152 19s. 9d. ; fat lambs, £314 5s. 4d. ; fat sheep, £8 15s. 10d. : total, £476 0s. 11d. Approximately 250 tons of dry wattle-bark were harvested, 200 tons being sold and the balance stored in sheds till required by tanners. A quantity of wattle timber has been disposed of on a royalty basis.

In the vineyard the necessary work of pruning, spraying, and cultivation was carried out. The grape crop, generally speaking, was only fair. With a view to increasing the crop a scheme of manuring is under consideraton. The sales of wine manufactured at the station were slightly in excess of those of the previous year, the total quantity sold being 6,721 gallons.

Orchard Registration and Orchard-tax.

During the year a total of 6,774 commercial orchards were registered, representing some 30,000 acres of all varieties of fruits. Tax-demand notices were issued to all registered orchardists, and the amount of £1,970 collected in orchard-tax. A considerable amount of clerical work is involved in the checking of payments, changes of ownership, abandoned orchards, &c.

Registration and Inspection of Nurseries.

This work has progressed smoothly, and little difficulty has been experienced in the carrying-out of the requirements of the regulations. Nursery stock generally is in good condition and comparatively free from disease. A total of 587 nurseries were registered and inspected and certificates issued. The registration fees collected amounted to £591 10s.

Local Markets.

The Inspectors report that the bulk of New-Zealand-grown fruit and vegetables coming on to the local markets is of good quality and free from disease. At the commencement of the season apples and pears were inclined to be immature, having apparently been picked too soon in order to catch an early market.

The requirements of the regulations relating to the sale of New-Zealand-grown fruit for local consumption are now being more satisfactorily complied with by growers generally, although in some instances an improvement is desirable in the matter of packing and branding of cases. A voluntary local Control Board was established in the Nelson District for handling the 1924 fruit crop. Some 120,000 cases of fruit were dealt with. Although the scheme could not be considered a complete success, it certainly demonstrated that a great deal of fruit could be sold direct to the retailer at fixed prices for standard grades, and also that grades could be kept more uniform and attain the elimination of low-grade fruit from the local markets.

Fruit Cool Storage.

The capacity of the recognized cool stores has been fully taxed during the season, and the bulk of the fruit has kept in good condition. Further extensive experiments for the control of flesh-collapse in apples have been conducted by Mr. R. Waters, of the Biological Laboratory, in co-operation with an officer of this Division. It is satisfactory to note that the results obtained are very encouraging, the trouble being less prominent than formerly. Further experiments which are being carried out this season will include pears.

Proposed School of Horticulture.

This is a matter which has been strongly advocated by Fruitgrowers' and Nurserymen's Associations and others for some considerable time past. Such an institution could do a great deal of good and necessary work. The New Zealand Institute of Horticulture (Inc.), established in 1923, is making satisfactory progress under the management of its secretary (Mr. G. A. Green).

Imported Fruit, Plants, etc.

There has been a considerable increase in the quantity of fruit and plants imported through the main ports of entry as compared with the previous year, the bulk of the lines arriving in good condition. A few lines of oranges and mandarins from Australia arrived in an overripe condition. Fruit-fly infection was responsible for the destruction of one or two consignments of island oranges. The necessary fumigation had to be carried out in connection with a number of lines found on examination to be infected with live scale, mealy bug, &c. The new up-to-date fumigating-building at Auckland was completed during the year. This was badly needed, as the old building, which had been in use for a large number of years, had become quite unsuitable for the efficient carrying-out of fumigation work.

Hop-culture.

Reports to hand from the Nelson and Motueka districts indicate that the hop crop will be well above the average, some record crops having been harvested. The question as to what prices will be realized will largely depend on the quantities of hops at present on hand on the Home market. According to the Customs figures 4,469 cwt. of hops, valued at £31,112, were exported from the Dominion during the year.

The quantities and values of hops exported during the last five years are as follows: 1921, 1,765 cwt., £19,201; 1922, 2,056 cwt., £18,054; 1923, £2,243 cwt., £21,153; 1924, 3,883 cwt., £27,615; 1925, 4,469 cwt., £31,112.

Tobacco-culture.

The growing of tobacco is still receiving considerable attention, some 300 acres being now under cultivation. The question of systematic or organized tobacco-culture in New Zealand is worthy of being thoroughly gone into, both from a production and a marketing point of view.

Viticulture and Winemaking.

There is a gradual increase in the area grown in grapes, both for wine purposes and for dessert. The past season has been a satisfactory one, and the returns both for outdoor and under glass were in excess of those of the previous year. Owing to the larger quantity of dessert grapes produced outside, prices were a little easier, but still quite remunerative to the grower. The yield from wine grapes is estimated at 85,000 gallons of wine, valued at approximately £34,000. A satisfactory demand still exists for New-Zealand-made wines, and winemakers generally are doing good business. Some splendid crops have been obtained from vines grown under glass, the returns from glasshouses being estimated at £32,000.

Cider.

The manufacture of cider is steadily extending, especially in the Nelson District, where a large quantity of low-grade apples which would otherwise be unsaleable is utilized in the manufacture of this beverage. The quantity of cider during the year is estimated at 45,000 gallons, valued at £11,250.

The Beekeeping Industry.

It is pleasing to note the steady advance that is still being made in the beekeeping industry, both in the North and South Islands. A good indication in this direction is the considerable increase in the sales of beekeeping equipment. Firms operating report that the output of equipment has been greatly in excess of that of previous years. The weather experienced during the 1924–25 season favoured the production of honey in most districts throughout the Dominion. The crop in the Auckland District was an exceptionally good one, and the quality of the honey well above the average. Good average crops were obtained in the other districts, with the exception of Canterbury, where the crops were patchy owing to the dry season prevailing. A noticeable feature is the development of the industry on the west coast of the South Island, where a considerable extension is taking place. The close proximity of the honey-grading store at Greymouth to the centres of production, and the linking-up of the east and west coast by rail, have rendered conditions in this district more favourable to beekeeping than in the past.

The activities of the Apiary Instructors have been well maintained in most districts, and as a result satisfactory progress has been made in the eradication of disease. The scheme of employing part-time Apiary Inspectors to assist the Apiary Instructors was again put into practice during the past year in certain areas in the Waikato, Wairarapa, and Southland districts, and was extended to include a portion of the Canterbury District. Taken as a whole the work carried out by these temporary Inspectors has been satisfactory, the concentrated inspection resulting in a more thorough cleaning-up of diseased apiaries in the localities concerned.

An additional Apiary Instructor has been appointed for the Marlborough, Nelson, and South Island west coast districts, with headquarters at Nelson. This should greatly improve the position in the South Island, and will relieve the Christchurch Instructor of the more isolated portions of his district and enable him to devote more attention to the South Canterbury areas than has been possible in the past. The west coast, which hitherto has received only spasmodic attention, will benefit largely, and this district, together with the other areas controlled by the Nelson Instructor, will now receive more systematic inspection.

A poll of honey-producers taken in December resulted in the proposal that the Honey-export Control Act passed last session be brought into operation being carried by a large majority. The setting-up of the New Zealand Honey Control Board marks the year as an eventful one in the history of the beekeeping industry. The function of the Board is to control all honey for export, and the pooling of the whole of the New Zealand crop should make for consolidation and increased prices to producers.

Export of Honey.—The whole of the grading of honey for export at the different grading stores is carried out by one officer attached to the Division. While this arrangement makes for uniformity in the grading, it is at the same time recognized that too much dependence cannot be placed on the services of one officer. With this in view, it has been arranged for instruction in this branch of the work to be given to the other Apiary Instructors, the idea being to eventually supply an understudy to assist the present officer. There has been a marked improvement in the casing of lines for export. The quantity of honey exported during the year was 10,836 cwt., valued at £30,549—a considerable increase as compared with the previous year's figures. The following shows the quantities and values of honey exported from the Dominion during the last five years ending 31st March: 1921, 7,633 cwt., £30,962; 1922, 8,542 cwt., £31,943; 1923, 10,605 cwt., £43,032; 1924, 9,157 cwt., £26,910; 1925, 10,836 cwt., £30,549.

Registration of Apiaries.—Approximately 7,000 apiaries are now registered, representing some 99,755 colonies of bees. Although the registrations to date have been fairly satisfactory, a fair number of unregistered apiaries exist in isolated districts, and it was found necessary to institute proceedings against a number of unregistered beekeepers during the year. The next triennial registration of all apiaries takes place next year (1926), when it is hoped the registrations will be more complete.

Staff.

Mr. A. Gooding, Apiary Instructor, Hamilton, resigned from the Department at the end of the year in order to take over the management of a large apiary concern. His retirement will be a distinct loss to the Department. I have to thank all members of the staff for their valuable assistance during a particularly busy year.

FIELDS DIVISION.

REPORT OF A. H. COCKAYNE, DIRECTOR.

The Agricultural Year.

The agricultural year has been extremely favourable for production. The dry summer of 1923–24 was followed by remarkable grass-growth over all parts of New Zealand, due to abundant warm autumn rains and a particularly mild winter. The comparative failure of the root crop in many districts was therefore not much felt by farmers, and stock generally wintered in good condition; a fact reflected in the high butterfat yield and excellent meat and wool production of the season.

The area in cereals showed an increase of about 60,000 acres in oats and a decrease of about 10,000 acres in wheat. In the case of wheat it is clear that so long as wool and meat prices remain at anything like their present level the area devoted to this crop will decrease to the point that it is grown only

on those mixed farms where the yield is high and where its production is essential in keeping the farm team fully employed. This definitely lessens the cost of special fodder production, apart from any great profit being derived from the wheat crop. That is, wheat as a regular farm crop as profitable in itself as other major farm products will disappear, and whether a farmer grows wheat or not will depend, quite apart from the rise and fall of prices, on whether he is forced to maintain a full team for his fodder-crop production or not. So far as oats are concerned, the replacement of the horse by mechanical traction and the consequent lessened demand for horse-feed, will reduce the area sown as the years go on, but it is likely to remain sufficient for all local requirements, except in years of crop failure. Last season represented one of our failure years with regard to oats, and heavy importations of white oats from Canada and chaff from Australia took place.

The wet, early summer of 1924–25 throughout the cereal-growing belt of the South Island was marked by an alarming development of rust and mildew, but the harvesting returns show that their effect on the wheat crop was not serious. In the case of oats, many crops were badly damaged with rust, and the amount of undergrade chaff is far above that of normal years.

Probably the most striking feature of the year was the great increase in the top-dressing of grassland with phosphatic fertilizers. Auckland and Taranaki have for many years past shown that top-dressing is the farmers' most profitable investment, but outside these districts its immediate money-earning value was not sufficiently recognized. The movement has now become Dominion-wide, and its extension on to every farm of the country is now only a matter of time. The work of the Instructors in Agriculture has been a potent factor in this development.

Instructors in Agriculture.

During the year one assistant Instructor in Agriculture has been appointed, but as he is attached to the teaching staff of Ruakura Farm of Instruction no strengthening of the field staff has taken place. With the limited number of Instructors—six senior and eight junior officers—it is impossible to organize their work on a basis satisfactory both to the Department and to the farmer. The individual instructorates are so large that many districts can only be visited for brief periods at very long intervals. The essential pre-requisite for successful extension—frequent personal contact between Instructor and farmer—cannot thus be maintained. Experience has shown that advice by correspondence is satisfactory only with a very limited percentage of farmers, and is comparatively ineffective in comparison with actual oral information given on the farm, or in farming-centres to individuals or groups of farmers having similar interests in common. Thus the personal farm visit, field days on farms or on demonstration areas, and day and evening addresses in farming-centres constitute the only rational methods of really successful farm-extension work. In order to in any way cater for the growing demand on the part of the farmer for these methods of direct instruction an increase in the number of Instructors is imperative. A difficulty, however, at once arises. A capable Instructor must not only be well trained in modern agricultural thought and practice, but he must also be extremely well versed in local conditions and local requirements. Such men are few and far between. Advice of a general character, or that based mainly on theoretical considerations, is frequently valueless. The farmer wants to know exactly what to do, and how best to do it, under the particular conditions of soil, climate, and finance with which he is faced. Agricultural extension work is thus fundamentally different from ordinary agricultural teaching, where a solid grounding in the principles alone, both scientific and practical, is the main objective. It is far easier to secure men capable of carrying out general agricultural teaching and agricultural investigation than it is to secure really efficient farming advisers. In consequence of this it would appear to be a wise plan to increase the number engaged in agricultural investigation and gradually draft them into the instruction service when they have gained sufficient localized experience. This scheme would have the advantage of being able to make use of the best of those agricultural graduates whose youth generally precludes them from possessing that wide experience necessary to warrant the farmers' confidence.

In general it may be said that an Instructor in Agriculture cannot deal efficiently with a district containing more than two thousand holdings. Even then, if called upon to do any great amount of original investigation, he will not be able to cover the area sufficiently intensively to do full justice either to himself or the farmer. At the present time each Instructor has to try and deal with an average of six thousand holdings, and it is impossible under such conditions to expect a maximum of efficiency. The building-up of a full and highly capable staff, with consequent delimitation of individual districts, is the only solution of the difficulties with which Instructors in Agriculture are at present faced.

Experimental Areas.

Puwera.—The work at Puwera has continued along similar lines as formerly. The main object of this area is to determine the best and at the same time most economic method of converting gum-land into permanently productive grass-land suitable for milk-production. The investigations to date show that excellent grass-land estimated to carry, with only a moderate extra winter-feed provision, one milking-cow to about 2½ acres can be produced at a cost of £15 per acre, including full payment for all labour involved, provided £1 per acre is spent on annual top-dressing with phosphatic manure. The only point that now requires careful study is the actual butterfat-producing capacity of the pastures established, as up to the present they have been on a dry-stock basis. In order to ascertain this point it is proposed to equip the area for dairying at an early date. As there are fully half a million acres of gum-land at present entirely unproductive, it can be seen that the work at Puwera, which was looked upon as amongst the most difficult of gum-soil types, has an extremely important aspect. The results obtained at least indicate that there are great economic possibilities in gum-land soils, and it is confidently expected that finally they will add a not inconsiderable amount to New Zealand's

quota of butterfat. The area has proved of very great value in instruction work, and the dissemination throughout the province of the actual results achieved is having a profound influence on the methods of gum-land farming.

Albany.—This area, originally established to ascertain what useful plants were suitable for gum-land soils, has now but little value. The gum-land problems are not concerned so much with the introduction of any crops specially suited to the virgin soils as they are with the management of the soils themselves.

Marton.—Cereal variety testing, wild-white-clover-seed production, and an elaborate series of top-dressing trials testing the comparative efficiency of very finely crushed Nauru rock phosphate and the ordinary grade of fineness, constitute the main work carried out.

Ashburton.—Winter feeding of ewes on chaffed lucerne hay, and wether and lamb fattening on grazed lucerne, have been continued with remarkably effective results. Trials of seventeen new varieties of wheat for comparative yield were carried out, and it is likely that some of these will replace certain of our present standard varieties. A series of soil-fertility-increase trials have been established. This is perhaps the most important line of research that can be undertaken in the interests of Canterbury agricultural development.

Gore.—Variety testing of cereals, roots, and potatoes represents the main work of the year—in the case of roots particularly from the aspects of dry-rot and club-root. It is proposed to in future devote the major portion of this area to root-crop-disease investigation.

Winton.—Comparative economics of temporary, short-rotation, and permanent grass-land under varying systems is the main work undertaken. The trials at Winton are having a great effect on grass-land management in Southland, and the area is probably the most successful of all the experimental areas. The establishement there of a dairy herd would enable a better interpretation of the results to be secured.

Galloway.—In order to demonstrate the butter-fat capacity of irrigated soil in Central Otago, Galloway has been equipped as a small dairy farm, and a small herd was established during the year. It is proposed to increase this herd to from twenty-five to thirty cows during the coming season.

Waimaunga.—Buildings to enable dairying to be carried out have been erected, and a herd of thirty-five cows is being transferred to the area from Moumahaki.

Subsidized Farms.—The subsidized farms at Stratford and Manaia have continued to do very useful demonstration work.

Co-operative Experiments.

Co-operative experimental work has been mainly confined to manurial trials. These may be divided into those that are mainly of a demonstrational character, and those that are conducted on the most modern lines of field experimentation where the results can be accurately interpreted on statistical lines. The phosphate wheat trials and the comparison between very finely and ordinarily ground Nauru phosphate are of the latter class. The two seasons' work on wheat has shown that in Canterbury 1 cwt. of super increases the yield by 6 bushels per acre, or approximately 15 per cent. The finely ground Nauru rock has not on one season's work given any significant increase over the ordinary 80-per-cent.-fineness grinding.

Accurate statistical measurement of field trials is only possible on comparatively flat uniform land, and so far as top-dressing is concerned these methods are not applicable on unploughable hill country. The fact that the major portion of the grazing-area of the North Island consists of such country has necessitated the planning of co-operative top-dressing trials on a basis hitherto not undertaken by the Department. Large areas of not less than 50 acres are being sown with manure by hand, and the results judged on a comparative basis with unmanured blocks; the stock carried, and their condition, being factors carefully studied. Last season one such area was dealt with, but the work now has been put on a co-operative basis, farmer, manure-merchant, and Department all contributing to the cost on about an equal basis. This season about 1,500 acres will be treated on some twenty-five farms.

Winter Farm-schools.

Ten farmers' schools of a week's duration each were held during the year at the following centres: Dargaville, Ruakura, Stratford, Weraroa, Masterton, Blenheim, Greymouth, Timaru, Dunedin, and Invercargill. These schools are exceedingly popular and are largely attended: at Dargaville, for instance, over two hundred farmers were present at many of the lectures. Apart from the instruction given, the gathering together of large groups of farmers, and their interchange of views is of the greatest value.

Permanent Farm-school, Ruakura Farm of Instruction.

Over forty students carrying out a two-year course of directed study and practical farm-work are in residence. An extra teacher, Mr. Holmes, M.Sc., B.Ag., was appointed during the year. A prospectus giving full details of the course has been issued.

Boys' and Girls' Agricultural Clubs.

These clubs are still conducted in the Auckland, Taranaki, Wellington-West Coast, Wairarapa, and Otago districts, and on the west coast of the South Island. Taranaki still remains the strongest centre, but an increase in the number of clubs has taken place in the Wellington-West Coast and Wairarapa districts.

Farmers' Field Competitions.

These competitions were conducted on the same lines as in previous years, and the interest taken in the competitions was well maintained. The movement tends to spread, and at times great difficulty is experienced in getting the crops judged within a reasonable time.

The Hemp Industry.

The amount of hemp produced for the twelve months ended 31st March, 1925, showed a decided increase over the amount produced for the previous twelve months. The total number of bales of hemp graded for the year ended 31st March, 1925, was 85,976, as compared with 63,879 for the previous year, an increase of 22,097 bales. The quantity of tow graded was 22,323 bales, as against 15,563, an increase of 6,760. Of stripper-slips 2,189 bales were graded, as against 161, an increase of 2,028 bales. The number of bales of stripper-tow graded was 1,318, as against 1,204, an increase of 114 bales. Of the hemp graded 9·71 per cent. was good-fair, 52·28 per cent. high-fair, and 30·88 per cent. fair grade; 16·92 per cent. of the tow was first grade, 64·49 per cent. second grade, and 15·39 per cent. third grade; stripper-tow was 17·22 per cent. first grade, 71·90 per cent. second grade, and 6·30 per cent. third grade.

Biological Laboratory.

Seed-testing Station.—The activities of this station have been well maintained during the past year. For the twelve months ending December, 1924, 8,266 seed-samples were received for testing; of these approximately 8,000 were submitted by seed-merchants. As the seed-testing work has become intimately bound up with the New Zealand seed trade, absolute accuracy is essential in all analyses and tests made. Much work of an experimental nature has been carried out to endeavour to discover the best means of obtaining the maximum growth of different species. During the year much valuable data was collected in connection with the loss of vitality of Chewings fescue. The Department has carried out a considerable amount of experimental work with Chewings fescue during the past three or four years, but to enable this work to be carried to a successful conclusion these experiments will have to be conducted on a much larger scale than that hitherto attempted. Investigational work has been commenced into the poor germinating-qualities of Sandon rye-grass. The average germination capacity of the rye-grass from this district has been low for the last two or three years, and this year assistance has been asked for on behalf of the Sandon rye-grass growers. Up to the present the work has been confined to the Laboratory, where experiments designed to test the behaviour of the seed under various conditions of temperature, humidity, &c., are being carried out. Later field experiments will be commenced. During the year a large number of seed-specimens have been identified, advice given to farmers and the trade, statistical information tabulated and issued, and seed collections made up and issued to schools and colleges. A large number of seed-growers and seed-merchants have been visited in various parts of New Zealand in conncetion with special problems relating to the production, sale, and export of seed.

Agricultural Botany.—As in previous years, large numbers of specimens have been received for identification, including those of grasses, weeds, and various other plants. During the year the herbarium has been greatly increased, and these collections are proving very helpful in the work of all branches of the Laboratory. Besides plants of direct economic importance, indigenous ones are collected, such specimens being of great use in making exchanges with other countries.

Blackberry Investigation.—In connection with the blackberry problem regulations have been gazetted giving conditions under which private experimenters can apply for the £10,000 bonus offered by the Government. The investigation into methods of control or eradication has been continued during the year. A section of several acres densely covered with blackberry has been secured in Wairoa County, where a field experimental area is being established. Researches into the biological, chemical, and ecological methods of control in the field are entailing a large amount of laboratory work, and during the past six months over ten thousand tests have been made, these being mainly of substances for, and methods of, eradication. In addition, experiments with control measures by the use of parasites, both insect and fungous, are being initiated, and in this connection mycologists and entomologists have been communicated with in all parts of the world in the hope of securing some useful parasite. Further work is being carried out in several places with top-dressing experiments and the use of goats.

Entomology.—The rearing and distribution of *Cryptolaemus* for the control of mealy bug has been carried out successfully on a much larger scale than last year, and facilities for extending this work on a wide basis are being made available. Reports regarding the utility of this ladybird in the field are extremely favourable, and it has become established at certain points where it has survived a winter. The ladybird liberated against the gum-tree scale in the North Island has checked that blight, though a great deal of damage had been done by the latter. Soil-fumigation experiments with calcium cyanide against pear-midge have given definite results. Work with this material as a soil and plant fumigant against other insects is now under way. Lectures given to farmers at various centres dealt with the different phases of entomology in relation to crop and live-stock development, orchard practice, and timber conservation. Material collected or sent in by correspondents has been set up and added to the collections, while a great deal has been photographed and set aside for exhibit purposes. An exhibit consisting of show-boxes containing various insect pests in their different stages has been prepared. The project is to extend this scheme to include as many as possible of the insects of major interest to economic development. A work entitled "Forest and Timber Insects in New Zealand" is in the press; it is being published by the State Forest Service.

Mycology.—Owing to the completion of the manuscript of a book dealing with the fungous diseases of fruit-trees (now in the press), the staff of this Section have been able to devote their time more fully to dealing with the diseases of agricultural crops. In April, 1924, the Mycologist obtained

leave of absence to visit the Imperial Mycological and Botanical Conferences held in London. While abroad he obtained the latest information relative to the technical side of his subject, and on his return in September this knowledge was incorporated in the routine work of the laboratory, with marked results in so far as cultural technique was concerned. Experiments during the season were undertaken in cereal-smut control. Results obtained showed that modified hot-water treatment efficiently combated loose-smut of wheat; and that for stinking-smut of wheat and loose-smut of oats copper-carbonate dust gave the most satisfactory results. The latter treatment, owing to ease of process and cheapness of material, will replace the formalin and copper-sulphate treatments previously used throughout New Zealand. Potato-diseases are now under investigation in the laboratory. A cheap and rapid method of controlling corticium disease of potatoes has been evolved, for it was found that under New Zealand conditions the standard treatment for this disease failed to give complete control. A serious collar-rot disease of peas is now under investigation, and experiments for its control are being tested under laboratory conditions. A study of dry-rot of swedes has been undertaken and much information obtained regarding the life-history of the causal organism. As in past seasons, the mycological herbarium has been considerably added to, both by collections made in New Zealand and by specimens obtained in exchange from abroad. Routine work in connection with the diseases of agricultural and horticultural plants and their control, and naming of fungi sent for identification, occupies about three-fourths of the time of the Mycologist. This material is forwarded by farmers and fruitgrowers, Agricultural and Horticultural Instructors, State Forest rangers, and Education agricultural instructors. In addition a series of lectures and lantern-slides for the Ruakura Farm of Instruction courses has been prepared.

Fruit Cool Storage.—Extensive investigations have been made during the past year into the causes of the extensive losses that have occurred under storage conditions. Concerning the rotting of local and export apples attention has been directed to the following points: Over-maturity; picking into contaminated cases; puncturing or otherwise rupturing the skin in picking, grading, packing, and transport; delayed storage or "cool storage" of such fruit in temperatures over 40°F. Recommendations to thoroughly disinfect certain cool stores have been given effect to in order to avoid infection of fruit at the store. Summarizing the fourth annual report upon the research at the cool stores into the cause and control of apple flesh-collapse, it may be said that whereas in former years certain growers reported a 50-per-cent. loss amongst Sturmers (and certain other varieties) from this disease, last year the commercial loss did not exceed 2 per cent. Use was made experimentally of a new system in which the condition of certain apples was measured from time to time and the results employed as a guide as to what storage conditions to impose throughout the storage season. Further researches into cool-storage methods are being undertaken this season.

Bacteriology.—Much of this work has been of a routine nature, particularly in regard to diseases of bees. Much more material has been collected in the study of *Nosema apis*, but the organism so far cannot be associated with any specific disease. Another disease of bees—paralysis—has been dealt with from a bacteriological standpoint, but from many examinations the presence of bacteria which would account for the disease could not be demonstrated. In the spring of 1924 a disease of pear shoots and flowers occurred in the Nelson District, and was at first suspected of being due to fireblight. Apple twigs from trees in Auckland, Canterbury, and Hawke's Bay showing wilting have been received at the laboratory from time to time, and this disease, together with the one from Nelson, were studied comparatively. The conclusion to date of the research is that in both cases, though bacteria are always present, the trouble was due to physiological causes. Periodically the Laboratory undertakes bacteriological examination of the milk utensils and machinery of the Wellington City milk-supply. Such examinations have shown that the handling of the milk is very satisfactory, and that where improvements have been suggested these improvements have satisfactorily reduced the ultimate bacterial content of the milk. The causes of several diseases of crops have been investigated, chiefly those affecting potatoes, tomatoes, and peas, and preliminary work on the control of these diseases is now in progress. In regard to the disease of peas a control has been evolved, but further work is required.

Agrostology.—The deteriorated hill country of the North Island has claimed the greatest amount of attention during the past year. The experiments in regrassing laid down in the autumn of 1924 have been carefully examined, and the sowing of a further series of experimental seed mixtures, based on information gleaned from the past year's operations, has just been completed. Approximately 140 acres of hill country have been sown. From a careful detailed study of these sowings it is hoped to arrive at the cheapest and most efficient seed mixture that can be employed in this country. Besides the grass seedings, other aspects of hill country are receiving attention. Among these are—exact conditions that determine dominance and succession in secondary growth, the economics of cattle as a means of secondary-growth control, methods of management, costs of maintaining the country, methods of fertility upkeep, general economics of hill-country farming, and detailed farm surveys. In connection with the bringing-back of reverted hill country, the Agrostologist formed one of a special committee set up by the Lands Department to investigate the state and extent of deterioration and to suggest remedies. The report of this committee has been submitted to the Hon. Minister of Lands.

Photography.—During the year 1,800 photographs have been taken, and 5,400 prints and 1,535 lantern-slides made. This work is of the greatest value not only for recording and illustration purposes, but also for the purpose of agricultural instruction.

Staff.

The staff of the Fields Division have all rendered good and loyal service, and any success that may have attended the work of this branch of the Department is largely due to the earnestness and hearty co-operation of the officers.

CHEMISTRY SECTION.

REPORT OF B. C. ASTON, CHEMIST.

The work of the past year shows an increase in the number of samples received in all branches, except in the routine examination of butter for water content. The latter work has now been taken over by the Dairy Division, samples being sent to this Laboratory only when there is a likelihood of legal proceedings being taken.

All members of the staff have given good and loyal service. Those officers who are attending Victoria University College have been successful in passing the College and University examinations which they sat for, and have obtained favourable reports from the professors.

Soil Survey.

This work has occupied the greater part of the time of the staff during the year, and 187 further samples were collected personally by the officers of the Laboratory, the work having in general been confined to the soils of the Rotorua district. In addition to these soils fifty-seven samples have been received from Field Officers of the Department, and sixty-one samples from other sources. A series of samples of typical Wellington soils has been supplied to Professor Benson, Otago University, in connection with research work on the occurrence of goitre in New Zealand. A topographical survey of the Rotorua district is at present being carried out by the Survey Department, and the results, when completed, will be of great assistance in connection with the soil survey of the same district which is being under taken by this Laboratory.

Bush Sickness.

The research on "iron starvation" or bush sickness, has been continued. The results of the past five years' work at Mamaku Farm were summarized and published in the Department's *Journal* for April, 1924. The Laboratory work for the same period has also been summarized, and articles on the results obtained appeared in the *Journal* for May, June, July, and August, 1924. Several visits have been paid to Mamaku and the surrounding district, and further experimental work with curative medicines and with methods of soil-treatment has been put under way.

Malnutrition of Sheep in South Canterbury.

In June, 1924, it was reported by the Live-stock Division that there was a difficulty in raising and fattening sheep on certain river-terrace lands in South Canterbury. These were stated to grow beautiful pasture, including clover, but after weaning-time the ewes picked up very slowly, or fell back in condition, scouring badly. Lambs grew very slowly. It was reported that similar difficulties had been experienced with cattle. The trouble occurred mainly at the time of flush of green pasture in spring. The matter was gone into on the spot by an officer of the Laboratory in company with the local Government Veterinarian. Representative samples of soil were taken from both upper and lower terraces. Chemical analysis showed that these soils were plentifully supplied with plant-foods, especially phosphoric acid and lime, but were deficient in "available" iron. The following treatment on an experimental scale was advised: Increase of soil-moisture by irrigation; ploughing-in of green crops; application of sulphate of iron to the soil, and feeding of iron ammonium citrate to the stock either in the form of a lick or as treated hay. No report as to the success or otherwise of the treatments is yet available.

Investigation of Wheat and its Products.

A further series of wheat-samples has been experimentally milled and tested during the past year. The varieties tested differed from those received previously, consisting for the most part of lesser-known varieties. Three samples of Yeoman were milled. This is a comparatively new variety, bred at Cambridge, which is stated to crop heavily when grown on typical wheat-lands in England; in addition it has been found to be of sufficient strength to enable it to compete favourably with the good bread-making wheats imported from abroad. The miscellaneous samples were remarkable for their average very good strength. Most of these were grown at the Ashburton Experimental Farm, and contained an amount of gluten much above the average. Whether this is due to environment, the varieties themselves, or the growing season experienced in the summer of 1923-24, only the testing of further samples from future harvests will show. Amongst the total miscellaneous samples, the following contained very good amounts of gluten of good quality and were good strong samples: Essex Conqueror, Marquis, Jumbuck, Red Fife, Red Straw, and Queen Fan. Amongst the medium-strong samples were Zealand, Queen Fair, Hybrid W., Burbank's Super, and Turretfield Eclipse. Of the better-known varieties it was found that the samples of Velvet again maintained a very good average as regards quality. The strength of various Tuscans showed considerable improvement, and this year the average was very good. Victor again proved to be a wheat giving very good yields of flour but of inferior strength Dreadnought was again a good medium-strong wheat. The weight per bushel of the above wheats was calculated, and should prove of interest when compared with the other properties of the different samples. Contrary to results obtained elsewhere, no close correlation between weight per bushel and yield of flour was observed. Nor did there appear to be any connection between weight per bushel and the quality of the grain, or the quantity of the gluten present in the flour.

Cattle-dips.

An examination of samples from the public cattle dips of the tick-infested districts was undertaken in conjunction with the Live-stock Division. It was shown that many of the dips are in an unsatisfactory state, in some cases the dipping-fluid being far below the correct strength. Arrangements have been made by which samples from every dip will be sent to this Laboratory each month during the busy season, and each alternate month during the off season. It is proposed to appoint an officer whose duty it will be to visit and test the dips periodically and collect the samples for the Laboratory.

Lime and Limestones.

Fifty samples of limestone were examined and reported on during the year, and advice has been given as hitherto on the best methods of utilizing deposits.

Fertilizers.

Included in the samples of fertilizers received during the year were thirty-four unofficial samples forwarded by officers of the Department, and twenty-three samples received from farmers and from other sources. One sample of "fertilizer" received from a Waikato farmer proved to be mainly ground limestone, with traces of phosphate and a very small amount of organic nitrogen. Unfortunately, the sample was not sent in until some months after purchase, and on inquiry it was found that the vendors (who had not registered under the Fertilizers Act) were no longer carrying on business. At the suggestion of the Board of Agriculture, field experiments have been instituted to test the effect of finer grinding of Nauru phosphate, the material used being of such fineness that all but a trace passes a sieve of 120 meshes to the linear inch. The tests are being carried out at the Mamaku and Wallaceville Farms, and on experimental areas under the control of the Fields Division.

Toxicological.

An unusual number of cases of poisoning or suspected poisoning of stock have been dealt with during the year. Several cases of poisoning by sheep-dips came under notice. In one instance the use of too strong a solution of an arsenical sheep-dip as a wash for lice resulted in the death of five out of six valuable plough-horses. Difficulty has been experienced in dealing with many cases of suspected poisoning of stock owing to senders forwarding inadequate samples, or samples not properly packed.

Work for the Divisions.

For the Dairy Division many analyses have been made of butters, milks, cheese, casein, &c. A number of proprietary substances offered to the dairy industry for various purposes have been examined and reported on, and samples of parchment paper have been examined for substances which might have an injurious effect on butter. A complaint of "soda flavour" in butter was investigated, and suggestions were made as to its cause and remedy. Assistance has also been given to officers of the Dairy Division in connection with various chemical problems affecting the industry. For the Live-stock Division, the meat-marking ink required for branding inspected meat has been prepared. Medicinal preparations required for the bush-sickness experimental work have been made, and the manufacture of licks in brick form has been carried out at the Wallaceville Laboratory. Other medicinal preparations required for experimental work on stock have also been prepared as required. The top-dressing experiments for production of mutton have been continued at Wallaceville. For the Fields Division samples of soils have been examined, and samples of fertilizers used on experimental areas have been analysed and reported on.

Summary of Samples received during the Year.

These were as follow: Soils, 305; fertilizers, 62; reputed fertilizers and phosphate rocks, 34; limes and limestones, 50; toxicological specimens, 40; wheats, 37; flours, pollards, and brans, 6; cheese, 10; milks and creams, 58; butters, 18; caseins, 19; waters, 29; fodder plants, 26; sheep and cattle dips, 71; spraying materials and insecticides, 5; miscellaneous, 74; feeding stuffs, 3: total, 847.

Approximate Cost of Paper.—Preparation, not given; printing (975 copies), £39 10s.

By Authority: W. A. G. Skinner, Government Printer, Wellington.—1925.

Price 9d.]